

Cisco CMTS Cable Command Reference

First Published: 2017-08-28

Last Modified: 2025-04-25

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

© 2017–2025 Cisco Systems, Inc. All rights reserved.



CONTENTS

CHAPTER 1 **Cable Commands: a through cable-modem** 1

ac-start-delay 2

ac-stop-delay 4

access-denied 6

activate-rule at-byte-count 8

active 11

add-priv-data 12

admission-control max-reserved-bandwidth 13

admission-control application-type 15

analog 17

annex 18

annex modulation 19

announce-event-profile 21

application-id 23

assign 24

attributes 26

auto-channel-id 28

base-channel-power 29

bind-vcg 30

block-unref-pids 31

CHAPTER 2 **Cable Commands: cable a through cable c** 33

cable acfe constant-eir-demand 35

cable acfe enable 36

cable acfe guar-bw-sync-period 37

cable acfe max-bonus-bandwidth 38

cable acfe max-eir-ratio 39
cable admission-control 40
cable admission-control ds-bandwidth 42
cable admission-control event 45
cable admission-control max-reserved-bandwidth 47
cable admission-control preempt priority-voice 49
cable admission-control us-bandwidth 50
cable application-type include 53
cable application-type name 57
cable arp 59
cable arp filter 61
cable asf-qos-profile 64
cable attribute-mask 66
cable bgsync 68
cable bgsync active 70
cable bonding-group-id 72
cable bonding-group-secondary 75
cable cache-snmp active 77
cable channel-group 78
cable clock clear-counters 79
cable clock dti 81
cable clock dti clear-counters 82
cable clock force 83
cable clock source-midplane 85
cable clock upgrade 87
cable cm-status 88
cable cm-status enable 90
cable cmc 93
cable cmc image_upgrade 96
cable cmcpe-list valid-time 97
cable cmts-id 99
cable config-file 100
cable controller-profile 104

CHAPTER 3 Cable Commands: cable d 105

cable d31-mode 108

cable d40-mode 110

cable dci-response 111

cable dci-upstream-disable 113

cable def-phy-burst 115

cable default-phy-burst 117

cable depi multicast pool 120

cable depi multicast pool redundant include-video-controller 121

cable depi multicast statistic monitor 124

cable device 125

cable dfo-retry-count 127

cable dhcp ipv4 profile 128

cable dhcp-giaddr 129

cable dhcp-insert 133

cable dhcp-parse option 135

cable diaglog 136

cable diplexer-band-edge 137

cable diplexer-mdd-override-band-edge 138

cable divert-rate-limit 139

cable docsis30-voice downstream req-attr-mask 140

cable docsis-ver 142

cable dot1q-vc-map 143

cable dot1q-vc-map port-channel 146

cable downstream annex 147

cable downstream attribute-mask 149

cable downstream channel-id 150

cable downstream-channel-id automatic 152

cable downstream controller-profile 153

cable downstream description 154

cable downstream dsg 155

cable downstream dsg chan-list 156

cable downstream dsg dcd-enable 158

cable downstream dsg disable 160
cable downstream dsg rule 161
cable downstream dsg tg 163
cable downstream dsg tg channel 165
cable downstream dsg timer 167
cable downstream dsg vendor-param 169
cable downstream freq-profile 171
cable downstream frequency 172
cable downstream if-output 175
cable downstream interleave-depth 177
cable downstream modulation 179
cable downstream ofdm-chan-profile 181
cable downstream ofdm-flow-to-profile 183
cable downstream ofdm-modulation-profile 185
cable downstream ofdm-power-profile 186
cable downstream ofdm-prof-mgmt exempt-sc-pct 188
cable downstream ofdm-prof-mgmt mer-margin-qdb 189
cable downstream ofdm-prof-mgmt prof-dwngrd-auto 190
cable downstream ofdm-prof-mgmt prof-order-method 191
cable downstream ofdm-prof-mgmt prof-upgrade-pma 192
cable downstream ofdm-prof-mgmt recommend-profile-age 193
cable downstream ofdm-prof-mgmt rxmer-poll-interval 194
cable downstream ofdm-prof-mgmt unfit-profile-age 195
cable downstream override 197
cable downstream power-down-2nd-module 199
cable downstream qam-profile 200
cable downstream qos wfq weight 201
cable downstream rate-limit 203
cable downstream rf-power 206
cable downstream rf-shutdown 209
cable ds-high-low-rate-ratio 212
cable ds-max-burst 213
cable ds-resiliency 216
cable dsg 217

cable dsg cfr 221
cable dsg chan-list 224
cable dsg client-list 226
cable dsg keepalive 228
cable dsg name-update-interval 230
cable dsg tg 231
cable dsg tg channel 233
cable dsg tg channel ucid 235
cable dsg tg channel vendor-param 237
cable dsg tg default-priority 239
cable dsg tg priority 240
cable dsg timer 241
cable dsg tunnel 243
cable dsg tunnel srv-class 245
cable dsg vendor-param 247
cable dynamic-bonding-group 249
cable dynamic-bw-sharing 251
cable dynamic-flow vrf 253
cable dynamic-qos trace 254
cable dynamic-secret 255
cable dynamic-secret exclude 263
cable dynamic-secret tftp insert-upgrade-server 265

CHAPTER 4 **Cable Commands: cable e through cable i** 267

cable enable-trap 268
cable event priority 271
cable event syslog-server 274
cable event throttle-adminStatus 277
cable event throttle-interval 280
cable event throttle-threshold 282
cable falcon-100g 284
cable fiber-node 285
cable filter group 288
cable flap-list aging 295

cable flap-list insertion-time 297
cable flap-list miss-threshold 299
cable flap-list power-adjust threshold 301
cable flap-list size 303
cable freq-range 305
cable frequency-exclusion-band 310
cable helper-address 311
cable host access-group 315
cable high-priority-call-window 317
cable igmp static-group 319
cable init-channel-timeout 321
cable insertion-interval 322
cable intercept 324
cable ip-init 327
cable ip-broadcast-echo 328
cable ip-multicast-echo 330
cable ipc-stats 332
cable ipc-watermark 333
cable ipv6 dhcp-insert 334
cable ipv6 dhcp-relay override 336
cable ipv6 source-verify 337
cable ipv6 source-verify dhcp ns-probe 340
cable ipv6 source-verify leasequery-filter downstream 342

CHAPTER 5 **Cable Commands: cable l** 343
cable l2vpn 345
cable l2-vpn-service atm-vc 346
cable l2-vpn-service default-nsi 347
cable l2-vpn-service dot1q 349
cable l2-vpn-service xconnect 351
cable l2-vpn-service xconnect nsi dot1q interface port-channel 353
cable l2-vpn dot1q-nsi-redundancy force-switchover 354
xconnect backup force-switchover 355
cable l3-mobility 356

cable lcha partial-service-reset-timer 358
cable lcha sw-reset 359
cable license 100G-conversion 360
cable linecard auto-rommon-downgrade 361
cable linecard auto-rommon-upgrade 362
cable linecard critical-event-poweroff 363
cable load-balance d20-ggrp-default 365
cable load-balance d20 GLBG auto-generate 368
cable load-balance d30-ggrp-default 370
cable load-balance docsis-enable 373
cable load-balance docsis20-enable 374
cable load-balance docsis30-enable 375
cable load-balance docsis30-enable dynamic downstream 378
cable load-balance docsis30-enable static 379
cable load-balance docsis30-dynamic-enable 380
cable load-balance docsis-group 381
cable load-balance docsis-policy 384
cable load-balance exclude 385
cable load-balance fixed-primary-channel 389
cable load-balance group 390
cable load-balance group (interface) 395
cable load-balance group (Supporting Dynamic Channel Change) 398
cable load-balance group interval 400
cable load-balance group policy 402
cable load-balance group policy ugs 404
cable load-balance group threshold 406
cable load-balance group threshold (Supporting Dynamic Channel Change) 411
cable load-balance method-utilization min-threshold 413
cable load-balance modem max-failures 414
cable load-balance restrict modem 415
cable load-balance rule 416
cable load-balance static cm-delay 418
cable logging badipsource 419
cable logging downstream-index 422

cable logging layer2events 424

CHAPTER 6 Cable Commands: cable m to n 427

cable map-advance 429
cable match address 431
cable max-hosts 433
cable mc-link-stat ignore 435
cable metering data-per-session 436
cable metering destination 438
cable metering filesystem 442
cable metering ipdr 445
cable metering ipdr-d3 447
cable metering localtime 449
cable metering source-interface 450
cable modem access-group 453
cable modem change-frequency 455
cable modem max-cpe 456
cable modem max-hosts 458
cable modem opt0 460
cable modem qos profile 461
cable modem remote-query 463
cable modem service-class-name 466
cable modem v6-max-cpe-prefix 468
cable modem vendor 469
cable modulation-profile 471
cable modulation-profile global-scheme 481
cable mod-profile-ofdma 483
cable mod-profile-ofdma data-iuc modulation pilot-pattern cwerr-downgrade-iuc 485
cable monitor 487
cable mrc-mode 491
cable mtc-mode 493
cable multicast auth enable default-action 495
cable multicast auth profile-name 496
cable multicast group-encryption 497

cable multicast group-qos 498
cable multicast group-qos default 500
cable multicast mdf-disable 501
cable multicast qos group 503
cable multicast ses-cache 505
cable multicast source 507
cable nd 508
cable nd timeout 509
cable nd validate 510

CHAPTER 7 Cable Commands: cable o through cable r 511
cable ofdm-rf-change-trigger 514
cable ofdma-frequency-exclusion-band 516
cable ofdma-frequency-unused-band 517
cable oudp-leak-detect 518
cable oudp-leak-detect session-id 518
cable oudp-leak-detect 521
cable oudp-leak-detect 522
cable oob 523
cable power 524
cable pre-equalization exclude 527
cable primary-sflow-qos11 keep 530
cable privacy 532
cable privacy bpi-plus-enforce 536
cable privacy bpi-plus-exclude 538
cable privacy bpi-plus-policy 539
cable privacy clone-detect 541
cable privacy eae-exclude 543
cable privacy eae-policy 544
cable privacy encrypt-alg-priority 546
cable privacy hotlist 548
cable privacy kek 550
cable privacy non-mtc-aes128 552
cable privacy revocation crl skip-sig-check 553

cable privacy revocation enable 554
cable privacy revocation ocsp skip-sig-check 555
cable privacy revocation skip-cm-cert 556
cable privacy revocation timeout 557
cable privacy tek 558
cable profile 560
cable profile rpd-event 565
cable proxy-arp 567
cable qos enforce-rule 569
cable qos permission 572
cable qos pre-registration 574
cable qos pro max-ds-burst 575
cable queue-limit 578
cable ranging cm packet 580
cable ranging upstream packet 581
cable rate-limit-algorithm min-plus-excess 582
cable rcc-template 583
cable rcc-templates frequency-based 584
cable rcp-control 585
cable rcp-id 587
cable reconciliation enable 589
cable reconciliation time 590
cable reduction-mode energy-management dynamic-channel-percent 591
cable reduction-mode energy-management enable 592
cable reduction-mode energy-management process-queue-size 593
cable reduction-mode energy-management ranging-init-technique 594
cable reduction-mode mta-battery 595
cable redundancy hashfilter 597
cable redundancy myid 599
cable redundancy node 600
cable redundancy node frequency 602
cable redundancy target 603
cable redundancy threshold 605
cable registration-timeout 607

cable relay-agent-option 608
cable resiliency cm-max-rbg-moves 610
cable resiliency exclude 611
cable resiliency ds-bonding 613
cable resiliency free-interval 614
cable resiliency idle-interval 615
cable resiliency rbg-throttle 616
cable resiliency traps-interval 619
cable rf-adapt timer 620
cable rf-bandwidth-percent 622
cable rf-change-dampen-time 625
cable rf-change-trigger 626
cable rf-change-up-multiplier 628
cable rf-channel 629
cable rf-channels 634
cable rfswitch copy 636
cable rfswitch delete 637
cable rfswitch reboot 638
cable rfswitch set-active 639
cable rpd 640
cable rpd period-fft (exec mode) 642
cable rpd external-core 643
cable rpd external-core (exec mode) 643
cable rphy static-route 645
cable rphy gcp 647
cable rphy gcp keepalive timeout 649
cable rphy rpd-capability reject-mismatch 651
cable rphy statistics session update-freq 653
cable rphy supso suppress-rpd 654
cable rsvp default-scn 656

CHAPTER 8 **Cable Commands: cable s** 657
cable service attribute ds-bonded downstream-type bonding-enabled 659
cable service attribute non-ds-bonded downstream-type bonding-disabled 661

cable service attribute non-ds-bonded legacy-ranging downstream-type 663
cable service attribute voice-enabled 665
cable service attribute withhold-TLVs 667
cable service class 668
cable service flow activity-timeout 675
cable service-flow inactivity-timeout 677
cable service flow inactivity-threshold 679
cable service flow priority 681
cable service type 682
cable set mpls-experimental 683
cable sflog 684
cable shared-secondary-secret 686
cable shared-secret 689
cable sid-cluster-group 692
cable sid-cluster-switching 694
cable sip cir-scale 696
cable sip fpd-auto 697
cable sip ib-stats 698
cable snmp cache active 699
cable snmp cm-rcs 700
cable snmp iftype ds-phy 701
cable snmp trap detailed-alarm 702
cable source-route 703
cable source-verify 704
cable source-verify dhcp arp-probe 709
cable source-verify enable-sav-static 710
cable source-verify enable-sav-trust-last 711
cable source-verify group 712
cable source-verify leasequery-filter downstream 714
cable source-verify leasequery-filter upstream 716
cable source-verify sav-static-group-override 718
cable spectrum-group (global) 719
cable spectrum-group (interface) 723
cable spectrum-group hop period 725

cable spectrum-group hop threshold 727
cable spectrum-group shared 730
cable submgmt default 732
cable sync-interval 738

CHAPTER 9 Cable Commands: cable t 739
cable tag 740
cable telco-return enable 743
cable telco-return interval 745
cable telco-return registration-ip 747
cable telco-return spd dhcp-authenticate 749
cable telco-return spd dhcp-server 751
cable telco-return spd dial-timer 753
cable telco-return spd factory-default 755
cable telco-return spd manual-dial 757
cable telco-return spd password 759
cable telco-return spd phonenum 761
cable telco-return spd ppp-authenticate 763
cable telco-return spd radius-realm 765
cable telco-return spd service-provider 767
cable telco-return spd threshold 769
cable telco-return spd username 771
cable tftp-enforce 773
cable throttle-modem 778
cable throttle-ranging 780
cable time-server 781
cable toaster-shrink 782
cable toaster-voltage-adjust 783
cable trust 784
cable trust-last 786
cable tx-power-headroom 787

CHAPTER 10 Cable Commands: cable u through cable w 789
Configuring Upstream Cable Interface Features on the Cisco CMTS Routerscable udc-capability 792

cable upgrade dsphy-fw auto 793
cable upstream active-codes 794
cable upstream adjust-frequency 795
cable upstream admission-control 796
cable upstream admission-control max-reserved-bandwidth 800
cable upstream attribute-mask 802
cable upstream balance-scheduling 803
cable upstream bcast-init-ranging tcc-enc excl-timing 805
cable upstream bonding-group 806
cable upstream chan-class-id 808
cable upstream channel-width 810
cable upstream codes-per-minislot 815
cable upstream concatenation 816
cable upstream connector 817
cable upstream controller-profile 821
cable upstream data-backoff 822
cable upstream description 824
cable upstream differential-encoding 825
cable upstream docsis-mode 826
cable upstream dpon 831
cable upstream dps 833
cable upstream equalization-coefficient 834
cable upstream equalization-error-recovery 837
cable upstream ext-power 839
cable upstream fec 840
cable upstream fec-strength 841
cable upstream fragmentation 842
cable upstream fragment-force 844
cable upstream freq-adj averaging 847
cable upstream frequency 848
cable upstream hopping blind 851
cable upstream hop-priority 853
cable upstream ingress-noise-cancellation 855
cable upstream jumbo-grants 858

cable upstream load-balance group 859
cable upstream maintain-psd 861
cable upstream max-channel-power-offset 863
cable upstream max-codes-per-subframe 864
cable upstream max-interleave-step 865
cable upstream max-logical-chans 867
cable upstream max-ports 871
cable upstream min-bwreq-ops 873
cable upstream minimal-voice-jitter 874
cable upstream minislot-size 875
cable upstream modulation-profile 878
cable upstream ofdma-prof-mgmt active-scs-threshold-pct 884
cable upstream ofdma-prof-mgmt downgrade 885
cable upstream ofdma-prof-mgmt exempt-mslot-pct 887
cable upstream ofdma-prof-mgmt mer-margin-qdb 888
cable upstream ofdma-prof-mgmt prof-upgrade-auto 889
cable upstream ofdma-prof-mgmt rxmer-poll-interval 890
cable upstream power-adjust 891
cable upstream power-level 895
cable upstream priority 898
cable upstream qos wfq 899
cable upstream range-backoff 901
cable upstream ranging-init-technique 903
cable upstream ranging-poll 904
cable upstream rate-adapt (global) 906
cable upstream rate-adapt (interface) 907
cable upstream rate-limit 909
cable upstream rate-limit-bwreq exempted-priority 911
cable upstream rate-limit-ccf 912
Upstream Channel Bondingcable upstream resiliency 914
cable upstream resiliency recover 917
cable upstream rf-adapt (logical channel) 918
cable upstream rf-adapt 920
cable upstream rng-holdoff 922

cable upstream scheduling type 924
cable upstream scrambler 926
cable upstream-sharing 928
cable upstream shutdown 929
cable upstream spectrum-group 931
cable upstream spreading-interval 933
cable upstream threshold 934
cable upstream threshold hysteresis 939
cable upstream threshold rf-adapt 941
cable upstream timing-adjust 943
cable upstream unfrag-slot-jitter 945
cable util-interval 946
cable vc-map 948
cable video 950
cable video source-switch 951
cable vrf-steering cable-modem 952
cable wideband auto-reset 953

CHAPTER 11 **Cable Commands: ca through cr** 955

ca-interface 957
ca-system-id 959
channel-group 960
channel-id (cable configuration file) 962
check-scg-at-prov 964
class 966
clear cable admission control counters 967
clear cable arp-filter 969
clear cable bgsync counters 971
clear cable cmc 972
clear cable dsg 973
clear cable flap-list 975
clear cable hop 977
clear cable host 980
clear cable ipc-stats 982

clear cable load-balance 983
clear cable load-balance error-statistics 985
clear cable logging 986
clear cable modem attribute-masks 988
clear cable modem cm-status 990
clear cable modem counters 992
clear cable modem delete 994
clear cable modem device-class 998
clear cable modem flap-counters 1001
clear cable modem lock 1004
clear cable modem name 1007
clear cable modem partial-service 1009
clear cable modem path-sel 1010
clear cable modem pnm 1011
clear cable modem rcs-counts 1013
clear cable modem reset 1015
clear cable modem rf-adapt 1019
clear cable modem service-type-id 1021
clear cable modem voice 1023
clear cable multicast ses-cache 1025
clear cable multicast statistics counter 1028
clear cable resil-rf-status 1029
clear cable rf-status 1030
clear cable rpd all event 1031
clear cable rpd reset 1032
clear cable secondary-ip 1034
clear cable upstream ofdma mer-fec 1036
clear hccp counters 1037
clear hccp linecard 1039
clear packetcable gate counter commit 1040
clear packetcable rks 1042
clear pxf 1044
clear pxf statistics drl all 1046
clear pxf statistics drl cable-wan-ip 1047

clear pxf statistics drl wan-non-ip 1048
clear pxf statistics drl max-rate 1049
clear redundancy 1050
cmc 1052
connection 1053
controller downstream-oob 55d1-profile 1054
controller integrated-cable 1055
controller modular-cable 1057
controller upstream-cable 1059
controller upstream-oob 55d1-profile 1060
cops ip dscp 1061
cops listeners access-list 1065
cops tcp window-size 1067
core-interface 1069
cp-overrule 1070
cpd 1071
cpd cr-id 1072
cpe max 1073
cyclic-prefix 1075

CHAPTER 12 Cable Commands: d through h 1077
default-nit-reference 1079
default-onid 1080
default-psi-interval 1081
depi-class 1082
depi-tunnel 1084
depi cin-failover 1086
depi eqam-stats 1088
desc-rule 1089
description (bonding-group) 1090
description (cable fiber-node) 1092
description (OFDM channel profile) 1093
description (OFDM modulation profile) 1094
description (redundancy-linecard) 1095

dest-ip 1096
diagnostic load 1097
diagnostic ondemand action-on-failure 1099
diagnostic unload 1101
disable-auto-restart 1103
do-not-insert 1104
docsis-channel-id 1105
docsis-policy 1106
docsis-version 1107
downstream 1108
downstream cable 1110
downstream downstream-cable 1112
downstream downstream-cable rf-channel 1113
downstream integrated-cable rf-channel (interface) 1114
downstream local upstream 1116
downstream modular-cable rf-channel (channel group) 1117
downstream modular-cable rf-channel (interface) 1118
downstream modular-cable rf-channel 1120
ds-channel 1122
duration 1123
dvb 1126
ecm-pid-source 1127
ecmg 1129
ecmg (Tier-based) 1130
eis 1131
enable (Tier-based) 1132
enabled (enforce-rule) 1133
encrypt 1135
enforced qos-profile 1136
event-profile 1139
exception pxf 1140
facility-alarm (ubr10012) 1142
factory-reset all 1145
factory-reset all secure 1147

fail-to-clear 1149
fail-to-clear-duration 1150
filter pid vcg 1151
filter program vcg 1152
freq-profile 1153
frequency 1154
guardband-override (OFDM channel profile) 1155
hccp authentication 1157
hccp authentication key-chain 1159
hccp bypass version 1161
hccp channel-switch 1163
hccp check version 1167
hccp ds-switch 1169
hccp lockout 1171
hccp protect 1173
hccp resync 1175
hccp revertive 1177
hccp reverttime 1179
hccp switch 1181
hccp timers 1183
hccp track 1185
hccp unlockout 1188
hccp working 1190
hw-module bay reload 1192
hw-module shutdown (ubr10012) 1193
hw-module slot 1196
hw-module slot pos 1198
hw-module slot srp 1200
hw-module subslot 1202

CHAPTER 13 **Cable Commands: i through p** 1205

identifier 1209
init-tech-list 1210
init-tech-ovr 1211

interface cable 1213
interface cable-modem 1215
interface integrated-cable 1217
interface modular-cable 1219
interface port-channel 1221
interface virtualportgroup 1223
interface wideband-cable 1224
interleaver-depth (QAM profile) 1227
interleaver-depth (OFDM channel profile) 1229
interval 1230
ip (virtual-arpd) 1231
ip (virtual-om) 1232
ip address 1233
ip address docsis 1234
ip-address (controller) 1236
ip dhcp ping packet 0 1238
ip dhcp pool 1241
ipdr associate 1244
ipdr authorization 1246
ipdr collector 1247
ipdr exporter ack-timeout 1249
ipdr exporter connection active 1250
ipdr exporter keepalive 1251
ipdr exporter max-unacked 1252
ipdr exporter start 1253
ipdr session 1254
ipdr session (global configuration) 1255
ipdr template 1257
ipdr type 1260
ipv6 address ?
issu linecard abortversion 1263
issu linecard acceptversion 1265
issu linecard changeversion 1266
issu linecard loadversion 1268

issu linecard prepareversion 1269
issu linecard process stop 1271
issu linecard reloadversion 1273
issu linecard runversion 1275
jitter 1276
join-group 1277
keepalive 1278
lacp fast-switchover 1279
lacp max-bundle 1280
lacp min-bundle 1281
lacp port-priority 1282
lacp system-priority 1284
lane start-freq 1285
lc-control-plane-timeout 1286
lc-us-scheduler-timeout 1287
lcha-preferred 1288
license feature evaluation disable 1289
license feature evaluation enable 1291
linecard 1293
linecard-group (redundancy) 1295
listening-port 1296
logging cmts ipc-cable 1297
logging cmts sea 1299
logical-edge-device 1301
load-interval 1302
low-latency 1303
mac-addr-filter 1304
mac-address 1305
mgmt-intf virtualportgroup 1307
main-cpu 1308
maintenance-mode 1310
match 1312
match rule 1313
max-carrier 1315

max-comp-time 1316
max-ofdm-spectrum 1318
max-streams 1319
member slot 1321
method 1323
mgmt-ip 1325
mgmt-ip (DVB) 1327
microcode (uBR10012) 1328
microcode reload (uBR10012) 1330
min-cp-duration 1332
mode 1334
modular-host subslot 1336
modulation 1338
monitoring-basics 1339
monitoring-duration 1341
mute 1344
multicast-label 1345
multicast-pool 1346
multicast-uplink 1347
name 1348
nc 1349
network 1350
network-delay 1352
nls 1353
nls ag-id auth-key 1354
nls resp-timeout 1355
ofdm-freq-excl-band 1356
ofdm channel-profile 1357
onid 1358
oui 1359
output-rate 1360
override 1362
overrule 1363
overwrite-scg 1365

packetcable 1366
packetcable authorize vanilla-docsis-mta 1368
packetcable element-id 1370
packetcable gate maxcount 1372
packetcable gate send-subscriberID 1374
packetcable multimedia 1375
packetcable timer 1376
pcr-based-source-switch 1378
peak-time1 1379
penalty-period 1383
periodic-rel-pxf enable 1387
ping docsis 1388
ping docsis pnm 1393
platform power protection 1394
platform punt-policer 1396
platform punt-sbrl 1398
platform aom pending-thresh 1401
pilot-scaling 1402
pme cem 1403
pme mgmt-ip 1405
pme vodsid 1406
policy 1407
power-adjust 1408
power-tilt 1409
prefix 1410
principal 1412
privacy 1413
profile 1415
profile-control 1416
profile-data 1418
profile-description 1420
profile-ncp 1421
protect-tunnel 1422
protocol 1423

provider-name 1424
psi-interval 1425
show ptp clock running 1426
pxf-fail-switchover-trap enable 1427

CHAPTER 14 Cable Commands: q through sg 1429
qos-profile enforced 1432
qos-profile registered 1435
qam-profile 1437
r-dti 1438
rcp-id 1439
receive-channel 1440
receive-module 1442
redundancy 1444
redundancy force-failover main-cpu 1445
redundancy force-switchover main-cpu 1447
redundancy linecard-group 1449
redundancy reload 1454
redundancy switch-activity 1457
registered qos-profile 1459
remap pid vcg 1461
rep-period 1462
report-stream-error cc-error 1464
report-stream-error input-stream-failure report-interval syslog 1465
request platform hardware diagnostic load 1466
request platform hardware diagnostic unload 1467
request platform software package expand 1468
request platform software package install node 1469
request platform software package install rp 1471
request platform software process restart 1472
reserve-pid-range 1474
reset-interval 1475
restart-retry 1476
restricted 1477

revertive 1478
rf-chan 1479
rf-channel 1480
rf-channel (Virtual Carrier Group) 1481
rf-channel (table-based vcg) 1482
rf-channel cable downstream channel-id 1483
rf-channel depi-tunnel 1486
rf-channel description 1487
rf-channel frequency 1489
rf-channel group-address 1492
rf-channel ip-address mac-address udp-port 1493
rf-channel network-delay 1496
rf-channel rf-power 1498
rf-channel rf-shutdown 1501
rf-channel stacking 1503
rf-output 1504
rf-port integrated-cable 1505
rf-switch auxport enable 1506
roll-off 1507
route-ecmg 1508
routing-interface-ip 1510
routing-interface-vrf 1511
rpd-ds downstream-cable 1512
rpd-ds downstream-oob-vom 1513
rpd-event 1514
rpd-us upstream-cable 1515
rpd-us upstream-oob-varpd 1516
rpd downstream-cable 1517
sbfd 1518
scramble-video-audio 1519
secondary aux 1520
server 1521
service divert-limit 1523
service divert-rate-limit 1524

service divert-rate-limit ip 1526
service divert-rate-limit ipv6 1528
service divert-rate-limit ip trusted-site 1531
service divert-rate-limit max-rate us-cable 1533
service divert-rate-limit max-rate wan 1535
service divert-rate-limit non-ip 1537
service divert-rate-limit trusted-site 1538
service divert-rate-limit trusted-site-ipv6 1540
service instance 1542
service udp-small-servers max-servers no-limit 1543
service-class 1545
service-class (cmts-tag) 1547
service-class (enforce-rule) 1548
service-descriptor-default 1550
service-distribution-group 1551
service-id 1552
service-name 1553
service-type (service descriptor) 1554
service-type (virtual carrier group) 1555
service-type-id (load-balance) 1556
service-type-id (cmts-tag) 1557
serving-area 1558
session 1559
session name multicast-label 1562
session-range 1564
set clock 1565

CHAPTER 15 **Cable Commands: show a through show cable l** 1567

show application-buckets 1569
show bridge cable-modem 1571
show cable acfe controller 1573
show cable acfe interface 1576
show cable acfe summary 1579
show cable active-reman 1581

show cable admission-control 1584
show cable admission-control fiber-node 1592
show cable arp-filter 1593
show cable asf-qos-profile 1601
show cable bgsync 1603
show cable bgsync sync-info cable 1607
show cable bundle 1611
show cable bundle multicast 1614
show cable burst-profile 1616
show cable calls 1618
show cable card 1620
show cable cgd-associations 1623
show cable channel-group 1625
show cable clock 1628
show cable clock dti counters 1634
show cable clock dti status 1635
show cable cmc 1636
show cable cmts-id 1646
show cable depi multicast 1647
show cable device access-group 1649
show cable downstream controller-profile 1652
show cable dp aqm 1653
show cable dp pfg 1655
show cable dp queue 1656
show cable dsg 1658
show cable dsg cfr 1662
show cable dsg host 1667
show cable dsg static-group bundle 1669
show cable dsg tg 1671
show cable dsg tunnel 1674
show cable dynamic-qos trace 1681
show cable dynamic-bonding-group 1683
show cable entropy status 1690
show cable fiber-node 1691

show cable filter 1697
show cable flap-list 1702
show cable flap-list reset-cm-list 1713
show cable flap-list wb-rf 1714
show cable freq-profile 1717
show cable hop 1720
show cable host access-group 1725
show cable ib-ipc 1727
show cable ipc-stats 1728
show cable ipv6 leasequery-filter 1732
show cable ipv6 leasequery-stats 1733
show cable l2-vpn dot1q-nsi-redundancy 1734
show cable l2-vpn dot1q-vc-map 1736
show cable l2-vpn vc-map 1741
show cable l2-vpn xconnect 1743
show cable leasequery-filter 1748
show cable leasequery-stats 1752
show cable licenses all 1753
show cable licenses cpb 1756
show cable license wan 1758
show cable load-balance 1759
show cable load-balance docsis-group 1771
show cable logging 1804

CHAPTER 16 **Cable Commands: show cable m to show cable u** 1811

show cable mac-domain cable forwarding 1816
show cable mac-domain cable cgd-associations 1818
show cable mac-domain cable downstream-service-group 1821
show cable mac-domain cable dpd ocd 1825
show cable mac-domain cable rcc 1827
show cable mac-domain cable rcc simplified 1830
show cable mac-domain cable upstream-service-group 1832
show cable mac-domain fiber-node 1834
show cable mac-domain docsis-mode 1836

show cable mcast-shadow 1838
show cable metering-status 1840
show cable modem 1844
show cable modem access-group 1904
show cable modem asf 1908
show cable modem asf sup 1910
show cable modem auth-profile 1911
show cable modem calls 1913
show cable modem classifiers 1916
show cable modem cnr 1919
show cable modem connectivity 1928
show cable modem counters 1933
show cable modem cpe 1938
show cable modem docsis device-class 1942
show cable modem docsis version 1951
show cable modem docsis version d31-capable 1963
show cable modem docsis version d40-capable 1965
show cable modem domain-name 1967
show cable modem errors 1970
show cable modem extended-power 1974
show cable modem fiber-node mac-domain 1976
show cable modem flap 1977
show cable modem internal load-balance 1983
show cable modem ipv6 1985
show cable modem ipv6 summary 1995
show cable load-balance move-history cable x/y/z 1996
show cable modem low-latency-capable 1998
show cable modem mac 1999
show cable modem maintenance 2011
show cable modem offline 2017
show cable modem partial-mode 2027
show cable modem partial-service 2030
show cable modem path-sel 2033
show cable modem phy normalized 2036

show cable modem phy 2047
show cable modem phy us-pwr 2058
show cable modem phy ofdm 2064
show cable modem phy ofdm-profile 2065
show cable modem primary-channel 2068
show cable modem primary-channel summary total 2070
show cable modem privacy 2073
show cable modem prof-mgmt 2079
show cable modem qos 2109
show cable modem reduction-mode energy-management-mode 2116
show cable modem reduction-mode energy-management-param 2117
show cable modem reduction-mode energy-management-status 2118
show cable modem reduction-mode mta-battery 2119
show cable modem registered 2120
show cable modem remote-query 2127
show cable modem resiliency 2132
show cable modem rogue 2134
show cable modem rbg-activity 2138
show cable modem rpd 2140
show cable modem rpd all summary 2184
show cable modem select 2185
show cable modem service-type-id 2191
show cable modem service-flow 2193
show cable modem smp 2208
show cable modem subscriber 2209
show cable modem summary 2211
show cable modem summary scn 2218
show cable modem summary wb-rf 2219
show cable modem sysDescr 2222
show cable modem tcs summary 2225
show cable modem tftp 2228
show cable modem timeline 2230
show cable modem type 2233
show cable modem unregistered 2237

show cable modem vendor 2248
show cable modem verbose 2255
show cable modem voice 2269
show cable modem wideband 2270
show cable modem wideband phy 2282
show cable modem wideband primary-channel 2285
show cable modem wideband rcs-status 2286
show cable modulation-profile 2291
show cable multicast authorization 2300
show cable multicast db 2304
show cable multicast debug 2310
show cable multicast dsid 2313
show cable multicast qos 2318
show cable multicast ses-cache 2321
show cable multicast statistics 2326
show cable noise 2331
show cable ofdm-chan-profiles 2332
show cable ofdm-modulation-profiles 2334
show cable privacy 2336
show cable profile 2338
show cable qam-profile 2340
show cable qos enforce-rule 2342
show cable qos permission 2347
show cable qos profile 2349
show cable rate-adapt 2352
show cable rate-limit-ccf 2354
show cable rcp-id 2356
show cable rcps 2357
show cable redundancy 2358
show cable resil-rf-status 2360
show cable resiliency 2362
show cable resiliency counts 2364
show cable resiliency exclude 2365
show cable resiliency throttled-cm 2366

show cable rf-adapt 2368
show cable rf-status 2371
show cable rpd 2373
show cable rpd 55d1-us cpp-cache 2377
show cable rpd alloc-chan-resources 2378
show cable rpd auxiliary 2379
show cable rpd capability 2381
show cable rpd config 2383
show cable rpd core-ident 2385
show cable rpd depi 2387
show cable rpd depi session 2392
show cable rpd depi tunnel 2396
show cable rpd event 2399
show cable rpd gcp-session 2400
show cable rpd gcp-state 2402
show cable rpd gcp-transaction 2404
show cable rpd group 2407
show cable rpd host-resources 2411
show cable rpd lcce-chan-reach 2413
show cable rpd identification 2414
show cable rpd info 2415
show cable rpd ipv6 2416
show cable rpd lcha-cores 2417
show cable rpd location 2419
show cable rpd md-association 2420
show cable rpd name 2422
show cable rpd online 2424
show cable rpd offline 2426
show cable rpd pilot-tone 2428
show cable rpd principal 2430
show cable rpd sbfd-session 2432
show cable rpd spectrum-capture-capabilities 2433
show cable rpd slot 2435
show cable rpd summary 2436

show cable rpd tengigabitethernet 2437
show cable rpd topology 2438
show cable rpd us-phy channel 2439
show cable rpd verbose 2441
show cable rpd version 2443
show cable rpd sw-version 2444
show cable rsvp flow-db 2445
show cable service-class 2447
show cable service-voice downstream-type 2451
show cable service-flow summary 2452
show cable service-flow summary detail 2456
show cable signal-quality 2458
show cable snmp cache-status 2462
show cable spectrum-analysis 2463
show cable spectrum-group 2466
show cable subscriber-usage 2469
show cable tech-support 2473
show cable throttle-modem 2477
show cable upstream controller-profile 2479
show cable upstream service-flow summary 2480
show cable upstream ofdma mer-fec 2482
show cable upstream ofdma chan-util 2483
show cable urm 2484
show cable us-sg 2490
show cable video announce-event-profile 2492
show cable video encryption 2493
show cable video encryption dvb 2494
show cable video encryption linecard 2497
show cable video encryption pme 2499
show cable video gqi connections 2501
show cable video jitter 2502
show cable video integrated-cable 2503
show cable video logical-edge-device 2505
show cable video low-latency linecard 2507

show cable video output-port 2508
show cable video scg 2509
show cable video service-distribution-group 2511
show cable video session all 2512
show cable video session logical-edge-device 2514
show cable video snmp-alarms 2520
show cable video snmp-alarm-config 2522
show cable video vei-bundle 2523
show cable video virtual-carrier-group 2524

CHAPTER 17 Cable Commands: show ch through show cr 2527
show checkpoint 2528
show cmts ipc-cable client base 2535
show controller gigabitethernet 2540
show controller integrated-cable 2542
show controllers integrated-cable counter ofdm-channel snmp-rolling-avg 2574
show controller integrated-cable counter rf-channel 2576
show controllers integrated-cable counter rf-channel snmp-rolling-avg 2578
show controller tengigabitethernet 2580
show controllers cable 2586
show controllers cable jib 2608
show controllers cable upstream spectrum 2615
show controllers clock-reference 2620
show controllers downstream-cable 2626
show controllers downstream-cable rf-channel prof-order 2629
show controllers jacket 2631
show controllers modular-cable 2633
show controllers upstream-cable 2646
show cpd 2649
show cr10k-rp cable 2650
show cr10k-rp controller 2654
show cr10k-rp queue 2657
show cr10k-rp slots 2661
show crypto entropy sample 2664

show crypto entropy status 2665
show crypto ikev2|ipsec sa detail 2666

CHAPTER 18 Cable Commands: show d through show i 2669
show debug 2672
show depi 2674
show depi session 2676
show depi tunnel 2684
show derived-config interface cable 2687
show derived-config interface wideband-Cable 2689
show dhcp 2691
show diag all eeprom detail | include MAC 2694
show diagnostic bootup level 2695
show diagnostic content 2696
show diagnostic ood-status 2700
show diagnostic result 2704
show diagnostic schedule 2708
show diagnostic status 2710
show facility-alarm status 2711
show frame-clocks 2714
show hardware pxf 2715
show hccp 2716
show hccp channel-switch 2726
show hccp group 2730
show hccp interface 2733
show hccp linecard 2735
show hdd-devices summary 2737
show hw-module bay 2738
show hw-module bay oir 2745
show hw-module bay transceiver 2749
show hw-module subslot oir 2751
show ib statistic 2754
show interface bundle 2755
show interface cable 2759

show interface cable admission-control reservation 2766
show interface cable cable-monitor 2770
show interface cable controller 2774
show interface cable downstream 2776
show interface cable dsg downstream 2779
show interface cable dsg downstream tg 2787
show interface cable dynamic-service statistics 2790
show interface cable intercept 2792
show interface cable mac-scheduler 2794
show interface cable modem 2807
show interface cable monitor 2817
show interface cable multicast-sessions 2819
show interface cable packetcable statistics 2822
show interface cable privacy 2825
show interface cable qos paramset 2829
show interface cable service-flow 2833
show interface cable sid 2847
show interface cable signal-quality 2859
show interface cable upstream 2861
show interface cable upstream debug 2874
show interface gigabitethernet 2878
show interface integrated-cable 2881
show interface integrated-cable queue 2888
show interface modular-cable 2893
show interface modular-cable accounting 2895
show interface modular-cable description 2897
show interface modular-cable dlm 2899
show interface modular-cable downstream 2901
show interface modular-cable intercept 2903
show interface modular-cable multicast-sessions 2905
show interface modular-cable stats 2908
show interface modular-cable summary 2910
show interface modular-cable switching 2912
show interface multicast-gcr 2914

show interface port-channel 2916
show interface rf-status 2919
show interface resil-rf-status 2921
show interfaces tengigabitethernet 2923
show interfaces video accounting 2925
show interfaces VirtualPortGroup 2926
show interface wideband-cable 2928
show interface wideband-cable multicast-sessions 2938
show interface wideband-cable queue 2941
show ip arp vrf 2945
show ip interface brief 2947
show ipdr collector 2949
show ipdr exporter 2950
show ipdr session 2952
show ipdr session collector 2954
show ipdr session template 2956

CHAPTER 19 Cable Commands: show l through show z 2957

show lacp 2959
show lcha logging 2964
show lcha rfsw 2966
show license summary 2967
show logging onboard 2969
show nls 2973
show nls ag-id 2975
show nls flow 2976
show cable oudp-leak-detect 2977
show packetcable cms 2979
show packetcable event 2983
show packetcable gate 2986
show packetcable gate counter commit 2990
show packetcable gate ipv6 2992
show packetcable gate multimedia 2995
show packetcable global 2999

show platform hardware diagnostic status 3003
show platform hardware dpic 3004
show platform hardware qfp active cable dpic-lcha if-name 3006
show platform hardware qfp active cable us-mpls-tc 3008
show platform hardware qfp active feature docsis bf 3010
show platform hardware qfp active feature docsis cbl-vrf-steering 3012
show platform hardware qfp active feature docsis mpls_tc-precfy db 3013
show platform hardware qfp active infrastructure punt sbrl 3014
show platform hardware qfp active infrastructure punt summary 3016
show platform integrity 3018
show platform software cable 3022
show platform software iomd 3024
show platform software ios/cdman ipccl 3026
show platform software ios ipccl 3029
show platform software ios socket statistics 0 3032
show platform software patch 3033
show platform software ptpd stat stream 3035
show platform software punt-policer 3037
show platform software restart info 3041
show platform software trace message lc-veman LC slot number/0 3043
show ptp clock 3044
show pxf cable 3047
show pxf cable controller 3053
show pxf cable feature 3055
show pxf cable interface 3057
show pxf cable multicast 3060
show pxf cpu 3061
show pxf cpu drl-trusted-sites 3078
show pxf cpu queue wb-spa 3080
show pxf cpu statistics drl ipv4 3083
show pxf cpu statistics drl ipv6 3085
show pxf cpu statistics drl max-rate us-cable 3087
show pxf cpu statistics drl max-rate wan 3088
show pxf cpu statistics drl us-cable 3089

show redundancy 3091
show redundancy config-sync 3103
show redundancy linecard 3105
show redundancy platform 3107
show running-config interface cable 3109
show run interface VirtualPortGroup 3113
show run | se ptp 3114
show snmp | i queue 3115
show tech-support 3116
show usb-devices summary 3121

CHAPTER 20 Cable Commands: snmp through w 3123
snmp manager 3126
snmp server dispatcher-queue-size 3128
snmp-server enable traps cable 3129
snmp-server enable traps rpd-event 3132
snmp-server enable traps docsis-cm 3133
snmp-server enable traps docsis-cmts 3135
snmp-server enable traps docsis-resil 3137
snmp-server enable traps video-cable 3139
snmp-server host traps docsis-resil 3141
snmp-server host traps version 2c public udp-port 3142
snmp server local-queue-size 3143
snmp-trap input-stream-failure multicast 3144
source-id 3145
spectrum-inversion 3146
start-delay 3148
start-frequency 3150
stop-delay 3151
strong-pairing-enforce 3153
subcarrier-spacing 3154
switchover pxf restart 3156
switchover timeout 3158
symbol-rate 3160

table-based 3161
tag 3162
test cable dcc (Supporting Dynamic Channel Change) 3163
test cable pnm rxmer ifIndex get all 3167
test cable pnm rxmer show 3168
test cable voice 3169
threshold 3170
tier-based 3172
timeout init-session 3173
timeout idle-session 3174
timeout off-session 3175
timestamp 3176
tlv 3178
tos 3179
tos (multicast qos) 3180
trans-start-delay 3181
trans-stop-delay 3183
type 3185
type (ECMG) 3186
upgrade fpd auto 3187
upgrade fpd file 3189
upgrade fpga auto-upgrade 3190
upgrade fpga file 3192
upgrade hw-programmable cable 3194
upstream 3196
upstream (config-lb-group) 3197
upstream cable channel 3199
upstream cable connector 3201
upstream freq-range 3203
upstream upstream-cable 3205
us-channel 3206
us-channel chan-class-id 3209
us-channel channel-width 3210
us-channel cyclic-prefix 3212

us-channel description 3213
us-channel docsis-mode 3214
us-channel equalization-coefficient 3216
us-channel frequency 3218
us-channel hop-priority 3220
us-channel ingress-noise-cancellation 3222
us-channel maintain-psd 3223
us-channel minislot-size 3224
us-channel modulation-profile 3226
us-channel power-level 3228
us-channel rng-holdoff 3230
us-channel spectrum-group 3231
us-channel subcarrier-spacing 3232
us-channel threshold 3233
us-channel threshold hysteresis 3235
vcg 3236
vcg (config-video-bd) 3237
vcg (table-based) 3239
vei-bundle 3240
video 3242
virtual-arpd 3244
virtual-carrier-group 3245
virtual-edge-input-ip 3246
virtual-om 3248
vrf (multicast qos) 3249
weekend duration 3250
weekend off 3252
weekend peak-time1 3253
width 3256

CHAPTER 21 Cisco CMTS Router ROM Monitor Commands 3257
alias 3258
boot 3260
break 3264

confreg 3266
cont 3269
context 3271
cpu_card_type 3273
dev 3274
dir 3275
dis 3276
frame 3278
help 3280
history 3282
meminfo 3284
repeat 3285
reset 3287
set 3289
show_spd 3291
stack 3293
sync 3295
sysreset 3297
unalias 3299
unset 3301



Cable Commands: a through cable-modem

- ac-start-delay, on page 2
- ac-stop-delay, on page 4
- access-denied, on page 6
- activate-rule at-byte-count, on page 8
- active, on page 11
- add-priv-data, on page 12
- admission-control max-reserved-bandwidth, on page 13
- admission-control application-type , on page 15
- analog, on page 17
- annex, on page 18
- annex modulation, on page 19
- announce-event-profile, on page 21
- application-id, on page 23
- assign, on page 24
- attributes, on page 26
- auto-channel-id, on page 28
- base-channel-power, on page 29
- bind-vcg, on page 30
- block-unref-pids, on page 31

ac-start-delay

To configure the time between start of first CP after a change in AC and start of ECM broadcast, use the **ac-start-delay** command in the DVB scrambling ECMG overrule configuration mode. To void the time configuration, use the **no** form of this command.

ac-start-delay *delay*
no ac-start-delay

ac-start-delay *delay*	Specifies the time between start of first CP after a change in AC and start of ECM broadcast in millisecond.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the time between start of first CP after a change in AC and start of ECM broadcast in millisecond. The valid range is from -30000 to 30000.

The following is an example of how to specify the time between start of first CP after a change in AC and start of ECM broadcast:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#ac-start-delay 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.

Command	Description
min-cp-duration	Specifies the minimum crypto period.
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

ac-stop-delay

To configure the time between end of last CP preceding a change in AC and end of ECM broadcast, use the **ac-stop-delay** command in the DVB scrambling ECMG overrule configuration mode. To void the time configuration, use the **no** form of this command.

ac-stop-delay *delay*
no ac-stop-delay

ac-stop-delay *delay*	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast in millisecond.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the time between end of last CP preceding a change in AC and end of ECM broadcast in milliseconds. The valid range is from -30000 to 30000.

The following is an example of how to configure the time between end of last CP preceding a change in AC and end of ECM broadcast:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#ac-stop-delay 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.

Command	Description
min-cp-duration	Specifies the minimum crypto period.
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

access-denied

To create a DOCSIS configuration file that disables network access to the customer premise equipment (CPE) devices that are attached to the cable modem (CM) on a Cisco CMTS router, use the **access-denied**command in cable config-file configuration mode. To enable access, use the **no** form of this command.

access-denied
no access-denied

Syntax Description

This command has no arguments or keywords.

Command Default

Access to the cable network is permitted.

Command Modes

Cable config-file configuration (config-file)

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Network Access Control object in the DOCSIS configuration file. If the object is set to 1 (set by the default of **no access-denied**), the CPE devices behind the CM allow access to the network. If the object is set to 0 (by configuration of the **access-denied** command) to disable network access for the CPE devices, the CM does not forward traffic from its attached CPE devices.

For normal operation, the CM must be set to allow access (the default). However, to deny service for reasons such as nonpayment or unauthorized use of services, the **access-denied** command can be used.

Examples

The following example shows how to disable network access for the CPE devices that are connected to the CM:

```
cable config-file disable.cm
 access-denied
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
channel-id	Specifies upstream channel ID.
cpe max	Specifies customer premise equipment information.
download	Specifies download information for the configuration file.

Command	Description
frequency	Specifies the downstream frequency.
option	Specifies vendor-specific information fields in a DOCSIS configuration file.
privacy	Specifies privacy options for baseline privacy images.
service-class	Specifies service class definitions for the configuration file.
snmp manager	Specifies Simple Network Management Protocol (SNMP) options.
timestamp	Enables time-stamp generation.

activate-rule at-byte-count

Note Effective with Cisco IOS Release 12.3(9a)BC, the **activate-rule at-byte-count** command is not available in Cisco IOS software.

To specify the number of bytes that a subscriber can transmit during the monitoring period on a Cisco CMTS router, use the **activate-rule at-byte-count** command in enforce-rule configuration mode. To reset the rule to its default values, use the **no** form of this command.

activate-rule at-byte-count *kbytes* {**downstream** | **upstream**} [**enforce**]
no activate-rule at-byte-count *kbytes* {**downstream** | **upstream**} [**enforce**]

Syntax Description

kbytes	Maximum number of kilobytes that the subscriber can transmit in the specified direction during the monitoring period. The valid range is 1 to 4294967, with a default of 0 (no limit). **Note** To reset the kilobyte count to 0, use the **no** form of this command.
downstream	Specifies that the kilobyte count applies to traffic in the downstream direction.
upstream	Specifies that the kilobyte count applies to traffic in the upstream direction. The default value is **upstream**.
enforce	(Optional) Specifies that the enforce-rule QoS profile should be applied automatically if a user violates the registered QoS profile. **Note** You must have previously configured a registered QoS profile, using the **qos-profile registered** command, before being able to use the **enforce** keyword.

Command Default

The *kbytes* value defaults to 0 (no limit), upstream direction, and enforce-rule QoS profiles are not automatically applied (**no activate-rule at-byte-count enforce**).

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(9a)BC	This command was removed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **activate-rule at-byte-count** command specifies the maximum number of bytes that a subscriber can transmit during the monitor window period (see the **monitoring-duration** command). If a subscriber transmits traffic beyond this maximum value, the CMTS router considers the subscriber to be overconsuming.

If the optional **enforce** keyword has been specified for an enforce-rule, the CMTS router automatically switches overconsuming subscribers to the enforced QoS profile (see the **qos-profile enforced**command). The enforced QoS profile remains in force during the penalty time period (see the **qos-profile registered** command).

An enforce-rule can be created for only one direction, either upstream or downstream. To activate subscriber traffic management for both the upstream and downstream directions, create two different enforce-rules, with one rule's **activate-rule-at-byte-count** command specifying the downstream direction and the other rule specifying the upstream direction.

When you change the configuration of a currently active enforce-rule, that rule begins using the new configuration immediately to manage the cable modems tracked by the enforce-rule.



Note You can create an enforce-rule that is a duplicate of an existing enforce-rule, but the duplicate rule is not activated and applied to service flows until at least one of its parameters is changed so that it has a unique configuration.

Examples

The following example shows a typical **activate-rule-at-byte-count** command for the downstream direction:

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential

Router(enforce-rule)# activate-rule at-byte-count 20 downstream
```

The following example shows a typical **activate-rule-at-byte-count** command for the upstream direction. The **enforce** option is also added so that the enforce-rule QoS profile is automatically applied to users who exceed their registered profile:

```
Router# configure terminal

Router(config)# cable qos enforce-rule test

Router(enforce-rule)# activate-rule at-byte-count 5 upstream enforce
```

The following example shows the same command being given for a second enforce-rule. The system rejects the command because it is a duplicate of an existing rule, using the same QoS profile and direction. You must change at least one of the rule parameters to make it unique before it is mapped and applied to service flows.

```
Router# configure terminal

Router(config)# cable qos enforce-rule test2

Router(enforce-rule)# activate-rule at-byte-count 5 upstream enforce

Enforce-rule test2 won't be mapped to service flows as it is duplicate of test1 with same
registered qos-profile 5 and same direction
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers that violate their registered QoS profiles.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

active

To activate the logical edge device, use the **active** command in logical edge device protocol configuration mode. To deactivate the logical edge device, use the **no** form of this command.

active
no active

Command Default

None.

Command Modes

Logical edge device protocol configuration (config-video-led-protocol)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command activates the logical edge device.

Examples

The following example shows how to activate the logical edge device:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# logical-edge-device vod id 1
Router(config-video-led)# protocol table-based
Router(config-video-led-protocol)# active
```

Related Commands

Command	Description
logical-edge-device	Define a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
vcg	Specifies the virtual carrier group assigned to this logical edge device.
show cable video logical-edge-device	Displays the logical edge device information.

add-priv-data

To add private data to the descriptor, use the **add-priv-data** command in the DVB scrambling ECMG descriptor configuration mode. To void the addition, use the **no** form of this command.

add-priv-data {**as-per-eis** | **at-es-level**}**private-data** *data* {**all** | **ecm-ids** *id*}
no add-priv-data {**as-per-eis** | **at-es-level**}**private-data** *data* {**all** | **ecm-ids** *id*}

as-per-eis	Specifies that the insertion level is determined by EIS.
at-es-level	Insert at elementary streams level.
private-data *data*	Specifies the private data for the descriptor.
all	Apply the rule for all ecm ids.
ecm-ids *id*	Specifies the ecm ids to apply the rule. Only applies to session-based scrambling.

Command Default

None

Command Modes

DVB scrambling ECMG descriptor configuration mode (config-video-encrypt-dvb-ecmg-desc)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to add private data to the descriptor:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#desc-rule desc_8_1 id 1
Router(config-video-encrypt-dvb-ecmg-desc)#add-priv-data at-es-level private-data 12345678
 ecm-ids 81,82,83,84,85
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
do-not-insert	Prohibits inserting standard descriptors.

admission-control max-reserved-bandwidth

To define the maximum reserved bandwidth per bonding group for all service flows that are allowed by the Cisco CMTS, use the **admission-control max-reserved-bandwidth** command in the interface configuration mode. To reset or disable the maximum reserved bandwidth value, use the **no** form of this command.

admission-control max-reserved-bandwidth *bw-in-kbps*
no admission-control max-reserved-bandwidth

Syntax Description

bw-in-kbps	Maximum admission control reserved bandwidth. The value is in kbps and is based on the RF bandwidth percent defined for the bonding group. Valid range is from 0 to the maximum bandwidth of the upstream bonding group.

Command Default

Without explicitly configured max-reserved-bandwidth, service flows admitted on a US bonding group are not subject to admission control.

Command Modes

Upstream bonding configuration (config-upstream-bonding)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to define the maximum reserved bandwidth per bonding group. The default maximum reserved bandwidth value is 80 percent. However the user can choose to configure a higher (up to 96 percent) or lower reserved bandwidth so that there is bandwidth allocated for zero committed information rate (CIR) best effort traffic.

Examples

The following example shows a sample definition of the maximum reserved bandwidth value.

```
Router> enable
Router# configure terminal
Router(config)# interface c5/0/1
Router(config-if)# cable upstream bonding-group 1
Router(config-upstream-bonding)#  admission-control max-reserved-bandwidth 6344
```

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for the Cisco CMTS router and supporting broadband processing engines (BPEs).
cable admission-control event	Configures and enables admission control event types on the Cisco CMTS router.
cable admission-control ds-bandwidth	Configures admission control downstream bandwidth thresholds on the Cisco CMTS router.

Command	Description
cable admission-control us-bandwidth	Configures admission control upstream bandwidth thresholds on the Cisco CMTS router.
debug cable admission-control	Enables automatic admission control troubleshooting processes on the Cisco CMTS router.
show cable admission-control	Displays the current admission control configuration and status on the Cisco CMTS router or on a specified interface.

admission-control application-type

To enable Service Group Admission Control (SGAC) checking for the specified application-type, use **admission-control application-type** command in cable fiber node configuration mode. To remove the configuration, use the **no** form of this command.

admission-conrtrol application-type *app-type* **ds-bandwidth** *percentage*
no admission-conrtrol application-type *app-type* **ds-bandwidth**

admission-conrtrol application-type *grouplist* **ds-bandwidth** *percentage*
no admission-conrtrol application-type *grouplist* **ds-bandwidth**

Syntax Description

application-type *app-type*	Specifies the application type. The valid range is from 1 to 8.
application-type *grouplist*	Specifies the application type. The valid range is from 1 to 8. The *grouplist* variable can be either a range of application types or a list of specific application types separated by a space.
ds-bandwidth *percentage*	Specifies the downstream bandwidth percentage. Valid range is from 0 to 100.

Command Default

The command is not configured by default.

Command Modes

cable fiber node configuration (config-fiber-node)

Command History

Release	Modification
IOS-XE 3.17.0S	This command was modified. The *app-type* variable was replaced by *grouplist* variable.
IOS-XE 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **admission-control application-type** command under each fiber node to enable SGAC check for an application type and any service flow of the specified application type, which is admitted to a service group.

Starting with Cisco IOS-XE Release 3.17.0S, admission control can be applied for both normal priority and emergency voice flows. The *grouplist* variable can be either a range of application types or a list of specific application types separated by a space.

Examples

The following example shows how to enable SGAC check for an application type and any service flow of the specified application type:

```
Router# configure terminal
Router(config)# cable fiber-node 1
Router(config-fiber-node)# admission-control application-type 1 ds-bandwidth 1
```

The following example shows how to enable SGAC check for a group of application types:

```
Router# configure terminal
Router(config)# cable fiber-node 1
Router(config-fiber-node)# admission-control application-type 1 6 ds-bandwidth 1

Or

Router# configure terminal
Router(config)# cable fiber-node 1
Router(config-fiber-node)# admission-control application-type 3-6 ds-bandwidth 1
```

Related Commands

Command	Description
cable application-type	Defines an application type and its categorization rules.

analog

To configure the analog Tx/Rx modules alarm threshold, use the **analog** command in RPD configuration mode. To void the alarm threshold configuration, use the **no** form of this command.

analog {rx-power | tx-power} major-lo-th *value* **minor-lo-th** *value* **normal-th** *value* **minor-hi-th** *value*

no analog {rx-power | tx-power}

Syntax Description

rx-power	Specifies the RPD analog module receiving power.
tx-power	Specifies the RPD analog module transmitting power.
major-lo-th	Specifies the major low threshold.
minor-lo-th	Specifies the minor low threshold.
normal-th	Specifies the normal threshold.
minor-hi-th	Specifies the minor high threshold.

Command Default

None

Command Modes

RPD configuration (config-rpd)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1d	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the analog Tx/Rx modules alarm threshold.

Note The threshold for each alarm must follow this rule: major low threshold < minor low threshold < normal threshold < minor high threshold. Otherwise the command can not be executed.

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# analog rx-power major-lo-th 0 minor-lo-th 50 normal-th 150 minor-hi-th
 200
```

Related Commands

Command	Description
cable rpd	Enters the RPD configuration mode.

annex

To set the annex (MPEG framing format) for a specific QAM profile, use the **annex** command in QAM profile configuration mode.

annex {**A** | **B** | **C**}

Syntax Description

A |**B** |**C**	Specifies the MPEG framing format: • **A**–Annex A. The downstream is compatible with the European MPEG framing format specified in ITU-TJ.83 Annex A. • **B**–Annex B. The downstream is compatible with the North American MPEG framing format specified in ITU-TJ.83 Annex B. • **C**–Annex C. The downstream is compatible with the Japan MPEG framing format specified in ITU-TJ.83 Annex C.

Command Default

None

Command Modes

QAM profile configuration (config-qam-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the Annex (MPEG framing format) for a specific QAM profile.

Examples

The following example shows how to set the MPEG framing format for a specific QAM profile:

```
Router# configure terminal
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)# annex A
```

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.
interleaver-depth	Set the interleaver-depth.
modulation	Set the QAM modulation format.
spectrum-inversion	Set the spectrum-inversion on or off.
symbol-rate	Set the symbol rate.

annex modulation



Note Effective with Cisco IOS Release 12.3(23)BC, the **annex modulation** command is obsolete and **annex** and **modulation** are included as keyword options in the **rf-channel frequency** command.

To set the annex (MPEG framing format) and modulation for the Wideband SPA, use the **annex modulation** command in controller configuration mode. To set the annex to B and the modulation to 64 QAM, use the **no** form of this command.

annex {**A** | **B**} **modulation** {**64qam** | **256qam**} [*rf-start-index rf-end-index*]
no annex {**A** | **B**} **modulation** {**64qam** | **256qam**} [*rf-start-index rf-end-index*]

Syntax Description

A |**B**	Specifies the MPEG framing format: • **A**–Annex A. The downstream is compatible with the European MPEG framing format specified in ITU-TJ.83 Annex A. • **B**–Annex B. The downstream is compatible with the North American MPEG framing format specified in ITU-TJ.83 Annex B.
64qam|**256qam**	Specifies the modulation rate: • **64qam**–64-QAM modulation. • **256qam**–256-QAM modulation.
rf-start-index *rf-end-index*	(Optional) Specifies the start and end indexes for RF channels. The following values are allowed: • If the annex is A and the modulation is 256 QAM, *rf-start-index* must be 0, and *rf-end-index* must be 17. • For all other cases, *rf-start-index* must be 0, and *rf-end-index* must be 23.

Command Default

No annex or modulation is set for the Wideband SPA.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.3(23)BC	This command was made obsolete and **annex** and **modulation** were included as keyword options in the **rf-channel frequency** command.
IOS-XE 3.15.0S	This command was replaced by the **controller Integrated-Cable** and **controller Upstream-Cable** commands on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the following on a Wideband SPA:

- Annex (MPEG framing format)
- Modulation
- Start and end indexes for RF channels

Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command.

- For annex A and 256 QAM modulator, each Wideband SPA supports 18 RF channels.
- For all other cases, each Wideband SPA supports 24 RF channels.

The *rf-start-index* and *rf-end-index* arguments are intended for future use and are not currently needed. If *rf-start-index* and *rf-end-index* are not specified, the default values are as follows:

- If the annex is A and the modulation is 256 QAM, *rf-start-index* is 0, and *rf-end-index* is 17.
- For all other cases, *rf-start-index* is 0, and *rf-end-index* is 23.

Examples

The following example shows how to set the MPEG framing format and modulation for the Wideband SPA located at slot 1, subslot 0, bay 0:

```
Router(config)# controller modular-cable 1/0/0
Router(config-controller)# annex B modulation 64qam
```

Related Commands

Command	Description
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
ip-address (controller)	Sets the IP address of the Wideband SPA FPGA.
modular-host subslot	Specifies the modular-host line card.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.
rf-channel network delay	Specifies the CIN delay for each RF channel.
rf-channel description	Specifies the description for each RF channel.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.

announce-event-profile

To configure the GQI announce event profile, use the **announce-event-profile** command in global configuration mode.

announce-event-profile {*name* | **id** *id* }
ack-timeout *time (in seconds)*
filter [**all-events** | *event-code*]

Syntax Description

name	Specify a name for the GQI announce event profile.
id	Specify an ID for the GQI announce event profile.
ack-timeout *time (in seconds)*	Specify the time (in seconds) the Cisco cBR-8 router waits for an acknowledgement from the SRM before sending the next announce message. The range is from 0-240 seconds. If the time is set to 0 seconds, the Cisco cBR-8 router sends the message without waiting for an acknowledgement from SRM.
filter all-events	Specifies that the Cisco cBR-8 router does not send any announce messages.
filter *event-code*	Filter one or more messages by using specific event codes.

Command Default

None.

Command Modes

Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the GQI announce event profile:

```
enable
configure terminal
cable video
  announce-event-profile gqi-led-1 id 2
      ack-timeout 240
      filter 5502
      filter 5602
logical-edge-device led-1 id 1
   protocol gqi
    event-profile gqi-led-1
    vcg vcg-1
    active
```

Related Commands

Command	Description
show cable video announce-event-profile	Displays the configuration of the GQI announce event profile and a list of LEDs that use the profile.
event-profile	Applies the GQI announce event profile to a specific LED.

application-id

To specify an application type to allow admission control to be applied to a group configuration, use the **application-id** command in multicast QoS configuration mode. To disable admission control, use the **no** form of this command.

application-id *number*
no application-id *number*

Syntax Description

number	Specifies the application identification number of the multicast QoS group. The valid range is 1–65535.

Command Default

Multicast QoS group application type is not identified.

Command Modes

Multicast QoS configuration (config-mqos)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

To enable intelligent multicast admission control, you must enable and configure an application type using the **application-id** command.

Examples

The following example identifies a multicast QoS group application ID using the **applicaton-id** command:

```
Router(config)# cable multicast qos group 20 priority 55 global
Router(config-mqos)# application-id 44
```

The following example identifies a multicast QoS group application ID using the **applicaton-id** command in Cisco cBR Series Converged Broadband Routers:

```
Router(config)# cable multicast qos group 30 priority 60 global
Router(config-mqos)# application-id 77
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
showinterfacebundlemulticast-sessions	Displays multicast session information for a specific virtual cable bundle.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

assign

To assign modulation to subcarrier, use the **assign** command in OFDM modulation profile configuration mode. To undo a modulation assignment, use **no** form of this command.

assign {**modulation-default** *value* | **modulation** *value* {**list-subcarriers** {**freq-abs** | **freq-offset**}*freqency* | **range-subcarriers** {**freq-abs** | **freq-offset**}*freqency* **width** *value*}}

no assign {**modulation-default** *value* | **modulation** *value* {**list-subcarriers** {**freq-abs** | **freq-offset**}*freqency* | **range-subcarriers** {**freq-abs** | **freq-offset**}*freqency* **width** *value*}}

Syntax Description

modulation-default *value*	Assign a modulation value as the default value for all subcarriers. Valid values are QPSK, 16-QAM, 64-QAM, 128-QAM, 256-QAM, 512-QAM, 1024-QAM, 2048-QAM, and 4096-QAM.
modulation *value*	Assign a specific modulation value to a range or list of subcarriers. Valid values are QPSK, 16-QAM, 64-QAM, 128-QAM, 256-QAM, 512-QAM, 1024-QAM, 2048-QAM, 4096-QAM, and zero-bit-load.
list-subcarriers	Assign modulation to a list of up to 10 subcarriers.
range-subcarriers	Assign modulation to a range of consecutive subcarriers specified by the first frequency and width in Hz.
freq-abs *freqency*	Specify range using absolute frequencies in Hz.
freq-offset *freqency*	Specify range using frequency offsets in Hz from the first configurable subcarrier determined by the profile's width.
width *value*	Specify width of range in Hz.

Command Default

None

Command Modes

OFDM modulation profile configuration (config-ofdm-mod-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE 16.8.1	This command was modified on the Cisco cBR Series Converged Broadband Routers. **zero-bit-load** was added as a modulation value.

Usage Guidelines

Use this command to assign modulation to subcarrier.

Only **freq-abs** or **freq-offset** keyword can be used depending on whether the **start-frequency** is configured. If it is configured, **freq-abs** is used and subsequent frequency values must be absolute values. If it is not configured, **freq-offset** is used and subsequent frequency values are offsets from the first configurable subcarrier determined by the profile's width.

Examples

The following example shows how to assign modulation to subcarrier with **start-frequency** configured:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 21
Router(config-ofdm-mod-prof)# width 96000000
Router(config-ofdm-mod-prof)# start-frequency 627000000
Router(config-ofdm-mod-prof)# assign modulation 1024-QAM range-subcarriers freq-abs 635000000
 width 74050000
```

The following example shows how to assign modulation to subcarrier without **start-frequency** configured:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 21
Router(config-ofdm-mod-prof)# width 96000000
Router(config-ofdm-mod-prof)# assign modulation 1024-QAM range-subcarriers freq-offset
8000000 width 74050000
```

The following example shows how to configure ZBL on a modulation profile:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 159
Router(config-ofdm-mod-prof)# description an example of ZBL starting at 10MHZ for 1MHZ
Router(config-ofdm-mod-prof)# subcarrier-spacing 50KHZ
Router(config-ofdm-mod-prof)# width 96000000
Router(config-ofdm-mod-prof)# assign modulation-default 1024-QAM
Router(config-ofdm-mod-prof)# assign modulation zero-bit-load range-subcarriers freq-offset
 10000000 width 1000000
```

Related Commands

Command	Description
cable downstream ofdm-modulation-profile	Define the OFDM modulation profile on the OFDM channel.
description (OFDM modulation profile)	Specify a user defined description for the profile up to 64 characters.
start-frequency	(Optional) Specify the starting frequency associated with the first configurable subcarrier in the profile determined by the width.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.
width	Specify width of profile in Hz.

attributes

To configure the attribute value for an upstream bonding group, use the **attributes** command in upstream bonding configuration submode. To restore the default attribute value, use the **no** form of this command.

attributes *value*
no attributes

Syntax Description

value	The upstream bonding group attibute value, in hexadecimal format. The range is from 0 to FFFFFFFF. The default is 80000000.

Command Default

The upstream bonding group attribute value is 80000000.

Command Modes

Upstream bonding configuration (config-upstream-bonding)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The changes made to the configuration, using this command, on the working line card are synchronized with the configuration on the protect line card only after exiting the configuration mode. Use the end command to exit to Privileged EXEC mode, before using the show running configuration command.

Note Effective with Cisco IOS Release 12.2(33)SCH, the **no** form of this command disables the attribute on a Cisco uBR10012 router.

Examples

The following example shows how to configure the attribute value for an upstream bonding group on a cable interface line card on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable7/1/0
Router(config-if)# cable upstream bonding-group 20
Router(config-upstream-bonding)# attributes eeeeeeee
```

The following example shows how to configure the attribute value for an upstream bonding to allow all devices:

```
Router# configure terminal
Router(config)# interface cable7/1/0
Router(config-if)# cable upstream  2 attribute-mask 20000000
```

The following example shows how to configure the attribute value for an upstream bonding to specific devices:

```
Router# configure terminal
Router(config)# interface cable7/1/0
Router(config-if)# cable upstream  2 attribute-mask 20000004
```

Related Commands

Command	Description
cable upstream bonding-group	Creates an upstream bonding group on a cable interface.

auto-channel-id

To enable automatic channel ID selection, use the **auto-channel-id** command in the DVB scrambling ECMG configuration mode. To disable automatic channel ID selection, use the **no** form of this command.

auto-channel-id
no auto-channel-id

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to enable automatic channel ID selection:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#auto-channel-id
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
connection	Configures the ECMG connection.
ecm-pid-source	Configures the source of ECM PID.
ca-system-id	Configures the CA system ID.
type	Configures the ECMG type.
mode	Configures the application mode of ECMG.
desc-rule	Configures the descriptor rule.
overrule	Overrules the default settings.

base-channel-power

To set the base channel power level, use the **base-channel-power** command in the controller sub configuration mode.

base-channel-power *value*

Syntax Description

value	Value for the base channel power level. Valid range is from 26 to 34.

Command Default

If not specified, the default value is calculated based on the number of carriers.

Command Modes

Controller sub configuration mode (config-controller).

Command History

Release	Modification
Cisco IOS-XE Release 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to specify the base channel power level on an RF port.

The following example shows how to define the base channel power level:

```
router#configure terminal
router(config)#controller Integrated-Cable 3/0/0
router(config-controller)#base-channel-power 26
router(config-controller)#exit
router#show controllers Integrated-Cable 3/0/0 rf-port
  Admin:  UP  MaxCarrier: 128  BasePower: 26 dBmV  Mode: normal
cbr8-router #show controller integrated-Cable 3/0/0 rf-channel 0

Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output

0     UP   UP   93000000   DOCSIS  B    256   5361  I32-J4       1    26   NORMAL
```

Related Commands

Command	Description
max-carrier	Specifies the maximum number of carriers.
power-adjust	Adjusts the power levels of the RF channel.

bind-vcg

To bind a set of virtual RF-channels defined in the virtual carrier group to the physical port in the service distribution group, use the **bind-vcg** command in video configuration mode. To unbind all virtual groups, use the **no** form of this command.

bind-vcg
no bind-vcg

Command Default

None.

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command binds a set of virtual RF-channels defined in the virtual carrier group to the physical port in the service distribution group.

Examples

The following example shows how to bind a set of virtual RF-channels defined in the virtual carrier group to the physical port in the service distribution group:

```
Router#config t
Router(config)#cable video
Router(config-video)#bind-vcg
Router(config-video-bd)#vcg movie-channels sdg west-regions
```

Related Commands

Command	Description
service-distribution-group	Defines a service distribution group.
rf-port integrated-cable	Specifies the RF ports in a service distribution group.
virtual-carrier-group	Defines a virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.

block-unref-pids

To block unreferenced PIDs on a QAM channel, use the **block-unref-pids** command in video configuration mode. To remove the configuration, use the **no** form of the command.

block-unref-pids
no block-unref-pids

Command Default

None.

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE 16.8.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to block unreferenced PIDs on a QAM channel:

```
Router(config)# cable video
Router(config-video)# filter pid vcg vcg1
Router(cable-video-filter)#rf-channel 20-21
Router(cable-video-filter-ch)#block-unref-pids
```



Cable Commands: cable a through cable c

- cable acfe constant-eir-demand, on page 35
- cable acfe enable, on page 36
- cable acfe guar-bw-sync-period, on page 37
- cable acfe max-bonus-bandwidth, on page 38
- cable acfe max-eir-ratio, on page 39
- cable admission-control, on page 40
- cable admission-control ds-bandwidth, on page 42
- cable admission-control event, on page 45
- cable admission-control max-reserved-bandwidth, on page 47
- cable admission-control preempt priority-voice, on page 49
- cable admission-control us-bandwidth, on page 50
- cable application-type include, on page 53
- cable application-type name, on page 57
- cable arp, on page 59
- cable arp filter, on page 61
- cable asf-qos-profile, on page 64
- cable attribute-mask, on page 66
- cable bgsync, on page 68
- cable bgsync active, on page 70
- cable bonding-group-id, on page 72
- cable bonding-group-secondary, on page 75
- cable cache-snmp active , on page 77
- cable channel-group, on page 78
- cable clock clear-counters, on page 79
- cable clock dti, on page 81
- cable clock dti clear-counters, on page 82
- cable clock force, on page 83
- cable clock source-midplane, on page 85
- cable clock upgrade, on page 87
- cable cm-status, on page 88
- cable cm-status enable, on page 90
- cable cmc, on page 93
- cable cmc image_upgrade, on page 96

- cable cmcpe-list valid-time, on page 97
- cable cmts-id, on page 99
- cable config-file, on page 100
- cable controller-profile, on page 104

cable acfe constant-eir-demand

To set the EIR demand(raw/scale) value for a bonding group, use **cable acfe constant-eir-demand** command in interface configuration mode.

cable acfe constant-eir-demand *value*

Syntax Description

value	Constant EIR demand value for a bonding group. The valid range is from 1 to 100.

Command Default

0

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

ACFE uses the EIR demand value as weight to allocate bandwidth between bonding groups. The EIR demand value is calculated dynamically base on service flow priority, unless this command is configured.

Examples

The following example shows how to configure the EIR demand value for a bonding group:

```
Router(config-if)# cable acfe constant-eir-demand 11
```

Related Commands

Command	Description
cable acfe enable	Enables Fairness Across DOCSIS Interfaces feature on the CMTS routers.
debug cable dp acfe	Displays the debug information related to algorithm or interaction with the system.

cable acfe enable

To enable Fairness Across DOCSIS Interfaces feature on the integrated-cable (IC), modular-cable (MC), or wideband-cable (WB) interfaces, use the **cable acfe enable** command in global configuration mode. To disable Fairness Across DOCSIS Interfaces feature, use the **no** form of this command.

cable acfe enable
no cable acfe enable

Syntax Description

This command has no arguments or keywords.

Command Default

Fairness Across DOCSIS Interfaces feature is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Configure the Fairness Across DOCSIS Interfaces feature on the MC, IC, or WB interfaces.

It is recommended that you clear the CIR reservation above the legacy "reservable" bandwidth before disabling Fairness Across DOCSIS Interfaces feature. This is to prevent any CIR over-subscription after disabling Fairness Across DOCSIS Interfaces feature.

Examples

The following example shows how to enable Fairness Across DOCSIS Interfaces feature in cable interfaces.

```
Router(config)# cable acfe enable
```

Related Commands

Command	Description
cable acfe period	Configures the interval for running the EIR rebalancing process.
show cable acfe summary	Displays Fairness Across DOCSIS Interfaces feature status and statistics.
debug cable acfe (for uBR series router)	Displays the debug information related to algorithm or interaction with the system.
debug cable dp acfe (for cBR series router)	Displays the debug information related to algorithm or interaction with the system.

cable acfe guar-bw-sync-period

Use the **cable acfe guar-bw-sync-period** configuration command to adjust bandwidth synchronisation period between active SUP and standby SUP. The default value is 40 seconds.

cable acfe guar-bw-sync-period

Syntax Description

This command has no arguments or keywords.

Command Default

The default value is 40 seconds.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS XE Fuji 16.7.1	This command was introduced.

Examples

The following example shows how to configure the ACFE to adjust bandwidth synchronisation period between active SUP and standby SUP

```
Router(config)# cable acfe guar-bw-sync-period
```

Related Commands

Command	Description
cable acfe period	Configures the interval for running the EIR rebalancing process.
show cable acfe summary	Displays Fairness Across DOCSIS Interfaces feature status and statistics.

cable acfe max-bonus-bandwidth

To configure the maximum usable bonus bandwidth for a bonding group (BG), use the **cable acfe max-bonus-bandwidth** command in interface configuration mode. To revert to the default values, use the **no** form of this command.

cable acfe max-bonus-bandwidth *bonus-bandwidth*
no cable acfe max-bonus-bandwidth

Syntax Description

bonus-bandwidth	Maximum usable bonus bandwidth for a BG. There is no valid range, and the bonus bandwidth can use the entire bandwidth of an interface.

Command Default

The bonus bandwidth can use the entire bandwidth of an interface.

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable acfe max-bonus-bandwidth** command configures the maximum usable bonus bandwidth. After disabling Fairness Across DOCSIS Interfaces feature, this configuration is retained. However, it will not be used.

Examples

The following example shows how to configure the maximum usable bonus bandwidth for a BG:

```
Router(config-if)# cable acfe max-bonus-bandwidth 1000000
```

Related Commands

Command	Description
cable acfe enable	Enables Fairness Across DOCSIS Interfaces feature on the CMTS routers.
debug cable dp acfe	Displays the debug information related to algorithm or interaction with the system.

cable acfe max-eir-ratio

To configure the maximum EIR ratio between the BE bandwidth among adjacent bonding groups (BGs), use the **cable acfe max-eir-ratio** command in global configuration mode. To return to the default values, use the **no** form of this command.

cable acfe max-eir-ratio *eir-ratio*
no cable acfe max-eir-ratio

Syntax Description

eir-ratio	EIR rebalance ratio between two adjacent BGs. The valid range is from 1 to 100 with a default value of 10.

Command Default

The default value for EIR rebalance ratio is 10.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable acfe max-eir-ratio** command configures the maximum EIR ratio between the BE bandwidth among adjacent BGs.

The failure to maintain the maximum EIR ratio may reduce the guaranteed bandwidth rate for the BE traffic to zero. This may lead to rejection of unicast CIR flows.

Examples

The following example shows how to configure the EIR rebalance ratio between two adjacent BGs:

```
Router(config)# cable acfe max-eir-ratio 20
```

Related Commands

Command	Description
cable acfe enable	Enables Fairness Across DOCSIS Interfaces feature on the CMTS router.
debug cable acfe (for uBR series router)	Displays the debug information related to algorithm or interaction with the system.
debug cable dp acfe (for cBR series router)	Displays the debug information related to algorithm or interaction with the system.

cable admission-control

To configure the CPU and memory thresholds for a Cisco CMTS router supporting broadband processing engines (BPEs), use the **cable admission-control** command in global configuration mode. This command sets the CPU averaging method and memory thresholds. To remove thresholds from a Cisco CMTS router, use the **no** form of this command.

cable admission-control {**cpu-5sec** | **cpu-avg**} {[**io-mem**] | [**proc-mem**] | [**total-memory**]}**minor** *num1* **major** *num2* **critical** *num3*
no cable admission-control {**cpu-5sec** | **cpu-avg**} {[**io-mem**] | [**proc-mem**] | [**total-memory**]}**minor** *num1* **major** *num2* **critical** *num3*

Syntax Description

cpu-5sec	Sets Admission Control thresholds on the Cisco CMTS based on a five-second average for the CPU. This setting must be combined with the additional **minor**, **major**, and **critical** threshold percentage values.
cpu-avg	Sets Admission Control thresholds on the Cisco CMTS based on a one-minute average for the CPU. This setting must be combined with the additional **minor**, **major**, and **critical** threshold percentage values.
io-mem	Sets Admission Control thresholds for input/output (IO) memory on the Cisco CMTS route processors and BPE processors.
proc-mem	Sets Admission Control thresholds according to CPU processor memory on the Cisco CMTS.
total-memory	Sets Admission Control thresholds on the Cisco CMTS according to total-memory allocation.
minor *num1*	Sets the minor threshold level for the CPU or memory resource to be configured. Num1 expresses a percentage and must be an integer between 1 and 100.
major *num2*	Sets the major threshold level for the CPU or memory resource to be configured. Num2 expresses a percentage and must be an integer between 1 and 100.
critical *num3*	Sets the critical threshold level for the CPU or memory resource to be configured. Num3 expresses a percentage and must be an integer between 1 and 100.

Command Default

Admission control is disabled with no CPU or memory resource threshold settings on the Cisco CMTS router.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced on the Cisco uBR10012 router and the Cisco uBR7246VXR router, with supporting broadband processing engines (BPEs) or cable interface line cards on the respective routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The threshold counters are set to zero when the resource is reconfigured.

An important concept for system resources that are set with this command (CPU and memory) is the concept of *dampening* . Without dampening, and when admission control is configured for the first time, the system resource check is unsuccessful if the current value exceeds the critical threshold. When this happens, the system resource check subsequently succeeds only if the current value drops below the major threshold.



Note When the **minor** threshold value set with *Num1* or a **major** threshold value set with *Num2* is crossed, the Cisco CMTS router sends an alarm (SNMP trap, when supported). When the **critical** threshold value set with *Num3* is crossed, the Cisco CMTS router drops the call request.

This dampening approach helps prevent significant fluctuations in the outcome of resource checks. For example, if the critical threshold were 80 percent and the current values fluctuated between 79 and 81 percent, this scenario would lead to an alternate success then failure event without dampening. The first check would succeed, the second check would fail, and so forth.

For additional Admission Control feature information, refer to the *Admission Control for the Cisco Cable Modem Termination System* document on Cisco.com.

Examples

The following example configures the Cisco CMTS router with a Quality of Service (QoS) policy that includes admission control dampening. This example illustrates the following conditions:

- When the **cpu-avg** exceeds 60%, a minor alarm (SNMP trap, when supported) is sent.
- When the **cpu-avg** exceeds 70%, a major alarm (SNMP trap, when supported) is sent.
- When the **cpu-avg** exceeds 80%, the incoming call request is rejected, and additional calls are not accepted until after the **cpu-avg** returns to below 60% (the minor alarm level).

```
Router(config)# cable admission-control cpu-avg minor 60 major 70 critical 80
```

Related Commands

Command	Description
cable admission-control event	Configures and enables admission control event types on the Cisco CMTS router.
cable admission-control ds-bandwidth	Configures admission control downstream bandwidth thresholds on the Cisco CMTS router.
cable admission-control us-bandwidth	Configures admission control upstream bandwidth thresholds on the Cisco CMTS router.
clear cable admission control counters	Clears all admission control resource counters on the Cisco CMTS router.
debug cable admission-control	Enables automatic admission control troubleshooting processes on the Cisco CMTS router.
show cable admission-control	Displays the current admission control configuration and status on the Cisco CMTS router, or on a specified interface.

cable admission-control ds-bandwidth

To set the minor, major, and exclusive thresholds for downstream voice or data bandwidth for all interfaces on a Cisco CMTS router, use the **cable admission-control ds-bandwidth** command in global configuration mode or interface configuration mode. To remove this setting from a Cisco CMTS router or from a specified interface, use the **no** form of this command.

cable admission-control ds-bandwidth *traffic-type* **minor** *minor-threshold* **major** *major-threshold* **exclusive** *exclusive-percentage* **non-exclusive** *non-exclusive-percentage*
no cable admission-control ds-bandwidth *traffic-type* **minor** *minor-threshold* **major** *major-threshold* **exclusive** *exclusive-percentage* **non-exclusive** *non-exclusive-percentage*

Syntax Description

ds-bandwidth	Sets downstream throughput thresholds.
traffic-type	Either of the following keywords sets the traffic type for which Admission Control applies. Both settings can be applied to the Cisco CMTS. • **voice**—Applies thresholds to downstream voice traffic. • **data**—Applies thresholds to downstream data traffic.
minor *minor-threshold*	Sets the minor alarm threshold. The minor-threshold value is a percentage value from 1 to 100.
major *major-threshold*	Sets the major alarm threshold. The major-threshold value is a percentage value from 1 to 100.
exclusive *exclusive-percentage*	Specifies the percentage of throughput reserved exclusively for this class (voice or data). The *exclusive-percentage* value is an integer between 1 and 100. No other class can use this throughput.
non-exclusive *non-exclusive-percentage*	Specifies the percentage of throughput, over and above the exclusive share, that can be used by this class. The *non-exclusive-percentage* value is an integer between 1 and 100. Because this throughput is non-exclusive, it can be used by other classes as specified.

Command Default

Admission control is disabled on the Cisco CMTS router.

Command Modes

Global configuration (config)

Interface configuration (config-if)

Command History

Release	Modification
12.3(13a)BC	This command was introduced on the Cisco uBR10012 and the Cisco uBR7246VXR router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Release	Modification
12.2(33)SCC	This command was modified to run on modular cable and integrated cable interfaces.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Downstream bandwidth settings support all interfaces on the Cisco CMTS router through global configuration.

Downstream bandwidth settings can be further refined per-interface or per-upstream, the latter of which provides optimal downstream Admission Control granularity on the Cisco CMTS router.

When interface-level downstream configuration is used in combination with global configuration, then the interface configuration supersedes global configuration.

Note The **critical** keyword is not present for the upstream throughput resource management with the Cisco Service Flow Admission Control feature.

Note The **minor** threshold level cannot be greater than the **major** threshold level.

Examples

The following example configures downstream bandwidth in the global configuration mode, with 30% of downstream bandwidth reserved exclusively for voice traffic. Minor and major alarms for voice traffic are also set to be generated at 15% and 25% respectively.

```
Router(config)# cable admission-control ds-bandwidth voice minor 15 major 25 exclusive 30
```

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for the Cisco CMTS router and supporting broadband processing engines (BPEs).
cable admission-control event	Configures and enables admission control event types on the Cisco CMTS router.
cable admission-control max-reserved-bandwidth	Defines the maximum reserved bandwidth per bonding group for all service flows that are allowed by the Cisco CMTS.
cable admission-control us-bandwidth	Configures admission control upstream bandwidth thresholds on the Cisco CMTS router.
clear cable admission control counters	Clears all admission control resource counters on the Cisco CMTS router.
debug cable admission-control	Enables automatic admission control troubleshooting processes on the Cisco CMTS router.

Command	Description
show cable admission-control	Displays the current admission control configuration and status on the Cisco CMTS router or on a specified interface.

cable admission-control event

To configure admission control event types on a Cisco CMTS router, and to enable admission control for all previously configured resources on a Cisco CMTS router, use the **cable admission-control event** command in global configuration mode. To disable admission control event types on a Cisco CMTS router, use the **no** form of this command.

cable admission-control event {**cm-registration** | **dynamic-service**}
no cable admission-control event *event_type*

Syntax Description

cm-registration	Performs admission control checks when a cable modem registers with the Cisco CMTS router headend. This setting can be combined with the **dynamic-service** setting, in which cable modems are allowed to register but remain subject to a Quality of Service (QoS) policy on the Cisco CMTS.
dynamic-service	Performs admission control checks each time a voice call is made, and rejects voice calls if they would impede QoS policies on the Cisco CMTS router. This setting can be combined with the **cm-registration** setting.

Command Default

Admission control event types are not defined on the Cisco CMTS router.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced for the Cisco uBR10012 router and the Cisco uBR7246VXR router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

At least one event type must be configured to enable admission control on the Cisco CMTS router.

For additional Admission Control feature information, refer to the *Admission Control for the Cisco Cable Modem Termination System* document on Cisco.com.

Examples

The following example configures each available option for the **cable admission-control event** command on the Cisco CMTS router.

```
Router(config)# cable admission-control event cm-registration
Router(config)# cable admission-control dynamic-service
```

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for a Cisco CMTS router and supporting broadband processing engines (BPEs).
cable admission-control ds-bandwidth	Configures admission control downstream bandwidth thresholds on a Cisco CMTS router.
cable admission-control us-bandwidth	Configures admission control upstream bandwidth thresholds on a Cisco CMTS router.
clear cable admission control counters	Clears all admission control resource counters on a Cisco CMTS router.
debug cable admission-control	Enables automatic admission control troubleshooting processes on a Cisco CMTS router.
show cable admission-control	Displays the current admission control configuration and status on a Cisco CMTS router, or on a specified interface.

cable admission-control max-reserved-bandwidth

To define the maximum reserved bandwidth per bonding group for all service flows that are allowed by the Cisco CMTS, use the **cable admission-control max-reserved-bandwidth** command in the interface configuration mode. To reset or disable the maximum reserved bandwidth value, use the **no** form of this command.

cable admission-control max-reserved-bandwidth *bw-in-kbps*
no cable admission-control max-reserved-bandwidth

Syntax Description

bw-in-kbps	Maximum admission control reserved bandwidth. The value is in kbps and is based on the RF bandwidth percent defined for the bonding group. Valid range is from 0 to 14762.

Command Default

The max-reserved-bandwidth value is 80 percent of the aggregate bandwidth of the RF channels configured in the US or DS bonding group.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to define the maximum reserved bandwidth per bonding group. The default maximum reserved bandwidth value is 80 percent. However the user can choose to configure a higher (up to 96 percent) or lower reserved bandwidth so that there is bandwidth allocated for zero committed information rate (CIR) best effort traffic.

Examples

The following example shows a sample definition of the maximum reserved bandwidth value.

```
Router> enable
Router# configure terminal
Router(config)# interface c5/0/1
Router(config-if)# cable admission-control max-reserved-bandwidth 6344
```

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for the Cisco CMTS router and supporting broadband processing engines (BPEs).
cable admission-control event	Configures and enables admission control event types on the Cisco CMTS router.
cable admission-control ds-bandwidth	Configures admission control downstream bandwidth thresholds on the Cisco CMTS router.

Command	Description
cable admission-control us-bandwidth	Configures admission control upstream bandwidth thresholds on the Cisco CMTS router.
debug cable admission-control	Enables automatic admission control troubleshooting processes on the Cisco CMTS router.
show cable admission-control	Displays the current admission control configuration and status on the Cisco CMTS router or on a specified interface.

cable admission-control preempt priority-voice

To change the default PacketCable emergency 911 call preemption functions on a Cisco CMTS router to support throughput and bandwidth requirements for emergency 911 calls above all other buckets on the Cisco CMTS router, use the **cable admission-control preempt priority-voice** command in global configuration mode. To disable preemption and return the bucket that supports PacketCable emergency 911 calls to its default configuration, use the **no** form of this command.

cable admission-control preempt priority-voice
no cable admission-control preempt priority-voice

Syntax Description

This command has no arguments or keywords.

Command Default

Emergency 911 call preemption and service flow admission control is enabled on the Cisco CMTS router.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router and the Cisco uBR7246VXR router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, PacketCable Emergency 911 calls are given priority on the Cisco CMTS. This priority may be preempted or removed from the Cisco CMTS router with non-standard configuration of the Service Flow Admission Control feature.

For additional information for Service Flow Admission Control beginning in Cisco IOS Release 12.3(21)BC, refer to the *Service Flow Admission Control for the Cisco Cable Modem Termination System* document on Cisco.com.

Examples

The following example disables and then restores emergency 911 call preemption on the Cisco CMTS router.

```
Router(config)# no cable admission-control preempt priority-voice
Router(config)# cable admission-control preempt priority-voice
```

cable admission-control us-bandwidth

To configure upstream bandwidth thresholds for admission control on a Cisco CMTS router, use the **cable upstream admission-control us-bandwidth** command in global configuration or interface configuration mode. To disable or to remove this configuration from a Cisco CMTS router or the specified port, use the **no** form of this command.

cable admission-control us-bandwidth [**sched** *scheduling-type* | **service** *service-class-name*] **minor** *minor-threshold* **major** *major-threshold* **exclusive** *exclusive-percentage* **non-exclusive** *non-exclusive-percentage*
no cable admission-control us bandwidth [**sched** *scheduling-type* | **service** *service-class-name*] **minor** *minor-threshold* **major** *major-threshold* **exclusive** *exclusive-percentage* **non-exclusive** *non-exclusive-percentage*

Syntax Description

n	Upstream on the router interface.
us-bandwidth	Configures the upstream throughput thresholds.
sched *scheduling-type*	(Optional) Specifies the scheduling type for a traffic class, where *scheduling-type* is one of the following values: • **BE**—Selects best effort traffic. • **NRTPS**—Selects non-real-time polling service. • **RTPS**—Selects real time polling service. • **UGS-AD**—Selects UGS-AD service. • **UGS**—Selects UGS service.
service *service-class-name*	(Optional) Displays a string representing a previously defined service class. Instead of specifying a class by a scheduling type, this keyword can be used to specify a class using the *service-class-name*.
minor *minor-threshold*	Sets the minor alarm threshold in a percentage value between 1 and 100.
major *major-threshold*	Sets the major alarm threshold in a percentage value between 1 and 100.
exclusive *exclusive-percentage*	Represents the critical threshold for the upstream throughput resource in a percentage value between 1 and 100. Specifies the percentage of throughput reserved exclusively for this class.
non-exclusive *non-exclusive-percentage*	Specifies the percentage of throughput, over and above the exclusive share, that can be used by this class. The *non-exclusive-percentage* value is an integer between 1 and 100. Because this throughput is non-exclusive, it can be used by other classes as specified.

Command Default

Admission control is disabled by default on a Cisco CMTS router.

Command Modes

Global configuration (config)

Interface configuration (config-if)

Command History

Release	Modification
12.3(13a)BC	This command was introduced on the Cisco uBR10012 and the Cisco uBR7246VXR routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC	This command was modified to run on modular cable and integrated cable interfaces.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Upstream bandwidth settings support all interfaces on a Cisco CMTS router through global configuration.

Upstream bandwidth settings can be further refined on a per-interface or per-upstream basis using interface configuration mode. Per-upstream settings provide the optimal upstream admission control granularity on the Cisco CMTS router.

When interface or per-upstream configuration is used in combination with global configuration, then interface or per-upstream configuration supersedes global configuration. Per-upstream configuration also supersedes per-interface configuration.

Note The **critical** keyword is not present for the upstream throughput resource management with Cisco Admission Control.

Note The **minor** threshold level cannot be greater than the **major** threshold level.

Examples

For additional Admission Control feature information and examples, refer to the *Admission Control for the Cisco Cable Modem Termination System* document on Cisco.com.

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for the Cisco CMTS router and supporting broadband processing engines (BPEs).
cable admission-control event	Configures and enables admission control event types on the Cisco CMTS router.
cable admission-control ds-bandwidth	Configures admission control downstream bandwidth thresholds on the Cisco CMTS router.
cable admission-control max-reserved-bandwidth	Defines the maximum reserved bandwidth per bonding group for all service flows that are allowed by the Cisco CMTS.

Command	Description
clear cable admission control counters	Clears all admission control resource counters on the Cisco CMTS router.
debug cable admission-control	Enables automatic admission control troubleshooting processes on the Cisco CMTS router.
show cable admission-control	Displays the current admission control configuration and status on the Cisco CMTS router or on a specified interface.

cable application-type include

To associate an application type with a specific and prioritized bucket on a Cisco CMTS router, use the **cable application-type include** command in global configuration mode. To remove the application type settings, use the **no** form of this command.

cable application-type *bucket-number* **include** {**Best-effort** | **multicast** *application-id* | **packetcable** {**normal** | **priority**} | **pcmm** {**app-id** *gate-app-id* | **priority** *gate-priority*} | **sched-type** *type* | **service-class** *service-class-name*}
no cable application-type *bucket-number* **include** {**Best-effort** | **multicast** *application-id* | **packetcable** {**normal** | **priority**} | **pcmm** {**app-id** *gate-app-id* | **priority** *gate-priority*} | **sched-type** *type* | **service-class** *service-class-name*}

Cisco cBR Series Converged Broadband Routers
cable application-type *bucket-number* **include** {**Best-effort** | **multicast** *application-id* | **packetcable** {**normal** | **priority**} | **pcmm** {**app-id** *gate-app-id* | **priority** *gate-priority*} | **service-class** *service-class-name*}
no cable application-type *bucket-number* **include** {**Best-effort** | **multicast** *application-id* | **packetcable** {**normal** | **priority**} | **pcmm** {**app-id** *gate-app-id* | **priority** *gate-priority*} | **service-class** *service-class-name*}

Syntax Description

bucket-number	Bucket number to which an application type is associated. Range is from 1 to 8, with 1 as the first in the sequence.
Best-effort	Applies best effort committed information rate (CIR) to the specified bucket.
multicast *application-id*	Specifies the application identification for the multicast service flow. The valid range is 1 to 65535.
packetcable {**normal** | **priority**}	Specifies PacketCable service flows for the designated bucket, with the following priorities: • **normal**—Selects PacketCable calls with normal priority. • **priority**—Selects PacketCable calls with high priority.
pcmm {**app-id** *gate-app-id* | **priority** *gate-priority*}	Specifies PacketCable Multimedia (PCMM) service flows for the designated bucket, with the following options: • **app-id** *gate-app-id*—Selects the gate application identifier from 0 to 65535. For each bucket, up to ten application type rules may be defined. • **priority** *gate-priority*—Selects the priority level from 0 to 7.
sched-type *type*	Specifies upstream scheduling types, with one of the following additional keywords used for the DOCSIS scheduling type: • **be**—Best effort. • **nrtps**—Non-real-time polling service. • **rtps**—Real-time polling service. • **ugs**—Unsolicited Grant Service. • **ugs-ad**—Unsolicited grant service-activity detection (UGS-AD) service.

service-class *service-class-name*	Specifies the name of the service class being assigned to the designated bucket, where *service-class-name* is an alphanumeric string.

Command Default

Service flow admission control is enabled without the application types.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router and the Cisco uBR7246VXR router.
12.2(33)SCA	This command was introduced in Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added. The **multicast** keyword was added to this command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.16.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **sched-type** keyword was removed.

Usage Guidelines

The details of this command vary according to the bucket number and application type being mapped to a service flow on the Cisco CMTS router. This command overrides default service flow admission control settings on the Cisco CMTS.

Best Effort

The best effort CIR service flow rule may be applicable to both upstream and downstream. However, in the case of upstream service flows, in most cases, the same service flow may map both the rules.

For best effort, there is also the **sched-type** keyword option that applies to upstream service flows. This best effort scheduling type rule is applicable only for upstream service flows.

Service Classes

DOCSIS 1.1 introduced the concept of service classes. A service class is identified by a service class name. A service class name is a string the CMTS router associates with a QoS parameter set. One of the objectives of using a service class is to allow the high-level protocols to create the service flows with the desired QoS parameter set. Using a service class is a convenient way to bind the application with the service flows. The rules provide a mechanism to implement such binding.

Note the following factors when using the **service-class** keyword:

- Service classes are separately configured using the **cable match** command to provide the QoS for multicast traffic. This step maps a bucket using a rule to allocate bandwidth for multicast traffic.
- A named service class may be classified into any application type.
- Up to ten service class names may be configured per application type. Attempting to configure more than ten service classes results in an error message.

For additional information, see the *Service Flow Admission Control* feature documentation on Cisco.com.

Examples

The following example maps high-priority PacketCable service flows into application bucket 5:

```
Router(config)# cable application-type 5 include packetcable priority
```

The following example maps normal PacketCable service flows into application bucket 1:

```
Router(config)# cable application-type 1 include packetcable normal
```

The following example maps the specified bucket number with PCMM service flow with a priority of 7, then maps an application identifier of 152 for the same bucket number:

```
Router(config)# cable application-type 2 include pcmm priority 7
Router(config)# cable application-type 2 include pcmm app-id 152
```

The following example maps both UGS and UGS-AD into bucket number 1:

```
Router(config)# cable application-type 1 include sched-type ugs
Router(config)# cable application-type 1 include sched-type ugs-ad
```

The following example maps the best effort CIR flows to bucket 3:

```
Router(config)# cable application-type 3 include Best-effort
```

The following example maps the service class name with a value of service-name1 into application bucket 3:

```
Router(config)# cable application-type 3 include service-class service-name1
```

The following example maps the multicast application type with a value of 18 into application bucket 3:

```
Router(config)# cable application-type 3 include multicast 18
```

Related Commands

Command	Description
cable admission-control ds-bandwidth	Sets the minor, major, and exclusive thresholds for downstream voice or data bandwidth for all interfaces on the Cisco CMTS router.
cable admission-control preempt priority-voice	Changes the default PacketCable emergency 911 call preemption functions on the Cisco CMTS router to support throughput and bandwidth requirements for emergency 911 calls above all other buckets on the Cisco CMTS router.
cable admission-control us-bandwidth	Configures upstream bandwidth thresholds for admission control on the Cisco CMTS router.
cable application-type name	Assigns an alphanumeric name for the specified bucket.
cable upstream admission-control	Configures per-upstream bandwidth thresholds and exclusive or non-exclusive resources on the Cisco CMTS router.
debug cable admission-control flow-categorization	Displays service flow categorization results, enabled when a service flow is classified.
show application-buckets	Displays rules for any or all buckets supporting service flow admission control on the Cisco CMTS router.

Command	Description
show interface cable admission-control reservation	Displays service flows, categorizations, and bandwidth consumption on the Cisco CMTS router, for the specified interface, and the specified service flow direction.

cable application-type name

To assign an alphanumeric name for the specified bucket, use the **cable application-type name** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable application-type *bucket-number* **name** *bucket-name*
no cable application-type *bucket-number* **name** *bucket-name*

Cisco cBR Series Converged Broadband Routers
cable application-type *bucket-number* **name** *bucket-name*
no cable application-type *bucket-number* **name** *bucket-name*

Syntax Description

bucket-number	Bucket number to which the name is applied. The priority sequence of the buckets, according to their original numeration of 1 to 8, still applies, whether the default bucket numbers or customized alphanumeric names are used.
bucket-name	Alphanumeric bucket name.

Command Default

Service flow admission control and the default configuration of this command is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router and the Cisco uBR7246VXR router.
12.2(33)SCA	This command was introduced in Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.16.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This bucket name appears in supporting **show** and **debug** commands along with the default bucket number.

For additional information, see the *Service Flow Admission Control* feature documentation on Cisco.com.

Examples

The following example illustrates the use of descriptive names for the associated buckets:

```
Router(config)# cable application-type 2 name video
Router(config)# cable application-type 3 name gaming
```

Related Commands

Command	Description
cable admission-control ds-bandwidth	Sets minor, major and exclusive thresholds for downstream voice or data bandwidth for each or all interfaces on the Cisco CMTS
cable admission-control preempt priority-voice	Changes the default PacketCable Emergency 911 call preemption functions on the Cisco CMTS, supporting throughput and bandwidth requirements for Emergency 911 calls above all other buckets on the Cisco CMTS.
cable admission-control us-bandwidth	Configures global or interface-level upstream bandwidth thresholds and exclusive or non-exclusive resources on the Cisco CMTS.
cable application-type include	Associates an application type with a specific and prioritized bucket on the Cisco CMTS.
cable upstream admission-control	Configures per-upstream bandwidth thresholds and exclusive or non-exclusive resources on the Cisco CMTS.
debug cable admission-control flow-categorization	Displays service flow categorization results, enabled when a service flow is classified.
show application-buckets	Displays rules for any or all buckets supporting Service Flow Admission Control on the Cisco CMTS.
show interface cable admission-control reservation	Displays service flows, categorizations, and bandwidth consumption on the Cisco CMTS, for the specified interface, and the specified service flow direction.

cable arp

To activate cable Address Resolution Protocol (ARP), use the **cable arp** command in cable interface or subinterface configuration mode. To block ARP requests for cable modems (CMs), use the **no** form of this command.

cable arp
no cable arp

Syntax Description

This command has no arguments or keywords.

Command Default

ARP is enabled.

Command Modes

Interface configuration (config-if)

Subinterface configuration (config-subif)

Command History

Release	Modification
12.1T	This command was introduced.
12.0(6)SC	This command was supported.
12.1(2) EC1	This command was supported.
12.1(3a)EC	Subinterface support was added.
12.2(8)BC1	Interaction with the **clear arp-cache** command was changed. Previously, the **clear arp-cache** command sent an ARP request to a CM before clearing its ARP entry. Now, the **clear arp-cache** command clears the ARP entry without communicating with the CM. The CM (or its CPE devices) must send one or more IP packets to the CMTS before IP communications can be restored (assuming the CM or CPE devices are authorized to connect to the network).
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. This command is integrated into bundle interface configuration mode.

Usage Guidelines

ARP is an Internet protocol used to map IP addresses to MAC addresses on computers and other equipment installed in a network. You must activate ARP requests so that the Cisco CMTS router can perform IP address resolution on the downstream path.

Occasionally, you might want to use the **no cable arp** and **clear arp-cache** commands to block out new ARP requests and clear the existing ARP table. In this situation, the Cisco CMTS router will retain the ARP addresses of currently online CMs (CMs with a known IP address) and will continue to send ARP requests for those CMs when those ARP entries time out or are cleared, so that those CMs can continue to remain online. ARP

requests for CMs that are currently offline and for any other unknown IP addresses, however, will remain blocked until ARP requests are reenabled on the downstream using the **cable arp** command.

Note Using the **no cable arp** and **no cable proxy-arp** commands shifts all responsibility for the management of the IP addresses used by CMs and CPE devices to the DHCP server and provisioning system.

Tip You can expect to see a temporary spike in CPU usage after initially giving the **no cable arp** command, because of the need to verify CPE IP addresses. CPU usage drops after the router has verified and learned all of the CPE IP addresses that are currently online. (This same situation occurs after initially enabling the **cable source-verify dhcp** command, because the router must send a DHCP LEASEQUERY request for every unknown CPE IP address.)

Note Starting from IOX-XE 3.15 OS, this command is integrated into bundle interface configuration mode for cBR Series Converged Broadband Routers.

Examples

The following example shows how to activate cable ARP requests for port 0 on the cable interface line card installed in slot 6 of a Cisco CMTS router:

```
router(config)# interface cable 6/0
router(config-if)# cable arp
```

The following example shows how to activate cable ARP requests for port 0 on the cable interface line card installed in slot 6, subinterface 1, of a Cisco CMTS router:

```
router(config)# interface cable 6/0.1
router(config-subif)# cable arp
```

The following example shows how to activate cable ARP requests on the bundle interface line card on Cisco cBR Series Converged Broadband Routers:

```
router(config)# interface bundle 1
router(config-if)# cable arp
```

Related Commands

Command	Description
clear arp-cache	Clears the ARP table on the router.
cable proxy-arp	Activates cable proxy ARP on the cable interface.

cable arp filter

To control the number of Address Resolution Protocol (ARP) packets that are allowable for each Service ID (SID) on a cable interface, use the **cable arp filter** command in cable interface configuration mode. To stop the filtering of ARP broadcasts for CMs, use the **no** form of this command.

cable arp filter {**reply-accept** | **request-send**} *number window-size*
no cable arp filter {**reply-accept** | **request-send**}
default cable arp filter {**reply-accept** | **request-send**}

Syntax Description

reply-accept	Configures the cable interface to accept only the specified *number* of ARP reply packets every *window-size* seconds for each active Service ID (SID) on that interface. The cable interface drops ARP reply packets for a SID that would exceed this number.
request-send	Configures the cable interface to send only the specified *number* of ARP request packets every *window-size* seconds for each active SID on that interface. The cable interface drops ARP requests for a SID that would exceed this number.
number	Number of ARP reply packets that is allowed for each SID within the window time period. The allowable range is 0 to 20 packets, with a default of 4 packets. If *number* is 0, the cable interface drops all ARP reply packets.
window-size	Size of the window time period, in seconds, in which to monitor ARP requests. The valid range is 1 to 5 seconds, with a default of 2 seconds.

Command Default

ARP packets are not filtered, which means the Cisco CMTS router accepts all ARP reply packets and sends all ARP request packets.

Command Modes

Cable interface configuration (config-if)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers.
12.3(9a)BC	The values of number and window-size are optional for the the respective **reply-accept** and **request-send** settings. In this release and for earlier supporting releases, when ARP filtering is enabled, the default values for *number* and *window-size* are 4 and 2 respectively.
12.3(17a)BC	In this release and for later releases, when ARP filtering is enabled, the default values for *number* and *window-size* are 3 and 2 respectively.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. This command is integrated into bundle interface configuration mode.

Usage Guidelines

Viruses, worms, and theft-of-service attacks can generate a large volume of ARP requests on a cable interface. In some situations, the volume of ARP traffic can become so large that it throttles all other traffic.

To control the number of ARP replies and ARP requests that are allowed for each SID on a cable interface, use the **cable arp filter** command. This command configures the interface so that it accepts only a certain number of ARP reply or request packets per a specified time period. If a SID generates more ARP packets than what is allowed, the cable interface drops the excessive traffic.

By default, no ARP filtering is done. ARP filtering is enabled on individual cable interfaces, and you can choose to filter ARP packets only on the specific cable interfaces that require it. You can further choose to filter only ARP request packets, only ARP reply packets, or both. You can configure different threshold values on each interface, allowing you to customize the feature for each interface's traffic patterns.

If using bundled cable interfaces, the Cable ARP Filtering feature is configured separately on the primary and subordinate interfaces. This allows you to configure the feature only on the particular interfaces that require it.



Note Cisco IOS Release 12.3(9a)BC introduces enhanced command option syntax for the **cable arp filter** command, where *number* and *window-size* values are optional for **reply-accept** and **request-send** settings.



Note Disabling the cable ARP filtering feature, using the **no cable arp filter** command, does not reset the ARP packet counters. The ARP packet counters do not increment when cable ARP filtering is disabled, but the counters retain their current values until the interface counters are specifically cleared, using the **clear counters** command.

The Linksys Wireless-B Broadband Router BEFW11S4 version 4 with 1.44.2 firmware incorrectly sends its own ARP reply packet for every ARP request packet it receives, instead of replying only to the ARP requests that are specifically for itself. Customers with these routers should upgrade the firmware to the latest revision to fix this bug. To upgrade the firmware, go to the download section on the Linksys web site.



Note Starting from IOX-XE 3.15 OS, this command is integrated into bundle interface configuration mode for cBR Series Converged Broadband Routers.

Examples

The following example shows how to filter cable ARP reply packets, so that the cable interface accepts a maximum of 15 ARP replies every three seconds per SID:

```
Router(config)# interface cable 5/1/0

Router(config-if)# cable arp filter reply-accept 15 3
```

The following example shows how to filter cable ARP request packets, so that the cable interface sends a maximum of 10 requests per second per SID:

```
Router(config)# interface cable 6/0

Router(config-if)# cable arp filter request-send 10 1
```

The following example shows how to enable the filtering of cable ARP request and reply packets on a cable interface, using the default values of 4 packets per CPE per every 2 seconds:

```
Router(config)# interface cable 3/0

Router(config-if)# default cable arp filter reply-accept

Router(config-if)# default cable arp filter request-send

Router(config-if)# end

Router# show running-config | include filter

cable arp filter reply-accept 4 2
cable arp filter request-send 4 2
```

The following example shows how to disable the filtering of cable ARP request and reply packets on a cable interface:

```
Router(config)# interface cable 1/0

Router(config-if)# no cable arp filter reply-accept

Router(config-if)# no cable arp filter request-send
```

The following example shows how to filter cable ARP reply packets, so that the bundle interface accepts a maximum of 15 ARP replies every three seconds per SID on Cisco cBR Series Converged Broadband Routers:

```
Router(config)# interface bundle 1

Router(config-if)# cable arp filter reply-accept 15 3
```

The following example shows how to filter cable ARP request packets, so that the bundle interface sends a maximum of 10 requests per second per SID on Cisco cBR Series Converged Broadband Routers:

```
Router(config)# interface bundle 1

Router(config-if)# cable arp filter request-send 10 1
```

Related Commands

Command	Description
cable arp	Activates cable ARP.
cable proxy-arp	Activates cable proxy ARP on the cable interface.
clear arp-cache	Refreshes dynamically created entries from the ARP cache.
clear counters	Clears the packet counters on all interfaces or on a specific interface.
debug cable arp filter	Displays debugging messages about the filtering of ARP broadcasts.
show cable arp-filter	Displays the total number of ARP replies and requests that have been sent and received, including the number of requests that have been filtered.

cable asf-qos-profile

This feature introduces LLD support for cBR-8 routers. LLD capable D31 modems can establish a bidirectional ASF with two associated static service flows (sent from modem in individual TLVs). You can evaluate different downstream classification approaches to have gaming traffic over one SF and BE traffic over the other SF. Low Latency ASF can be configured via TLVs, Service Classes and/or ASF QoS Profiles (AQPs).

Use the **cable asf-qos-profile** command to configure an ASF QoS Profiles (AQPs) in global configuration mode.

cable asf-qos-profile *profile-name* [**ds** | **us**] { **aqm-coupling** *value* | **data-rate-unit** *data-rate* | **classic-sf-scn** *string* | **ll-classifiers** *hex-data* | **ll-sf-scn** *string* | **max-burst** | **max-rate** *value* | **peak-rate** *value* | **priority** *value* | **qp-drain-rate-exp** *value* | **qp-enable** *value* | **qp-latency-threshold** *value* | **qp-score-threshold** *value* | **scheduling-weight** *value* }

Syntax Description

profile-name	Name of the ASF QoS profile
ds	Downstream ASF.
us	Upstream ASF.
aqm-coupling *value*	AQM Coupling Factor. The range is 0-255.
classic-sf-scn	Classic SF SCN string.
data-rate-unit *data-rate*	Configure Data Rate Unit Setting. The range is 0–3. 0=bps, 1=kbps, 2=Mbps, 3=Gbps.
ll-classifiers	Low Latency SF Classifiers. Enter Hex-data value (Classifier TLV hexbytes).
ll-sf-scn	The Ascii string identifier for this Service Class.
llasf	Low Latency ASF. Enter 1 to enable and 0 to disable.
max-burst	Max Tx Burst. The supported range is 1522-4294967295.
max-rate	Max Rate (bps). The supported range is 0-4294967295.
min-packet-size	Min Packet Size for Reserved Rate. The supported range is 0-65535.
min-rate	Min Resv Rate (bps). The supported range is 0-4294967295.
peak-rate	Peak Rate within maximum traffic burst (bps). The supported range is 0-4294967295.
priority	Priority.The supported range is 0-7.
qp-drain-rate-exp	Queue Protection Drain Rate Exponent. The supported range is 0-255.
qp-enable	Queue Protection. Enter 1 to enable and 0 to disable.
qp-latency-threshold	Queue Protection Latency Threshold. The supported range is 0-65535.

qp-score-threshold	Queue Protection Score Threshold. The supported range is 0-65535.
scheduling-weight	Scheduling Weight (ratio out of 256). The supported range is 0-255.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	The **data-rate-unit** *data-rate* option is added.
Cisco IOS XE Cupertino 17.9.1x	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to configure an `asf-qos-profile`:

```
Router# configure terminal
Router(config)# cable asf-qos-profile profile1 ds
```

Command	Description
show cable asf-qos-profile	Display Cable AQP Table.

cable attribute-mask

To configure an attribute for a modular cable interface, use the **cable attribute-mask** command in interface configuration mode or MAC domain profile configuration mode. To disable this configuration, use the **no** form of this command.

cable attribute-mask *mask*
no cable attribute-mask *mask*

Syntax Description

mask	Specifies the mask value for the interface.

Command Default

If this command is not used, the default attribute will be used for the modular cable interface. The default attribute for a modular cable interface is zero.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The attribute mask comprises 32 attributes and each attribute represents a single bit in the mask. You can configure a provisioned attribute mask for each channel and provisioned bonding group to assign values to the operator-defined binary attributes, or to override the default values of the specification-defined attributes. The operator may configure, in the CM configuration file, a required attribute mask and a forbidden attribute mask for a service flow. Additionally, in a CM-initiated dynamic service request, the CM can include a required attribute mask and a forbidden attribute mask for a service flow.

Examples

The following example shows how to configure an attribute for a modular cable interface:

```
Router# configure terminal
Router(config)# interface modular-cable 1/0/0:0
Router(config-if)# cable attribute-mask 2000ff00
```

The following example shows how to configure an attribute for a Integrated cable interface:

```
Router# configure terminal
Router(config)# interface Integrated-Cable 9/0/3:0
Router(config-if)# cable attribute-mask 2000ff00
```

Related Commands

Command	Description
interface modular-cable	Specifies a modular cable interface.
cable downstream attribute-mask	Specifies an attribute mask value for a wideband cable interface.
interface wideband-cable	Specifies a wideband cable interface.

cable bgsync

To set the data intervals for the background synchronization of SNMP MIB data on the Cisco CMTS, use the **cable bgsync** command in global configuration mode. To disable background synchronization, use the **no** form of this command.

cable bgsync {**itime** *i-interval* | **ptime** *p-interval* | **delay** *seconds*}
no cable bgsync

Syntax Description

itime	Indicates the data interval time between two interval synchronizations.
ptime	Indicates the incremental data interval time between two synchronizations.
i-interval	Length of the data interval in seconds. The valid range is from 5 to 31536000. The default value is 86400.
p-interval	Length of the incremental data interval in seconds. The valid range is from 5 to 86400. The default value is 5.
delay *seconds*	Indicates the delay time (in seconds) by which the first i packet (synchronization packet) is sent after SUP switchover. The valid range is from 0 to 31536000. The default value is 0.

Command Default

This command is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0S	This command is implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Fuji 16.7.3	This command is update to include **delay** keyword.

Usage Guidelines

Note To use the **cable bgsync** command, you must configure the **service internal** command in global configuration mode. Use the **cable bgsync** command carefully as it can impact the CPU utilization.

For more information about MIB objects that are synchronized during background synchronization, see the Cisco CMTS Universal Broadband Router Series MIB Specifications Guide 12.2SC.

Examples

The following example shows how to set the data intervals for background synchronization on the Cisco CMTS:

```
Router# configure terminal
Router(config)# service internal
Router(config)# cable bgsync itime 3600
Router(config)# cable bgsync ptime 6
Router(config)# cable bgsync delay 300
Router(config)#
```

Related Commands

Command	Description
cable bgsync active	Activates background synchronization process on the Cisco CMTS.
clear cable bgsync counters	Clears the background synchronization counters on the Cisco CMTS.
show cable bgsync	Displays the information on the background synchronization process on the Cisco CMTS.

cable bgsync active

To activate the background synchronization process on the Cisco CMTS, use the **cable bgsync active** command in global configuration mode. To deactivate the background synchronization process, use the **no** form of this command.

cable bgsync active
no cable bgsync active

Syntax Description

This command has no arguments or keywords.

Command Default

This command is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0S	This command is implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable bgsync active** command to activate the background synchronization process.

In Cisco uBR10012 and Cisco 7200 Series routers, SNMP objects use interprocess communication (IPC) to access data between the line card and the route processor (RP). When SNMP queries are sent to a Cisco CMTS with large number of modems configured, IPC takes a long time to retrieve the information from the line card and pass it on to the RP. This resulted in an increase in the SNMP response time. The background synchronization process slowly synchronizes the data between the line card and the RP. Therefore, when SNMP queries are sent to the Cisco CMTS, the Cisco CMTS returns the SNMP data from the RP. IPC requests are not sent to retrieve the data, thereby improving the SNMP performance.

In Cisco cBR Series routers, SNMP background synchronization features provides periodic background synchronization of DOCSIS MIB data from line card to Supervisor in order to improve the performance of the SNMP polling of these MIB tables. It is based on raw socket and uses TCP protocol.

The background synchronization process is enabled by default on the Cisco cBR-8, Cisco uBR10012, and Cisco 7200 Series routers.

For more information about the MIB objects that are synchronized during background synchronization, see the Cisco CMTS Universal Broadband Router Series MIB Specifications Guide 12.2SC. and Cisco cBR Series Converged Broadband Routers Troubleshooting and Network Management Configuration Guide.

Examples

The following example shows how to deactivate the background synchronization process on the Cisco CMTS:

```
Router# configure terminal
```

```
Router(config)# no cable bgsync active
Router(config)#
```

Related Commands

Command	Description
cable bgsync	Sets the data intervals for background synchronization on the Cisco CMTS.
show cable bgsync	Displays the information on the background synchronization process, on the Cisco CMTS.
clear cable bgsync counters	Clears the background synchronization counters on the Cisco CMTS.

cable bonding-group-id



Note Effective with Cisco IOS Release 12.2(33)SCE, the **cable bonding-group-id** command is replaced by the **cable bonding-group-secondary** command. See the **cable bonding-group-secondary** command for more information.

To specify a Bonding Group ID and indicate whether the bonding group is a primary or secondary bonded channel, use the **cable bonding-group-id** command in wideband-cable interface configuration mode. To remove a bonding group configuration and revert to the default bonding group (a primary bonding group), use the **no** form of this command.

cable bonding-group-id *id_num* [**secondary**]
no cable bonding-group-id *id_num* [**secondary**]

Syntax Description

id_num	A unique Bonding Group ID. Valid values are 1 to 255. The bonding group ID must be unique for each wideband channel on the CMTS.
secondary	Specifies that the bonding group is a secondary bonding group. If the **secondary** keyword is not used, the bonding group is a primary bonding group.

Command Default

If the **cable bonding-group-id** command is not issued, Cisco IOS software assigns a default ID to the bonding group and configures the wideband-channel cable interface as a primary bonding group.

Command Modes

Interface configuration mode for a wideband-cable interface (config-if)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCE	This command was replaced with the **cable bonding-group-secondary** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable bonding-group-id** command is not needed for the wideband channels that will be received by the Scientific Atlanta DPC2505 or EPC2505 wideband cable modems.

The **cable bonding-group-id** command is used only for wideband channels that will be received by the Linksys WCM300-NA, WCM300-EURO, or WCM300-JP wideband cable modems.

Linksys WCM300 Cable Modem

For wideband channels that will be received by the Linksys WCM300-NA, WCM300-EURO, and WCM300-JP cable modems, the **cable bonding-group-id** command assigns a Bonding Group ID to a wideband-channel

cable interface and configures the bonding group as a primary bonding group if the **secondary** keyword is not specified, or as a secondary bonding group if the **secondary** keyword is specified.

- A primary bonding group is a primary bonded channel.
- A secondary bonding group is a secondary bonded channel.

The primary bonded channel is the wideband channel on which the Linksys WCM300 modem receives all of its unicast traffic and some of its multicast traffic. The cable modem may identify the primary bonded channel and any secondary bonded channels to the CMTS at cable modem registration time. The DOCSIS configuration file may define the primary bonded channel for the CMTS to assign to the cable modem.

In addition to joining one primary bonded channel, the Linksys WCM300 may join up to two secondary bonded channels simultaneously in order to receive additional data streams. The DOCSIS configuration file may define the secondary bonded channels for the modem to pass to the CMTS. Secondary bonded channels are intended to receive multicast traffic such as broadcast video that is not available on the primary bonded channel.

For information on the TLV encodings that can be used in the DOCSIS configuration file to identify primary and secondary bonded channels, see the *Cisco Cable Wideband Solution Design and Implementation Guide, Release 1.0* .

Note If a wideband channel is specified as a primary or secondary bonded channel in the DOCSIS configuration file, it *must be identically defined* as a primary or secondary bonded channel in the CMTS active, running configuration file.

- If a wideband channel is configured with the **cable bonding-group-id** command or by default to be a primary bonded channel, the Linksys WCM300 modem will not register using it as one of its secondary bonded channels.
- If a wideband channel is configured with the **cable bonding-group-id** command to be a secondary bonded channel, the Linksys WCM300 modem will not register using it as its primary bonded channel.

Note When a wideband channel is defined on a Wideband SPA, Cisco IOS software configures the wideband channel as a primary bonding group (primary bonded channel) and assigns a default ID to the bonding group. If a wideband channel is to be used as a secondary bonded channel, use the **cable bonding-group-id** command with the **secondary** keyword to specify that the channel is a secondary bonded channel.

If you specify a non-unique Bonding Group ID for the *id_num* argument, **cable bonding-group-id** displays an error message and does not modify the ID.

Examples

The following examples show how to use the **cable bonding-group-id** command for a variety of purposes. The following **cable bonding-group-id** command specifies that wideband channel 10 on the Wideband SPA in slot/subslot/bay 1/0/1 will be a secondary bonding group (secondary bonded channel) having the bonding group ID 20.

```
Router# configure terminal

Router(config)# interface wideband-cable 1/0/1:10
Router(config-if)# cable bonding-group-id 20 secondary
```

The following example shows how to change a bonding group with an ID of 20 from a secondary to a primary bonding group by omitting the **secondary** keyword:

```
Router(config-if)# cable bonding-group-id 20
```

The **no** form of the **cable bonding-group-id** removes the configured bonding group and reverts the configuration to the default bonding group. For a secondary bonding group with the ID of 20, the following **no** forms of the command are equivalent:

```
Router(config-if)# no cable bonding-group-id 20
```

or

```
Router(config-if)# no cable bonding-group-id 20 secondary
When either of the preceding commands are issued, the wideband-channel cable interface is
configured to use a default bonding group, which has a default bonding group ID assigned
by Cisco IOS software and is a primary bonding group.
```

Related Commands

Command	Description
interface	Enters interface configuration mode.

cable bonding-group-secondary

To specify a bonding group as a secondary bonded channel, use the **cable bonding-group-secondary** command in wideband-cable interface configuration mode. To remove the bonding group configuration and revert to the default bonding group (a primary bonding group), use the **no** form of this command.

cable bonding-group-secondary
no cable bonding-group-secondary

Command Default

If the **cable bonding-group-secondary** command is not issued, Cisco IOS software configures the wideband-channel cable interface as the primary bonding group.

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

Command History

Release	Modification
12.2(33)SCE	This command was introduced for the Cisco uBR-MC3GX60V cable interface line card.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Starting with Cisco IOS Release 12.2(33)SCE, the **cable bonding-group-secondary** command replaces the **cable bonding-group-id** command. If you upgrade from an earlier Cisco IOS Release to Cisco IOS Release 12.2(33)SCE and later, the **cable bonding-group-id** command will no longer change the bonding-group ID.

The **cable bonding-group-secondary** command is used only for wideband channels that are received by the Linksys WCM300-NA, WCM300-EURO, or WCM300-JP wideband cable modems.

Linksys WCM300 Cable Modem

For wideband channels that are received by the Linksys WCM300-NA, WCM300-EURO, and WCM300-JP cable modems, the **show controllers Modular-Cable** *slot*/*subslot*/*controller* **wideband** command displays the bonding group ID of a wideband-channel cable interface and the **cable bonding-group-secondary** command configures the bonding group as a secondary bonding group.

The primary bonded channel is the wideband channel on which the Linksys WCM300 modem receives all of its unicast traffic and some of its multicast traffic. The cable modem identifies the primary bonded channel and any secondary bonded channels to the CMTS at cable modem registration time. The DOCSIS configuration file defines the primary bonded channel for the CMTS to assign to the cable modem.

In addition to joining one primary bonded channel, the Linksys WCM300 joins up to two secondary bonded channels simultaneously in order to receive additional data streams. The DOCSIS configuration file defines the secondary bonded channels for the modem to pass to the CMTS. Secondary bonded channels are intended to receive multicast traffic such as broadcast video that is not available on the primary bonded channel.

For information on the TLV encodings that can be used in the DOCSIS configuration file to identify primary and secondary bonded channels, see *Cisco Cable Wideband Solution Design and Implementation Guide, Release 1.0* .

Note If a wideband channel is specified as a primary or secondary bonded channel in the DOCSIS configuration file, it must be identically defined as a primary or secondary bonded channel in the CMTS active, running configuration file.

The following points list the restrictions for configuring the wideband channel with the **cable bonding-group-secondary** command:

- If a wideband channel is not configured with the **cable bonding-group-secondary** command, the Linksys WCM300 modem may not use it as a secondary bonding group.
- If a wideband channel is configured with the **cable bonding-group-secondary** command to be a secondary bonded channel, the Linksys WCM300 modem may not use it as a primary bonded group.

Note When a wideband channel is defined, the Cisco IOS software configures the wideband channel as a primary bonding group (primary bonded channel) and assigns a default ID to the bonding group. If a wideband channel is to be used as a secondary bonded channel, use the **cable bonding-group-secondary** command to specify that the channel is a secondary bonded channel.

Examples

The following example shows how to use the **cable bonding-group-secondary** command:

```
Router# configure terminal

Router(config)# interface wideband-cable 1/0/1:10
Router(config-if)# cable bonding-group-secondary
```

Related Commands

Command	Description
interface	Enters interface configuration mode.

cable cache-snmp active

To enable the cache mechanism, use **cable cache-snmp active** command in global configuration mode. To remove the configuration, use the **no** form of this command.

cable cache-snmp active
no cable cache-snmp active

Syntax Description

This command has no arguments or keywords.

Command Default

The cache mechanism is active by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCI2	This command was introduced.

Usage Guidelines

By default, the SNMP cache feature is activated. It can be enabled or disabled globally using the **cable cache-snmp active** command. It cannot be enabled or disabled per table currently. You can turn cache off if their polling strategy does not suit the cache principle so that cache will help on a sequential polling.

Examples

The following example shows how to enable the cache mechanism:

```
Router#configure terminal
Router(config)#cable cache-snmp active
Router(config)#
```

cable channel-group

To configure the channel group, use the **cable channel-group** command in global configuration mode. To disable the channel group, use the **no** form of the command.

cable channel-group *group-id*

no cable channel-group *group-id*

Syntax Description

group-id	Channel group ID. The range is from 1 to 1000.

Command Default

Channel group is not configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to configure a channel group:

```
Router# configure terminal
Router(config)# cable channel-group 1
Router(config-ch-group)# upstream Cable 7/1/0 channel 0-3
Router(config-ch-group)# downstream Modular-Cable 7/1/0 rf-channel 0-15
Router(config-ch-group)# cmc 0010.2024.7035
```

Related Commands

Command	Description
show cable channel-group	Displays the channel group information.
upstream cable channel	Configures the upstream cable channel for a channel group.
downstream modular-cable rf-channel (channel group)	Configures the downstream modular cable RF channel for a channel group.
cmc	Configures the Cisco Coaxial Media Converter (CMC).

cable clock clear-counters

To reset the counters that are displayed with the **show controllers clock-reference** command, use the **cable clock clear-counters** command in privileged EXEC mode.

cable clock clear-counters

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(1a)T1	This command was introduced.
12.1(2)EC1	This command was supported on the EC train for the Cisco uBR7246VXR router.
12.2(2)XF	This command was supported for the TCC+ card on Cisco uBR10012 routers.
12.2(4)BC1	Support for this command was added to the Release 12.2 BC train for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.3(23)BC	This command is supported only for standalone (freerun) mode.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command resets any counters that were displayed from the last time the **show controllers clock-reference** command was used.

Note This command is not supported on the SC train.

This command supports the Cisco CMTS clock feature set, which provides a synchronized clock for improved Voice-over-IP (VoIP) operations. The clock feature set requires one of the following configurations:

- A Cisco uBR10012 router with one or two TCC+ cards that are connected to an external national clock source.

Note Beginning in Cisco IOS Release 12.3(23)BC, TCC+ is replaced with the DOCSIS Timing and Control Card (DTCC) and does not require to be connected to an extenal national clock source.

- A Cisco uBR7246 VXR router using a Cisco uBR-MC16S, Cisco uBR-MC16E, Cisco uBR-MC28C, or Cisco uBR-MC28C-BNC cable interface line card. The router must also be equipped with a Cisco cable clock card and be running Cisco IOS Release 12.1(1a)T1, Cisco IOS Release 12.1(2)EC1, or a later release. The Cisco cable clock card should be connected to an external national clock source.

Only these cable interface cards support the external clock card reference from a clock card to distribute that signal to CMs or set-top boxes (STBs) attached to the specific network segments. You can use other cable interface cards, such as the Cisco uBR-MC16C, with the clock card, but these other cable interfaces will not synchronize their downstream SYNC messages with the external clock source.

Each CM or STB must also support VoIP applications and the clock feature set. For example, the Cisco uBR924, running Cisco IOS Release 12.0(7)T or later releases, supports the clock card feature automatically.



Note The **show controllers clock-reference** command might display compare errors on the Cisco uBR10012 router because there could be a slight delay at system startup before the clock cards synchronize with each other. These initial compare errors can be ignored and cleared with the **cable clock clear-counters** command.

Examples

The following example shows how to reset all counters that are displayed for the clock card:

```
Router# cable clock clear-counters
```

Related Commands

Command	Description
show controllers clock-reference	Displays the cable clock card's hardware information.

cable clock dti

To configure the DOCSIS Timing Interface (DTI) clock reference mode, use the **cable clock dti** command in global configuration mode. To terminate the DTI clock referemce mode and restart the standalone mode, use the **no** form of the command.

cable clock dti
no cable clock dti

Syntax Description

This command has no keywords or arguments.

Command Default

Standalone mode

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure DTI clocking mode.

This command may be stored in NVRAM as part of the DOCSIS Timing and Control Card (DTCC) configuration on the Cisco uBR10012 and Cisco uBR7225VXR routers.



Note When the **cable clock dti** command or its **no** form is used to configure the DTI clock reference mode, the DTCC card on the Cisco uBR10012 router restarts and the cable modems may re-initialize or re-register.

Examples

```
Router# configure terminal
Router(config)# cable clock dti
```

Related Commands

Command	Description
show cable clock dti	Displays DTI information.

cable clock dti clear-counters

To reset the counters that are displayed with the **show cable clock dti counters** command in DOCSIS Timing Interface (DTI) mode, use the **cable clock dti clear-counters** command in privileged EXEC mode.

cable clock dti clear-counters *slot/subslot*

Syntax Description

slot/subslot	Specifies the slot and subslot location of the DTCC ports. Valid values are 1/1 or 2/1.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced on the Cisco uBR10012 router .
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command resets any counters that were displayed from the last time the **show cable clock dti client** command was used in DTI mode.

This command supports the Cisco CMTS clock feature set, which provides a synchronized clock for improved Voice-over-IP (VoIP) operations.

Examples

The following example shows how to reset all counters that are displayed for the clock card:

```
Router# cable clock dti clear-counters
```

Related Commands

Command	Description
show cable clock dti counters	Displays the cable clock card's hardware information.

cable clock force

To select the external timing source when the clock card is in holdover mode, use the **cable clock force** command in global configuration mode. To disable the selection and return to the default, use the **no** form of this command.

cable clock force {**primary** | **secondary**}
no cable clock force

Syntax Description

primary	Forces the primary source to act as the clock reference.
secondary	Forces the secondary source to act as the clock reference.

Command Default

The clock card automatically uses the primary external source, if available. If the primary source fails, the clock card enters holdover mode and, after a few seconds, switches to the secondary external source. The clock card switches back to the primary source when it becomes available.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(1a)T1	This command was introduced.
12.1(2)EC1	This command was integrated into Cisco IOS Release 12.1(2)EC1.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command overrides the default behavior of the clock card when the clock card is in holdover mode. If the clock card is not in holdover mode, this command is ignored. You cannot force the reference to a port if the clock card is in free-running mode.

Note This command is not applicable on the SC train.

Note The clock card enters holdover mode if the forced reference is lost, even if the other external reference is available.

To support the clock feature set in VoIP configurations, a Cisco uBR7246 VXR chassis, equipped with a clock card; and a Cisco uBR-MC16S, a Cisco uBR-MC16E, or a Cisco uBR-MC28C cable interface line card must be used running Cisco IOS Release 12.1(1a)T1 or later releases. Only these cable interface line cards support the external clock card reference from a clock card to distribute that signal to CMs or set-top boxes (STBs) attached to the specific network segments. You can use other cable interface cards, such as the Cisco uBR-MC16C, with the clock card, but these other cable interfaces will not synchronize their downstream SYNC messages with the external clock source.

Each CM or STB must also support VoIP applications and the clock feature set. For example, the Cisco uBR924, running Cisco IOS Release 12.0(7)T or later releases, supports the clock card feature automatically.

Examples

The following example shows how to force the timing reference for the cable clock card to come from the secondary external source, when the clock card is in holdover mode:

```
Router(config)# cable clock force secondary
```

Related Commands

Command	Description
show cable clock	Displays status information for the cable clock card.
show controllers clock-reference	Displays hardware information, register values, and current counters for the cable clock card.

cable clock source-midplane

To make the midplane time-division multiplexing (TDM) clock the primary timing reference for the clock card, use the **cable clock source-midplane** command in global configuration mode. To disable the selection and return to the default, use the **no** form of this command.

cable clock source-midplane
no cable clock source-midplane

Syntax Description

This command has no keywords or arguments.

Command Default

The clock card does not get its timing reference from the midplane TDM clock.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(1a)T1	This command was introduced.
12.1(2)EC1	This command was integrated into Cisco IOS Release 12.1(2)EC1.
12.3BC	This command was integrated into Cisco OS Release 12.3BC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Because the clock card automatically provides the timing reference to the midplane TDM clock, the midplane cannot in turn act as the reference for the clock card. This means that the **cable clock source-midplane** command does not take effect unless a port adapter is configured as the primary clock reference source for the midplane.

Note This command is not applicable on the SC train.

To support the clock feature set in VoIP configurations, a Cisco uBR7246 VXR chassis, equipped with a clock card; and a Cisco uBR-MC16S, a Cisco uBR-MC16E, or a Cisco uBR-MC28C cable interface line card must be used running Cisco IOS Release 12.1(1a)T1 or higher releases. Only these cable interface line cards support the external clock card reference from a clock card to distribute that signal to CMs or set-top boxes (STBs) attached to the specific network segments. You can use other cable interface cards, such as the Cisco uBR-MC16C, with the clock card, but these other cable interfaces will not synchronize their downstream SYNC messages with the external clock source.

Each CM or STB must also support VoIP applications and the clock feature set. The Cisco uBR924, running Cisco IOS Release 12.0(7)T or later releases, supports the clock card feature automatically.

Examples

The following example shows how to set the primary clock reference to the midplane TDM clock:

```
Router(config)# cable clock source-midplane
```

Related Commands

Command	Description
show cable clock	Displays status information for the cable clock card.

cable clock upgrade

To upgrade the Field-Programmable Gate Array (FPGA) image manually on the DOCSIS Timing & Control Card (DTCC), use the **cable clock upgrade** command in privileged EXEC mode.

```
cable clock upgrade slot/subslot
```

Syntax Description

slot	Chassis slot number of the DTCC card. The valid slot is 1.
subslot	Secondary slot number of the DTCC card. Valid subslots are 1 or 2.

Command Default

No default behaviors or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

In Cisco IOS Release 12.2(33) SCC and later, you can manually upgrade the FPGA image only if a single DTCC card is installed on the Cisco uBR 10012 router. If the manual upgrade fails or is interrupted, the DTCC card may become unusable. Do not reset or unplug the DTCC card during the manual upgrade. We recommend that you take precaution against extended downtime if the FPGA upgrade fails unexpectedly by having a standby DTCC card installed on the Cisco uBR10012 router.



Note You will have to enter **y** (**yes**) when the system prompts you to continue the manual upgrade.

Examples

The following example shows how to start the manual FPGA upgrade process on the DTCC card:

```
Router# cable clock upgrade 1/1
```

Related Commands

Command	Description
cable clock dti	Configures the DOCSIS Timing Interface (DTI) clock reference mode.

cable cm-status

To configure the values of the "Event Holdoff Timer" and "Number of Reports per Event" parameters for the cable modem (CM) status events, use the **cable cm-status** command in global configuration mode. To revert to the default values, use the **no** form of this command.

cable cm-status {**all***event*} [**holdoff** {*timer* | **default**} | **reports** {*reportvalue* | **default**}]
no cable cm-status

Syntax Description

all	Specifies all CM status events.
event	Type of CM status event.
holdoff	(Optional) Sets the CM status event holdoff timer. The holdoff units are defined in milliseconds. The timer value increments by 20 milliseconds. • *timer*—Holdoff timer value. The valid range is from 1 to 65535 milliseconds. The default value is 500 milliseconds. • **default**—Specifies the default value of 500 milliseconds.
reports	(Optional) Sets the value for the number of reports per event. • *reportvalue*—Report value. The valid range is from 0 to 255. The default value is 5. • **default**—Specifies the default value of 5.

Command Default

Default values are used for the "Event Holdoff Timer" and "Number of Reports per Event" parameters.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE 17.3.1z	The default value was updated.

Usage Guidelines

The **cable cm-status** command updates the event table for the MAC Domain Descriptor (MDD) belonging to a primary channel. The help text of the command provides a mapping of an event type to the corresponding integer.

The ten CM status events are:

1. Secondary channel MDD time-out
2. QAM/FEC lock failure
3. Sequence out-of-range

4. MDD recovery
5. QAM/FEC lock recovery
6. T4 time-out
7. T3 re-tries exceeded
8. Successful ranging after T3 re-tries exceeded
9. CM operating on battery backup
10. CM returned to A/C power

Note The CM-STATUS message event 'sequence out of range' is enabled and supported on the Cisco Wideband SPA from Cisco IOS Release 12.2(33)SCE5 onwards. When the Cisco CMTS receives the 'sequence out of range' event, it toggles the sequence-change-count (SCC) bit for each of the indicated downstream service identifiers (DSIDs).

Examples

The following example shows how to configure an event holdoff timer of 100 milliseconds and four reports per event for all CM-STATUS events:

```
Router# configure terminal
Router(config)# cable cm-status all holdoff 100 reports 4
```

The following example shows how to configure the CM status event "MDD recovery" with an event holdoff timer of 150 milliseconds and three reports for the event:

```
Router# configure terminal
Router(config)# cable cm-status 4 holdoff 150 reports 3
```

Related Commands

Command	Description
cable cm-status enable	Enables a CM status event or a group of CM status events on a primary cable interface.

cable cm-status enable

To enable a CM status event or a group of CM status events on a primary cable interface, use the **cable cm-status enable** command in interface configuration mode or MAC domain profile configuration mode. To disable a particular event on a primary cable interface, use the **no** form of this command.

cable cm-status enable *range*
no cable cm-status

Syntax Description

range	Specifies the CM status events you want to enable on a primary cable interface. The valid range is 1 to 10. You can enable a single event by specifying the event number or a group of events by specifying a range (for example, 1-9). The following events are enabled by default on a cable or modular cable interface on the Cisco uBR10012 and Cisco uBR7200 series routers: • Secondary channel MDD time-out • QAM/FEC lock failure • Sequence out of range • MDD recovery • QAM/FEC lock recovery **Note** The default events are not displayed in the output of the **show running-config interface cable** command.

Command Default

The downstream related events such as secondary channel MDD time-out, QAM/FEC lock failure, Sequence out of range, MDD recovery, and QAM/FEC lock recovery are enabled.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command applies to all non-primary RF channels on a CMTS.

The ten CM status events per interface on the Cisco uBR10012 and Cisco uBR7200 series routers are:

- 1—Secondary channel MDD time-out

- 2—QAM/FEC lock failure
- 3—Sequence out of range
- 4—MDD recovery
- 5— QAM/FEC lock recovery
- 6—T4 time-out
- 7— T3 re-tries exceeded
- 8— Successful ranging after T3 re-tries exceeded
- 9— CM operating on battery backup
- 10— CM returned to A/C power

The six CM status events per interface on the Cisco cBR series routers are:

- 3—Sequence out of range
- 6—T4 time-out
- 7—T3 re-tries exceeded
- 8— Successful ranging after T3 re-tries exceeded
- 9—CM operating on battery backup
- 10— CM returned to A/C power



Note If the **no** form of the command is executed on the interface for specific events, then the **show running-config interface** command lists the events only that are enabled. If no events are enabled then, the **show running interface cable** command displays **no cable cm-stauts enable** with the events.

Examples

The following example shows how to enable all CM status events on a primary cable interface:

```
Router# configure terminal
Router(config)# interface cable 8/0/0
Router(config-if)# cable cm-status enable 1-10
```

The following example shows the **no cable cm-status enable** command being configured and the corresponding example shows **show running-config interface** command output:

```
Router(config)# interface cable 8/0/0
Router(config-if)# cable cm-status enable 1-10
Router(config-if)# no cable cm-status enable 1-2 4-5
Router(config-if) exit
Router# show running-config interface cable 8/0/0
Building configuration...
Current configuration : 1557 bytes
!
interface Cable8/0/0
 shutdown
 cable cm-status enable 3 6-10
```

```
 no cable packet-cache
 cable default-phy-burst 0
 cable map-advance dynamic 300 500
 cable bundle 1
 cable downstream channel-id 145
```

The following example shows the **show running-config interface cable** command output when no events are enabled on the CMTS:

```
Router# show running-config interface cable 8/0/0
Building configuration...
Current configuration : 1558 bytes
!
interface Cable8/0/0
 shutdown
 no cable cm-status enable 1-10
 no cable packet-cache
 cable default-phy-burst 0
 cable map-advance dynamic 300 500
 cable bundle 1
 cable downstream channel-id 145
 cable downstream annex B
 cable downstream modulation 256qam
 cable downstream interleave-depth 32
 cable downstream frequency 555000000
 cable downstream rf-shutdown
 cable upstream max-ports 4
 no cable upstream 0 connector
 cable upstream 0 frequency 40000000
 cable upstream 0 channel-width 3200000 3200000
 cable upstream 0 power-level 26
 cable upstream 0 docsis-mode tdma-atdma
 cable upstream 0 minislot-size 4
 --More--
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.

cable cmc

To configure the downstream RF power or Forward Optical Receiver Module (FRx) for the Cisco Coaxial Media Converter (CMC), use the **cable cmc** command in global configuration mode. To disable the configuration, use the **no** form of the command.

cable cmc *mac-address* {**ds-rf-power** *power* [**tilt** *tilt-value*] | **frx** {**att** *att-value* | **eq** *eq-value*}}

no cable cmc *mac-address* { **ds-rf-power** | **frx** {**att** | **eq**}}

Syntax Description

mac-address	MAC address of the Cisco CMC.
ds-rf-power	Specifies the RF power for downstream channels on the Cisco CMC.
power	RF power in dBmV. The valid range is from 35 to 62. RF power is specified in the format *xy.z*, where *z* is 0.
tilt *tilt-value*	(Optional) Sets the tilt equalization value for downstream channel RF power on the Cisco CMC. The default value is 9 dB. *tilt-value*—Tilt equalization can be set to one of the following values: • **-15dB**—Sets the tilt equalization value to -15 dB. • **-12dB**—Sets the tilt equalization value to -12 dB. • **-9dB**—Sets the tilt equalization value to -9 dB. • **-6dB**—Sets the tilt equalization value to -6 dB. • **-3dB**—Sets the tilt equalization value to -3 dB. • **0dB**—Sets the tilt equalization value to 0 dB.
frx	Configures FRx on the Cisco CMC.
att *att-value*	Specifies the attenuation value in dB. • *att-value*—Attenuation value. The valid range is from 0 to 10.
eq *eq-value*	Sets the equalization value in dB. • *eq-value*—Equalization value. The valid range is from 3 to 15.

Command Default

Downstream RF power and FRx are not configured on the Cisco CMC.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS Release 12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable cmc** command configures the resource sharing between the Cisco CMCs in a channel group based on the MAC address.

The valid downstream RF power value is based on the number of active downstream RF channels on the Cisco CMC. If the configured downstream RF power value for a specific number of downstream RF channels is out of the valid range, the downstream RF power is adjusted according to the number of active downstream RF channels on the Cisco CMC and a warning message is displayed.

We recommend that you use the following downstream RF power values based on the number of active downstream RF channels:

Table 1: Recommended Downstream RF Power Values

Number of Downstream RF Channels	Recommended RF Power Values
1	50 dBmV to 6 2dBmV
2	46 dBmV to 58 dBmV
3	44 dBmV to 56 dBmV
4	42 dBmV to 54 dBmV
5	41 dBmV to 53 dBmV
6	40 dBmV to 52 dBmV
7	39 dBmV to 51 dBmV
8	39 dBmV to 51 dBmV
9	38 dBmV to 50 dBmV
10	38 dBmV to 50 dBmV
11	37 dBmV to 49 dBmV
12	37 dBmV to 49 dBmV
13	36 dBmV to 48 dBmV
14	36 dBmV to 48 dBmV
15	35 dBmV to 47 dBmV
16	35 dBmV to 47 dBmV

The following example shows how to configure RF power for downstream channel on the Cisco CMC with a tilt equalization value of 0 dB:

```
Router# configure terminal
Router(config)# cable cmc 0001.0002.0003 ds-rf-power 35 tilt 0dB
```

The following example shows how to configure FRx for the Cisco CMC with an attenuation value of 6 dB:

```
Router# configure terminal
Router(config)# cable cmc 0001.0002.0003 frx att 6
```

The following example shows how to configure FRx for the Cisco CMC with an equalization value of 3 dB:

```
Router# configure terminal
Router(config)# cable cmc 0001.0002.0003 frx eq 3
```

Related Commands

Command	Description
clear cable cmc	Clears the information on the Cisco CMC.
show cable cmc	Displays the Cisco CMC information.

cable cmc image_upgrade

To upgrade the Cisco CMC image , use the **cable cmc image_upgrade** command in privileged EXEC mode. To disable the upgrade, use the **no** form of the command.

cable cmc *mac-address* **image_upgrade**

no cable cmc *mac-address* **image_upgrade**

Syntax Description

mac-address	MAC address of the Cisco CMC.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS Release 12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Before upgrading the Cisco CMC image through the Cisco CMTS, you must specify the TFTP or FTP server address and the full file path in the DHCP server.

The following example shows how to upgrade the Cisco CMC image:

```
Router> enable
Router# cable cmc 0001.0002.0003 image_upgrade
```

cable cmcpe-list valid-time

To set the length of time that a CMTS router will consider the current list of CM and CPE devices to be valid, use the **cable cmcpe-list valid-time** command in global configuration mode. To reset the time period to its default value of 3 minutes, use the **no** form of this command.

cable cmcpe-list valid-time *time*
no cable cmcpe-list valid-time

Syntax Description

time	Specifies the time period, in seconds, that the Cisco CMTS router should consider the current CM/CPE list to be valid. In Cisco IOS Release 12.2(15)BC1 and earlier releases, the valid range is 0 to 3600 seconds, with a default value of 180 seconds (3 minutes). In Cisco IOS Release 12.2(15)BC2 and later releases, the valid range is 0 to 86400 seconds, with a default value of 900 seconds (15 minutes).

Command Default

180 seconds (3 minutes)—Cisco IOS Release 12.2(15)BC1 and earlier releases

900 seconds (15 minutes)—Cisco IOS Release 12.2(15)BC2 and later releases

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(15)SC1, 12.1(8)EC1,	This command was introduced for the Cisco uBR7100 series and Cisco uBR7200 series routers.
12.2(4)BC1	This command was supported on the 12.2 BC train for the Cisco uBR10012 router.
12.2(15)BC2	The maximum range for time was expanded from 3600 to 86400 seconds, and the default was changed from 180 to 900 seconds.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS router maintains an internal list of cable modems and CPE devices that were connected on its cable interfaces in the last 24 hours. This list does not capture cable modems and CPE devices that were connected before the last 24 hours.

The CMTS router uses this list to provide the data for various **show** commands and to respond to SNMP requests that query the entries in the cdxCmCpeTable table in the CISCO-DOCS-EXT-MIB MIB.

By default, the Cisco CMTS router uses the current list if it is less than 3 minutes old. If the current list is older than 3 minutes, the Cisco CMTS router considers it invalid and rebuilds a new list. This prevents the CMTS router from having to build a new list for every query, which could impact system performance.

You can use the **cable cmcpe-list valid-time** command to change the length of time that the CMTS router considers the current CM and CPE device list to be valid. This allows you to find the optimum time value that provides the most current information without affecting the number of CPU cycles that are available for network processing.

A smaller time period ensures that the CM and CPE device list is more current but it requires more processing time to maintain the list. A longer time period reduces the load on the processor but the CM/CPE list might not be current.

If CPU usage dramatically increases when performing SNMP queries of the cdxCmCpeTable table, use this command to increase the valid list time so that the Cisco CMTS router does not have to rebuild the CM/CPE list more often than needed to respond to the queries.



Note To find the current valid list time, use the **show running-config** command and look for the **cable cmcpe-list valid-time** command in the output. If the command does not appear, the valid list time is set for its default value.

Examples

The following example shows how to set the valid list time to 60 seconds (1 minute):

```
Router(config)# cable cmcpe-list valid-time 60
```

The following example shows how to find the current valid list time setting:

```
Router# show running-config | include cmcpe-list

cable cmcpe-list valid-time 60
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.

cable cmts-id

To configure the CMTS ID for the Cisco CMTS, use the **cable cmts-id** command in global configuration mode. To set the CMTS ID to its default value, use the **no** form of this command.

cable cmts-id *cmts-id*
no cable cmts-id *cmts-id*

Syntax Description

cmts-id	CMTS ID for the Cisco CMTS. The range is from 0 to 16383. The default is 8191.

Command Default

CMTS ID is 8191.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This configuration allows you to define the value for the CMTS ID portion of Gate IDs. The CMTS ID value is the 13 least significant bits (0-12) of the Gate ID.

Example

The following example shows how to configure the CMTS ID:

```
Router(config)# cable cmts-id 9000
```

Related Commands

Command	Description
show cable cmts-id	Displays the configured CMTS ID.

cable config-file

To create a configuration filename for a Cisco CMTS router internal CM configuration file, use the**cable config-file** command in global configuration mode. To delete the configuration filename, use the**no** form of this command.

cable config-file *filename*
no cable config-file *filename*

Syntax Description

filename	Specifies the configuration filename to create and edit.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(4)BC1	This command was integrated into Cisco IOS Release 12.2(4)BC1.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A DOCSIS CMTS router automatically downloads a DOCSIS configuration file to a CM during its initial registration procedure. The DOCSIS configuration file configures the CM for its network operations and includes information such as the maximum number of CPE devices that are supported, the quality of service (QoS) options provided for the CM, and whether the CM should upgrade to a new software image.

The DOCSIS specification defines the format of the DOCSIS configuration files, which can be created by any number of tools. In addition to the other tools that Cisco provides for this purpose, the **cable config-file** command can be used to create the DOCSIS configuration files needed for your network. These configuration files are stored in the Flash memory on the Cisco CMTS router and can be automatically downloaded to the CM as needed.

The **cable config-file** command creates the DOCSIS configuration file if it does not already exist and then enters config-file configuration mode. You can then give one of the following subcommands to create the configuration file:

- **access-denied**
- **channel-id**
- **cpe max**
- **download**

- **frequency**
- **option**
- **privacy**
- **service-class**
- **snmp manage**r
- **timestamp**



Note When a DOCSIS shared secret is configured on the downstream interface (see the **cable shared-secret** command), the **cable config-file** command automatically inserts the appropriate MD5 Message Integrity Check (MIC) value at the end of the dynamically generated DOCSIS configuration file. You do not need to specify the DOCSIS shared secret string with the **cable config-file** command.

After using the **cable config-file** subcommands, enter the **exit** command to leave config-file mode and to save the configuration file in the Flash memory. After a configuration file is created, it also appears in the running-configuration file. To delete a configuration file and remove it from Flash memory, use the **no cable config-file** command

To allow CMs to download the configuration files, you must also enable the router's onboard TFTP server, using the **tftp-server** configuration command. Unless you are running on a small lab network, you should also remove the default limit of 10 TFTP sessions by using the **service udp-small-serves max-servers no limit** command.

In addition, the following commands are also recommended:

- **cable time-server** - Enables the Cisco CMTS router to function as a time-of-day (ToD) server.
- **ip dhcp pool** - Configures the Cisco CMTS router as a DHCP server. Otherwise, you need an external DHCP server.
- **ip dhcp ping packets 0** - Improves the scalability of the Cisco CMTS router DHCP server.



Note For complete information on DOCSIS configuration files, see Appendix C in the DOCSIS 1.1 Radio Frequency (RF) Interface Specification, available on the DOCSIS Cable Labs official web site at http://www.cablemodem.com

Examples

The following example shows two DOCSIS configuration files being configured. The first configuration file allows each CM to have up to four CPE devices and configures the QoS parameters for its traffic. The second configuration file denies network access to the CM and its CPE devices.

```
Router# configure terminal
Router(config)# cable config-file test.cm
Router(config-file)# cpe max 4
Router(config-file)# service-class 1 priority 2
Router(config-file)# service-class 1 max-upstream 128
Router(config-file)# service-class 1 max-downstream 1000
```

```
Router(config-file)# timestamp
Router(config-file)# exit
Router(config)# cable config-file denied.cm
Router(config-file)# access-denied
Router(config-file)# exit
Router(config)#
```

The following is a portion of a typical Cisco IOS configuration file that shows the above two DOCSIS configuration files, as well as a typical DHCP server configuration:

```
Router# show running-config
...
service udp-small-servers max-servers no-limit
!
cable time-server
!
cable config-file test.cm
  cpe max 4
  service-class 1 priority 2
  service-class 1 max-upstream 128
  service-class 1 max-downstream 1000
  timestamp
cable config-file disable.cm
 access-denied
!
ip dhcp pool modems-c3
    network 10.30.128.0 255.255.240.0
    bootfile test.cm
    next-server 10.30.128.1
    default-router 10.30.128.1
    option 7 ip 10.30.128.1
    option 4 ip 10.30.128.1
    option 2 hex 0000.0000
!
...
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
access-denied	Disables access to the network.
channel-id	Specifies upstream channel ID.
cpe max	Specifies the maximum number of CPE devices allowed access.
debug cable config-file	Displays information about the DOCSIS configuration files that are generated by the internal DOCSIS configuration file editor.
download	Specifies the filename and server IP address for downloading a new software image.
frequency	Specifies the downstream frequency.
option	Specifies options for the configuration file that are not provided for by the other commands.
privacy	Specifies privacy options for baseline privacy images.

Command	Description
service-class	Specifies service class definitions for the configuration file.
snmp manager	Specifies Simple Network Management Protocol (SNMP) options.
timestamp	Enables time-stamp generation.
show running-config	Displays the current run-time configuration, which includes any configuration files that have been defined.
show startup-config	Displays the current saved configuration, which includes any configuration files that have been defined and saved.

cable controller-profile

To enable I-CMTS controller profile configuration, use the **cable controller-profile I-CMTS enable** command in global configuration mode.

Post configuring the **cable controller-profile I-CMTS enable** command, total chassis only supports Profile based controller configuration. Once enabled, it cannot rollback.

cable controller-profile I-CMTS enable

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.7.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

i-CMTS controllers are configured using legacy controller configuration commands by default. If you want to use i-CMTS controller profile, then you must enable it first.

The following example shows how to enable i-CMTS controller profile configuration:

```
Router# configure terminal
Router(config)# cable controller-profile I-CMTS enable
```

Related Commands

Command	Description
cable downstream controller-profile	Enters downstream controller profile configuration mode.
cable upstream controller-profile	Enters upstream controller profile configuration mode.



Cable Commands: cable d

- cable d31-mode, on page 108
- cable d40-mode, on page 110
- cable dci-response, on page 111
- cable dci-upstream-disable, on page 113
- cable def-phy-burst , on page 115
- cable default-phy-burst, on page 117
- cable depi multicast pool, on page 120
- cable depi multicast pool redundant include-video-controller, on page 121
- cable depi multicast statistic monitor , on page 124
- cable device, on page 125
- cable dfo-retry-count, on page 127
- **cable dhcp ipv4 profile**, on page 128
- cable dhcp-giaddr, on page 129
- cable dhcp-insert, on page 133
- cable dhcp-parse option, on page 135
- cable diaglog, on page 136
- cable diplexer-band-edge, on page 137
- cable diplexer-mdd-override-band-edge, on page 138
- cable divert-rate-limit, on page 139
- cable docsis30-voice downstream req-attr-mask, on page 140
- cable docsis-ver, on page 142
- cable dot1q-vc-map, on page 143
- cable dot1q-vc-map port-channel, on page 146
- cable downstream annex, on page 147
- cable downstream attribute-mask, on page 149
- cable downstream channel-id, on page 150
- cable downstream-channel-id automatic, on page 152
- cable downstream controller-profile, on page 153
- cable downstream description, on page 154
- cable downstream dsg, on page 155
- cable downstream dsg chan-list, on page 156
- cable downstream dsg dcd-enable, on page 158
- cable downstream dsg disable, on page 160

- cable downstream dsg rule, on page 161
- cable downstream dsg tg, on page 163
- cable downstream dsg tg channel, on page 165
- cable downstream dsg timer, on page 167
- cable downstream dsg vendor-param, on page 169
- cable downstream freq-profile, on page 171
- cable downstream frequency, on page 172
- cable downstream if-output, on page 175
- cable downstream interleave-depth, on page 177
- cable downstream modulation, on page 179
- cable downstream ofdm-chan-profile, on page 181
- cable downstream ofdm-flow-to-profile, on page 183
- cable downstream ofdm-modulation-profile, on page 185
- cable downstream ofdm-power-profile, on page 186
- cable downstream ofdm-prof-mgmt exempt-sc-pct, on page 188
- cable downstream ofdm-prof-mgmt mer-margin-qdb, on page 189
- cable downstream ofdm-prof-mgmt prof-dwngrd-auto, on page 190
- cable downstream ofdm-prof-mgmt prof-order-method, on page 191
- cable downstream ofdm-prof-mgmt prof-upgrade-pma, on page 192
- cable downstream ofdm-prof-mgmt recommend-profile-age, on page 193
- cable downstream ofdm-prof-mgmt rxmer-poll-interval, on page 194
- cable downstream ofdm-prof-mgmt unfit-profile-age, on page 195
- cable downstream override, on page 197
- cable downstream power-down-2nd-module, on page 199
- cable downstream qam-profile, on page 200
- cable downstream qos wfq weight, on page 201
- cable downstream rate-limit, on page 203
- cable downstream rf-power, on page 206
- cable downstream rf-shutdown, on page 209
- cable ds-high-low-rate-ratio, on page 212
- cable ds-max-burst, on page 213
- cable ds-resiliency, on page 216
- cable dsg, on page 217
- cable dsg cfr, on page 221
- cable dsg chan-list, on page 224
- cable dsg client-list, on page 226
- cable dsg keepalive, on page 228
- cable dsg name-update-interval, on page 230
- cable dsg tg, on page 231
- cable dsg tg channel, on page 233
- cable dsg tg channel ucid, on page 235
- cable dsg tg channel vendor-param, on page 237
- cable dsg tg default-priority, on page 239
- cable dsg tg priority, on page 240
- cable dsg timer, on page 241
- cable dsg tunnel, on page 243

- cable dsg tunnel srv-class, on page 245
- cable dsg vendor-param, on page 247
- cable dynamic-bonding-group, on page 249
- cable dynamic-bw-sharing, on page 251
- cable dynamic-flow vrf, on page 253
- cable dynamic-qos trace, on page 254
- cable dynamic-secret, on page 255
- cable dynamic-secret exclude, on page 263
- cable dynamic-secret tftp insert-upgrade-server, on page 265

cable d31-mode

To enable the DOCSIS 3.1 mode on a MAC domain, use the **cable d31-mode** command in the interface configuration mode. To disable the DOCSIS 3.1 mode, use the **no** form of the command.

[**no**] **cable d31-mode**

This command has no keywords or arguments.

Command Default

DOCSIS 3.1 mode is enabled.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Enabling the DOCSIS 3.1 mode has the following effects:

- MDDs advertise the MAC domain as DOCSIS 3.1 capable.
- DOCSIS 3.1 protocol support is enabled for the MAC domain, including:
  - v5 Ranging support
  - D3.1 TLV parsing
  - D3.1 MMMs
- OFDM channels are included in MD-SG calculations assuming that they are a member of an associated fiber node.
- OFDM channels are allowed to become active primary-capable downstream channels within the MAC domain.

The following example shows how to enable DOCSIS 3.1 mode:

```
router#configure terminal
router(config)#interface c3/0/0
router(config-if)#cable d31-mode
```

Related Commands

Command	Description
cable mtc-mode	Enables Multiple Transmit Channel mode for the MAC domain. For d31-mode to be active, mtc-mode must also be configured.
cable mrc-mode	Enables Multiple Receive Channel mode for the MAC domain. For d31-mode to be active, mrc-mode must also be configured.

Command	Description
show interface Cable *slot/subslot/port* **controller**	Displays the status of the controller, including the d31-mode enablement state.

cable d40-mode

To enable the DOCSIS 4.0 mode on a MAC domain, use the **cable d40-mode** command in the interface configuration mode. To disable the DOCSIS 4.0 mode, use the **no** form of the command.

cable d40-mode

no cable d40-mode

This command has no keywords or arguments.

Command Default

DOCSIS 4.0 mode is enabled.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Enabling the DOCSIS 4.0 mode has the following effects:

- MDDs advertise the MAC domain as DOCSIS 4.0 capable.
- DOCSIS 4.0 protocol support is enabled for the MAC domain, including:
  - D4.0 TLV parsing
  - D4.0 MMMs
- OFDM channels are included in MD-SG calculations assuming that they are a member of an associated fiber node.
- OFDM channels are allowed to become active primary-capable downstream channels within the MAC domain.

The following example shows how to enable DOCSIS 4.0 mode:

```
router#configure terminal
router(config)#interface c4/0/0
router(config-if)#cable d40-mode
```

Related Commands

Command	Description
cable d31-mode	To enable the DOCSIS 3.1 mode on a MAC domain, use the **cable d31-mode** command in the interface configuration mode.

cable dci-response

To configure how a cable interface responds to DCI-REQ messages for CMs on that interface, use the **cable dci-response** command in cable interface configuration mode.

cable dci-response [**success** | **ignore** | **reject permanent** | **reject temporary**]

Syntax Description

success	(Optional) Configures the interface so that the Cisco CMTS responds to DCI-REQ messages from CMs on the interface by sending a DCI-RSP response with the confirmation code of Success (0).
ignore	(Optional) Configures the interface so that the Cisco CMTS ignores DCI-REQ messages from CMs on the interface. It does not send any DCI-RSP responses.
reject permanent	(Optional) Configures the interface so that the Cisco CMTS responds to DCI-REQ messages from CMs on the interface by sending a DCI-RSP response with the confirmation code of Reject Permanent (4).
reject temporary	(Optional) Configures the interface so that the Cisco CMTS ignores the first four DCI-REQ messages from a CM on the interface, but on the fifth DCI-REQ message, the CMTS responds with a DCI-RSP response with the confirmation code of Reject Temporary (3). The CMTS then continues to ignore the next seven DCI-REQ messages and then restarts this process when it receives the twelfth DCI-REQ message.

Command Default

The Cisco CMTS router responds to DCI-REQ messages from all CMs by sending a DCI-RSP response with the confirmation code of Success (0).

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Description
12.1(4)CX	This command was introduced for DOCSIS 1.1 operation.
12.2(4)BC1	This command was integrated into Cisco IOS Release 12.2(4)BC1.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Device Class Identification (DCI) messages are part of the Media Access Control Specification section of the DOCSIS 1.1 specification (revision SP-RFIv1.1-I05-000714 and above). A CM can optionally use the DCI-REQ message to inform the CMTS router of certain capabilities, such as whether it is a CPE-controlled cable modem (CCCM).

The CMTS router then responds with one of the following confirmation codes:

- Success—Allows the CM to continue with the registration process.

- Reject Permanent—Instructs the CM to cancel its registration process on this downstream channel. The CM must try all other available downstream channels before attempting to register on this downstream channel again.
- Reject Temporary—Instructs the CM to reset its DCI-REQ counter, to send another DCI-REQ message, and to wait for the DCI-RSP before proceeding with the registration process.



Note The CMTS router also can respond with an Upstream Transmitter Disable (UP-DIS) message. See the description of the **cable dci-upstream-disable** command for details.

Examples

The following example shows how to configure the CMTS router so that it ignores all DCI-REQ messages from CMs on the cable interface at slot 6:

```
Router# configure terminal
Router(config)# interface c6/0
Router(config-if)# cable dci-response ignore
```

The following example shows how to configure the CMTS router so that it returns to its default behavior for the cable interface on slot 6, which is to respond to all DCI-REQ messages from CMs by sending a DCI-RSP with a Success confirmation code:

```
Router# configure terminal
Router(config)# interface c6/0
Router(config-if)# cable dci-response success
```



Note The **cable dci-response success** command does not appear in a startup or running configuration file, because it is the default configuration for a cable interface.

Related Commands

Command	Description
cable dci-upstream-disable	Configures the cable interface so that it transmits an Upstream Transmitter Disable (UP-DIS) message instead of a DCI-RSP message to a particular CM.
debug cable dci	Enables debugging of DCI-REQ, DCI-RSP, and UP-DIS messages.

cable dci-upstream-disable

To configure a cable interface so that it transmits a DOCSIS 1.1 Upstream Transmitter Disable (UP-DIS) message to a particular CM, use the **cable dci-upstream-disable** command in cable interface configuration mode. To remove that configuration and return to the default configuration, use the **no** form of this command.

cable dci-upstream-disable *mac-address* [**enable** | **disable**]
no cable dci-upstream-disable *mac-address* [**enable** | **disable**]

Syntax Description

mac-address	Specifies the MAC physical layer address for a particular CM.
enable	(Optional) Enables the UP-DIS message for the particular CM, so that when the CM sends a DCI-REQ message, the CMTS router responds by sending an UP-DIS response.
disable	(Optional) Disables the sending of UP-DIS messages to a particular CM.

Command Default

The Cisco CMTS router does not transmit UP-DIS messages to any CMs.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Description
12.1(4)CX	This command was introduced for DOCSIS 1.1 operation.
12.2(4)BC1	This command was integrated into Cisco IOS Release 12.2(4)BC1.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS 1.1 specification (revision SP-RFIv1.1-I05-000714 and above) allows a CMTS router to transmit an Upstream Transmitter Disable (UP-DIS) message to a CM. If the CM supports the UP-DIS message, it responds by immediately disabling its upstream transmitter circuitry. The CM must be power-cycled before it can begin transmitting on the upstream again.

Examples

The following example shows the **cable dci-upstream-disable** command being used to enable the UP-DIS message for the CM with the MAC address of 0123.4567.89ab.

```
Router# configure terminal
Router(config)# interface c6/0
Router(config-if)# cable dci-upstream-disable 0123.4567.89ab enable
Router(config-if)# exit
Router(config)# exit
```

Related Commands

Command	Description
cable dci-response	Configures how the cable interface responds to DCI-REQ messages from CMs on that interface.
debug cable dci	Enables debugging of DCI-REQ, DCI-RSP, and UP-DIS messages.

cable def-phy-burst

To specify a value for the upstream Maximum Traffic Burst parameter for CMs that do not specify their own value, use the **cable def-phy-burst** command in controller configuration mode. To reset the maximum burst size to its default, use the **no** form of this command.

cable def-phy-burst *burst-size*
no cable def-phy-burst

Syntax Description

burst-size	Specifies the maximum number of bytes that are allowed in a burst. The valid range is 0 to 4096 bytes, with a default of 2000 bytes. A value of 0 specifies that CMs cannot register unless they specify a valid burst size.

Command Default

2000 bytes

Command Modes

Controller configuration—upstream-cable only (config-controller)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable default-phy-burst** command.

Usage Guidelines

Note The **cable def-phy-burst** command applies to cable modems that cannot perform fragmentation. The value specified by the **cable def-phy-burst** command is used to determine the maximum total frame burst size supported for a cable modem request. In contrast, the **cable upstream fragment-force** command may be used to determine the largest single physical burst a cable modem can transmit, when the cable modem supports fragmentation.

The DOCSIS 1.0 specification allows CMs to register without specifying a maximum upstream burst size, or to register with a value of 0, which means an unlimited burst size. This behavior can interfere with DOCSIS 1.1 networks because excessively large bursts on an upstream will generate unpredictable jitter and delay in voice calls. DOCSIS 1.1 CMs can also cause this problem if they register without enabling fragmentation of packets at the DOCSIS MAC layer.

This command allows you to specify a default burst size for CMs that register without specifying a burst size or that register with a burst size of 0. It also specifies the maximum size of long data grants if a CM specifies a size of 0 (unlimited) in the Upstream Channel Descriptor (UCD) packet. If a CM specifies a long data grant that would exceed the maximum burst size, and the CM is not using DOCSIS concatenation, the DOCSIS scheduler drops the bandwidth request.

To prevent CMs from registering without defining a burst profile, use this command with a *burst-size* of zero. CMs that do not define a burst profile will not be allowed to register and come online.



Note Typically, DOCSIS 1.1 CMs set the maximum upstream transmit burst size to the larger value of 1522 bytes and maximum concatenated burst size (which can be a maximum of 4096 bytes).

The default PHY burst parameter interacts with two other parameters that are configured in the DOCSIS configuration file:

- DOCSIS 1.1 configuration files can also specify a value for the maximum concatenation burst, which has a default of 1522 bytes. If this parameter is greater than the default PHY burst size, the CM can override the default PHY burst when it is using concatenation.
- DOCSIS 1.0 and 1.1 configuration files can also specify a maximum transmit burst size. In DOCSIS 1.1 configurations, this parameter defaults to 3044 bytes, with a minimum of 1522 bytes. DOCSIS 1.0 configuration files could set this parameter to a value lower than 1522 bytes, depending on what version of the DOCSIS 1.0 specification they support. The CMTS router will enforce the lower limit between the default phy burst and the maximum transmit burst, so you should ensure that all configuration files in your network specify a minimum of 1522 bytes for the maximum transmit burst size.

Example

The following example shows how to set the default maximum burst size to 1 on a Cisco cBR-8 router:

```
Router(config)# controller upstream-Cable 3/0/1
Router(config-controller)# cable def-phy-burst 1
```

Related Commands

Command	Description
cable upstream fragmentation	Enables fragmentation of DOCSIS frames on a particular upstream.
cable upstream fragment-force	Specifies that a cable interface line card should fragment DOCSIS frames on an upstream when the frame exceeds a particular size.
show cable modem	Displays information for the registered and unregistered CMs, including the QoS configuration for individual CMs.
show controllers cable	Displays the downstream MPEG framing format (Annex A or Annex B) setting.

cable default-phy-burst

To specify a value for the upstream Maximum Traffic Burst parameter for CMs that do not specify their own value, use the **cable default-phy-burst** command in cable interface configuration mode. To reset the maximum burst size to its default, use the **no** form of this command.

cable default-phy-burst *burst-size*
no cable default-phy-burst

Syntax Description

burst-size	Specifies the maximum number of bytes that are allowed in a burst. The valid range is 0 to 4096 bytes, with a default of 2000 bytes. A value of 0 specifies that CMs cannot register unless they specify a valid burst size.

Command Default

2000 bytes

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.2(8)BC1	This command was introduced for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
12.2(15)BC2	The **cable upstream fragment-force** command is introduced, with considerations to the **cable defaut-phy-burst** command. The maximum upstream traffic burst may also be influenced by the new **cable upstream fragment-force** command for cable modems that are able to perform fragmentation.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was replaced by the **cable def-phy-burst** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Note The **cable default-phy-burst** command applies to cable modems that cannot perform fragmentation. The value specified by the **cable default-phy-burst** command is used to determine the maximum total frame burst size supported for a cable modem request. In contrast, the **cable upstream fragment-force** command may be used to determine the largest single physical burst a cable modem can transmit, when the cable modem supports fragmentation.

The DOCSIS 1.0 specification allows CMs to register without specifying a maximum upstream burst size, or to register with a value of 0, which means an unlimited burst size. This behavior can interfere with DOCSIS 1.1 networks because excessively large bursts on an upstream will generate unpredictable jitter and delay in

voice calls. DOCSIS 1.1 CMs can also cause this problem if they register without enabling fragmentation of packets at the DOCSIS MAC layer.

This command allows you to specify a default burst size for CMs that register without specifying a burst size or that register with a burst size of 0. It also specifies the maximum size of long data grants if a CM specifies a size of 0 (unlimited) in the Upstream Channel Descriptor (UCD) packet. If a CM specifies a long data grant that would exceed the maximum burst size, and the CM is not using DOCSIS concatenation, the DOCSIS scheduler drops the bandwidth request.

To prevent CMs from registering without defining a burst profile, use this command with a *burst-size* of zero. CMs that do not define a burst profile will not be allowed to register and come online.

Note Typically, DOCSIS 1.1 CMs set the maximum upstream transmit burst size to the larger value of 1522 bytes and maximum concatenated burst size (which can be a maximum of 4096 bytes).

The default PHY burst parameter interacts with two other parameters that are configured in the DOCSIS configuration file:

- DOCSIS 1.1 configuration files can also specify a value for the maximum concatenation burst, which has a default of 1522 bytes. If this parameter is greater than the default PHY burst size, the CM can override the default PHY burst when it is using concatenation.
- DOCSIS 1.0 and 1.1 configuration files can also specify a maximum transmit burst size. In DOCSIS 1.1 configurations, this parameter defaults to 3044 bytes, with a minimum of 1522 bytes. DOCSIS 1.0 configuration files could set this parameter to a value lower than 1522 bytes, depending on what version of the DOCSIS 1.0 specification they support. The CMTS router will enforce the lower limit between the default phy burst and the maximum transmit burst, so you should ensure that all configuration files in your network specify a minimum of 1522 bytes for the maximum transmit burst size.

Examples

The following example shows the default maximum burst size to 1522 bytes, which is the minimum size required by the DOCSIS 1.1 specification:

```
Router(config)# interface cable 5/1
Router(config-if)# cable default-phy-burst 1522
```

The following example shows the default maximum burst size to 0, which means that a CM must specify a valid burst profile before the Cisco CMTS allows it to register and come online:

```
Router(config)# interface cable 5/1
Router(config-if)# cable default-phy-burst 0
```

The following example shows the default maximum burst size being reset to its default of 2000 bytes:

```
Router(config)# interface cable 5/1
Router(config-if)# no cable default-phy-burst
```

Related Commands

Command	Description
cable upstream fragmentation	Enables fragmentation of DOCSIS frames on a particular upstream.
cable upstream fragment-force	Specifies that a cable interface line card should fragment DOCSIS frames on an upstream when the frame exceeds a particular size.
show cable modem	Displays information for the registered and unregistered CMs, including the QoS configuration for individual CMs.
show controllers cable	Displays the downstream MPEG framing format (Annex A or Annex B) setting.

cable depi multicast pool

To configure the DEPI multicast pool for downstream virtual splitting, use the **cable depi multicast pool** command in global configuration mode. To void the DEPI multicast pool configuration, use the **no** form of this command.

cable depi multicast pool *id*

no cable depi multicast pool *id*

Syntax Description

id	Specifies the ID of the DEPI multicast pool.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the DEPI multicast pool.

The following example shows how to configure the DEPI multicast pool:

```
Router# configure terminal
Router(config)# cable depi multicast pool 1
Router(config-multicast-pool)#
```

Related Commands

Command	Description
ip address	Specifies IP address range for multicast pool.

cable depi multicast pool redundant include-video-controller

To configure the DEPI multicast pool for downstream virtual splitting, use the **cable depi multicast pool** *id* **[redundant include-video-controller]** command in global configuration mode. To void the DEPI multicast pool configuration, use the **no** form of this command.

cable depi multicast pool *id* [**redundant** [**include-video-controller**]]

no cable depi multicast pool *id* [**redundant** [**include-video-controller**]]

Syntax Description

id	Specifies the ID of the DEPI multicast pool.
redundant	Redundant multicast pool for secondary Linecard Downstream Controller.
redundant include-video-controller	IP assignment for redundant(stand-by) controllers including video controllers if supported by CBR-CCAP-LC-G2-R Linecard.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

- If you configure `cable depi multicast pool 10 redundant`, then multicast IPs is assigned only to downstream-cable controllers.
- If you configure `cable depi multicast pool 10 redundant include-video-controller`, then multicast IPs are assigned for both downstream-cable and downstream-video controllers CBR-CCAP-LC-G2-R Linecards.

If video controllers are not supported by CBR-CCAP-LC-40G Linecards, then IPs are assigned only to downstream-cable controllers. The total redundant pool is set up by the system and allocates IP addresses for all possible controllers multiplied by the number of interfaces available.

The following example shows how to configure `redundant include-video-controller`:

```
Router# configure terminal
Router(config)# cable depi multicast pool 10
Router(config-multicast-pool)# redundant include-video-controller
Router(config-multicast-pool)#
```

The following example shows the difference between `redundant` and `redundant include-video-controller` configurations:

- If you use the `redundant` config, then the total controllers = 16 DOCSIS(x interfaces) + 20 OOB.

- If you use the `redundant include-video-controller` config, then the total controllers = 16 DOCSIS(x interfaces) + 16 VIDEO(x interfaces) + 20 OOB

For Example, If Linecard '0' is secondary, then IP is allocated to downstream-cable and downstream-video controllers as shown below:

- The following allocations are only applicable to CBR-CCAP-LC-40G and CBR-CCAP-LC-G2-R Linecards prior to Cisco IOS XE Bengaluru 17.6.1z:
  - If Linkha is enabled and `redundant` is configured as 16(x4) + 20 = 84 IPs, then the IPs are assigned to the following controllers:

Controllers	Interfaces
DS0/0/0 to DS0/0/15	Te0/1/0 and Te0/1/2
DS0/0/16 to DS0/0/31	Te0/1/4 and Te0/1/6

  - If Linkha is disabled and `redundant` is configured as 16(x8) + 20 = 148 IPs, then the IPs are assigned to the following controllers:

Controllers	Interfaces
DS0/0/0 to DS0/0/15	Te0/1/0, Te0/1/1, Te0/1/2, Te0/1/3
DS0/0/16 to DS0/0/31	Te0/1/4, Te0/1/5, Te0/1/6, Te0/1/7

  - If Linkha is enabled and `redundant include-video-controller` is configured as 16(x4) + 16(x4) + 20 = 148 IPs, then the IPs are assigned to the following controllers:

Controllers	Interfaces
DS0/0/0 to DS0/0/15	Te0/1/0 and Te0/1/2
DS0/0/16 to DS0/0/31	Te0/1/4 and Te0/1/6
VID0/0/0 to VID0/0/15	Te0/1/0 and Te0/1/2
VID0/0/16 to VID0/0/31	Te0/1/4 and Te0/1/6

  - If Linkha is disabled and `redundant include-video-controller` is configured as 16(x8) + 16(x8) + 20 = 276 IPs, then the IPs are assigned to the following controllers:

Controllers	Interfaces
DS0/0/0 to DS0/0/15	Te0/1/0, Te0/1/1, Te0/1/2, Te0/1/3
DS0/0/16 to DS0/0/31	Te0/1/4, Te0/1/5, Te0/1/6, Te0/1/7
VID0/0/0 to VID0/0/15	Te0/1/0, Te0/1/1, Te0/1/2, Te0/1/3
VID0/0/16 to VID0/0/31	Te0/1/4, Te0/1/5, Te0/1/6, Te0/1/7

- The following allocations are only applicable to CBR-CCAP-LC-G2-R cards for Cisco IOS XE Bengaluru 17.6.1z and later.

  If Linkha is disabled and `redundant include-video-controller` is configured as 16(x8) + 16(x8) + 20 = 276 IPs, then the IPs are assigned to the following controllers:

Controllers	Interfaces
DS0/0/0 to DS0/0/7	Te0/1/0, Te0/1/1
DS0/0/8 to DS0/0/15	Te0/1/2, Te0/1/3
DS0/0/16 to DS0/0/23	Te0/1/4, Te0/1/5
DS0/0/24 to DS0/0/31	Te0/1/6, Te0/1/7
VID0/0/0 to VID0/0/7	Te0/1/0, Te0/1/1
VID0/0/8 to VID0/0/15	Te0/1/2, Te0/1/3
VID0/0/16 to VID0/0/23	Te0/1/4, Te0/1/5
VID0/0/24 to VID0/0/31	Te0/1/6, Te0/1/7

Related Commands

Command	Description
cable depi multicast pool	Specifies the ID of the DEPI multicast pool.

cable depi multicast statistic monitor

This feature enables you to view statistics for the multicast group assigned by DEPI multicast pool. You can enable this feature using the **cable depi multicast statistic monitor** command. Use this command for docsis, bcast and ncast video configurations. OOB configuration is not supported. To void the configuration, use the **no** form of this command.

cable depi multicast statistic monitor

no cable depi multicast statistic monitor

Syntax Description

monitor	Enable monitor multicast DEPI throughput.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced for the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to view statistics for the multicast group assigned by DEPI multicast pool.

The following example shows how to configure the **cable depi multicast statistic monitor** command:

```
Router# configure terminal
Router(config)# cable depi multicast statistic monitor
Router(config)#
```

After configuring the command, you can verify your configuration using the following command:

```
Router# show cable depi multicast counter
IP                                          POOL ID pps          bps          IF
Controller
225.225.225.0                               1       4686         39335848     Te3/1/0
DS3/0/1
```

Related Commands

Command	Description
cable rphy statistics session update-freq	Specifies the DEPI statistics synchronization interval in units of 5 seconds

cable device

To configure an access list for a cable modem (CM) device or host on the Cisco CMTS router, use the **cable device** command in privileged EXEC mode. To remove an access group, use the **no access-group** option of this command.

cable device { {*ip-addressmac-address*} [**no**] **access-group** {*access-listaccess-name*} | [**vrf** *vrf-name*] *ip-address* [**no**] **access-group** [*access-listaccess-name*]}

Syntax Description

ip-address	IP address of the CM device or host.
mac-address	MAC address of the CM device or host.
access-group	Enables **access-group** options. The **no** form removes access-group specifications.
{*access-list* | *access-name*}	Specifies the IP access list (standard or extended), either by access-list number (1 to 199) or by access-list name.
vrf *vrf-name*	Specifies a virtual routing and forwarding (VRF) instance that is populated with VPN routes. • *vrf-name*—Name of the VRF instance

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Description
12.1	This command was moved from earlier releases.
12.1(1a)T1	The **vrf** keyword was added for Multiprotocol Label Switching (MPLS) VPN support.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For the **vrf** keyword of this command, only the *ip-address* option is supported.

An access list can be configured to deny access to any IP address other than the ones previously configured, using the **access-list** *access-list* **deny any any** command. Starting with Cisco IOS Release 12.2(33)SCD, when a CM is added to such an access list on the Cisco uBR7200 series universal broadband routers, the ping fails. If the CM is reset, removed, or powered off, the ping succeeds after the CM comes online. However, the **show cable modem access-group** command displays that the CM does not belong to the access-group.

Note The **cable device** command is not supported on the Cisco uBR10012 universal broadband router.

Note The **vrf** keyword is not supported in Cisco IOS Releases 12.0 SC, 12.1 EC, and 12.2 BC.

Examples

The following example shows how to assign an access list to the MAC address of a cable device:

```
Router# configure terminal

Router(config)# cable device 0010.7b6b.77ed acc 1
Router(config)# exit
```

Related Commands

Command	Description
clear cable host	Clears the host from the internal address tables of the Cisco CMTS router.
cable host access-group	Configures the access list for the specified hosts on the Cisco CMTS router.
show cable device access-group	Displays CMs and hosts behind the CMs on the network on the Cisco CMTS router.
show cable host access-group	Displays hosts behind the CMs on the network on the Cisco CMTS router.

cable dfo-retry-count

To configure the Downstream Frequency Override (DFO) retry count, use the **cable dfo-retry-count** command in global configuration mode. To reset the DFO retry count to its default value, use the **no** form of this command.

cable dfo-retry-count *n*
no cable dfo-retry-count *n*

Syntax Description

n	Downstream frequency override retry count. The valid range is from 1 to 100.

Command Default

The DFO retry count is 20 on the Cisco uBR10012 and Cisco uBR7200 series routers.

The DFO retry count is 5 on the Cisco cBR series routers.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD7	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Downstream Frequency Override (DFO) feature enables cable modems to register on a specific primary RF channel. Because of RF failure conditions and some cable modem types, the cable modem takes more time to register on a specific primary RF channel. You can configure the DFO retry count to reduce the cable modem registration time using the **cable dfo-retry-count** command.

Examples

The following example shows how to configure the DFO retry count as 10:

```
Router# configure terminal
Router(config)# cable dfo-retry-count 10
```

Related Commands

Command	Description
cable service attribute ds-bonded downstream-type bonding-enabled	Forces a downstream bonding-capable modem to initialize on a bonded primary-capable downstream channel.
cable service attribute non-ds-bonded downstream-type bonding-disabled	Forces the non-bonding-capable modems to register only on non-bonded RF channels on the CMTS.
cable service type ds-frequency	Redirects matching service types to the downstream frequency.

cable dhcp ipv4 profile

To enter the IPv4 DHCP profile configuration mode, use the **cable dhcp ipv4 profile** command in global configuration mode. To remove the configured profile, use the **no** form of this command.

cable dhcp ipv4 profile *name*
no cable dhcp ipv4 profile *name*

Syntax Description

name	Specifies the name of the IPv4 DHCP profile.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS XE Fuji 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enter the IPv4 DHCP profile configuration mode:

```
Router# configure terminal
Router(config)# cable dhcp ipv4 profile DEVICE1
Router(config-dhcpv4-profile)#
```

Related Commands

Command	Description
match	Specifies the matching option for the IPv4 DHCP profile.

cable dhcp-giaddr

To modify the GIADDR field for the DHCPDISCOVER and DHCPREQUEST packets with a relay IP address before they are forwarded to the DHCP server, use the **cable dhcp-giaddr** command in cable interface or subinterface configuration mode. To set the GIADDR field to its default, use the **no** form of this command.

cable dhcp-giaddr {**policy** [**strict** | **host** | **mta** | **ps** | **stb** | **profile** *name*] *giaddr* | **primary**}
no cable dhcp-giaddr

Syntax Description

policy	Selects the control policy, so that the primary address is used for cable modems and the secondary addresses are used for hosts and other customer premises equipment (CPE) devices. This setting is typically used when the CMs on the interface are configured for routing, so that the CMs and hosts can use IP addresses on different subnets.
strict	(Optional, only when the **policy** keyword is specified) Selects the GIADDR IP address as the source IP address in the forwarded DHCPOFFER packet. By default when using the **policy** option, the Cisco CMTS changes the source IP address in the DHCPOFFER packet to match that of the primary address on the cable interface. Enable the **strict** option to prevent this behavior, which could interfere with any access lists applied to the CM when the CM is using a different subnet from the primary address space of the cable interface.
host	Specifies the GIADDR for hosts.
mta	Specifies the GIADDR for media terminal adapters (MTA).
ps	Specifies the GIADDR for portal servers (PS).
stb	Specifies the GIADDR for set-top boxes (STB).
profile *name*	Specifies DHCP profile as control policy.
giaddr	IP addresses of the secondary interface of the bundle interface.
primary	Selects the primary address always to be used for the GIADDR field for both CMs and CPE devices. This option is typically used for the Cisco uBR-MC16E card and Cisco uBR7100E series routers to support EuroDOCSIS operations.

Command Default

None

Command Modes

Interface configuration (config-if)

Subinterface configuration (config-subif)

Command History

Release	Modification
12.0(4)T	This command was introduced.

Release	Modification
12.0(6)SC	This command was integrated into Cisco IOS Release 12.0(6)SC.
12.1(2)EC1	This command was integrated into Cisco IOS Release 12.1(2)EC1.
12.1(3a)EC	This command was modified to support subinterfacess.
12.2(15)BC2	This command was modified to include the **strict** option.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. This command was modified to support the Cisco uBR7225VXR router.
12.2(33)SCD5	This command was modified to support the **host**, **mta**, **ps**, and **stb** keywords.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.8.1	Thiscommand was modified to add the **profile** keyword.

Usage Guidelines

You can use this command to modify the GIADDR field of DHCPDISCOVER and DHCPREQUEST packets to provide a relay IP address before packets are forwarded to the DHCP servers. Use this command to set a policy option such that primary addresses are used for CMs and secondary addresses are used for hosts (such as PCs) behind the CMs.

When using multiple secondary subnets, the Cisco CMTS router uses the first secondary IP address as the GIADDR field when forwarding a DHCPDISCOVER request to the DHCP server. If no DHCP server responds with a DHCPOFFER message after three attempts, the Cisco CMTS router uses the next secondary IP address, up to a maximum of 16 secondary addresses.



Note If you have configured a Cisco CM for routing mode and are also using the **cable-modem dhcp-prox nat** command on the CM, you must configure the corresponding cable interface on the Cisco CMTS using the **cable dhcp-giaddr policy strict**] command.



Caution You cannot use the **strict** option with the internal DHCP server that is onboard the Cisco CMTS router, because the **strict** option requires the use of DHCP relay operation, which is not performed by DHCP termination points such as the internal DHCP server.



Note For cBR Series Converged Broadband Routers, internal DHCP server is not supported.

Examples

The following example shows how to set the primary address to be used always for GIADDR:

```
Router# configure terminal
```

```
Router(config)# interface cable 3/0

Router(config-if)# cable dhcp-giaddr primary
```

The following example shows how to set the primary address to be used always for GIADDR in the cable subinterface mode:

```
Router# configure terminal

Router(config)# interface cable 6/0.1

Router(config-subif)# cable dhcp-giaddr primary
```

The following example shows how to configure the router so that the primary address is used for CMs and the secondary addresses are used for hosts. In addition, the GIADDR is used as the source IP address in forwarded DHCPOFFER packets.

```
Router# configure terminal

Router(config)# interface cable 5/1/0

Router(config-if)# cable dhcp-giaddr policy strict
```

The following example shows how to configure the router so that the CPE device (in this case, the MTA) uses a specific secondary interface:

```
Router# configure terminal
Router(config)# interface bundle 25
Router(config-if)# cable dhcp-giaddr mta 172.10.10.1
```

The following example shows how to specify DHCP profile as control policy:

```
Router# configure terminal
Router(config)# interface bundle 2
Router(config-if)# cable dhcp-giaddr policy profile DEVICE1 2.2.1.1
```

Related Commands

Command	Description
cable helper-address	Specifies a destination IP address for the User Datagram Protocol (UDP) broadcast (DHCP) packets.
cable relay-agent-option	Enables the system to insert the CM MAC address into a DHCP packet received from a CM or host, and forward the packet to a DHCP server.
cable source-verify	Enables CM upstream verification.
cable telco-return spd dhcp-authenticate	Enforces the telco-return CM to use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the Dynamic Host Configuration Protocol (DHCP) server that the telco-return CM must access.
debug cable dhcp	Enables debugging of the DHCP when it is used on the cable interface.

Command	Description
debug cable mac-address	Enables debugging of the MAC address on the cable interface.
ip dhcp relay information option	Enables the system to insert the CM MAC address into a DHCP packet received from a CM or host and forward the packet to a DHCP server.
ip dhcp smart-relay	Monitors client retransmissions when address pool depletion occurs.

cable dhcp-insert

To configure the Cisco CMTS router to insert descriptors into DHCP packets using option 82, use the **cable dhcp-insert** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dhcp-insert {**downstream-description** | **hostname** | **service-class** | **upstream-description**}

Syntax Description

downstream-description	Appends received DHCP packets with downstream port descriptors.
hostname	Appends received DHCP packets with router host names.
service-class	Appends received DHCP packets with router service class.
upstream-description	Appends received DHCP packets with upstream port descriptors.

Command Default

This configuration is disabled by default.

Command Modes

Interface configuration (config-if) and bundle interface configuration.

Command History

Release	Modification
12.3(21)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCF2	This command was modified. The **service-class** keyword was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable dhcp-insert** command is used to configure the following feature:

DHCP, ToD, and TFTP Services for the CMTS Routers

This feature enhances the DHCP security potential and the Cable Duplicate MAC Address Feature on the Cisco CMTS router.

The **cable dhcp-insert** command specifies which descriptors to append to DHCP packets. The DHCP servers can then detect cable modem clones and extract geographical information.

Note Multiple types of descriptor strings can be configured as long as the maximum relay information option size is not exceeded.

The Cisco CMTS router can use the DHCP Relay Agent Information option (DHCP option 82) to send particular information about a cable modem, such as its MAC address and the cable interface to which it is connected. If the DHCP server cannot match the information with that belonging to a cable modem in its

database, the Cisco CMTS router identifies that the device is a CPE device. This allows the Cisco CMTS router and DHCP server to retain accurate information about which CPE devices are using which cable modems and whether the devices should be allowed network access.

The DHCP Relay Agent can also be used to identify cloned modems or gather geographical information for E911 and other applications. Using the **cable dhcp-insert** command, configure the Cisco CMTS router to insert downstream, upstream, hostname, or service class descriptors into DHCP packets. A DHCP server can utilize such information to determine service levels available to the host specific to the provisioned subscriber.



Note To use the **service-class** option, the service class name specified in the CM configuration file must be configured on the Cisco CMTS. The **ip dhcp relay information option-insert** command should be configured on the bundle interface to insert the **service-class** option into the DHCP DISCOVER messages.

Examples

The following example shows how to insert descriptors into DHCP packets. The DHCP server can then use these descriptors to identify cable modem clones and extract geographical information.

```
Router(dhcp-config)# cable dhcp-insert service-class
```

Related Commands

Command	Description
ip dhcp relay information option-insert	Enables the system to insert a DHCP Relay Agent option in forwarded BOOTREQUEST messages to a DHCP server.
cable ipv6 dhcp-insert	Enables the system to insert descriptors into DHCPv6 packets.

cable dhcp-parse option

To enable parsing of Dynamic Host Configuration Protocol (DHCP) options, use the **cable dhcp-parse option** command in cable interface configuration mode. To disable parsing, use the **no** form of this command.

cable dhcp-parse option-*optnum*
no cable dhcp-parse option-*optnum*

Syntax Description

-*optnum*	Specifies the DHCP option. Valid values are 43 and 60.

Command Default

The CMTS does not parse the specified DHCP options.

Command Modes

Cable interface configuration (config-if)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To determine specific device and system information, configure cable **dhcp-parse option-43** command on the CMTS. The CMTS parses option-43 of the CPE DHCP message to determine the device and system information of the CPE.

To determine the CPE device type, configure **cable dhcp-parse option-60** command on the CMTS. The CMTS parses option-60 of the CPE DHCP message to determine the device type of the CPE.

Examples

The following example shows DHCP option 43 enabled on the CMTS:

```
Router(config-if)# cable dhcp-parse option-43

Router(config-if)#
```

Related Commands

Command	Description
cable helper address	Specifies a destination IP address for User Datagram Protocol (UDP) broadcast Dynamic Host Configuration Protocol (DHCP) packets.

cable diaglog

To enable the DOCSIS 3.1 mode on a MAC domain, use the **cable d31-mode** command in the interface configuration mode. To disable the DOCSIS 3.1 mode, use the **no** form of the command.

[**no**] **cable d31-mode**

This command has no keywords or arguments.

Command Default

DOCSIS 3.1 mode is enabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Fuji 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Enabling the DOCSIS 3.1 mode has the following effects:

- MDDs advertise the MAC domain as DOCSIS 3.1 capable.
- DOCSIS 3.1 protocol support is enabled for the MAC domain, including:
  - v5 Ranging support
  - D3.1 TLV parsing
  - D3.1 MMMs
- OFDM channels are included in MD-SG calculations assuming that they are a member of an associated fiber node.
- OFDM channels are allowed to become active primary-capable downstream channels within the MAC domain.

The following example shows how to enable DOCSIS 3.1 mode:

```
router#configure terminal
router(config)#interface c3/0/0
router(config-if)#cable d31-mode
```

Related Commands

Command	Description
cable mtc-mode	Enables Multiple Transmit Channel mode for the MAC domain. For d31-mode to be active, mtc-mode must also be configured.
cable mrc-mode	Enables Multiple Receive Channel mode for the MAC domain. For d31-mode to be active, mrc-mode must also be configured.
show interface Cable *slot/subslot/port* **controller**	Displays the status of the controller, including the d31-mode enablement state.

cable diplexer-band-edge

To enable transmitting diplexer band edges in MAC Domain Descriptor (MDD) messages use the **cable diplexer-band-edge** comand. To disable transmitting diplexer band edges in MAC Domain Descriptor (MDD) messages use the **no cable diplexer-band-edge** comand.

cable diplexer-band-edge
no cable diplexer-band-edge

This command has no keywords or arguments.

Command Default

Transmitting diplexer band edges in MAC Domain Descriptor (MDD) messages is enabled by default.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Example

The following sample shows and example of the **cable diplexer-band-edge** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) #cable diplexer-band-edge
Router(config-profile-md)#end
```

The following sample shows and example of the **no cable diplexer-band-edge** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) #no cable diplexer-band-edge
Router(config-profile-md)#end
```

cable diplexer-mdd-override-band-edge

To override diplexer band edge settings in MAC Domain Descriptor (MDD) messages, use the **cable diplexer-band-edge** comand. You can manually set the values used in MDD TLV 21.

To disable override diplexer band edge settings in MAC Domain Descriptor (MDD) messages, use the **no cable diplexer-band-edge** comand.

cable diplexer-mdd-override-band-edge { **ds_lower** *frequency-value* | **ds_upper** *frequency-value* | **us_upper** *frequency-value* }
no cable diplexer-mdd-override-band-edge

Syntax Description

ds_lower *frequency-value*	Configure DS Lower Band Edge. You can configure 108MHz or 258MHz.
ds_upper *frequency-value*	Configure DS Upper Band Edge. You can configure 1002MHz or 1218MHz.
us_upper *frequency-value*	Configure DS Upper Band Edge. You can configure 42MHz, 65MHz, 85MHz, 117MHz, 204MHz.

Command Default

override diplexer band edge settings in MAC Domain Descriptor (MDD) messages is disabled by default.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1w	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

The following sample shows an example of the **cable diplexer-mdd-override-band-edge** command.

```
Router#configure terminal
Router#(config)#interface Cable1/0/0
Router(config-if)#cable diplexer-mdd-override-band-edge us_upper 204MHz
Router(config-if)#cable diplexer-mdd-override-band-edge ds_lower 258MHz
Router(config-if)#cable diplexer-mdd-override-band-edge ds_upper 1218MHz
Router(config-if)#end
```

Use the following command to verify the configuration.

```
Router#show cable mac-domain Cable1/0/0 mdd Integrated-Cable 1/0/0 0 | be Diplexer
Diplexer Band Edge
        US Upper Band Edge:  4
        DS Lower Band Edge:  1
        DS Upper Band Edge:  0
```

cable divert-rate-limit

To set Cable-side DRL rate and limit, use the **cable divert-rate-limit** command in interface configuration mode. To reset the rate and limit to the default values, use the **no** form of this command.

cable divert-rate-limit rate *rate* **limit** *limit*
no cable divert-rate-limit

Syntax Description

rate	Specifies the divert rate in packets per second. Minimum rate is 1 packet per second. Maximum rate is 65535 packets per second. The default rate is 2000 packets per second.
limit	Specifies the number of packets to be diverted in an initial burst of packets. Minimum limit is 4 packets. Maximum limit is 4194 packets. The default limit is 2000 packets.

Command Default

The default DRL configuration for every physical cable interface is 2000 packets per second and the default limit is 2000 packets.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **platform punt-sbrl subscriber rate** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Cable-side DRL is configured on the physical cable interface. It cannot be configured on a cable bundle interface.

Examples

The following example shows how to configure the rate and limit values for a cable interface.:

```
Router(config-if)# cable divert-rate-limit rate 1 limit 4
```

Related Commands

Command	Description
service divert-rate-limit ip	This command configures DRL rate and limit for WAN-side IP packet streams.
service divert-rate-limit non-ip	This command configures DRL for WAN-side non-IP packet streams.

cable docsis30-voice downstream req-attr-mask

To configure downstream DOCSIS 3.0 QoS parameters of the required attribute-mask and forbidden attribute-mask number for all DS voice flows, use the **cable docsis30-voice downstream req-attr-mask** command in global configuration mode. To disable the required attribute-mask and forbidden attribute-mask number, use the **no** form of this command.

cable docsis30-voice downstream req-attr-mask *req-attr-mask* **forb-attr-mask** *forb-attr-mask*
no cable docsis30-voice

Syntax Description

req-attr-mask	Specifies the required attribute-mask value. Example: 0 It can also include HEX format. Example: cable docsis30-voice downstream req-attr-mask FF for-attr-mask 8000AAbb
forb-attr-mask	Specifies the forbidden attribute-mask value. Example: 80000000

Command Default

The value of required attribute-mask and forbidden attribute-mask number is 0. Use the **no** form of this command to return to default. It will set the values for required attribute-mask and forbidden attribute-mask number to 0.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to configure DOCSIS 3.0 voice-related downstream service-flow attribute-mask number.

Examples

The following example shows how to configure the downstream attribute mask for the interface cable:

```
Router# configure terminal

Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# cable docsis30-voice downstream req-attr-mask ?

<0-FFFFFFFF> The attribute bitmap in hex
Router(config)# cable docsis30-voice downstream req-attr-mask aa00 ?
forb-attr-mask SF Forbidden Attribute Mask
Router(config)# cable docsis30-voice downstream req-attr-mask aa00 forb-attr-mask ?
```

```
<0-FFFFFFFF> The attribute bitmap in hex
Router(config)# cable docsis30-voice downstream req-attr-mask aa00 forb-attr-mask bbcc

Router(config)# do show run | include docsis30
cable docsis30-voice downstream req-attr-mask AA00 forb-attr-mask BBCC

Router(config)# no cable docsis30-voice down

Router(config)# no cable docsis30-voice

Router(config)# do show run | include docsis30
```

Related Commands

Command	Description
cable downstream attribute-mask	This command enables attribute-based forwarding which allows CMTS to choose bonding group or individual channel for unicast and multicast forwarding.

cable docsis-ver

To report the CMTS-supported DOCSIS version to the DHCP server, use the **cable docsis-ver** command in global configuration mode. To report the default DOCSIS verison to the DHCP server, use the **no** form of the command.

cable docsis-ver [*major version* | *minor version*]
no cable docsis-ver [*major version* | *minor version*]

Syntax Description

major version	Specifies the major DOCSIS version.
minor version	Specifies the minor DOCSIS version.

Command Default

The default value of the command is **cable docsis-ver** *3 1*

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.7.1	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

cable dot1q-vc-map

To map a cable modem to a particular Virtual Local Area Network (VLAN) on a local outbound Ethernet interface, use the **cable dot1q-vc-map** command in global configuration mode. To remove this mapping, or to remove a particular customer's name from the internal tables, use the **no** form of this command.

cable dot1q-vc-map *mac-address ethernet-interface vlan-id* {*cust-name*}
cable dot1q-vc-map *mac-address ethernet-interface* **backup-interface** *ethernet-interface vlan-id* {*cust-name*}
no cable dot1q-vc-map *mac-address ethernet-interface* **backup-interface** *ethernet-interface vlan-id* {*cust-name*}
no cable dot1q-vc-map *mac-address*
no cable dot1q-vc-map customer *cust-name*

Syntax Description

mac-address	Hardware (MAC) address for the cable modem whose traffic is to be mapped.
ethernet-interface	Outbound interface to which this cable modem should be mapped. On the Cisco uBR7100 series and Cisco uBR7246VXR routers, you can specify an Ethernet, Fast Ethernet, or Gigabit Ethernet interface, depending on what interfaces are actually installed in the chassis. On the Cisco cBR series routers, you can specify the Gigabit Ethernet 0 interface or a Ten Gigabit Ethernet interface.
vlan-id	ID for the IEEE 802.1Q Virtual Local Area Network (VLAN) that should be used to tag the frames for this cable modem. The range is 1 to 4095, with no default on the Cisco uBR7100 series and Cisco uBR7246VXR routers. The range is 2 to 4095 on the Cisco cBR series routers. **Note** The switches acting as the bridge aggregators might support a lower number of VLAN IDs. If so, the Cisco CMTS router should be configured within the limits of the switches' maximum number of VLANs.
cust-name	(Optional) Identifies the customer using this VLAN. The *cust-name* can be any arbitrary alphanumeric string, up to 127 characters long.
customer *cust-name*	(Optional) Deletes all VCs belong to this customer. The *cust-name* can be any arbitrary alphanumeric string, up to 127 characters long.
backup-interface *ethernet-interface*	Specifies the backup WAN interface.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for Cisco uBR7246VXR universal broadband routers.

Release	Modification
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
12.2(33)SCJ	This command was modified. The **backup-interface** keyword was added.
IOS-XE 3.18.0S	This command was modified. The **backup-interface** keyword was added.

Usage Guidelines

This command maps a cable modem, on the basis of its hardware (MAC) address, to a particular IEEE 802.1Q VLAN on a particular outbound Ethernet interface. This enables the cable modem's traffic to be part of a virtual LAN at the Layer-2 level.



Note To use this command, you must first enable the use of IEEE 802.1Q Layer 2 tunnels, using the **cable l2-vpn-service dot1q** command. Then use this command to map individual cable modems to specific VLANs.

Examples

The following example shows how to enable the use of Layer 2 tunnels and then map specific CMs to VLANs on a specific interface on a Cisco uBR7246VXR router:

```
Router# configure terminal
Router(config)# cable l2-vpn-service dot1q
Router(config)# cable dot1q-vc-map 000C.0e03.69f9 GigabitEthernet 1/0 4
Router(config)# cable dot1q-vc-map 0010.7bed.9c95 GigabitEthernet 1/0 5
Router(config)# exit
```

The following example shows the same command as above on a Cisco uBR7246VXR router, but this time each VLAN is identified by the customer that is using it:

```
Router# configure terminal
Router(config)# cable l2-vpn-service dot1q
Router(config)# cable dot1q-vc-map 000C.0e03.69f9 GigabitEthernet 1/0 4 ENTERPRISE-CO1
Router(config)# cable dot1q-vc-map 0010.7bed.9c95 GigabitEthernet 1/0 5 ENTERPRISE-CO2
Router(config)# exit
```

The following example shows how to remove the Layer 2 mapping for a specific cable modem on a Cisco uBR7246VXR router. This particular cable modem's traffic is then routed using the normal Layer 3 routing processes.

```
Router# config terminal
Router(config)# no cable dot1q-vc-map 000C.0e03.69f9 GigabitEthernet 1/0 4
Router(config)# exit
```

The following example shows how to enable the use of Layer 2 tunnels and then map specific CMs to VLANs on a specific interface on a Cisco cBR-8 router:

```
Router# configure terminal
```

```
Router(config)# cable l2-vpn-service dot1q
Router(config)# cable dot1q-vc-map 000C.0e03.69f9 GigabitEthernet 0 2
Router(config)# cable dot1q-vc-map 0010.7bed.9c95 TenGigabitEthernet 4/1/0 5
Router(config)# exit
```

The following example shows how to configure a backup WAN interface on DOT1Q L2VPN on a Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# cable l2-vpn-service dot1q
Router(config)# cable dot1q-vc-map 0025.2eab.8482 Te4/0/1 backup-interface Te4/0/7 207
Topgun
```

Related Commands

Command	Description
cable l2-vpn-service dot1q	Enables the use of Layer 2 tunnels so that traffic for individual cable modems can be routed over a particular Virtual Local Area Network (VLAN) on an Ethernet interface.
debug cable l2-vpn	Displays debugging messages for the Layer 2 mapping of cable modems to particular PVCs or VLANs.
show cable l2-vpn dot1q-vc-map	Displays the mapping of one or all cable modems to VLANs on the router's Ethernet interfaces.

cable dot1q-vc-map port-channel

To configure the port-channel uplink port for TLS L2VPN, use the **cable dot1q-vc-map port-channel** command in global configuration mode.

cable dot1q-vc-map *mac address* **port-channel** *number vlan id custom name*

Syntax Description

mac address	MAC address of the cable modem.
number	Port-channel interface number.
vlan id	IEEE 802.1Q VLAN ID.
custom name	Name of the customer.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable dot1q-vc-map port-channel** command configures the port-channel uplink port for TLS L2VPN.

The following example shows how to configure the port-channel uplink port for TLS L2VPN:

```
router# configure terminal
router(config)#cable l2-vpn-service xconnect nsi dot1q
router(config)#cable dot1q-vc-map c8fb.26a5.551c port-channel 64 1200 topgun
```

cable downstream annex

To set the Moving Picture Experts Group (MPEG) framing format for a downstream port on a cable interface line card to either Annex A (Europe) or Annex B (North America), use the **cable downstream annex** command in cable interface configuration mode.

cable downstream annex {**A** | **B**}

Syntax Description

A	Annex A. The downstream uses the EuroDOCSIS J.112 standard.
B	Annex B. The DOCSIS-compliant cable plants that support North American channel plans use ITU J.83 Annex B downstream radio frequency.

Command Default

Annex B for all Cisco cable interface cards other than the Cisco uBR-MC16E. Annex A, if using the Cisco uBR-MC16E cable interface line card and the Cisco uBR7111E and Cisco uBR7114E universal broadband routers.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.1(1a)T1	This command was introduced.
12.0(7)T, 12.1(1a)T1, 12.1 mainline, 12.0(8)SC, 12.1(2)EC1	Support for Annex A was introduced for the Cisco uBR-MC16E cable interface line card.
12.1(7)EC	Support for Annex A was added for the Cisco uBR7111E and Cisco uBR7114E universal broadband routers.
12.2(15)CX	Support was added for both Annex A and Annex B on the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line cards.
12.2(15)BC2	Support was added for both Annex A and Annex B on the Cisco uBR-MC5X20U/S cable interface line cards.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The MPEG framing format must be compatible with the downstream symbol rate you set. Annex B is the North America (DOCSIS) standard and Annex A is the European (EuroDOCSIS) standard. You should review your local standards and specifications for downstream MPEG framing to determine which format you should use.

The Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR-MC5X20U cable interface line cards support both Annex A and Annex B operation. However, on the Cisco uBR-MC28U/X, both downstreams must be configured for the same mode (either both Annex A or both Annex B).

On the Cisco uBR-MC16U and Cisco uBR-MC28U (with integrated upconverter), the IF frequency is fixed at 44 MHz for both Annex A and Annex B modes of operation. On the Cisco uBR-MC16X and Cisco uBR-MC28X (without integrated upconverter), the IF frequency is set to 36.125 MHz in Annex A mode and 44 MHz in Annex B mode.



Note This command can be used to change the symbol rate, alpha, and other parameters for compliance with EuroDOCSIS (annex A), or DOCSIS (annex B). Annex A is not supported on the Cisco uBR-MC1xC, Cisco uBR-MC16B, Cisco uBR-MC16S, and Cisco uBR-MC28C cable interface line cards. Annex B is not supported on the Cisco uBR-MC16E card and on the Cisco uBR7111E and Cisco uBR7114E universal broadband routers.



Note The cable interface line card downstream ports and the CMs on the HFC network connected through these ports must be set to the same MPEG framing format.



Caution In Cisco IOS Release 12.1, only Annex B MPEG framing format is supported.



Tip Changing the MPEG framing format affects the PHY layer on the downstream and disconnects all online CMs. For this reason, if you are using N+1 HCCP redundancy, you should configure this command on both the Protect and Working interfaces, so that the PHY layer is properly configured before a switchover occurs. Otherwise, online CMs could be disconnected when a switchover occurs. (This also applies to the **cable downstream modulation** and **cable downstream interleave-depth** commands.)

Examples

The following example shows how to set the MPEG framing format to Annex A:

```
Router# configure terminal
Router(config)# interface cable 1/0
Router(config-if)# cable downstream annex A
```

The following example shows how to set the MPEG framing format to Annex B:

```
Router# configure terminal
Router(config)# interface cable 4/0
Router(config-if)# cable downstream annex B
```

Related Commands

Command	Description
show controllers cable	Displays the downstream MPEG framing format (Annex A or Annex B) setting.

cable downstream attribute-mask

To configure an attribute for a cable interface or a wideband cable interface, use the **cable downstream attribute-mask** command in interface configuration mode or MAC domain profile configuration mode. To disable this configuration, use the **no** form of this command.

cable downstream attribute-mask *mask*
no cable downstream attribute-mask *mask*

Syntax Description

mask	Specifies the mask value for the interface.

Command Default

If this command is not used, the default attribute is used for the cable interface and the wideband cable interface. The default attribute is 0x80000000 (31-bit) for the wideband cable interface and zero for the cable interface. For a wideband cable interface, 31-bit mask is always set to 1.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The attribute-mask comprises 32 attributes and each attribute represents a single bit in the mask. You can configure a provisioned attribute mask for each channel and provisioned bonding group to assign values to the operator-defined binary attributes, or to override the default values of the specification-defined attributes. The operator may configure, in the CM configuration file, a required attribute mask and a forbidden attribute mask for a service flow. Additionally, in a CM-initiated dynamic service request, the CM can include a required attribute mask and a forbidden attribute mask for a service flow.

Examples

The following example shows how to configure an attribute for a wideband cable interface:

```
Router# configure terminal
Router(config)# interface wideband-cable 1/0/0:0
Router(config-if)# cable downstream attribute-mask 800000ff
```

Related Commands

Command	Description
interface wideband-cable	Specifies a wideband cable interface.
interface cable	Specifies a cable interface.

cable downstream channel-id

To configure the downstream channel ID, use the **cable downstream channel-id** command in cable interface configuration mode. To set the downstream channel ID to its default value, use the **no** form of this command.

cable downstream channel-id *id*
no cable downstream channel-id

Syntax Description

id	Specifies a downstream channel ID. Valid values for releases prior to Cisco IOS Release 12.2(33)SCB are from 0 to 255 and the valid values for Cisco IOS Release 12.2(33)SCB and later are from 1 to 255 as 0 is reserved for network management.

Command Default

The unit number of the downstream device, starting with a value of 1.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(5)T	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB1	The downstream channel ID scheme was changed.
IOS-XE 3.15.0S	This command was replaced by the**docsis-channel-id**command on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Use this command to ensure that each downstream channel has a unique ID when there are multiple Cisco CMTS routers at a headend facility.

Cisco IOS assigns the default ID number of each downstream channel in the order in which devices connected to the downstream channels appear to the CMTS router. The downstream channel connected to the first device that appears to the CMTS router is configured with a default ID of 1, the downstream channel connected to the second device that appears is configured with an ID of 2, and so on.

The local downstream channel channel ID is unique across all SPA channels. When you add a channel to the MAC domain using the **downstream modular-cable rf-channel** command, the channel IDs in the MAC domain are unique. This also facilitates channel ID uniqueness when the channels are added to a fiber node.

The following applies to **rf-channel** *rf-port* **cable downstream channel-id** *channel-id* command also.

Table 2: Downstream Channel ID Scheme for 12.2(33)SCB1

	8/1	8/0	7/1	7/0	6/1	6/0	5/1	5/0	slot 3	slot 1
SPA Bay 0									217-240	193-216

	8/1	8/0	7/1	7/0	6/1	6/0	5/1	5/0	slot 3	slot 1
SPA Bay 1									217-240	193-216
SPA Bay 2									217-240	193-216
SPA Bay 3									217-240	193-216
5x20 DS /0	169	145	121	97	73	49	25	1		
5x20 DS /1	173	149	125	101	77	53	29	5		
5x20 DS /2	177	153	129	105	81	57	33	9		
5x20 DS /3	181	157	133	109	85	61	37	13		
5x20 DS /4	185	161	137	113	89	65	41	17		

Table 3: Downstream Channel ID Scheme for 12.3(23)BCx

	8/1	8/0	7/1	7/0	6/1	6/0	5/1	5/0	slot 3	slot 1
SPA Bay 0									24-47	24-47
SPA Bay 1									48-71	48-71
5x20	188-192	180-184	168-172	160-164	148-152	140-144	128-132	120-124		

Caution Changing the downstream channel ID of an active channel automatically disconnects all connected CMs and forces them to go offline and reregister with the CMTS router, as required by the DOCSIS specifications.

Examples

The following example shows how to configure the downstream channel on the cable interface line card in slot 6 of a Cisco CMTS router with a channel ID of 44:

```
Router(config-if)# cable downstream channel-id 44
```

The following example shows how to restore the downstream channel ID configuration to the default configuration:

```
Router(config-if)# cable downstream channel-id
```

cable downstream-channel-id automatic

To automatically configure the downstream channel IDs, use the **cable downstream-channel-id automatic** command in global configuration mode. To set the downstream channel ID (DCID) to its default value, use the **no** form of this command.

cable downstream-channel-id automatic
no cable downstream-channel-id automatic

Syntax Description

automatic	Specifies an automatic assignment of the DCIDs by the Cisco CMTS.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Use this command to automatically assign unique channel IDs for all downstream channels in a fiber node. Automatic DCIDs are not assigned to downstreams that are not in any fiber node.

Examples

This example shows how to automatically configure the downstream channel IDs:

```
Router(config)# cable downstream-channel-id automatic
```

Related Commands

Command	Description
show cable fibernode	Displays channel ID information for downstreams in a fiber node.

cable downstream controller-profile

To configure the downstream controller profile, use the **cable downstream controller-profile** command in global configuration mode. To void the downstream controller profile configuration, use the **no** form of this command.

cable downstream controller-profile *id* [**RPHY** | **I-CMTS**]

no cable downstream controller-profile *id*

Syntax Description

Syntax Description

id	Specifies the downstream controller profile ID.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Fuji 16.7.1	This command was modified on the Cisco cBR Series Converged Broadband Routers. Keywords **RPHY** and **I-CMTS** were added.

Usage Guidelines

Use this command to configure the downstream controller profile.

When configuring a new i-CMTS controller profile, keyword **I-CMTS** is needed. If user input **RPHY** or do not input any keyword, the system will consider it as a RPHY controller profile.

Examples

The following example shows how to enter the downstream controller profile configuration mode:

```
Router# configure terminal
Router(config)# cable downstream controller-profile 1 I-CMTS
Router(config-controller-profile)#
```

Related Commands

Command	Description
multicast-pool	Specifies the multicast pool for the downstream controller profile.

cable downstream description

To specify a description for a downstream port, use the **cable downstream description** *description* command.

cable downstream description *description*

Syntax Description

description	Specifies a description that is up to 80 characters describing the downstream port.

Command Default

By default, no description is configured.

Command Modes

cable interface (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Example

The following sample shows and example of the **cable downstream description** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # cable downstream description DS
Router(config-profile-md) # no cable downstream description
Router(config-profile-md)#end
```

cable downstream dsg

Supports Advanced-Mode DOCSIS Set-Top Gateway (A-DSG) configuration under MAC domain interface on a Cisco CMTS router with an OPS MD-profile. The method of configuring A-DSG by OPS MD-profile now is in addition to the existing method of using legacy CLI to configure DSG TG.

cable downstream dsg[**channel list** *DSG Channel List Setting* | **dcd-enable** *Enable DSG DCD messages when no enabled rules/tunnels* | **tg** *DSG Tunnel group* | **timer** *DSG Timer Setting* | **vendor-param** *DSG vendor specific parameters*]

chan-list	(Optional) Specifies the downstream Channel List Setting. The valid range is from 1 to 65535.
dcd-enable	(Optional) Enables the DSG DCD messages when no enabled rules/tunnels are enabled.
tg	(Optional) Specifies the DSG Tunnel group.
timer	(Optional) Specifies the DSG Timer Setting.
vendor-param	(Optional) Sepecifies the DSG vendor-specific parameters group ID.

The following example shows how the **show cable downstream dsg** command is used:

```
router# show cable downstream dsg tg
TG    Chan  TG             Rule Vendor   UCID   Service-group  Profile
id    id   state  I/F      pri  Param    list   Profile        chan state
-----    -----   ----- -------     ----    ------    --------------- --------------
2000   1    en    C1/0/0   0                       SG1           en
4500   1    en    C1/0/0   2       2       1 2     SG1           dis
4500   2    en             0                       --            --
```

cable downstream dsg chan-list

To associate an Advanced-mode DOCSIS Set-Top Gateway (A-DSG) channel list entry to a downstream channel and include it in the Downstream Channel Descriptor (DCD) message on a Cisco CMTS router, use the **cable downstream dsg chan-list**command in interface configuration mode. To remove the configuration, use the **no** form of this command.

cable downstream dsg chan-list *list-index*
no cable downstream dsg chan-list *list-index*

Syntax Description

list-index	Alphanumeric list index identifier.

Command Default

Channel lists are not defined by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 and Cisco uBR7200 series routers.
12.2SB	This command was integrated into Cisco IOS Release 12.2SB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Global configuration for A-DSG must be complete before configuring interface definitions.

Examples

The following example shows configuration of inclusion of DSG channel list entries in DCD messages on a downstream cable interface on a Cisco CMTS router:

```
interface Cable6/0
 cable downstream dsg chan-list 2
```

Examples for Cisco cBR Series Converged Broadband Router

```
Router# configure terminal
Router(config)#interface cable 1/0/0
Router(config-if)#cable downstream dsg chan-list 1
```

Related Commands

Command	Description
cable downstream dsg dcd-enable	Enables DCD messages to be sent on a downstream channel on a Cisco CMTS router.

Command	Description
cable downstream dsg rule	Defines and associates an A-DSG rule to a downstream channel on a Cisco CMTS router.
cable downstream dsg timer	Associates an A-DSG timer entry to a downstream channel and includes the DCD message on a Cisco CMTS router.
cable downstream dsg vendor-param	Associates A-DSG vendor parameters to a downstream and includes them in the DCD message on a Cisco CMTS router.
cable dsg chan-list	Configures the A-DSG downstream channel list on a CMTS router.

cable downstream dsg dcd-enable

To enable Downstream Channel Descriptor (DCD) messages to be sent on a downstream channel on a Cisco CMTS router, use the **cable downstream dsg dcd-enable** command in interface configuration mode. To disable DCD messages, use the **no** form of this command.

cable downstream dsg dcd-enable
no cable downstream dsg dcd-enable

Syntax Description

This command has no arguments or keywords.

Command Default

DCD messages are disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisc uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Global configuration for Advanced-mode DOCSIS Set-top Gateway (A-DSG) must be complete before configuring interface definitions. This command is used when there are no enabled rules or tunnels for A-DSG on a Cisco CMTS router.

Examples

The following example shows how to enable DCD messages on a downstream interface on a Cisco CMTS router along with several other A-DSG interface configuration commands:

```
interface Cable6/0
 cable downstream dsg dcd-enable
 cable downstream dsg chan-list 2
 cable downstream dsg timer 3
 cable downstream dsg vendor-param 2
 cable downstream dsg rule 1 priority 1 clients 1 tunnel 1
 cable downstream dsg rule 1 vendor-param 1
 cable downstream dsg rule 1 classifiers 1 5
 cable downstream dsg rule 2 priority 1 clients 2 tunnel 2
```

Related Commands

Command	Description
cable downstream dsg chan-list	Associates the A-DSG channel list entry to a downstream channel, to be included in the DCD message on a Cisco CMTS router.

Command	Description
cable downstream dsg rule	Defines and associates an A-DSG rule to a downstream channel on a Cisco CMTS router.
cable downstream dsg timer	Associates an A-DSG timer entry to a downstream channel and includes the DCD message on a Cisco CMTS router.
cable downstream dsg vendor-param	Associates A-DSG vendor parameters to a downstream and includes them in the DCD message on a Cisco CMTS router.

cable downstream dsg disable

To exclude the primary capable interface from DOCSIS Set-Top Gateway DSG forwarding, use the **cable downstream dsg disable** command in cable interface configuration mode. To remove the configuration, use the **no** form of this command.

cable downstream dsg disable
no cable downstream dsg disable

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable downstream dsg disable** command is associated with the Advanced Mode DOCSIS Set-Top Gateway 1.2 for the Cisco CMTS Routers feature.

When DSG is enabled on the MAC domain interface and DSG forwarding is disabled on the primary capable interface, the Cisco CMTS router does not create multicast service flows on the primary capable interface.

If DSG forwarding is already enabled on the primary capable interface, the Cisco CMTS router removes multicast service flows from the interface.

Examples

The following example shows how to disable A-DSG forwarding on a primary capable modular interface on the Cisco CMTS router:

```
Router# configure terminal
Router(config)# interface modular-cable 1/0/0:0
Router(config-if)# cable downstream dsg disable
Router(config-if)# end
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on the Cisco CMTS router.
show cable dsg cfr	Displays DSG classifier details.

cable downstream dsg rule

Note Effective with Cisco IOS Release 12.3(17a)BC2, the **cable downstream dsg rule** command is removed from Cisco IOS software.

To define and associate an Advanced-mode DOCSIS Set-top Gateway (A-DSG) rule to the downstream channel on a Cisco CMTS router, use the **cable downstream dsg rule** command in interface configuration mode. To remove the DSG rule configuration, use the **no** form of this command.

cable downstream dsg rule *rule-id* [**clients** *clnt-list-id* **tunnel** *tun-id* | **priority** *priority* | **vendor-param** *vsif-grp-id* | **ucid** *ucid1* | [*ucid1 ucid2 . . . ucidn*] | **cfr** *cfr-index* [*cfr-index . . .*] | **disable**]
no cable downstream dsg rule *rule-id* [**clients** *clnt-list-id* **tunnel** *tun-id* | **priority** *priority* | **vendor-param** *vsif-grp-id* | **ucid** *ucid1* | [*ucid1 ucid2 . . . ucidn*] | **cfr** *cfr-index* [*cfr-index . . .*] | **disable**]

Syntax Description

rule-id	Defines the DSG rule identifier.
clients *clnt-list-id*	Sets the DSG clients and associates the clients with the channel list identifier for this DSG rule.
tunnel *tun-id*	Sets the DSG tunnel to be associated with this rule, and defines the DSG tunnel identifier.
priority *priority*	Sets the priority of the DSG rule.
vendor-param *vsif-grp-id*	Associates DSG vendor-specific parameters with the specified DSG rule.
ucid *ucid1* | [*ucid1 ucid2...ucidn*]	Sets the upstream channel identifider for the DSG rule.
cfr *cfr-index* [*cfr-index...*]	Sets the index for the classifier value associated with the DSG rule.
disable	Disables a DSG rule.

Command Default

DSG rules are disabled by default when they are created.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.3(17a)BC2	This command was removed.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Global configuration for A-DSG must be complete before configuring interface definitions.

Because rules are disabled when they are created, you must enable the configuration using the **no cable downstream dsg rule disable** command. To disable a DSG rule configuration, use the **cable downstream dsg rule disable** command.

You can associate DSG clients, vendor specific parameters, classifiers, DSG tunnel address, upstream channel identifier range, and rule priority to a downstream channel. You can apply more than one rule to a downstream channel. All configured rules that are enabled are included in the Downstream Channel Descriptor (DCD) message.

Examples

The following example shows configuration and association of DSG rules on a downstream cable interface on a Cisco CMTS router, followed by an example of enabling the configured DSG rules:

```
interface Cable6/0
 cable downstream dsg rule 1 clients 1 tunnel 1
 cable downstream dsg rule 1 priority 1
 cable downstream dsg rule 1 vendor-param 1
 cable downstream dsg rule 1 classifiers 1 5
 cable downstream dsg rule 2 clients 2 tunnel 2
 cable downstream dsg rule 2 priority 1
!
! Enable the DSG rule configuration
!
 no cable downstream dsg rule 1 disable
 no cable downstream dsg rule 2 disable
```

The following example shows how to disable DSG rules that were previously enabled:

```
interface cable6/0
 cable downstream dsg rule 1 disable
 cable downstream dsg rule 2 disable
```

Related Commands

Command	Description
cable downstream dsg chan-list	Associates an A-DSG channel list to a downstream channel on a Cisco CMTS router.
cable downstream dsg dcd-enable	Enables DCD messages to be sent on a downstream channel on a Cisco CMTS router.
cable downstream dsg timer	Associates an A-DSG timer entry to a downstream channel and includes the DCD message on a Cisco CMTS router.
cable downstream dsg vendor-param	Associates A-DSG vendor parameters to a downstream and includes them in the DCD message on a Cisco CMTS router.

cable downstream dsg tg

To associate an Advanced-Mode DOCSIS Set-Top Gateway (A-DSG) tunnel group to a MAC domain interface on a Cisco CMTS router, use the **cable downstream dsg tg** command in cable interface configuration mode. To remove this association, use the **no** form of this command.

cable downstream dsg tg *tgid* [**channel** *channel_ID* | **priority** *DSG-rule-priority* [**enable** | **disable**] | **ucid** *ID1* [*ID2 ID3 ID4*] | **vendor-param** *vendor-group-ID*]
no cable downstream dsg tg *tgid*

Syntax Description

dsg tg *tgid*	Specifies the DSG tunnel group ID. The valid range is from 1 to 65535.
channel *channel_ID*	(Optional) Specifies the downstream channel ID. The valid range is from 1 to 65535.
priority *DSG-rule-priority*	(Optional) Specifies the DSG rule priority for the cable interface. The valid range is from 0 to 255.
enable	(Optional) Enables the DSG rule priority on a DSG tunnel group.
disable	(Optional) Disables the DSG rule priority on a DSG tunnel group.
ucid *upstream-channel-ID*	(Optional) Specifies the upstream channel ID (UCID). You can specify a maximum of four upstream channel IDs. Cisco cBR-8 router—The valid range is 0 to 8.
vendor-param *vendor-group-ID*	(Optional) Specifies the vendor specific parameters group ID. The valid range is from 1 to 65535.

Command Default

The DSG traffic is not forwarded to the MAC domain.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable downstream dsg tg** command is used to configure the Advanced Mode DOCSIS Set-Top Gateway 1.2 for the Cisco CMTS Routers feature.

If you do not specify a downstream channel ID using the **channel** keyword, the Cisco CMTS router automatically assigns a free channel to associate the MAC domain interface with the DSG tunnel group. This channel is created with default parameters.

If you specify the **channel** keyword in the **no** form of the command, only the MAC domain to DSG tunnel group association is removed from the configuration. If the **no** form of the command is used without the **channel** keyword, both the tunnel group association and the channel are removed.

Examples

The following example shows how to associate an A-DSG tunnel group to a MAC domain interface:

```
Router(config)# interface cable 5/1/0
Router(config-if)# cable downstream dsg tg 1
Router(config-if)# cable downstream dsg tg 1 channel 22
Router(config-if)# cable downstream dsg tg 1 priority 2 enable
Router(config-if)# cable downstream dsg tg 1 ucid 1 2 3 4
Router(config-if)# cable downstream dsg tg 1 vendor-param 20
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows how to associate an A-DSG tunnel group to a MAC domain interface on a Cisco cBR-8 router:

```
Router(config)# interface cable 1/0/0
Router(config-if)# cable downstream dsg tg 1
Router(config-if)# cable downstream dsg tg 1 channel 2
Router(config-if)# cable downstream dsg tg 1 priority 0 enable
Router(config-if)# cable downstream dsg tg 1 ucid 1 2 3 4
Router(config-if)# cable downstream dsg tg 1 vendor-param 20
```

Related Commands

Command	Description
cable downstream dsg disable	Excludes the primary capable interface from A-DSG forwarding.

cable downstream dsg tg channel

To associate an Advanced-mode DOCSIS Set-Top Gateway (A-DSG) tunnel group to a downstream interface on a Cisco CMTS router, use the **cable downstream dsg tg channel** command in interface configuration mode. To remove this configuration, use the **no** form of this command.

cable downstream dsg tg *group-id* **channel** *channel-id*
no cable downstream dsg tg *group-id* **channel** *channel-id*

Syntax Description

group-id	Specifies the A-DSG tunnel group identifier as a number from 1 to 65535.
channel-id	Specifies the downstream channel identifier as a number from 1 to 65535.

Command Default

The A-DSG tunnel group is not associated to a downstream interface.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(17a)BC2	This command was introduced to support A-DSG 1.2 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The**cable dsg tg channel** global configuration command establishes the configuration of tunnels in a tunnel group. Tunnel groups are enabled by default.

Then, you can associate the tunnel group to a downstream cable interface using the **cable downstream dsg tg channel** interface configuration command.

Examples

The following example shows the configuration and activation of a tunnel group with ID of 1 and channel ID of 2 in global configuration, followed by association of the tunnel group to a downstream interface on a Cisco CMTS router:

```
cable dsg tg 1 channel 2
interface cable 8/1/2
 cable downstream dsg tg 1 channel 2
```

Examples

This example shows the configuration and activation of a tunnel group with ID of 1 and channel ID of 1in global configuration, followed by association of the tunnel group to a downstream interface on a Cisco cBR-8 router:

```
cable dsg tg 1 channel 1
```

```
interface cable 1/0/0
 cable downstream dsg tg 1 channel 1
```

Related Commands

Command	Description
cable downstream dsg chan-list	Associates an A-DSG channel list entry to a downstream channel and includes it in the DCD message on a Cisco CMTS router.
cable downstream dsg dcd-enable	Enables DCD messages to be sent on a downstream channel on a Cisco CMTS router.
cable downstream dsg timer	Associates an A-DSG timer entry to a downstream channel and includes the DCD message on a Cisco CMTS router.
cable downstream dsg vendor-param	Associates A-DSG vendor parameters to a downstream and includes them in the DCD message on a Cisco CMTS router.
cable dsg tunnel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.

cable downstream dsg timer

To associate an Advanced-mode DOCSIS Set-Top Gateway (A-DSG) timer entry to a downstream channel and include it in the Downstream Channel Descriptor (DCD) message on a Cisco CMTS router, use the **cable downstream dsg timer** command in interface configuration mode. To remove this setting, use the **no** form of this command.

cable downstream dsg timer *timer-index*
no cable downstream dsg timer *timer-index*

Syntax Description

timer-index	Identifier for the DSG timer setting in the index.

Command Default

The downstream DSG timer is not configured by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Global configuration for A-DSG must be complete before configuring interface definitions.

Examples

The following example shows the configuration DSG timers for inclusion in DCD messages on a downstream cable interface on a Cisco CMTS router:

```
interface Cable6/0
 cable downstream dsg timer 3
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows how to associate an A-DSG tunnel group to a MAC domain interface on a Cisco cBR-8 router:

```
Router(config)# interface cable 1/0/0
Router(config-if)# cable downstream dsg timer 1
```

Related Commands

Command	Description
cable downstream dsg chan-list	Associates an A-DSG channel list entry to a downstream channel and include it in the DCD message on a Cisco CMTS router.
cable downstream dsg dcd-enable	Enables DCD messages to be sent on a downstream channel on a Cisco CMTS router.
cable downstream dsg rule	Defines and associates an A-DSG rule to a downstream channel on a Cisco CMTS router.
cable downstream dsg vendor-param	Associates A-DSG vendor parameters to a downstream and includes them in the DCD message on a Cisco CMTS router.

cable downstream dsg vendor-param

To associate Advanced-mode DOCSIS Set-Top Gateway (A-DSG) vendor parameters to a downstream, to be included in the Downstream Channel Descriptor (DCD) message on a Cisco CMTS router, use the **cable downstream dsg vendor-param** command in interface configuration mode. To remove this configuration from a Cisco CMTS router, use the **no** form of this command.

cable downstream dsg vendor-param *vsif-grp-id*
no cable downstream dsg vendor-param *vsif-grp-id*

Syntax Description

vsif-grp-id	Associates a vendor parameter with a group identifier.

Command Default

This command is not configured by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Global configuration for A-DSG must be complete before configuring interface definitions.

Examples

The following example shows configuration of A-DSG vendor parameters on a downstream interfac, along with several other downstream interface commands on a Cisco CMTS router:

```
interface Cable6/0
 cable downstream dsg dcd-enable
 cable downstream dsg chan-list 2
 cable downstream dsg timer 3
 cable downstream dsg vendor-param 2
 cable downstream dsg rule 1 priority 1 clients 1 tunnel 1
 cable downstream dsg rule 1 vendor-param 1
 cable downstream dsg rule 1 classifiers 1 5
 cable downstream dsg rule 2 priority 1 clients 2 tunnel 2
```

Related Commands

Command	Description
cable downstream dsg chan-list	Associates an A-DSG channel list entry to a downstream channel and include it in the DCD message on a Cisco CMTS router.

Command	Description
cable downstream dsg dcd-enable	Enables DCD messages to be sent on a downstream channel on a Cisco CMTS router.
cable downstream dsg rule	Defines and associates an A-DSG rule to a downstream channel on a Cisco CMTS router.
cable downstream dsg timer	Associates an A-DSG timer entry to a downstream channel and includes the DCD message on a Cisco CMTS router.

cable downstream freq-profile

To set the frequency profile for the cable interface line card, use the **cable downstream freq-profile** command in global configuration mode.

cable downstream freq-profile *id*

Syntax Description

Syntax Description

id	Downstream frequency profile ID. 0 to 3 are system defined, 4 to 15 are user defined.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the frequency profile for the cable interface line card.

Examples

The following example shows how to enable the downstream frequency profile configuration:

```
Router# configure terminal
Router(config)# cable downstream freq-profile 4
Router(config-freq-prof)#
```

Related Commands

Command	Description
lane start-freq	Set the start frequency for a specific lane.

cable downstream frequency

To note the downstream center frequency for the cable interface line card to reflect the digital carrier frequency of the downstream radio frequency carrier (the channel) for that downstream port, use the **cable downstream frequency** command in cable interface configuration mode. On cable interfaces with an integrated upconverter, to unset the downstream frequency and to disable the RF output from the integrated upconverter, use the **no** form of this command.

cable downstream frequency *down-freq-hz*
no cable downstream frequency

Syntax Description

down-freq-hz	The known center frequency of the downstream carrier in Hz (the valid range is 55,000,000 to 858,000,000). The usable range depends on whether the downstream is configured for DOCSIS or EuroDOCSIS operations: • DOCSIS = 88,000,000 to 855,000,000 MHz • Extended frequency range = 70,000,000 to 855,000,000 MHz • EuroDOCIS = 112,000,000 to 858,000,000 MHz The Cisco IOS supports a superset of these standards, and setting a center frequency to a value outside these limits violates the DOCSIS or EuroDOCSIS standards. Cisco does not guarantee the conformance of the downstream and upconverter outputs when using frequencies outside the DOCSIS or EuroDOCSIS standards.

Command Default

Disabled. On the Cisco uBR7100 series routers, the default downstream center frequency for the integrated upconverter is 500 MHz.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
11.3 XA	This command was introduced to support NTSC/DOCSIS Annex B RF operation.
12.0(7)XR2, 12.0(8)SC	Modified to support PAL/SECAM EuroDOCSIS RF operation.
12.1(2)EC1	Supports both Annex A and Annex B.
12.1(5)EC1	Modified to support the integrated upconverter on the Cisco uBR7100 series universal broadband router.
12.2(11)CY, 12.2(11)BC3	Support was added for the Cisco uBR-MC5X20S cable interface line card.
12.2(15)CX	Support was added for the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line cards.
12.2(15)BC2	Support was added for the extended frequency range and for the Cisco uBR-MC5X20U cable interface line card. In addition, the command was changed to accept only center frequencies in 250 KHz increments (previously, the command allowed 125 KHz increments).

Release	Modification
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is either optional or required, depending on the cable interface line card being used.

- On the Cisco uBR7100 series routers using the integrated upconverter (the DS0 RF output), and on cable interfaces that support integrated upconverters (such as the Cisco uBR-MC16U, Cisco uBR-MC28U, and Cisco uBR-MC5X20U), this command configures the frequency for the integrated upconverter. The **no** form of this command unsets the frequency and disables the output from the integrated upconverter.
- For cable interfaces that use an external upconverter (such as the Cisco uBR-MC16S and the DS0 (IF) output on Cisco uBR7100 series routers), this command is informational-only, because it does not affect the external upconverter. The external upconverter must be programmed separately with the appropriate center frequency.



Note The **no** form of this command is supported only on the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR-MC5X20S/U cable interface line cards, and on the Cisco uBR7100 series universal broadband router.



Note We recommend configuring this command on all cable interfaces, even those that are using external upconverters. This is because this command is required to enable the downstream frequency override feature and for N+1 line card redundant operation when using SNMP-capable external upconverters.

The downstream frequency of your RF output must be set to match the expected input frequency of your upconverter. To do this, you enter the fixed center frequency of the downstream channel for the downstream port. (You can also select a default that does not set a specific fixed value.) The valid range for a fixed center frequency is 54,000,000 to 858,000,000 Hz. The center frequency is also used to configure an IF-to-RF upconverter that must be installed in your downstream path.

The digital carrier frequency is specified to be the center of a 6.0 MHz channel. For example, EIA channel 95 spans 90.000 to 96.000 MHz. The center frequency is 93.000 MHz, which is the digital carrier frequency that should be configured as the downstream frequency. The typical range for current CATV headends is 88,000,000 to 860,000,000 Hz.

In Cisco IOS software releases before Cisco IOS Release 12.2(15)BC2, the **cable downstream frequency** command allowed the center frequency to be specified in 125 KHz increments. In Cisco IOS Release 12.2(15)BC2 and later releases, this was changed to allow only 250 KHz increments, because of the requirements of the Broadband Processing Engine cable interface line cards that use an internal upconverter (Cisco uBR-MC16U, Cisco uBR-MC28U, and Cisco uBR-MC5X20S/U).

Note DOCSIS allows downstreams to use any center frequency within 88,000,000 to 855,000,000 MHz. However, when most cable modems first come online, they initially start scanning the downstream for the frequencies that are in the NTSC channel plan. If a valid downstream is not found among those frequencies, the cable modems then beginning scanning the remaining frequencies. For the fastest and most efficient registration times, we recommend configuring downstreams for the frequencies that are specified in the NTSC channel plan.

Note For cBR Series Converged Broadband Routers, the frequency configuration will be available as a part of the RF channel configuration.

Examples

The following example shows how to set the downstream center frequency display value:

```
Router(config)# interface c6/0

Router(config-if)# cable downstream frequency 96000000
```

Related Commands

Command	Description
cable downstream annex	Sets the MPEG framing format for a downstream port on a cable interface line card to either Annex A (Europe) or Annex B (North America).
cable downstream rf-power	Configures the desired RF output power on the integrated upconverter.
cable downstream rf-shutdown	Enables or disables the RF output from the integrated upconverter.
show controllers cable	Displays status and configuration information for the cable interface. On supported cable interfaces, this includes information about the integrated upconverter.

cable downstream if-output

To activate a downstream port on a cable interface and to generate either a standard modulated signal or a test signal, use the **cable downstream if-output** command in cable interface configuration mode. To disable all signal output on the intermediate frequency (IF) carrier and to shut down the interface, use the **no** form of this command.

cable downstream if-output [**continuous-wave** | **prbs**]
no cable downstream if-output

Syntax Description

continuous-wave	Outputs an unmodulated carrier signal on the downstream, shutting down normal data network operations.
prbs	Outputs a Pseudo Random Bit Stream (PRBS) test signal on the downstream, shutting down normal data network operations.

Command Default

The downstream interface is enabled for normal data use.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.0(7)XR2, 12.0(7)T, 12.(0)SC,12.1(2)EC1	This command was modified to support Annex A (EuroDOCSIS) downstreams, and the **continuous-wave** and **prbs** options were added.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Typically, a downstream is configured to output a modulated signal, using the **cable downstream if-output** command, allowing data transmissions to be sent over the HFC cable network. However, this command can also be used to test the cable plant or to shut down the interface completely:

- **cable downstream if-output continuous-wave**—Generates an unmodulated, continuous sine wave on the downstream interface. You can use a spectrum analyzer to verify the frequency, amplitude, and power of the wave. The test signal continues on the downstream until you resume normal modulated operations using the **cable downstream if-output** command.
- **cable downstream if-output prbs**—Generates a PRBS test signal on the downstream interface. You can use a spectrum analyzer to verify the frequency, amplitude, and power of the wave. The test signal continues on the downstream until you resume normal modulated operations using the **cable downstream if-output** command.

- **no cable downstream if-output**—Terminates all signal output and shuts down the downstream interface. The interface remains shut down until you reactive the downstream using the **cable downstream if-output** command.



Note Generating a PRBS or continuous-wave test signal or shutting down the interface automatically stops the modulated carrier data signal and disconnects all CMs on that downstream. These commands should not be used on a live network except as part of troubleshooting major network problems.

Examples

The following example shows how to enable downstream port 0 on a cable interface:

```
Router# configure terminal
Router# interface c6/0
Router(config-if)# cable downstream if-output
```

The following example shows a PRBS test signal being generated on a downstream for a period of time. The downstream is then shut down so that the test engineer can verify that no signal is being sent on the downstream. After the tests have been run, the downstream is reactivated for normal modulated data use:

```
Router# configure terminal
Router# interface c6/0
Router(config-if)# cable downstream if-output prbs
(the signals are verified by a spectrum analyzer...)
Router#(config-if)# no cable downstream if-output
(the downstream is checked to verify no signals are being sent on it...)
Router#(config-if)# cable downstream if-output
Router#(config-if)# exit
```

cable downstream interleave-depth

To set the downstream interleave depth, use the **cable downstream interleave-depth** command in cable interface configuration mode. To restore the default setting, use the **no** form of this command.

cable downstream interleave-depth {**8** | **16** | **32** | **64** | **128**}
no cable downstream interleave-depth

Syntax Description

8 | **16** | **32** | **64** | **128**	Indicates the downstream interleave depth in number of rows of codewords.

Command Default

The downstream interleave depth value is 32.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Command History

Release	Modification
11.3 XA	This command was introduced.
12.0(7)XR2, 12.(0)SC,12.1(2)EC1	This command was modified to support Annex A operation (which uses a fixed interleave).
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Note This command is not supported on the Cisco uBR-MC16E cable interface line card or on the Cisco uBR7111E and Cisco uBR7114E universal broadband routers, because the interleave on the EuroDOCSIS downstream is fixed.

This command sets the minimum latency of the system. A higher interleave depth provides more protection from bursts of noise on the HFC network by spreading out the bits for each codeword over a greater transmission time.

Interleave transmissions do not transmit each codeword by itself, but instead send bits from multiple codewords at the same time, so that a noise burst affects the minimum number of bits per codeword, which allows the Forward Error Correction (FEC) algorithm a greater chance of detecting and correcting any transmission errors.

A higher interleave depth transmits bits from a greater number of codewords, increasing the efficacy of the FEC algorithm. However, a higher depth also increases downstream latency, which might slow TCP/IP

throughput for some configurations, so you need to choose an interleave depth that is appropriate both for your plant's noise levels and application needs.

If your cable plant is experiencing high noise levels, consider increasing the interleave from the default of 32 to 64. For plants with exceptionally high noise levels, increase the interleave to 128 to provide the maximum protection from noise bursts.

Low interleave depth values typically cause some packet loss on typical HFC networks, because burst noise lasts beyond the error correction block correctable length. However, on cable plants with exceptionally low noise levels, Cisco recommends initially using the default value of 32, and then trying an interleave of either 16 or 8 to see if this increases performance without increasing the number of errors that result from noise.

The table below shows interleave characteristics and their relation to each other.

Note The table below does not apply to EuroDOCSIS cable plants because the interleave depth for EuroDOCSIS cable interfaces is fixed.

Table 4: DOCSIS Downstream Cable Interleave Descriptions

I (Number of Taps)	J (Increment)	Burst Protection 64-QAM/256 QAM	Latency 64-QAM/256 QAM
8	16	5.9 microseconds/4.1 milliseconds	0.22 ms/0.15 ms
16	8	12 microseconds/8.2 milliseconds	0.48 ms/0.33 ms
32	4	24 microseconds/16 milliseconds	0.98 ms/0.68 ms
64	2	47 microseconds/33 milliseconds	2.0 ms/1.4 ms
128	1	95 microseconds/66 milliseconds	4.0 ms/2.8 ms

Tip Changing the interleave depth affects the PHY layer on the downstream and disconnects all online CMs. For this reason, if you are using N+1 HCCP redundancy, you should configure this command on both the Protect and Working interfaces, so that the PHY layer is properly configured before a switchover occurs. Otherwise, online CMs could be disconnected when a switchover occurs. (This also applies to the **cable downstream annex** and **cable downstream modulation** commands.)

Examples

The following example shows how to configure the downstream interleave depth to 128 microseconds:

```
Router# configure terminal
Router(config)# interface cable 3/0
Router(config-if)# cable downstream interleave-depth 128
```

cable downstream modulation

To set the modulation format for a downstream port on a cable interface line card, use the **cable downstream modulation** command in cable interface configuration mode.

cable downstream modulation {**64qam** | **256qam**}

Syntax Description

Syntax Description

64qam	Modulation rate is 6 bits per downstream symbol.
256qam	Modulation rate is 8 bits per downstream symbol.

Command Default

The default modulation for Cisco RF Gateway 10 is 64 QAM.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Command History

Release	Modification
11.3 XA	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Downstream modulation defines the speed in bits per second at which data travels downstream to the subscriber's CM. A symbol is the basic unit of modulation. QPSK encodes 2 bits per symbol, 16-QAM encodes 4 bits per symbol, 64-QAM encodes 6 bits per symbol, and 256-QAM encodes 8 bits per symbol.

Note Setting a downstream modulation format of 256-QAM requires approximately a 6-dB higher signal-to-noise ratio (SNR) than 64-QAM at the subscriber's cable modem. If your network is marginal or unreliable at 256-QAM, use the 64-QAM format instead.

Tip Changing the modulation format affects the PHY layer on the downstream and disconnects all online CMs. For this reason, if you are using N+1 HCCP redundancy, you should configure this command on both the Protect and Working interfaces, so that the PHY layer is properly configured before a switchover occurs. Otherwise, online CMs could be disconnected when a switchover occurs. (This also applies to the **cable downstream annex** and **cable downstream interleave-depth** commands.)

Examples

The following example shows how to set the downstream modulation to 256-QAM:

```
Router# configure terminal
Router(config)# interface cable 3/0
Router(config-if)# cable downstream modulation 256qam
```

cable downstream ofdm-chan-profile

To define the OFDM channel profile on the OFDM channel, use the **cable downstream ofdm-chan-profile** command in global configuration mode. To remove the profile, use **no** form of this command.

cable downstream ofdm-chan-profile *id*

no cable downstream ofdm-chan-profile *id*

Syntax Description

Syntax Description

id	Downstream OFDM modulation profile ID. Valid range is from 20 to 255.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to define the OFDM channel profile for the OFDM channel.

Examples

The following example shows how to enable the OFDM channel profile configuration:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)#
```

Related Commands

Command	Description
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
interleaver-depth	Specify the channel interleaver-depth.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-control	Specify default modulation or profile as the channel control profile.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.
roll-off	Specify the channel roll-off value.

Command	Description
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.
show cable ofdm-chan-profiles	Verify the OFDM channel profile configuration.

cable downstream ofdm-flow-to-profile

To override the profile selection logic, use the **cable downstream ofdm-flow-to-profile** command in global configuration mode.

Cisco cBR-8 Converged Broadband Router
cable downstreamofdm-flow-to-profile [**interface Integrated-Cable** *slot/subslot/port:chan*]**profile-data** *profile ID* **mac-address** *cable-modem-mac*

Syntax Description

profile ID	Data profile identifier.
cable-modem-mac	MAC address of the cable modem.
slot/subslot/port:chan	Specifies the OFDM channel.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Everest 16.6.1	This command was modified on the Cisco cBR Series Converged Broadband Routers. The **interface integrated-Cable** keyword was added.

Usage Guidelines

When this command is configured, all the service flows on the cable modem, identified by its MAC address,are mapped to the specified data profile. With the Interface option, profile override can be specified for a particular downstream OFDM channel. Thus with two OFDM downstream channels on a single CM, each channel can have a unique profile override. When the ofdm-flow-to-profile override is configured and no OFDM channel is specified, the profile Id will apply to all OFDM channels in use on the cable modem.

Examples

The following example shows how to override the selection logic:

```
Router(config)# cable downstream ofdm-flow-to-profile profile-data 2 mac-address
fc52.8d5e.9e55
```

Once this command is configured, all the service flows on the cable modem whose MAC address is fc52.8d5e.9e55, are mapped to the profile ID 2.

The following example shows how to override the selection logic on a specific channel.

```
Router(config)# cable downstream ofdm-flow-to-profile interface integrated-Cable 1/0/0:158
 profile-data 3 mac-address 4800.33ea.7012

Router(config)# cable downstream ofdm-flow-to-profile interface integrated-Cable 1/0/0:159
 profile-data 2 mac-address 4800.33ea.7012
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt unfit-profile-age *age*	Configure the unfit profile age.
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*	Configure the RxMER poll interval.
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*	Configure the percentage of subcarriers that can be exempted from bit loading comparison.
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto	Disable the automatic profile downgrade upon CM status event 16.
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*	Configure the offset.

cable downstream ofdm-modulation-profile

To define the OFDM modulation profile on the OFDM channel, use the **cable downstream ofdm-modulation-profile** command in global configuration mode. To remove the profile, use **no** form of this command.

cable downstream ofdm-modulation-profile *id*

no cable downstream ofdm-modulation-profile *id*

Syntax Description

Syntax Description

id	Downstream OFDM modulation profile ID. Valid range is from 8 to 255.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to define the OFDM modulation profile for the OFDM channel.

Examples

The following example shows how to enable the OFDM modulation profile configuration:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 21
Router(config-ofdm-mod-prof)#
```

Related Commands

Command	Description
assign	Assign modulations to subcarriers.
description (OFDM modulation profile)	Specify a user defined description for the profile up to 64 characters.
start-frequency	(Optional) Specify the starting frequency associated with the first configurable subcarrier in the profile determined by the width.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.
width	Specify width of profile in Hz.
show cable ofdm-modulation-profiles	Verify the OFDM modulation profile configuration.

cable downstream ofdm-power-profile

To configure an OFDM Power Profile on a DOCSIS 3.1 system, use the **cable downstream ofdm-power-profile** command in the global configuration mode.

cable downstream ofdm-power-profile *{profile_id}*

Syntax Description

profile_id	Specify a global power profile ID. You can define up to 64 OFDM power profiles with IDs from 1 to 64. This profile ID is used to apply the power profile to an OFDM channel in a controller-integrated cable OFDM channel configuration. You can apply a single OFDM power profile to multiple OFDM channels.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS-XE Release 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to apply a power profile to an OFDM channel on the Cisco cBR Series Converged Broadband Router.

The following example shows how to configure an OFDM power profile:

```
Router# configure terminal
Router(config)# cable downstream ofdm-power-profile 3
power-adjust-default 0.0
power-tilt-linear 3.5
band-index 0
power-adjust 4.0

controller Integrated-Cable 3/0/0
  ...
    rf-chan 158
        power-profile 3
```

Related Commands

Command	Description
power-adjust-default	Specifies the default power level value applied to bands that are not configured using other means. This value is also the starting power level for band 0 when a linear power-tilt is configured. The value is specified in dB. The valid range is limited by integrated-controllers in which the ofdm-power-profile is configured. The range remains between –9 and +8 dB.

Command	Description
power-tilt-linear	Specifies the amount of linear tilt that is corrected across the OFDM channel. The power tilt is applied from the band value 0, specified by the `power-adjust-default` value, to the last band value, specified by the `power-tilt-linear` value. Each band in-between is set to a power level based on the linear interpolation between these two values (to the nearest 1/10th dB). The integrated-cable controllers in which the OFDM power profile is configured limits the valid range for `power-tilt-linear`. The range remains between –9 dB and +8 dB.
band-index	Specifies a particular band or sequence of bands.
power-adjust	Specifies a power-level override for the current `band-index` range. Each band is set to the specified value. This command takes precedence over the `power-tilt-linear` values.
ofdm-channel-width	Specifies the channel width of the OFDM power profile in hertz (Hz). This width should match the OFDM channel width as configured in the integrated-cable (IC) controller OFDM channels. If the channel width of the OFDM power profile is larger than the IC controller OFDM channel width, the system allows configurations. However, it does not use all band settings of the 6 MHz bands of the power-profile. If the channel width of the OFDM power profile is smaller than the IC controller OFDM channel width, configuring the OFDM power profile in the IC controller OFDM channel is not allowed.
controller Integrated-Cable *{slot}/{subslot}/{port}* **rf-channel** *{158 - 162 }* **power-profile** *{ofdm-power-profile-id}*	The *{ofdm-power-profile-id}* specifies the global OFDM power profile that is applied to the OFDM channel of this controller.

cable downstream ofdm-prof-mgmt exempt-sc-pct

To configure a percentage of subcarriers that can be exempted from bit loading comparison, use the **cable downstream ofdm-prof-mgmt exempt-sc-pct** *percent* command in global configuration mode.

Cisco cBR-8 Converged Broadband Router
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*

Syntax Description

percent	Percentage of subcarriers that can be exempted from bit loading comparison. The valid range is from 0 to 100 percent.

Command Default

2 percent

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The configured percentage value is used while comparing a modem's desired bit loading values (derived from its RxMER) to the profiles. It is also used while comparing profiles to determine their ordering.

Examples

The following example shows how to configure the percentage of subcarriers that can be exempted from bit loading comparison:

```
Router(config)# cable downstream ofdm-prof-mgmt exempt-sc-pct 20
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt unfit-profile-age *age*	Configure the unfit profile age.
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*	Configure the RxMER poll interval.
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*	Configure the offset.
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto	Disable the automatic profile downgrade upon CM status event 16.
cable downstream ofdm-flow-to-profile profile-data *profile ID* **mac-address** *cable-modem-mac*	Override the selection logic.

cable downstream ofdm-prof-mgmt mer-margin-qdb

To configure the offset in quarter-decibel (DB), when RxMER is mapped to the ideal bit loading, use the **cable downstream ofdm-prof-mgmt mer-margin-qdb** command in global configuration mode.

Cisco cBR-8 Converged Broadband Router
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*

Syntax Description

quarter-decibel	Quarter-decibel to configure the offset. The valid value is from 0 to 40 quarter-DB.

Command Default

0 quarter-DB

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This value is used to control the aggressiveness in mapping RxMER values to the desired bit loading values by a CM. The configured offset value is added to the RxMER before using the default RxMER to bit loading mapping table published in DOCSIS 3.1 OSSI.

Examples

The following example shows how to configure the offset:

```
Router(config)# cable downstream ofdm-prof-mgmt mer-margin-qdb 20
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt unfit-profile-age *age*	Configure the unfit profile age.
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*	Configure the RxMER poll interval.
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*	Configure the percentage of subcarriers that can be exempted from bit loading comparison.
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto	Disable the automatic profile downgrade upon CM status event 16.
cable downstream ofdm-flow-to-profile profile-data *profile ID* **mac-address** *cable-modem-mac*	Override the selection logic.

cable downstream ofdm-prof-mgmt prof-dwngrd-auto

To disable the automatic profile downgrade upon CM-status event 16, use the **no cable downstream ofdm-prof-mgmt prof-dwngrd-auto** command in global configuration mode.

Cisco cBR-8 Converged Broadband Router
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto

Command Default

The automatic profile downgrade upon CM-status event 16 is enabled by default.

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to disable the automatic profile downgrade upon CM-status event 16:

```
Router(config)# no cable downstream ofdm-prof-mgmt prof-dwngrd-auto
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt unfit-profile-age *age*	Configure the unfit profile age.
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*	Configure the RxMER poll interval.
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*	Configure the percentage of subcarriers that can be exempted from bit loading comparison.
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*	Configure the offset.
cable downstream ofdm-flow-to-profile profile-data *profile ID* **mac-address** *cable-modem-mac*	Override the selection logic.

cable downstream ofdm-prof-mgmt prof-order-method

To configure the type of OFDM Profile Downgrade method **cable downstream ofdm-prof-mgmt prof-order-method** command in global configuration mode. Using the **no cable downstream ofdm-prof-mgmt prof-order-method** command, configures the default option (**bit-loading**).

Cisco cBR-8 Converged Broadband Router
cable downstream ofdm-prof-mgmt prof-order-method { **bit-loading** | **capacity** }

no cable downstream ofdm-prof-mgmt prof-order-method

Syntax Description

bit-loading	Legacy method of profile downgrade.
capacity	Configure this option if you wish to downgrade the profile based on the capacity. This option does not skip any good profiles.

Command Default

The **bit-loading** option is configured by default.

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The following example shows how to configure the **capacity** method of downgrading OFDM profiles.

```
Router(config)# cable downstream ofdm-prof-mgmt prof-order-method capacity
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.

cable downstream ofdm-prof-mgmt prof-upgrade-pma

To enable the external profile management application (PMA), use the **cable downstream ofdm-prof-mgmt prof-upgrade-pma** command in global configuration mode. This will disable internal PMA. To disable external PMA, use **no** form of this command. This will enable internal PMA.

Cisco cBR-8 Converged Broadband Router
cable downstream ofdm-prof-mgmt prof-upgrade-pma

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to disable the PMA:

```
Router(config)# cable downstream ofdm-prof-mgmt prof-upgrade-pma
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt unfit-profile-age *age*	Configure the unfit profile age.
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*	Configure the RxMER poll interval.
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*	Configure the percentage of subcarriers that can be exempted from bit loading comparison.
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*	Configure the offset.
cable downstream ofdm-flow-to-profile profile-data *profile ID* **mac-address** *cable-modem-mac*	Override the selection logic.
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto	Disable the automatic profile downgrade upon CM status event 16.

cable downstream ofdm-prof-mgmt recommend-profile-age

To configure the recommended profile age, use the **cable downstream ofdm-prof-mgmt recommend-profile-age** command in global configuration mode.

Cisco cBR-8 Converged Broadband Router
cable downstream ofdm-prof-mgmt recommend-profile-age *age*

Syntax Description

age	Recommended profile age in minutes. The valid range is from 5 to 1440 minutes.

Command Default

120 minutes

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If the recommended profile for a cable modem exceeds this age, that profile is no longer valid.

Examples

The following example shows how to configure the recommended profile age:

```
Router(config)# cable downstream ofdm-prof-mgmt recommend-profile-age 20
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt unfit-profile-age *age*	Configure the unfit profile age.
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*	Configure the RxMER polling interval.
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*	Configure the percentage of subcarriers that can be exempted from bit loading comparison.
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*	Configure the offset.
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto	Disable the automatic profile downgrade upon CM status event 16.
cable downstream ofdm-flow-to-profile profile-data *profile ID* **mac-address** *cable-modem-mac*	Override the selection logic.

cable downstream ofdm-prof-mgmt rxmer-poll-interval

To configure the Receive Modulation Error Ratio (RxMER) poll interval, use the **cable downstream ofdm-prof-mgmt rxmer-poll-interval** command in global configuration mode.

Cisco cBR-8 Converged Broadband Router
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*

Syntax Description

interval	RxMER poll interval in minutes. The valid range is from 5 to 1440 minutes.

Command Default

60 minutes

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The CMTS uses OPT message with bit-0 option to collect RxMER data from CMs, after the initial CM registration and periodically thereafter. The RxMER collection period or the poll interval is configurable. The collected RxMER data is used to compute the recommended profile for each CM.

Examples

The following example shows how to configure the RxMER poll interval:

```
Router(config)# cable downstream ofdm-prof-mgmt rxmer-poll-interval 20
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt unfit-profile-age *age*	Configure the unfit profile age.
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*	Configure the percentage of subcarriers that can be exempted from bit loading comparison.
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*	Configure the offset.
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto	Disable the automatic profile downgrade upon CM status event 16.
cable downstream ofdm-flow-to-profile profile-data *profile ID* **mac-address** *cable-modem-mac*	Override the selection logic.

cable downstream ofdm-prof-mgmt unfit-profile-age

To configure the unfit profile age, use the **cable downstream ofdm-prof-mgmt unfit-profile-age** command in global configuration mode. Using the **no cable downstream ofdm-prof-mgmt unfit-profile-age** command reverts to the default **unfit-profile-age** configuration of 60 minutes.

Cisco cBR-8 Converged Broadband Router
cable downstream ofdm-prof-mgmt unfit-profile-age { *age* | **diasble** }

no cable downstream ofdm-prof-mgmt unfit-profile-age

Syntax Description

age	Unfit profile age in minutes. The valid range is 5–1440 minutes.
diasble	Disable OFDM Unfit Profile aging. This is equivalent to an infinite timer.

Command Default

60 minutes

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Dublin 17.12.1z	The **diasble** option is introduced.

Usage Guidelines

If the unfit profile for a cable modem exceeds this age, the profile is no longer considered unfit for that CM.

Examples

The following example shows how to configure the unfit profile age:

```
Router(config)# cable downstream ofdm-prof-mgmt unfit-profile-age 20
```

Examples

The following example shows you how to disable OFDM Unfit Profile aging (Cisco IOS XE Dublin 17.12.1z and later):

```
Router(config)# cable downstream ofdm-prof-mgmt unfit-profile-age disable
```

Related Commands

Command	Description
cable downstream ofdm-prof-mgmt recommend-profile-age *age*	Configure the recommended profile age.
cable downstream ofdm-prof-mgmt rxmer-poll-interval *interval*	Configure the RxMER poll interval.

Command	Description
cable downstream ofdm-prof-mgmt exempt-sc-pct *percent*	Configure the percentage of subcarriers that can be exempted from bit loading comparison.
cable downstream ofdm-prof-mgmt mer-margin-qdb *quarter-decibel*	Configure the offset.
no cable downstream ofdm-prof-mgmt prof-dwngrd-auto	Disable the automatic profile downgrade upon CM status event 16.
cable downstream ofdm-flow-to-profile profile-data *profile ID* **mac-address** *cable-modem-mac*	Override the selection logic.

cable downstream override

To enable cable downstream frequency override, use the **cable downstream override** command in cable interface configuration mode. To disable the override feature, use the **no** form of this command.

cable downstream override
no cable downstream override

Syntax Description

This command has no keywords or arguments.

Command Default

Cable downstream frequency override is enabled by default.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.0(13)SC	This command was introduced.
12.1(5)EC1	This command was integrated into Cisco IOS Release 12.1(5)EC1.
12.1(6) and 12.1(6)T	This command was integrated into Cisco IOS Release 12.1(6) and Cisco IOS Release 12.1(6)T.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command is never needed for normal operations, because downstream frequency override is enabled by default for DOCSIS operations. However, this command can be used to disable the frequency override feature for test and lab use, so as to force the CMs on that interface to use a particular downstream frequency, regardless of the signal quality.

Note Because frequency override is enabled by default, this command does not appear as part of a cable interface's configuration section in the Cisco CMTS router configuration file unless the **no cable downstream override** command has been given.

Examples

The following example shows how to disable the downstream frequency override feature on a particular cable interface:

```
Router# configure terminal
Router(config)# interface cable 6/0
Router(config-if)# no cable downstream override
```

```
Router(config-if)# exit
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows how to disable the downstream frequency override feature on a particular cable interface:

```
Router# configure terminal
Router(config)# interface cable 1/0/0
Router(config-if)# no cable downstream override
Router(config-if)# exit
```

Use the **show running-config | include override** to see the disabled status of the command:

```
Router#show running-config | include override
 no cable downstream override
Router#
```

cable downstream power-down-2nd-module

To reduce power consumption on Cisco cBR-8 by powering down the second PHY module on the CCAP line card, use the **cabledownstreampower-down-2nd-module slot** command in global configuration mode.

cable downstream power-down-2nd-module slot

Command Default

None.

Command Modes

Global configuration (config).

Command History

Release	Modification
Cisco IOS XE Fuji 16.9.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows how to set up the power saving configuration.

```
Router# configure terminal
Router(config)# cable downstream power-down-2nd-module slot 1
```

cable downstream qam-profile

To set the QAM profile for the cable interface line card, use the **cable downstream qam-profile** command in global configuration mode.

cable downstream qam-profile *id*

Syntax Description

Syntax Description

id	Downstream QAM profile ID. 0 to 3 are system defined, 4 to 31 are user defined.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the QAM profile for the cable interface line card.

Examples

The following example shows how to enable the downstream QAM profile configuration:

```
Router# configure terminal
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)#
```

Related Commands

Command	Description
annex	Set the MPEG framing format.
interleaver-depth	Set the interleaver-depth.
modulation	Set the QAM modulation format.
spectrum-inversion	Set the spectrum-inversion on or off.
symbol-rate	Set the symbol rate.

cable downstream qos wfq weight

To specify custom DOCSIS priority to excess ratio mappings for downstream service flows, use the **cable downstream qos wfq weight** command in cable interface configuration mode. Use the **no** form of this command to revert to the default mappings.

cable downstream qos wfq weights *weight1...weight8*
no cable downstream qos wfq weights

Syntax Description

weights *weight*	Specifies the custom excess ratios for 8 priorities. • *weight1...weight8* —Custom weight. Valid values range from 1 to 100.

Command Default

DOCSIS priority to excess ratio mapping is used.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command configures custom DOCSIS priority to excess ratio mappings for downstream service flows.

Examples

This example example shows how to configure custom DOCSIS priority to excess ratio mappings for downstream service flows on a cable interface of Cisco uBR series router:

```
Router# configure terminal
Router(config)# interface cable 8/0/0
Router(config-if)# cable downstream qos wfq weights 10 20 30 40 50 60 70 80
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the configuration of QoS WFG weights on the wideband cable interface of a Cisco cBR-8 router:

```
Router(config)#interface  wideband-Cable 1/0/0:0
Router(config-if)#cable downstream qos wfq weights 10 20 30 40 50 60 70 80
```

This example shows the configuration on integrated cable interface of a Cisco cBR-8 router:

```
Router(config)#interface integrated-Cable 1/0/0:1
```

```
Router(config-if)#cable downstream qos wfq weights 10 20 30 40 50 60 70 80
```

Related Commands

Command	Description
show cr10k-rp queue	Displays the queue parameters associated with downstream service flow queues (including the excess ratio). (This command is not supported in Cisco cBR-8 routers.)
show running-config interface cable	Displays the configuration for the specified cable interface on a Cisco uBR series router.
show running-config interface [wideband-Cable | integrated-Cable	Displays the configuration for the specified cable interface on a Cisco cBR-8 router.

cable downstream rate-limit

Note Effective with Cisco IOS Release 12.2(33)SCF, the **cable downstream rate-limit** command is not supported for Cisco uBR-MC88U line card in Cisco IOS software.

To enable DOCSIS rate limiting on downstream traffic, use the **cable downstream rate-limit** command in cable interface configuration mode. To disable DOCSIS rate limiting on downstream traffic, use the **no** form of this command.

cable downstream rate-limit [**token-bucket** [[**shaping** [**granularity** *msec* | **max-delay** *msec*]] | **weighted-discard**]] [*exp-weight*]
no cable downstream rate-limit

Syntax Description

token-bucket	(Optional) Specifies the token-bucket filter algorithm, which enforces an average long-term transmission rate while permitting occasional bursts.
shaping	(Optional in Release 12.1 EC, Required in Release 12.2 BC) Enables rate limiting on the downstream port using the token-bucket policing algorithm with default traffic shaping parameters.
granularity*msec*	(Optional) Specifies traffic shaping granularity in milliseconds. Valid values are 1, 2, 4, 8, or 16 milliseconds.
max-delay *msec*	(Optional) Specifies the maximum traffic-shaping buffering delay in milliseconds. Valid values are 128, 256, 512, or 1028 milliseconds. As a general guideline, the lower the downstream rates, the higher the delay should be to ensure full use of the bandwidth.
weighted-discard	(Optional) Specifies the weighted discard algorithm.
exp-weight	(Optional) Specifies the weight for the exponential moving average of loss rate. Valid values are from 1 to 4.

Command Default

In Cisco IOS Release 12.1 EC and earlier releases, the system defaults to monitoring the traffic to and from each CM over each 1-second period, and if the CM exceeds its bandwidth quota for that second, the CMTS router drops packets for the rest of the second (**no cable downstream rate-limit**).

In Cisco IOS Release 12.2 BC and later releases, the **token-bucket** and **shaping** keywords are on by default, and the **max-delay** option is set to 128 milliseconds (**cable downstream rate-limit token-bucket shaping max-delay 128**).

Note In Cisco IOS Release 12.2 BC, do not use the **cable downstream rate-limit token** command without specifying the **shaping** option, because this results in packet drops.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
11.3(6) NA	This command was introduced.
12.0(4)XI, 12.0(5)T1, 12.1(1)EC1	The **shaping** keyword was added.
12.2(4)BC1	Support was added to the 12.2 BC train, and the defaults were changed so that the **shaping** keyword is on by default, to accommodate DOCSIS 1.1 requirements.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCF	This command does not support Cisco uBR-MC88U line card in Cisco IOS software.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable downstream rate-limit** command specifies the type of DOCSIS rate limiting that the CMTS router imposes on downstream traffic that is sent to the CMs. When rate-limiting is enabled, traffic to the CM is examined to ensure it will not exceed the limit set for the CM.

For DOCSIS networks, the best rate limiting algorithm combines the **token-bucket** and **shaping** to use keywords, which is optimized for relatively steady data rates, such as are used for web browser, without allowing the user to exceed the maximum allowable download rate that is specified in the DOCSIS configuration file.



Note The **token-bucket** and **shaping** options are the default in Cisco IOS Release 12.2 BC and should not be changed. If using a 64 kbps downstream rate, you can avoid a performance impact by turning off the **shaping** option, but this is not recommended for DOCSIS 1.1 operation because it can result in erratic traffic patterns and packet drops on the downstream.

If a packet would exceed the traffic limits for a CM, the CMTS router will buffer the packet, up to the maximum delay time given by the **max-delay** option, so that the traffic can be sent at a later time when it would not violate the maximum downstream traffic limits. If the packet is still too large, or if the volume of traffic consistently exceeds the traffic limits, even after the delay, the CMTS router begins dropping packets.

The default behavior of the **cable downstream rate-limit** command was changed in Cisco IOS Release 12.2 BC to accommodate the different requirements of DOCSIS 1.1 operation (which requires the use of the token-bucket rate-limiting algorithm). This default is optimized for downstream traffic rates that are higher than 84 kbps.

If you are using a 64 kbps downstream traffic rate on a Cisco CMTS router that is running Cisco IOS Release 12.2 BC, you should set the **max-delay** option to 256 milliseconds to avoid a performance impact on TCP/IP traffic that uses packets larger than 1024 bytes (such as FTP or HTTP web traffic). Alternatively, you can set the **max-burst** option on the **cable service class** command to 3044, which is two packets of the minimum size for DOCSIS 1.1 networks.

Understanding the max-delay and granularity Options

The Cisco CMTS router uses a calendar-queuing system to process the packets being shaped. The calendar queue is a time wheel that is as big as the value specified by the **max-delay** option (128, 256, 512, or 1028 milliseconds), and is divided into "buckets" of the size specified by the **granularity** option (1, 2, 4, 8, or 16 milliseconds).

The number of buckets depends on both the **max-delay** and **granularity** options. For example, if the **max-delay** option is set to 256 milliseconds, and the **granularity** option is set to 4 milliseconds, the calendar queue contains 256/4, or 64, buckets, where a new bucket is processed every 4 milliseconds.

When the Cisco CMTS router adds a shaped packet to the queue, it adds the packet into the bucket that corresponds to the deadline by which the packet must be processed. At the end of every granularity time period, the Cisco CMTS router processes the packets that are in the corresponding bucket.

Decreasing the **max-delay** value increases how often the packets in the entire queue are processed, while decreasing the **granularity** value increases the accuracy of the shaping mechanism. Decreasing these values, however, could result in a possible increase in CPU processor usage. In most circumstances, this increase in processor usage is negligible, but it should be monitored whenever fine-tuning the **max-delay** or **granularity** values.



Tip For more information about the DOCSIS 1.1 rate-limiting specifications, see section C.2.2.5.2, *Maximum Sustained Traffic Rate* , in the DOCSIS 1.1 specification.

Examples

The following example shows how to apply the token-bucket filter algorithm on a Cisco uBR7200 series router running Cisco IOS Release 12.1 EC:

```
Router(config)# interface cable 6/0
Router(config-if)# cable downstream rate-limit token-bucket
```

The following example shows how to apply the token-bucket filter algorithm on a Cisco uBR10012 router running Cisco IOS Release 12.2 BC:

```
Router(config)# interface cable 5/1/0
Router(config-if)# cable downstream rate-limit token-bucket shaping
```

The following example shows how to use token-bucket shaping with a **max-delay** of 256 milliseconds on a Cisco uBR7100 series router:

```
Router(config)# interface cable 1/0
Router(config-if)# cable downstream rate-limit token-bucket shaping max-delay 256
```

Related Commands

Command	Description
cable service class	Sets the parameters for a DOCSIS 1.1 cable service class.
cable upstream rate-limit	Sets DOCSIS rate limiting for an upstream port on a cable interface line card.

cable downstream rf-power

To set the RF power output level on an integrated upconverter on the Cisco uBR7100 series router, Cisco uBR-MC16U, Cisco uBR-MC28U, or Cisco uBR10-MC5X20S/U cable interface line card, use the **cable downstream rf-power** command in cable interface configuration mode. To reset the RF output power level to its default value, use the **no** form of this command.

cable downstream rf-power {*power-level* | **hccp-delta** *diff-pwr* | **hccp-override** *override-pwr*}
no cable downstream rf-power {*power-level* | **hccp-delta** *diff-pwr* | **hccp-override** *override-pwr*}

Syntax Description

power-level	RF output power level in dBmV. The valid range is from 45 to 63 dBmV. **Note** The official range for acceptable power levels in the DOCSIS specification is 50 to 61 dBmV. Cisco cable interfaces exceed the DOCSIS standard, but power levels outside the DOCSIS standards should be used only in lab and test environments.
hccp-delta *diff-pwr*	(Protect interfaces only) When using N+1 Hotstandby Connection-to-Connection Protocol (HCCP) redundancy, the protect interface adds the *diff-pwr* value to the current power value of the working interface when a switchover occurs. This allows the router to accommodate relative differences between the RF power levels in working and protect interfaces. The valid value for *diff-pwr* ranges from –12 to +12 dBmV.
hccp-override *override-pwr*	(Protect interfaces only) When using N+1 HCCP redundancy, the protect interface uses the override power value instead of the power value of the working interface when a switchover occurs. This allows the router to accommodate absolute differences between the RF power levels in working and protect interfaces. The valid value for *override-pwr* ranges from 45 to 63 dBmV. **Note** The official range for acceptable power levels in the DOCSIS specification is 50 to 61 dBmV. Cisco cable interfaces exceed the DOCSIS standard, but power levels outside the DOCSIS standards should be used only in lab and test environments.

Command Default

50 dBmV for the Cisco uBR7100 series router

55 dBmV for the Cisco uBR-MC5X20S cable interface line card on the Cisco uBR10012 router

55 dBmV for the Cisco uBR-MC16U and Cisco uBR-MC28U cable interface line cards

55 dBmV for the Cisco uBR10-MC5X20U-D cable interface line card on the Cisco uBR10012 router

Command Modes

Interface configuration (config-if).

Command History

Release	Modification
12.1(5)EC1	This command was introduced to provide support on the integrated upconverter on the Cisco uBR7100 series router.
12.2(11)CY, 12.2(11)BC3	Support was added for the Cisco uBR10-MC5X20S cable interface line card on the Cisco uBR10012 router.

Release	Modification
12.2(15)CX	Support was added for the Cisco uBR-MC16U and Cisco uBR-MC28U cable interface line cards.
12.2(15)BC2	Support was added for the Cisco uBR-MC5X20U cable interface line card. Support was also added for the **hccp-delta** and **hccp-override** options.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC4	Support for the following keywords was moved to the global redundancy configuration mode: • **hccp-delta** • **hccp-override**
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines



Note In Cisco IOS Release 12.2(33)SCC4, the support for the **hccp-delta** and **hccp-override** keywords is moved from the interface configuration mode to the global redundancy configuration mode. You can now configure these keyword options using the **member subslot** command.

The **hccp-delta** and **hccp-override** options can be configured only on a protect interface (an interface that has been configured with the **hccp protect** command). However, it is possible to manually edit a configuration file on a TFTP server to include these options on a working interface configuration, and then download that configuration to the router from the TFTP server.

If you manually edit the Cisco IOS configuration files, ensure that you specify these options only on protect interfaces. If you specify the **hccp-delta** or **hccp-override** option on a working interface, the router will modify the configured downstream power with the given power delta or override value.

The official range for acceptable power levels in the DOCSIS standard depends on the stacking level. The DOCSIS levels are as follows:

1:1 stacking—52 dBmV ~ 60 dBmV

2:1 stacking—48 dBmV ~ 56 dBmV

4:1 stacking—44 dBmV ~ 52 dBmV



Note Cisco cable interfaces exceed the DOCSIS standard, but power levels outside the DOCSIS standards should be used only in lab and test environments.

Examples

The following example shows how to configure the integrated upconverter on a Cisco uBR7100 series router for an RF output power level of 45 dBmV:

```
Router(config)# cable interface 1/0
Router(config-if)# cable downstream rf-power 45
```

The following example shows how to configure the first integrated upconverter on a Cisco uBR10012 router for an RF output power level of 53 dBmV:

```
Router(config)# cable interface 5/1/0
Router(config-if)# cable downstream rf-power 53
```

The following commands shows how to configure the first integrated upconverter to the default power level of 55 dBmV on the Cisco uBR10012 router:

```
Router(config)# cable interface 5/1/0
Router(config-if)# no cable downstream rf-power
Router(config-if)# exit
```

The following example shows how to configure a protect interface to add 3 dBmV to the current working RF power level when a switchover occurs:

```
Router(config)# cable interface 6/0/0
Router(config-if)# cable downstream rf-power hccp-delta 3
Router(config-if)# exit
```

The following example shows how to configure a protect interface to use an RF power level of 48 dBmV instead of the current working RF power level when a switchover occurs:

```
Router(config)# cable interface 6/0/0
Router(config-if)# cable downstream rf-power hccp-override 48
Router(config-if)# exit
```



Note The **hccp-delta** and **hccp-override** commands configure the power of the protect interface at the time of the switchover. To display the RF power currently being used on a cable interface, use the **show controller cable** command.

Related Commands

Command	Description
cable downstream frequency	Configures the cable downstream center frequency on the integrated upconverter.
cable downstream rf-shutdown	Enables or disables the RF output from the integrated upconverter.
debug cable upconverter	Enables debugging of the internal upconverter operation.
show controllers cable	Displays status and configuration information for the cable interface, including the integrated upconverter, if present.

cable downstream rf-shutdown

To disable the RF output from an integrated upconverter on the Cisco uBR7100 series router, Cisco uBR-MC16U, Cisco uBR-MC28U or the Cisco uBR10-MC5X20S/U cable interface line card and Cisco RF Gateway 10, use the **cable downstream rf-shutdown** command in cable interface configuration mode and QAM interface and subinterface configuration mode. To enable the RF output on the integrated upconverter, use the **no** form of this command.

cable downstream rf-shutdown
no cable downstream rf-shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

RF output is disabled.

Command Modes

Interface configuration—cable interface only (config-if)

QAM interface and subinterface configuration (config-if and config-subif)

Command History

Release	Modification
12.1(5)EC1	This command was introduced to provide support on the integrated upconverter on the Cisco uBR7100 series router.
12.2(11)CY, 12.2(11)BC3	Support was added for the Cisco uBR10-MC5X20S cable interface line card on the Cisco uBR10012 router.
12.2(15)CX	Support was added for the Cisco uBR-MC16U and Cisco uBR-MC28U cable interface line cards.
12.2(15)BC2	Support was added for the Cisco uBR-MC5X20U cable interface line card.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(44)SQ	This command was integrated into Cisco IOS Release 12.2(44)SQ. Support for the Cisco RF Gateway 10 was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

By default, the integrated upconverter on the Cisco uBR7100 series router, Cisco uBR-MC16U, Cisco uBR-MC28U, and the Cisco uBR10-MC5X20S/U cable interface line cards is disabled, and the downstream port does not output any signal. The **no** form of this command enables the integrated upconverter, allowing it to output an RF signal through the downstream port.

However, before a valid DOCSIS downstream signal can be output, the following must also be done:

- A valid downstream RF frequency must be configured using the **cable downstream frequency** cable interface command.
- The cable interface must be enabled using the **no shutdown** command on the cable interface.



Note This command does not affect the IF output from the DS0 downstream port on the Cisco uBR7100 series router. The Cisco uBR10-MC5X20S/U, Cisco uBR-MC16U, and Cisco uBR-MC28U cable interface line cards do not provide IF output for their downstream ports.

Executing this command at the port level command modifies all the QAM channels on that port. However no channel is affected if the command is executed at the channel level.

Examples

The following example enables the integrated upconverter on the Cisco uBR7100 series router:

```
Router(config)# cable interface 1/0

Router(config-if)# no cable downstream rf-shutdown
```

The following example enables the second integrated upconverter on a Cisco uBR-MC5X20S cable interface line card in the Cisco uBR10012 router:

```
Router(config)# cable interface 7/0/1

Router(config-if)# no cable downstream rf-shutdown
```

The following commands must also be given before the DS0 RF port can transmit a valid RF signal:

```
Router(config-if)# cable downstream frequency
center-frequency

Router(config-if)# no shutdown

Router(config-if)# exit

router(config)#
```

Cisco RF Gateway 10

The following example enables the integrated upconverter on the Cisco RFGW-10:

```
Router(config)#configure terminal
Router(config-if)#interface qam 3/1.1
Router(config-subif)#cable downstream rf-shutdown
```

Related Commands

Command	Description
cable downstream frequency	Configures the downstream center frequency on the integrated upconverter.
cable downstream rf-power	Configures the desired RF output power on the integrated upconverter.
debug cable upconverter	Enables debugging of the internal upconverter operation.
show controllers cable	Displays status and configuration information for the cable interface, including information about the integrated upconverter, if present.

Command	Description
show controllers qam	Displays cable downstream information configured on the QAM channel and port.

cable ds-high-low-rate-ratio

If the ratio between the highest and the lowest rates on an interface is too high, the output traffic can become bursty and may experience long delays. To specify the maximum allowed ratio to achieve expected latency requirement, use the**cable ds-high-low-rate-ratio** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable ds-high-low-rate-ratio *ratio*
no cable ds-high-low-rate-ratio

Syntax Description

ratio	Specifies the ratio of highest to lowest max-rate. Suggested value is 1000.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command only affects the service flows created after the ratio is configured. We suggest reset all modems after configuring this ratio.

Examples

The following example shows how to specify the maximum allowed ratio to achieve expected latency requirement:

```
Router> enable
Router# configure terminal
Router(config)# cable ds-high-low-rate-ratio 2000
```

cable ds-max-burst

To enable a specialized Enhanced-Rate Bandwidth Allocation (ERBA) feature on the Cisco uBR10012 router with Performance Routing Engine 2 (PRE2) or Performance Routing Engine 4 (PRE4) modules, use the**cable ds-max-burst** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable ds-max-burst [**burst-threshold** *threshold* **peak-rate** *peak-rate*]
no cable ds-max-burst

Cisco cBR Series Converged Broadband Routers
cable ds-max-burst [**burst-threshold** *threshold*]
no cable ds-max-burst

Syntax Description

burst-threshold *threshold*	(Optional) Defines the burst threshold in Kbytes. The range is from 64 Kbyte to 2 GB. The default is 1MB. For Cisco cBR Series Converged Broadband Routers, the valid rang is from 64Kbyte to 1 GB. This value is used to compare with the per-service flow maximum traffic burst value as defined in DOCSIS 2.0.
peak-rate *peak-rate*	Peak rate in Kbps. The default is 0, which represents the line rate. (For Cisco uBR10012 Router and CiscouBR7200 Series Routers)The peak-rate value is a global value and is applied to all the service flows created after the configuration of **cable ds-max-burst** command.

Command Default

This configuration is disabled on the Cisco uBR10012 router. This command is neither required nor supported on the Cisco uBR7100 Series, Cisco uBR7225VXR and Cisco uBR7246VXR router.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced in support of ERBA on the Cisco uBR10012 router with PRE2 modules.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	The peak-rate option was introduced and support for Performance Routing Engine 4 (PRE4) was added in Cisco IOS Release 12.2(33)SCB.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

Cisco IOS Release 12.3(21)BC introduces the ERBA feature on the Cisco uBR10012 CMTS with Performance Routing Engine 2 (PRE2) modules. The ERBA feature in Cisco IOS release 12.3(21)BC is characterized by the following enhancements:

- Enables support for the DOCSIS1.1 *Downstream Maximum Transmit Burst* parameter on the Cisco CMTS by using **cable ds-max-burst** configuration command. This command is not supported on the Cisco uBR7225VXR, Cisco uBR7246VXR and the Cisco uBR7100 Series routers, as this parameter is supported by default.
- Allows DOCSIS1.0 modems to support the *DOCSIS1.1 Downstream Maximum Transmit Burst* parameter by using DOCSIS QoS profile. This feature uses the **cable qos pro max-ds-burst** configuration command.

Note The**cable ds-max-burst** and related commands are supported only on the Cisco uBR10012 router with PRE2 or PRE4 modules on Cisco IOS Release 12.3(21)BC or later releases.

To display service flows on the Cisco uBR10012 router with PRE2 or PRE4, and identify which service flows have maximum burst enabled, use the following command in privileged EXEC mode:

show cr10k-rp cable *slot/subslot/port* **sid service-flow ds**

- • *slot* = 5 to 8
  • *subslot* = 0 or 1
  • *port* = 0 to 4 (depending on the cable interface)

For additional information about the **cable qos profile** command and configuring QoS profiles, see the *DOCSIS 1.1 for the Cisco CMTS* document on Cisco.com:

https://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst9400/software/release/16-6/configuration_guide/qos/b_166_qos_9400_cg/b_166_qos_9400_cg_chapter_01.html

Examples

The following example shows how to configure ERBA on the Cisco uBR10012 router, with a sample burst threshold setting:

```
Router> enable
Router# configure terminal
Router(config)# cable ds-max-burst burst-threshold 2048
peak-rate 1000
Router(config)# Ctrl^Z
Router# show cr10k-rp cable 7/0/0 sid service-flow ds
```

When this feature is enabled, new service flows with burst size larger than the burst threshold are supported. However, the existing service flows are not affected.

When this feature is disabled, no new service flows are configured with the *Downstream Maximum Transmit Burst* parameter—the **cable ds-max-burst** command settings. However, the existing service flows are not affected.

The following example illustrates configuration of the ERBA maximum burst for the specified service flow:

```
Router# sh cr10k-rp c7/0/0 1 service-flow ds
RP SFID  LC SFID  Conform    Exceed     Conform    Exceed     Total      QID
                  Xmit Pkts  Xmit Pkts  Drop Pkts  Drop Pkts  Pkts
32930    10       41         0          0          0          41         131349
Forwarding interface: Modular-Cable1/0/0:0
32931    13       0          0          0          0          0          131350
Forwarding interface: Modular-Cable1/0/0:0
```

Related Commands

Command	Description
cable qos profile	Configures a QoS profile.
show cable qos permission	Displays the status of permissions for changing QoS tables for a cable router.
show cable qos profile	Displays the QoS profiles that have been defined.
show cr10k-rp cable sid service-flow ds	Displays service flows on the Cisco uBR10012 router with PRE2, and identifies which service flows have maximum burst enabled.

cable ds-resiliency

To reserve a resiliency bonding group or wideband (WB) interface for a line card on the Cisco CMTS, use the **cable ds-resiliency** command in interface configuration mode. To remove this setting, use the **no** form of this command.

cable ds-resiliency
no cable ds-resiliency

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable ds-resiliency** command is used to configure the Donwstream Resiliency Bonding Group feature.

Remove all existing configuration commands from the WB interface when setting aside that interface as a WB resiliency bonding group.

The **cable ds-resiliency** command is used in conjunction with the **cable resiliency ds-bonding** command to configure the Downstream Resiliency Bonding Group feature.

Examples

The following example shows how to reserve a wideband cable interface in slot 5, subslot 1, and port 2 for a resiliency bonding group:

```
Router(config) interface wideband-cable 5/1/2:0
Router(config-if)# cable ds-resiliency
```

Related Commands

Command	Description
cable resiliency ds-bonding	Enables the Downstream Resiliency Bonding Group feature on the Cisco CMTS router.
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.
show cable resiliency	Displays all information about the resiliency bonding groups on the Cisco CMTS router.

cable dsg

Note Effective with Cisco IOS Release 12.3(13a)BC, the **cable dsg** command is not available in Cisco IOS software.

To enable the DOCSIS Set-Top Gateway (DSG) on a cable interface on a Cisco CMTS router, and to configure its tunnel-mapping parameters, use the **cable dsg** command in interface or subinterface configuration mode. To remove the DSG tunnel from the interface, use the **no** form of this command.

cable dsg *tunnel-MAC-address group-ip-address CA-vendor-name*
no cable dsg *tunnel-MAC-address group-ip-address CA-vendor-name*

Syntax Description

tunnel-MAC-address	Well-known MAC address for the DSG tunnel.
group-ip-address	Multicast group IP address for the DSG stream.
CA-vendor-name	Name for the Conditional Access (CA) vendor that owns the DSG tunnel. This parameter is a string up to 7 characters in length and should match the vendor of the CA server. A maximum of four vendors per router are supported.

Command Default

No DSG tunnels are defined.

Command Modes

Interface configuration—cable interface only (config-if)

Subinterface configuration—cable interface only (config-subif)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7100 series and Cisco uBR7246VXR routers.
12.3(9a)BC	This command was introduced for the Cisco uBR10012 router.
12.3(13a)BC	This command was removed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command enables DSG operations on the cable interface, creating a DSG tunnel that uses the specified IGMP multicast address and well-known MAC address.

The *tunnel-MAC-address* could optionally be an Internet Group Management Protocol (IGMP) multicast address, using the algorithm for converting host group IP address to an Ethernet MAC address that is given in RFC 1112. If the MAC address is 0000.0000.0000, the DSG tunnel uses the algorithm given in RFC 1112 to derive the multicast address for the tunnel as follows:

An IP host group address is mapped to an Ethernet multicast address by placing the low-order 23-bits of the IP address into the low-order 23 bits of the Ethernet multicast address 01-00-5E-xx-xx-xx (hex). Because

there are 28 significant bits in an IP host group address, more than one host group address may map to the same Ethernet multicast address.

For example, if you specify the command **cable dsg 0.0.0 228.9.9.9 AAA**, the command uses the IGMP IP address of 228.9.9.9 to generate the MAC address of 0100.5E09.0909 for the DSG tunnel. If the IGMP address were 228.129.9.9, the resulting MAC address would be 0100.5E01.0909.

You can specify only Global Scope (224.0.1.0 through 238.255.255.255) and Administratively Scoped (239.0.0.0 through 239.255.255.255) addresses. You cannot use Local Scope addresses (224.0.0.0 through 224.0.0.255).

Entering the **cable dsg**command also automatically configures the interface for the appropriate IGMP static group, using the **ip igmp static-group**command. Do not manually enter another **ip igmp static-group** command for this interface, because the system assumes that this IGMP configuration is for a separate configuration that cannot be used by the DSG subsystem.



Note If any previously configured static groups exist on this interface, you should remove those other **ip igmp static-group** commands on a cable interface before you can enter the **cable dsg** command. If you do not remove those other groups, the **cable dsg** command displays a warning notifying you that you should remove them.

The **no cable dsg** command automatically removes the IGMP static group from the interface by issuing the **no ip igmp static-group** command. Do not manually remove this static group yourself.

In addition, you must have enabled Protocol Independent Multicast (PIM) on the cable interface, using the **ip pim**interface configuration command, before enabling and configuring DSG operations. The DOCSIS Set-Top Gateway feature supports the following PIM modes:

- **ip pim sparse-mode**command—Configures sparse mode of operation.
- **ip pim sparse-dense-mode**command—Configures the interface for either sparse mode or dense mode of operation, depending on the mode in which the multicast group is operating.
- **ip pim dense-mode**command—Configures dense mode of operation.

Limitations and Restrictions

The DOCSIS Set-Top Gateway feature also has the following limitations:

- If using bundled interfaces, configure the DSG configurations only on the primary interface, not on the subordinate interfaces. However, when DSG has been properly configured on the primary interface, DSG traffic can flow across both the primary and subordinate interfaces.
- If using subinterfaces, you must configure the DSG tunnels only on subinterfaces. When DSG tunnels are configured on a subinterface, you cannot also configure the tunnels on the main interface. If you configure DSG tunnels on both the main interface and subinterfaces, the main interface can drop packets.

We also recommend putting all DSG configurations on the same, single subinterface. Although you can configure DSG tunnels on multiple subinterfaces, this is not guaranteed to be supported in future software releases.

- You can configure up to four separate Conditional Access (CA) vendors per router.
- You can configure a maximum of eight DSG tunnels (as identified by the well-known MAC address) per CA vendor, for a maximum possible total of 32 DSG tunnels per router.

- Each CA vendor can have one or more DSG tunnels on each cable interface, but each DSG tunnel must be using a separate IP multicast address.
- IP multicast routing should be enabled on the router, using the **ip multicast-routing** command.
- Multicast rate-limiting can be enabled optionally on a cable interface that is configured for DSG operations, using the **ip multicast rate-limit out group-list**command.
- For best performance, fast switching of IP multicast should be enabled on incoming and outgoing interfaces, using the**ip mroute-cache** command.
- You cannot use the same IP multicast groups for both DSG traffic and for other IP multicast traffic. If an IP multicast group is being used for DSG traffic, do not use the **ip igmp static-group** command to manually configure that same IP multicast group for other, non-DSG traffic.
- Different CA vendors cannot share IP multicast addresses. Each vendor must use a unique set of IP multicast addresses, and after an IP multicast address is assigned to a DSG tunnel, that same address cannot be used for any other purpose. However, all other multicast addresses and groups can still be used on the interface for other multicast applications.
- DSG-related IP unicast traffic is not supported. The CMTS receives the unicast traffic from the DSG network controllers, but it does not forward that traffic to the set-top boxes.
- DSG traffic should be less than 2.048 Mbps per vendor, so as to conform to the DSG specifications.
- DSG does not support Baseline Privacy Interface (BPI)-encrypted IP multicast streams.



Note In Cisco IOS Release 12.2(15)BC2, N+1 HCCP high availability redundancy does not preserve the DSG traffic and configuration after a switchover. If you configure a cable interface for both N+1 HCCP redundancy and for DSG operations, DSG traffic does not continue after a switchover.

Examples

The following example shows how to configure a cable interface on a Cisco uBR7246VXR router to enable the DSG feature on cable interface 3/0, using a well-known MAC address of 0001.0002.0003 and a destination IP address of 225.2.3.4:

```
interface cable 3/0
 ip pim dense-mode
 ip multicast rate-limit out group-list 123 1024
 cable dsg 1.2.3 225.2.3.4 CCC
```



Note The above configuration also automatically configures the interface with the appropriate **ip igmp static-group** command (**ip igmp static-group 225.3.4.5**). This command will appear in the interface configuration and should not be removed manually.

The following example shows the error message that appears if you specify a broadcast IP address that has already been added to the router's IGMP database. This entry typically would have been created manually on the router or dynamically by a customer premise equipment (CPE) device that is attached to a cable modem on the cable network.

```
interface cable 3/0
 cable dsg 1.1.1 224.3.3.10 cisco
Multicast group 224.3.3.10 is already in use on the interface Cable3/0, please retry.
```

The following example shows how to delete a DSG tunnel on a cable interface:

```
interface cable 4/0
 no cable dsg 0020.0020.0020 230.8.8.8 abc
4d17h: DSG: interface Cable5/0 left the igmp static group 230.8.8.8.
4d17h: DSG: tunnel 0020.0020.0020 is removed
4d17h: DSG: the specified DSG entry has been removed.
```

The following example shows the error message that appears when a unicast IP address is specified instead of a multicast IP address:

```
interface cable 4/0
 cable dsg 1.1.1 192.168.13.10 cisco
Only multicast is supported for current version.
```

Related Commands

Command	Description
cable dsg keepalive	Enables keepalive messages over DSG tunnels on all cable interfaces.
debug cable dsg	Enables general, DCD, or packet-related debugging for DSG on a Cisco CMTS router.
show cable dsg	Displays the current DSG tunneling parameters.

cable dsg cfr

To define and enable Advanced-Mode DOCSIS Set-Top Gateway (A-DSG) classifiers on a Cisco CMTS router, use the **cable dsg cfr** command in global configuration mode. To remove one or more specified A-DSG classifiers from a Cisco CMTS router, use the **no** form of this command. To disable one or more specified A-DSG classifiers but retain their configuration, use the **disable** form of this command.

cable dsg cfr *index* [**dest-ip** {*ipaddrhostname*}] [**tunnel** *index*] [**dest-ports** *start end*] [**priority** *priority*] [**src-ip** {*ipaddrhostname*} [**src-prefix-len** *length*]] [**disable** | **enable**] [**in-dcd** {**yes** | **no** | **ignore**}]
no cable dsg cfr *index*

Syntax Description

index	DSG index. The valid range is from 1 to 65535.
ipaddr	(Optional) Destination multicast group IP address. This argument is required for a new classifier, but optional for an existing classifier.
hostname	(Optional) Fully-qualified domain name (FQDN). This argument is required for a new classifier, but optional for an existing classifier.
tunnel *index*	(Optional) Defines a tunnel index identified by a number from 1 to 65535.
dest-ports*start end*	(Optional) Defines the destination TCP/UDP with the starting and ending port ranging from 0 to 65535.
priority *priority*	(Optional) Defines the classifier priority.
src-ip *ipaddr*	(Optional) Defines the source IP address and prefix length, if desired.
src-prefix-len *length*	(Optional) Defines the source prefix length.
disable	(Optional) Disables the classifier. This is the default.
enable	(Optional) Enables the classifier.
in-dcd {**yes** | **no** | **ignore**}	(Optional) Defines whether to include, exclude, or ignore the DSG rules of the Downstream Channel Descriptor (DCD) message. • **yes**—Includes the classifier. • **no**—Excludes the classifier. • **ignore**—Excludes the classifier from the DCD message and enables the DSG rule regardless of the tunnel MAC address.

Command Default

The A-DSG classifiers are undefined by default on a Cisco CMTS router. When configured, A-DSG classifiers are enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.3(17a)BC	The **in-dcd** keyword option was added.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD5	This command was modified. The **ignore** option was added to the **in-dcd** keyword.
12.2(33)SCG	This command was modified. The *hostname* argument was added to specify the FQDN for the destination or source IP address.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg cfr** command is used to configure the Advanced Mode DOCSIS Set-Top Gateway 1.2 for the Cisco CMTS Routers feature.

The **cable dsg cfr** command creates an index to which one or several A-DSG classifiers apply. The A-DSG classifiers can only be mapped to one DSG tunnel. The Cisco CMTS router applies the classifier parameters to the packets received from the DSG server in order to assign the packet to the appropriate DSG tunnel.

When you use the **in-dcd yes** option, the classifiers are also included in the DSG rules as part of the DCD message.

When you use the **in-dcd ignore** option, the DSG rule is enabled after bypassing the RFC-1112 MAC address check, and the DSG classifier is not included in the DCD message.

The **no** form of the **cable dsg cfr** command disables the DSG rule if the tunnel MAC address is derived from the RFC-1112.

During the software downgrade process, if the software does not support the **in-dcd ignore** option then the **in-dcd yes** option is used.

Examples

The following example shows how to configure an A-DSG classifier on a Cisco CMTS router:

```
Router(config)# cable dsg cfr 1

Router(config)# cable dsg cfr 2 dest-ip 209.165.200.225 tunnel 1 dest-port 0 65535 priority
 1
Router(config)# cable dsg cfr 2 dest-ip 209.165.200.226 dest-ports 22 777 enable in-dcd yes
Router(config)# cable dsg cfr 3 dest-ip 209.165.200.227 dest-ports 22 777 src-ip
ciscovideo.com
```

Examples

This example shows how to configure an A-DSG classifier on a Cisco cBR-8 router:

```
Router(config)# cable dsg cfr 1

Router(config)# cable dsg cfr 2 dest-ip 209.165.200.225 tunnel 1 dest-port 0 65535 priority
 1
Router(config)# cable dsg cfr 2 dest-ip 209.165.200.226 dest-ports 22 777 enable in-dcd yes
```

```
Router(config)# cable dsg cfr 3 dest-ip 209.165.200.227 dest-ports 22 777 src-ip
ciscovideo.com
```

Related Commands

Command	Description
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.
cable dsg vendor param	Configures vendor-specific parameters for an A-DSG on a Cisco CMTS router.

cable dsg chan-list

To configure the Advanced-mode DOCSIS Set-Top Gateway (A-DSG) downstream channel list on a CMTS router, use the **cable dsg chan-list** command in global configuration mode. To remove the A-DSG channel list, use the **no** form of this command.

cable dsg chan-list *list-index* **index** *entry-index* **freq** *freq*
no cable dsg chan-list *list-index* **index** *entry-index* **freq** *freq*

Syntax Description

list-index	Defines the DSG channel list and index identifier as a number in the range 1 to 65535.
index *entry-index*	Defines the DSG channel frequency entry index as a number in the range 1 to 65535.
freq *freq*	Defines the center frequency of the downstream channel in the range 47000000 to 862000000 Hz.

Command Default

A-DSG channel lists are disabled and undefined by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The channel list entry created with this command can be associated to a downstream interface and be included in the Downstream Channel Descriptor (DCD) message by using the **cable downstream dsg chan-list** command.

Examples

The following example shows A-DSG channel list global configurations on a Cisco CMTS router:

```
cable dsg chan-list 1 index 1 freq 47000000
cable dsg chan-list 1 index 2 freq 125000000
cable dsg chan-list 1 index 3 freq 55500000
cable dsg chan-list 2 index 1 freq 47000000
cable dsg chan-list 2 index 2 freq 125000000
cable dsg chan-list 2 index 3 freq 55500000
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.

Command	Description
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.
cable dsg vendor param	Configures vendor-specific parameters for A-DSG on a Cisco CMTS router.

cable dsg client-list

To configure client parameters for Advanced-mode DOCSIS Set-Top Gateway (A-DSG) on a Cisco CMTS router, use the **cable dsg client-list**command in global configuration mode. This command configures the client parameters and the associated DSG rule. To remove this configuration, use the **no** form of the command.

cable dsg client-list *client-list-id* **id-index** *id* {**application-id** *app-id* | **broadcast** [*broadcast-id*] | **ca-system-id** *sys-id* | **mac-addr** *mac-addr*}
no cable dsg client-list *client-list-id* **id-index** *id* {**application-id** *app-id* | **broadcast** [*broadcast-id*] | **ca-system-id** *sys-id* | **mac-addr** *mac-addr*}

Syntax Description

client-list-id	Defines an identifier for the *DSG client list as a number from 1 to 65535.*
id-index *id*	Defines the DSG client index identifier as a number from 1 to 65535.
application-id *app-id*	Defines the DSG client type application identifier as a hexadecimal value from 1 to FFFF.
broadcast [*broadcast-id*]	Defines an optional DSG client type broadcast value: • 1—Contains Society of Cable Telecommunications Engineers (SCTE) 65. • 2—Contains SCTE 18. • 3—Contains OpenCable Application Platform (OCAP) Object Carousel (OCAP 1.0) • 4—Contains OpenCable Common Download Carousel (OC-CD). • 5 to 55534—Reserved for future use. • 55535 to 65535—Reserved for Multipler Service Operator (MSO)-specific use.
ca-system-id *sys-id*	Defines the DSG client type CA system identifier as a hexadecimal value from 1 to FFFF.
mac-addr *mac-addr*	Defines the DSG client type hexadecimal MAC address.

Command Default

Client lists for A-DSG are not configured by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG on the Cisc uBR10012 router and Cisco uBR7200 series routers.
12.3(17a)BC2	The *broadcast-id* argument was added. Support for the same DSG client identifier to be associated with multiple DSG tunnels was added.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Beginning in Cisco IOS Release 12.3(17a)BC2, the same DSG client identifer can be associated with multiple DSG tunnels.

Examples

The following example shows global configuration for four A-DSG client lists:

```
cable dsg client-list 1 id-index 1 broadcast
cable dsg client-list 2 id-index 2 application-id FFFF
cable dsg client-list 3 id-index 3 ca-system-id EEEE
cable dsg client-list 4 id-index 4 mac-addr 0100.5e0a.0a04
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.
cable dsg vendor param	Configures vendor-specific parameters for A-DSG on a Cisco CMTS router.

cable dsg keepalive

Note Effective with Cisco IOS Release 12.3(13a)BC, the **cable dsg keepalive** command is not available in Cisco IOS software.

To enable keepalive messages over DOCSIS Set-Top Gateway (DSG) tunnels on all cable interfaces, use the **cable dsg keepalive** command in global configuration mode. To disable DSG keepalives, use the **no** form of this command.

cable dsg keepalive
no cable dsg keepalive

Syntax Description

This command has no arguments or keywords.

Command Default

Keepalive messages are disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7100 series and Cisco uBR7246VXR routers.
12.3(9a)BC	This command was introduced for the Cisco uBR10012 router.
12.3(13a)BC	This command was removed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, a Cisco CMTS router does not send keepalive messages on any DSG tunnels. When keepalives are enabled using the **cable dsg keepalive** command, the Cisco CMTS router sends one keepalive message each second on each DSG tunnel on each downstream. In Cisco IOS Release 12.2(15)BC2, the keepalive packet is a null packet.

Note Do not enable DSG keepalive messages unless your application and DSG set-top boxes require them.

Tip Use the **show cable dsg** command to display whether keepalive messages are enabled.

Examples

The following example shows how to enable DSG keepalives on all cable interfaces on the router:

```
cable dsg keepalive
```

The following example shows how to disable DSG keepalives on all cable interfaces, which is the default configuration:

```
no cable dsg keepalive
```

Related Commands

Command	Description
cable dsg	Enables DSG on a cable interface, and configures its tunnel-mapping parameters.
debug cable dsg	Enables the display of debugging messages for the operation of the DSG feature.
show cable dsg	Displays the current DSG tunneling parameters.

cable dsg name-update-interval

To update fully-qualified domain name (FQDN) classifiers on a Cisco CMTS router based on the DNS server record, use the **cable dsg name-update-interval** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dsg name-update-interval *minutes*
no cable dsg name-update-interval *minutes*

Syntax Description

minutes	Interval in minutes to check the DNS server for any FQDN classifier changes. The valid range is from 1 to 60. The default value is 5.

Command Default

The default value of 5 minutes is configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg-name-update-interval** command is used to configure the Advanced Mode DOCSIS Set-Top Gateway 1.2 for the Cisco CMTS Routers feature.

Use the **cable dsg name-update-interval** command to configure the DSG name process feature. This feature supersedes the Time to Live (TTL) value associated with the DNS server while obtaining the latest DNS server record.

Examples

The following example shows how to specify the DSG name interval on the Cisco CMTS router:

```
Router(config)# cable dsg name-update-interval 3
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.
show cable dsg cfr	Displays DSG classifier details.

cable dsg tg

To associate a group of Advanced-Mode DOCSIS Set-Top Gateway (A-DSG) tunnels to one or more downstream interfaces on a Cisco CMTS router, use the **cable dsg tg** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dsg tg *group-id* [**channel** *channel_ID* | **priority** *DSG-rule-priority* [**enable** | **disable**] | **ucid** *ID1* [*ID2 ID3 ID4*] | **vendor-param** *vendor-group-ID*]
no cable dsg tg *group-id*

Syntax Description

group-id	A-DSG tunnel group identifier. The valid range is from 1 to 65535.
channel-id	(Optional) The downstream channel identifier. The valid range is from 1 to 65535.
priority *DSG-rule-priority*	(Optional) Specifies the A-DSG rule priority. The valid range is from 0 to 255.
enable	(Optional) Enables the specified A-DSG tunnel group.
disable	(Optional) Disables the specified A-DSG tunnel group. This is the default.
ucid *upstream-channel-ID*	(Optional) Specifies the upstream channel ID. You can specify a maximum of four upstream channel IDs.
vendor-param *vendor-group-ID*	(Optional) Specifies the vendor specific parameters group ID. The valid range is from 1 to 65535.

Command Default

The A-DSG tunnel group configuration is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(17a)BC2	This command was introduced to support A-DSG version 1.2 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCG	The **channel** keyword was made optional, and the following new keywords were added: • **ucid** • **vendor-param**
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg tg** command establishes the configuration of the tunnel group. You can use the **disable** and **enable** keyword forms of the command to deactivate and activate the tunnel group configuration.

Examples

The following example shows configuration and activation of a DSG tunnel group with channel ID, A-DSG rule priority, upstream channel ID, and vendor parameter group ID:

```
Router(config)# cable dsg tg 1
Router(config)# cable dsg tg 1 channel 2
Router(config)# cable dsg tg 1 channel 2 enable
Router(config)# cable dsg tg 1 channel 2 priority 3
Router(config)# cable dsg tg 1 channel 2 priority 3 enable
Router(config)# cable dsg tg 1 channel 2 ucid 1
Router(config)# cable dsg tg 1 channel 2 vendor-param 30
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.

cable dsg tg channel

To associate a group of Advanced-mode DOCSIS Set-top Gateway (A-DSG) tunnels to one or more downstream interfaces on a Cisco CMTS router, use the **cable dsg tg channel** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dsg tg *group-id* **channel** *channel-id* [**priority** *rule-priority*] [**enable** | **disable**]
no cable dsg tg *group-id* **channel** *channel-id* [**priority** *rule-priority*]

Syntax Description

group-id	Specifies the A-DSG tunnel group identifier as a number from 1–65535.
channel-id	Specifies the downstream channel identifier as a number from 1–65535.
priority *rule-priority*	Specifies the A-DSG rule priority as a number from 0–255.
enable	Enables the specified A-DSG tunnel group.
disable	Disables the specified A-DSG tunnel group. This is the default.

Command Default

The A-DSG tunnel group configuration is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(17a)BC2	This command was introduced to support A-DSG version 1.2 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg tg channel** command establishes the configuration of the tunnel group. You can use the **disable** and **enable** keyword forms of the command to deactivate and activate the tunnel group configuration. To remove the configuration, use the **no** form of the command.

Examples

The following example shows configuration and activation of a tunnel group with group ID 1 and channel ID 2:

```
Router(config)# cable dsg tg 1 channel 2
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.

Command	Description
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.

cable dsg tg channel ucid

To configure the upstream channel IDs for an Advanced-mode DOCSIS Set-top Gateway (A-DSG) tunnel group on a Cisco CMTS router, use the **cable dsg tg channel ucid** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dsg tg *group-id* **channel** *channel-id* **ucid** *upstream-id* [*upstream-id* **. . .**]
no cable dsg tg *group-id* **channel** *channel-id* **ucid** *upstream-id* [*upstream-id* **. . .**]

Syntax Description

group-id	Specifies the A-DSG tunnel group identifier as a number from 1–65535.
channel-id	Specifies the downstream channel identifier as a number from 1–65535.
upstream-id	Specifies one or more upstream channel IDs as a number from 1–8.

Command Default

Upstream channel IDs are not defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(17a)BC2	This command was introduced to support A-DSG version 1.2 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg tg channel** command must be configured before this command is made available.

Examples

The following example shows configuration of a tunnel group with group ID 1 and channel ID 2, followed by configuration of the upstream channel IDs associated with the tunnel group:

```
Router(config)# cable dsg tg 1 channel 2
Router(config)# cable dsg tg 1 channel 2 ucid 1 2 3 4 5 6 7 8
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.

Command	Description
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.

cable dsg tg channel vendor-param

To associate a vendor-specific group with an Advanced-mode DOCSIS Set-top Gateway (A-DSG) tunnel group on a Cisco CMTS router, use the **cable dsg tg channel vendor-param** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dsg tg *group-id* **channel** *channel-id* **vendor-param** *vendor-group*
no cable dsg tg *group-id* **channel** *channel-id* **vendor-param** *vendor-group*

Syntax Description

group-id	Specifies the A-DSG tunnel group identifier as a number from 1–65535.
channel-id	Specifies the downstream channel identifier as a number from 1–65535.
vendor-group	Specifies the A-DSG vendor-specific group ID as a number from 1–65535.

Command Default

The A-DSG vendor-specific group is not associated.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(17a)BC2	This command was introduced to support A-DSG version 1.2 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg tg channel** command must be configured before this command is made available. You also need to configure the vendor-specific parameter list using the **cable dsg vendor-param** command before you can associate it with the tunnel group.

Examples

The following example shows configuration of the vendor-specific parameter list, followed by configuration of a tunnel group and ssociation with the defined vendor group 3:

```
! Configure the vendor-specific parameter list
cable dsg vendor-param 3 vendor 1 oui ABCDEC value 0101AB
!
! Configure the tunnel group and associate the vendor group to the tunnel
!
cable dsg tg 1 channel 2
cable dsg tg 1 channel 2 vendor-param 3
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.

Command	Description
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.
cable dsg vendor-param	Configures A-DSG vendor-specific parameters on a Cisco CMTS router.

cable dsg tg default-priority

To change the default channel priority for a tunnel group on the Cisco CMTS router, use the **cable dsg tg default-priority** command in global configuration mode. To set the channel priority back to the default value of zero, use the **no** form this command.

cable dsg tg *group-id* **default-priority** *DSG-rule-priority*
no cable dsg tg *group-id* **priority** *DSG-rule-priority*

Syntax Description

group-id	Advanced-Mode DOCSIS Set-Top Gateway (A-DSG) tunnel group identifier. The valid range is from 1 to 65535.
default-priority*DSG-rule-priority*	Specifies the DSG rule priority of the downstream channels. The range is from 0 to 255. The default is 0.

Command Default

The default channel priority for a tunnel group is 0.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg tg default-priority** command is associated with the Advanced Mode DOCSIS Set-Top Gateway 1.2 for the Cisco CMTS Routers feature.

All channels that are configured after setting the default priority use the same priority value.

Examples

The following example shows how to specify the default channel priority for a tunnel group on the Cisco CMTS router:

```
Router(config)# cable dsg tg 1 default-priority 20
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.

cable dsg tg priority

To change the priority of existing Advanced-Mode DOCSIS Set-Top Gateway (A-DSG) channels in a tunnel group on a Cisco CMTS router, use the **cable dsg tg priority** command in global configuration mode. To set the DSG rule priority of all existing channels in a tunnel group to the default value of zero, use the **no** form of this command.

cable dsg tg *group-id* **priority** *DSG-rule-priority*
no cable dsg tg *group-id* **priority** *DSG-rule-priority*

Syntax Description

group-id	A-DSG tunnel group identifier. The range is from 1 to 65535.
priority*DSG-rule-priority*	Specifies the DSG rule priority of the downstream channels. The range is from 0 to 255. The default is 0.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg tg priority** command is used to configure the Advanced Mode DOCSIS Set-Top Gateway 1.2 for the Cisco CMTS Routers feature.

This command does not impact the downstream channels configured after setting the priority. The **no** form of the **cable dsg tg priority** command sets the DSG rule priority of all existing channels in a tunnel group to the default value of 0.

Examples

The following example shows how to specify the DSG rule priority for all existing A-DSG channels in a tunnel group on a Cisco CMTS router:

```
Router(config)# cable dsg tg 1 priority 20
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.
show cable dsg cfr	Displays DSG classifier details.

cable dsg timer

To configure the Advanced-mode DOCSIS Set-Top Gateway (A-DSG) timer entry to be associated to the downstream channel, and encoded into the downstream channel descriptor (DCD) message on a Cisco CMTS router, use the **cable dsg timer** command in global configuration mode. To remove the cable A-DSG timer, use the **no** form of this command.

cable dsg timer *index* [**Tdsg1** *Tdsg1*] [**Tdsg2** *Tdsg2*] [**Tdsg3** *Tdsg3*] [**Tdsg4** *Tdsg4*]
no cable dsg timer *index* [**Tdsg1** *Tdsg1*] [**Tdsg2** *Tdsg2*] [**Tdsg3** *Tdsg3*] [**Tdsg4** *Tdsg4*]

Syntax Description

index	Defines the DSG timer and associates to an index for the downstream channel as a number from 1 to 65535.
Tdsg1 *Tdsg1*	(Optional) Sets the DSG Initialization Timeout (Tdsg1). The range is from 1 to 65535.
Tdsg2 *Tdsg2*	(Optional) Sets the DSG Operational Timeout (Tdsg2). The range is from 1 to 65535.
Tdsg3 *Tdsg3*	(Optional) Sets the DSG Two-Way Retry Timer (Tdsg3). The range is from 0 to 65535.
Tdsg4 *Tdsg4*	(Optional) Sets the DSG One-Way Retry Timer (Tdsg4). The range is from 0 to 65535.

Command Default

The A-DSG timer is not defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The A-DSG timer entry can be associated to the downstream to encode into the DCD message.

Examples

The following example shows global configuration of three A-DSG timers:

```
cable dsg timer 1 Tdsg1 1 Tdsg2 2 Tdsg3 3 Tdsg4 4
cable dsg timer 2 Tdsg1 2 Tdsg2 22 Tdsg3 33 Tdsg4 44
cable dsg timer 3 Tdsg1 2 Tdsg2 600 Tdsg3 300 Tdsg4 1800
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.
cable dsg vendor param	Configures vendor-specific parameters for A-DSG on a Cisco CMTS router.

cable dsg tunnel

To create Advanced-mode DOCSIS Set-top Gateway (A-DSG) tunnels on a Cisco CMTS router, use the **cable dsg tunnel** command in global configuration mode. To remove this configuration, use the **no** form of this command. To disable A-DSG tunnels, use the **disable** form of this command.

cable dsg tunnel *tunnel-id* **mac-addr** *mac-addr* **tg** *tunnel-group-id* **clients** *number* [**disable** | **enable**]
no cable dsg tunnel *tunnel-id* **mac-addr** *mac-addr* **tg** *tunnel-group-id* **clients** *number*

Syntax Description

tunnel-id	Defines the DSG tunnel with an identifier as a number from 1–65535.
mac-addr *mac-addr*	Specifies the multicast group MAC address in hexadecimal format.
tg *tunnel-group-id*	Associates a tunnel group ID as a number from 1–65535.
clients *number*	Specifies the client to which the configuration applies as a number from 1–65535.
disable	(Optional) Disables the specified A-DSG tunnel.
enable	(Optional) Enables the specified A-DSG tunnel.

Command Default

A-DSG tunnels are not configured by default, but are enabled by default once configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG version 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.3(17a)BC	The **tg** and **clients** keywords were added in support of A-DSG version 1.2.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **cable dsg tunnel** command establishes the configuration of the tunnel. You can use the **disable** and **enable** keywords of the command to deactivate and activate the tunnel configuration. To remove the configuration, use the **no** form of the command.

Each tunnel is mapped to the destination MAC address and once defined, can be associated with a configured QoS service class name using the **cable dsg tunnel srv-class** command.

Examples

The following example shows configuration of four A-DSG tunnels on a Cisco CMTS router:

```
cable dsg tunnel 1 mac-addr 0100.5e0a.0a01
cable dsg tunnel 2 mac-addr 0100.5e0a.0a02
```

```
cable dsg tunnel 3 mac-addr 0100.5e0a.0a03
cable dsg tunnel 4 mac-addr 0100.5e0a.0a04
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.
cable dsg vendor param	Configures vendor-specific parameters for A-DSG on a Cisco CMTS router.

cable dsg tunnel srv-class

To associate a cable service class with an Advanced-mode DOCSIS Set-top Gateway (A-DSG) tunnel on a Cisco CMTS router, use the **cable dsg tunnel srv-class** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dsg tunnel *tunnel-id* **srv-class** *class-name*
no cable dsg tunnel *tunnel-id* **srv-class** *class-name*

Syntax Description

tunnel-id	Identifies the DSG tunnel with an identifier as a number from 1–65535.
class-name	Specifies the name of a configured cable service class.

Command Default

Cable service classes are not configured or associated with a DSG tunnel.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC1	This command was modified to reflect the change in behavior of the command when the default MQoS is configured.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The A-DSG tunnel and tunnel group must be created before the **cable dsg tunnel srv-class** command becomes available to associate the tunnel with a configured QoS service class.

Examples

The following example shows how to configure a cable service class named “test” on a Cisco CMTS router, followed by the association of that test cable service class with a DSG tunnel:

```
Router(config)# cable service class 1 name test
Router(config)# cable service class 1 downstream
Router(config)# cable service class 1 max-rate 20000
Router(config)# cable service class 1 min-rate 3000
Router(config)# cable dsg client-list 1 id-index 1 mac-addr 0050.4d00.0007
Router(config)# cable dsg tg 1 channel 1
Router(config)# cable dsg tunnel 1 mac-addr 0050.4d00.0007 tg 1 clients 1
Router(config)# cable dsg tunnel 1 srv-class test
```

When the service class name is configured without the default MQoS configuration, the following error message is displayed and the configuration is rejected prompting the user to configure the default MQoS.

```
Router(config)# cable dsg tunnel 1 srv-class test
The default mqos doesn't exist, please, create one and then reconfigure service class name
 to tunnel 1
Router(config)#
```

When the last service class name is not configured, the following error message is displayed prompting the user to remove the default MQoS (if not needed.)

```
Router(config)# no cable dsg tunnel 1 srv-class test
There is no DSG tunnel associated with a service class name, so, remove the default mqos
if not needed
Router(config)#
```

Related Commands

Command	Description
cable service class	Configures parameters for a DOCSIS service class on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel	Associates a group of A-DSG tunnels to one or more downstream interfaces on a Cisco CMTS router.
cable dsg tg channel ucid	Configures the upstream channel IDs for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg tg channel vendor-param	Specifies a vendor-specific group for an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.
cable dsg vendor param	Configures vendor-specific parameters for A-DSG on a Cisco CMTS router.

cable dsg vendor-param

To configure Advanced-mode DOCSIS Set-top Gateway (A-DSG) vendor-specific parameters on a Cisco CMTS router, use the **cable dsg vendor-param** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable dsg vendor-param *group-id* **vendor** *vendor-index* **oui** *oui* **value** *value-in-TLV*
no cable dsg vendor-param *group-id* **vendor** *vendor-index* **oui** *oui* **value** *value-in-TLV*

Syntax Description

group-id	Defines the DSG vendor parameter and associates with a DSG group.
vendor *vendor-index*	Selects the DSG vendor and associated DSG index.
oui *oui*	Selects the DSG Organizationally Unique Identifier (OUI) setting.
value *value-in-TLV*	Sets the type/length value for the defined DSG vendor.

Command Default

The A-DSG vendor-specific parameters are not defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The vendor-specific parameters can be associated to the downstream to encode into the Downstream Channel Descriptor (DCD) message.

To associate a vendor parameter list with a tunnel group, use the **cable dsg tg channel vendor-param** command. The same vendor parameter list can be associated with multiple tunnel groups.

Examples

The following sample configuration illustrates global vendor parameters for A-DSG:

```
cable dsg vendor-param 1 vendor 1 oui ABCDEA value 0101AB
cable dsg vendor-param 2 vendor 1 oui ABCDEB value 0101AB
cable dsg vendor-param 3 vendor 1 oui ABCDEC value 0101AB
```

Related Commands

Command	Description
cable dsg cfr	Defines and enables A-DSG classifiers on a Cisco CMTS router.

Command	Description
cable dsg chan-list	Configures the A-DSG downstream channel list on a Cisco CMTS router.
cable dsg client-list	Configures the A-DSG client parameters and the associated DSG rule on a Cisco CMTS router.
cable dsg tg channel vendor-param	Associates a vendor-specific group with an A-DSG tunnel group on a Cisco CMTS router.
cable dsg timer	Configures the A-DSG timer on a Cisco CMTS router.
cable dsg tunnel	Creates A-DSG tunnels on a Cisco CMTS router.
cable dsg tunnel srv-class	Associates a cable service class with an A-DSG tunnel on a Cisco CMTS router.

cable dynamic-bonding-group

To enable dynamic bonding group, use the **cable dynamic-bonding-group** command. To disable dynamic bonding group, use the no form of the command.

cable dynamic-bonding-group [**eight-contiguous-channel** | **load-balance** | **reclaim-hold-interval** { **percent** *percentage* | **modems** *count* } | **reclaim-threshold** | **registration** | **snmp**]

Syntax Description

eight-contiguous-channel	Forces the cBR-8 router to create 8-channel DBG with contiguous frequency channels.
load-balance	Specifies that the dynamic bonding group creation can be triggered by the load balancing.
reclaim-hold-interval	Specifies the time interval in seconds between DBG unused and reclaim. The default value is 600 seconds. The range is 30-3600 seconds.
reclaim-threshold percent *value* **modems** *count*	Specifies the bonding group reclaim thresholds. The default values are 5 for *value* and 6 for *count*.
registration	Specifies that the dynamic bonding group creation can be triggered by the cable modem registration.
snmp	Enable the snmp trap on dynamic bonding group.

Command Default

The Dynamic Bonding Group is disabled by default.

Command Modes

Global configuration (config).

Command History

Release	Modification
Cisco IOS XE 16.7.1	This command is introduced on the Cisco cBR Series Converged Broadband Router.
Cisco 1x2 / Compact Shelf RPD Software 4.1	This command is modified to add **reclaim-threshold**, **registration**, and **load-balance** options.
Cisco IOS XE Bengaluru 17.6.1x	This command is modified to add `eight-contiguous-channel` option.
Cisco IOS XE Dublin 17.12.1w	This **reclaim-hold-interval** option is added.

The following example shows how to configure the time interval between DBG unused and reclaim:

```
router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# cable dynamic-bonding-group reclaim-hold-interval 1000
router(config)# end
```

Use the following command to verify the above configuration:

```
router# show run | s reclaim-hold-interval
cable dynamic-bonding-group reclaim-hold-interval 1000
```

The following example enables dynamic bonding group on a modular cable interface using the **cable dynamic-bonding-group** command:

```
router # configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# cable dynamic-bonding-group
router(config)# end
```

The following example shows how to configure the bonding group reclaim thresholds:

```
router # configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# cable dynamic-bonding-group reclaim-threshold percent 5% modems 6
router(config)# end
```

cable dynamic-bw-sharing

To enable dynamic bandwidth sharing (DBS) on a specific modular cable or wideband cable interface, use the **cable dynamic-bw-sharing** command in interface configuration mode. To disable DBS on the interface and revert to static bandwidth sharing, use the **no** form of this command.

cable dynamic-bw-sharing
no cable dynamic-bw-sharing

Syntax Description

This command has no arguments or keywords.

Command Default

Dynamic bandwidth sharing is disabled and static bandwidth sharing is enabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(23)BC1	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS release 12.2(33)SCB.
12.2(33)SCE	The command default was changed. The DBS mode is now enabled by default.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

DBS may be configured on a modular cable or wideband cable interface only when the interface is administratively down. Additionally, the interface must be administrative down when using the no form of this command to disable dynamic bandwidth sharing.

Note Starting with Cisco IOS Release 12.2(33)SCE, the DBS mode is enabled by default, on the WB/MC/IC interfaces. To disable the DBS mode, configure the **no cable dynamic-bw-sharing** command.

Note Starting with Cisco IOS-XE 3.15.0S, DBS is enabled by default on cBR series Converged Broadband Routers and cannot be disabled on.

Examples

The following example enables dynamic bandwidth sharing on a modular cable interface using the **cable dynamic-bw-sharing** command:

```
Router(config)# interface modular-cable 1/0/0:1
Router(config-if)# shutdown
Router(config-if)# cable dynamic-bw-sharing
Router(config-if)# no shutdown
```

The following example enables dynamic bandwidth sharing on a wideband cable interface using the **cable dynamic-bw-sharing** command:

```
Router(config)# interface wideband-cable 1/0/0:0
Router(config-if)# shutdown
Router(config-if)# cable dynamic-bw-sharing
Router(config-if)# no shutdown
```

Related Commands

Command	Description
cable rf-bandwidth-percent	Enables either static or dynamic bandwidth sharing for a modular cable (MC) interface.
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel and allocates bandwidth.
debug cr10k-rp dbs-queue	Displays debug information for dynamic bandwidth sharing (DBS) on the Cisco uBr10012 universal broadband router.
show pxf cable controller	Displays information about the RF channel Versatile Traffic Management System (VTMS) links and link queues.
show pxf cpu queue	Displays parallel express forwarding (PXF) queueing and link queue statistics.

cable dynamic-flow vrf

To configure a VPN routing or forwarding instance for dynamic flow settings, use the **cable dynamic-flow vrf** command. To disable this feature, use the no form of this command.

{ **no** } **cable dynamic-flow vrf** *vrf*

Syntax Description

vrf	Specifies the VPN Routing/Forwarding instance name

Command Default

By default, no VPN routing or forwarding instance is configured.

Command Modes

cable interface (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Example

The following sample shows and example of the **cable dynamic-flow vrf**command.

```
Router# conf t
Router(config)#vrf definition vrpd
Router(config-vrf)#vrf definition vrpd
Router(config-vrf)# rd 27:1
Router(config-vrf)# route-target export 27:1
Router(config-vrf)# route-target import 27:1
Router(config-vrf)#
Router(config-vrf)# address-family ipv4
Router(config-vrf-af)#  route-target export 27:1
Router(config-vrf-af)#  route-target import 27:1
Router(config-vrf-af)#end

Router# conf t

Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # cable dynamic-flow vrf vrpd
Router(config-profile-md) # no cable dynamic-flow vrf vrpd
Router(config-profile-md)#end
```

cable dynamic-qos trace

To enable the call trace functionality on the Cisco CMTS router for the PacketCable or PacketCable Multimedia (PCMM) service subscribers, use the **cable dynamic-qos trace** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable dynamic-qos trace *subscriber-number*
no cable dynamic-qos trace

Syntax Description

subscriber-number	Number of subscribers for a PacketCable or PCMM service. The range is from 1 to 20.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows how to configure the call trace functionality on the Cisco uBR10012 router for the PacketCable or PCMM service subscribers:

```
Router# configure terminal
Router(config)# cable dynamic-qos trace 12
```

Related Commands

Command	Description
debug cable dynamic-qos subscriber	Enables debugging of the call trace functionality on the Cisco CMTS router for a particular subscriber.
debug cable dynamic-qos trace	Enables call trace debugging on the Cisco CMTS router for all the subscribers for whom call trace is configured.
show cable dynamic-qos trace	Displays the number of subscribers for whom call trace is enabled on the Cisco CMTS router.

cable dynamic-secret

To enable the Dynamic Shared Secret feature, so that Data-over-Cable Service Interface Specifications (DOCSIS) configuration files are verified with a Message Integrity Check (MIC) that has been created with a dynamically generated shared secret, use the **cable dynamic-secret** command in cable interface configuration mode or MAC domain profile configuration mode. To disable this feature, use the **no** form of this command.

cable dynamic-secret {**lock** [*lock-qos*] | **mark** | **reject**} [**nocrypt**]
no cable dynamic-secret

Syntax Description

lock	Allows CMs that do not pass MIC verification to come online, but with a restrictive quality of service (QoS) configuration that limits access to the network. The CMTS also locks those CMs so that they must be offline for 24 hours before being allowed to reregister with a valid DOCSIS configuration file. (You can also manually unlock a cable modem using the **clear cable modem lock** command.)
lock-qos	(Optional) Specifies the QoS profile to be assigned to the CM while it is locked. The valid range is 1 to 256. If not specified, the CM is locked into a CMTS-created profile that limits both the upstream and downstream to 10 Kbps. **Note** The QoS profile must have already been created before it can assigned using the **lock** *lock-qos* option.
mark	Allows CMs to come online even if they do not present a DOCSIS configuration file with a valid CMTS MIC, but the CMTS prints a warning message and marks those CMs with an exclamation point (!) in the **show cable modem** command.
reject	Rejects registration for CMs with DOCSIS configuration files that contain an invalid CMTS MIC.
nocrypt	(Optional) Specifies that the filename for DOCSIS configuration files should not be encrypted when the Cisco CMTS sends the files to CMs. The CMTS instead transmits the files using their original filenames. The **nocrypt** option slightly decreases the security provided by the dynamic shared secret feature, but it allows the operator to poll the DOCSIS config file name listed by the cable modem for more convenient network management. **Note** A cable modem that is running unauthorized or hacked software can return whatever SNMP values the user desires. This information should therefore not be trusted by the billing and provisioning systems.

Command Default

The Dynamic Shared Secret feature is disabled. When enabled, the filenames for DOCSIS configuration files are encrypted.

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

MAC domain profile configuration (config-profile-md)

Note Configuring the Dynamic Shared Secret feature on the primary interface in a bundle also automatically configures it for all interfaces in the bundle.

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.2(15)BC1b	Support for the **nocrypt** option was added.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable dynamic-secret** configuration command automatically creates a unique DOCSIS shared secret on a per-modem basis, creating a one-time-use DOCSIS configuration file that is valid only for the current session. This ensures that a DOCSIS configuration file that has been downloaded for one cable modem can never be used by any other modem, nor can the same modem reuse this configuration file at a later time. This patent-pending feature is designed to guarantee that all registered modems are using only the QOS parameters that have been specified by the DOCSIS provisioning system for that particular modem at the time of its registration.

The **cable dynamic-secret** configuration command enhances the existing shared secret support on the Cisco CMTS by using a one-time, dynamically generated shared secret each time a cable modem registers. This prevents theft-of-service attacks in which users are able to substitute a DOCSIS configuration file that provides a higher-level of service during the registration phase.

The DOCSIS specification allows cable service providers to use a shared secret to create the CMTS MIC value that is stored in a DOCSIS configuration file. If a user attempts to register with the CMTS using a different or modified DOCSIS configuration file, the CMTS can compare the CMTS MIC value sent by the cable modem with the CMTS MIC it has calculated. If the two MIC values are different, the file has been modified.

The **cable dynamic-secret** command allows the CMTS to dynamically create the shared secret at the time that the cable modem is registering, and that shared secret is valid only for that particular session with that particular cable modem. A new dynamically generated shared secret is used each time each cable modem registers, which prevents users from guessing the shared secret and using it again to register with a modified DOCSIS configuration file.

If the cable modem's DOCSIS configuration file fails the CMTS MIC verification check, one of the following messages is displayed on the console:

```
%UBR7200-4-BADCFGFILE: Modem config file platinum.cm at C3/0: CMTS MIC Invalid
%UBR7200-4-BADCFGFILE: Modem config file platinum.cm at C3/0: No CMTS MIC
```

If the error message specifies that the reason for the failure is "CMTS MIC Invalid," the CMTS MIC was not encoded with the proper dynamically generated shared secret. If the reason is "No CMTS MIC," the DOCSIS configuration file did not contain any value for the CMTS MIC, which could indicate that the customer has attempted to bypass the DOCSIS security checks by creating the user's own DOCSIS configuration file without any MIC values.



Note The Dynamic Shared Secret feature does not affect the use of the original shared secret or secondary shared secrets that are configured using the **cable shared-secondary-secret** and **cable shared-secret** commands. (Cisco cBR-8 router does not allow the simultaneous configuration of the two commands.) If these shared secrets are configured, the Cisco CMTS continues to use them to validate the original DOCSIS configuration file that is downloaded from the TFTP server. If the DOCSIS configuration file fails to pass the original or secondary shared secret verification checks, the cable modem is not allowed to register, and the Dynamic Shared Secret feature is not invoked for that particular cable modem.



Note The Cisco uBR7100 series router does not support the Dynamic Shared Secret feature when running in MxU bridging mode.

The original filename for the DOCSIS configuration file is automatically encrypted by default to prevent unauthorized parties from obtaining any useful information from the filename, or from attempting to replace the original file with their own. This encryption can be disabled, using the **nocrypt** option, so that DOCSIS configuration files are sent using their original filenames.



Note Do not use the **cable dynamic-secret** command along with the **ip tftp-source** command in Cisco IOS Release 12.2(15)BC1, because this could result in certain models of CMs not being able to come online but instead be stuck in the init(o) state. This restriction is removed in Cisco IOS Release 12.2(15)BC2 and later releases.

Modes of Operation

The **cable dynamic-secret** command offers three different possible responses to cable modems that fail the CMTS MIC verification check:

- When the **mark** option is used, the CMTS allows CMs to come online even if they fail the CMTS MIC validity check. However, the CMTS also prints a warning message on the console and marks the cable modem in the **show cable modem** command with an exclamation point (!), so that this situation can be investigated. The following message is displayed on the console when such a CM registers with the Cisco CMTS:

```
06:53:57: %UBR7200-4-CMMARKED: Cable Modem 00ff.ffee.ddcc in C3/0 attempted theft of service
```

- When the **lock** option is used, the CMTS assigns a restrictive QoS configuration to CMs that fail the CMTS MIC validity check. If an optional *lock-qos* profile is specified, the CMTS assigns this profile to the CM while it is locked.

If the *lock-qos* profile is not specified, the CMTS uses a special QoS configuration that limits the network access for these CMs by restricting their downstream and upstream service flows to a maximum rate of 10

kbps. (If you do not specify the *lock-qos* profile, you must also allow cable modems to create QoS profiles, using the **cable qos permission** command. If you do not do this and use the **lock** option without specifying a particular QoS profile, locked cable modems will not be allowed to register until the lock clears or expires.)

If a customer resets their CM, the CM will reregister but still uses the restricted QoS profile. A locked CM continues with the restricted QoS profile until it goes offline and remains offline for at least 24 hours, at which point it is allowed to reregister with a valid DOCSIS configuration file. This option frustrates users who are repeatedly registering with the CMTS in an attempt to guess the shared secret, or to determine the details of the Dynamic Shared Secret security system.

In addition, the following message is displayed on the console when a CM is locked.

```
06:53:57: %UBR7200-4-CMLOCKED: Cable Modem 00ff.ffee.ddcc in C3/0 attempted theft of service
```

Locked cable modems are shown with an exclamation point (!) in the **show cable modem** displays:

```
Router# show cable modem

MAC Address    IP Address      I/F       MAC         Prim RxPwr  Timing  Num BPI
                                         State       Sid  (db)   Offset  CPE Enb
0010.9507.01db 144.205.151.130 C5/1/0/U5 online(pt)  1     0.25    938   1    N
0080.37b8.e99b 144.205.151.131 C5/1/0/U5 online      2     -0.25   1268  0    N
0002.fdfa.12ef 144.205.151.232 C6/1/0/U0 online(pt)  13    -0.25   1920  1    N
0002.fdfa.137d 144.205.151.160 C6/1/0/U0 !online     16    -0.50   1920  1    N
0003.e38f.e9ab 144.205.151.237 C6/1/0/U0 !online     3     -0.50   1926  1    N
Router#
```

Tip You can also manually clear the lock on a CM by using the **clear cable modem lock** command.

- When the **reject** option is used, the CMTS refuses to allow CMs to come online if they fail the CMTS MIC validity check. These cable modems appear with a MAC state of "reject(m)" in the displays generated by the **show cable modem** command. After a short timeout period, the CM attempts to reregister with the CMTS. The CM must register with a valid DOCSIS configuration file before being allowed to come online. When the CM does come online, the CMTS prints a warning message on the console and marks the cable modem in the **show cable modem** command with an exclamation point (!), so that this situation can be investigated.

Tip Cisco recommends that you initially use the **mark** option, so that potential problems are identified without immediately interfering with users' ability to come online. After you identify and resolve these initial problems, reconfigure the cable interfaces with the **reject** or **lock** option to block problem cable modems that attempt to come online without a valid shared secret.

Note To account for possible network problems, such as loss of packets and congestion, the Cisco CMTS will allow a cable modem to attempt to register twice before marking it as having failed the Dynamic Shared Secret authentication checks.

Filename Encryption

By default, the **cable dynamic-secret** command encrypts the original filename for a DOCSIS configuration file when the Cisco CMTS transmits the file to the CM. This filename changes in a semi-random manner, making it difficult for users to predict the filename for the file that should be downloaded to the CM.

This does mean, however, that the filenames specified in the DHCP HELLO and ACK messages are different, and that the filenames on the CM and on the TFTP server are different. This could interfere with custom network management applications and scripts. If this is the case, you can disable the automatic filename encryption by adding the **nocrypt** option to the command.

The **nocrypt** option does slightly decrease the security provided by this feature, so this possibility should be weighed against the ability to more conveniently manage the network.

Interaction with the TFTP Enforce Feature



Note Cisco cBR-8 router does not support **cable tftp-enforce** command.

The **cable tftp-enforce** command provides another layer of protection against theft-of-service attacks by requiring cable modems to download a DOCSIS configuration file through the CMTS cable interface before being allowed to register. When the **cable tftp-enforce** command is used with the **cable dynamic-secret** command, the TFTP enforce checks are done before the dynamic shared-secret checks. If a cable modem fails to download a DOCSIS configuration file through the CMTS, it is not allowed to register, regardless of the dynamic shared-secret checks.

Displaying Rogue Cable Modems

Use the **show cable modem rogue** command to display the cable modems that have failed the dynamic shared-secret authentication checks:

```
Router# show cable modem rogue
                                    Spoof TFTP
MAC Address    Vendor     Interface  Count Dnld Dynamic Secret
AAAA.7b43.aa7f Vendor1    C4/0/U5       2  Yes  45494DC933F8F47A398F69EE6361B017
AAAA.7b43.aa7f Vendor1    C4/0/U5       2  Yes  D47BCBB5494E9936D51CB0EB66EF0B0A
BBBB.7b43.aa7f Vendor2    C4/0/U5       2  No   8EB196423170B26684BF6730C099D271
AAAA.7b43.aa7f Vendor1    C4/0/U5       2  No   DF8FE30203010001A326302430120603
BBBB.7b43.aa7f Vendor2    C4/0/U5       2  No   300E0603551D0F0101FF040403020106
AAAA.7b43.aa7f Vendor1    C4/0/U5       2  Yes  820101002D1A264CE212A1BB6C1728B3
DDDD.7b43.aa7f Vendor4    C4/0/U5       2  Yes  7935B694DCA90BC624AC92A519C214B9
AAAA.7b43.aa7f Vendor1    C4/0/U5       2  No   3AB096D00D56ECD07D9B7AB662451CFF
Router#
```

If the CMTS cannot obtain the DOCSIS configuration file from the TFTP server, a message similar to the following is displayed on the console:

```
%UBR7200-4-NOCFGFILE: Cannot read modem config file platinum.cm from C3/0: <reason>
```

where the reason can be one of the following, depending on the error that the TFTP server reported:

- Compression Failed
- File too big
- Invalid Checksum
- Invalid IP address or hostname
- Uncompression Failed

- User Abort

Examples

The following example shows how to configure a cable interface on a Cisco uBR7200 series router with the **mark** option, so that CMs that fail the MIC verification are allowed to register but are marked in the **show cable modem** displays so that their situation can be further investigated:

```
Router# configure terminal

Router(config)# interface cable 4/0

Router(config-if)# cable dynamic-secret mark
Router(config-if)# exit

Router(config)# exit

Router#
```

The following example shows how to configure the cable interface on a Cisco uBR7100 series router, so that CMs that fail the MIC verification are locked with a QoS profile that limits upstream and downstream service flows to 10 kbps:

```
Router# configure terminal

Router(config)# cable qos permission create

Router(config)# cable qos permission update
Router(config)# interface cable 1/0

Router(config-if)# cable dynamic-secret lock

Router(config-if)# exit

Router(config)# exit

Router#
```



Note If you do not use the **cable qos permission** global configuration command to allow cable modems to create their own QoS profiles, the CMTS rejects this command and displays the following error message: %Need permission for modems to create QoS profile

The following example shows how to configure a cable interface so that CMs that fail the MIC verification are locked with a specific QoS profile:

```
Router# configure terminal

Router(config)# interface cable 1/0

Router(config-if)# cable dynamic-secret lock 31
Router(config-if)# exit

Router(config)# exit

Router#
```

Note If the specified QoS profile does not exist, the CMTS rejects this command and displays the following error message: %Profile *qos-id* to lock modem does not exist

The following example shows how to configure a cable interface on a Cisco uBR7200 series router, so that CMs that fail the MIC verification are not allowed to register and must reregister with a valid DOCSIS configuration file before being allowed to come online:

```
Router# configure terminal

Router(config)# interface cable 3/0

Router(config-if)# cable dynamic-secret reject
Router(config-if)# exit

Router(config)# exit

Router#
```

The following example shows how to disable the Dynamic Shared Secret feature on a cable interface on the Cisco uBR10012 router:

```
Router# configure terminal

Router(config)# interface cable 6/1/0

Router(config-if)# no cable dynamic-secret
Router(config-if)# exit

Router(config)# exit

Router#
```

Related Commands

Command	Description
cable dynamic-secret exclude	Excludes one or more specific cable modems from being processed by the Dynamic Shared Secret feature.
cable shared-secondary-secret	Configures one or more secondary shared secret keys that CMs can use to successfully process the DOCSIS configuration file and register with the CMTS.
cable shared-secret	Configures an authentication shared secret key that CMs must use to successfully process the DOCSIS configuration file and register with the CMTS.
cable tftp-enforce (for uBR series router)	Requires that all CMs on a cable interface attempt to download a DOCSIS configuration file using Trivial File Transfer Protocol (TFTP) through the cable interface before being allowed to register and come online.
clear cable modem lock	Resets the lock on one or more CMs, and reinitializes them, so that they can reregister with a valid DOCSIS configuration file.

Command	Description
show cable modem rogue	Displays a list of cable modems that have been marked, locked, or rejected because they failed the dynamic shared-secret authentication checks.

cable dynamic-secret exclude

To exclude one or more specific cable modems from being processed by the Dynamic Shared Secret feature, use the **cable dynamic-secret exclude** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable dynamic-secret exclude {**modem** *mac-address* | **oui** *oui-id*}
no cable dynamic-secret {**modem** *mac-address* | **oui** *oui-id*}

Syntax Description

modem *mac-address*	Specifies the hardware (MAC) address of a specific individual cable modem to be excluded from the Dynamic Shared Secret feature. (You cannot specify a multicast MAC address.)
oui *oui-id*	Specifies the organization unique identifier (OUI) of a vendor, so that cable modems from this vendor are excluded from the Dynamic Shared Secret feature. The OUI should be specified as three hexadecimal bytes separated by either periods or colons.

Command Default

All modems are processed by the Dynamic Shared Secret feature when the feature is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(9a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When the **cable dynamic-secret**configuration command is configured on a cable interface, it automatically includes all cable modems that register on that interface. To exclude one or more cable modems from being processed by the Dynamic Shared Secret security checks, use the **cable dynamic-secret exclude** command in global configuration mode.

You may exclude cable modems from the Dynamic Shared Secret security checks if they need to download additional files from the TFTP server at registration time. For example, Cisco cable CPE devices, such as the Cisco uBR925 cable access router, can be instructed to download a Cisco IOS configuration file after downloading the DOCSIS configuration file.

However, when Dynamic Shared Secret checks are being used, the Cisco CMTS does not allow the cable modem to download any other files after the first successful download of the DOCSIS configuration file. To allow these cable modems to download their Cisco IOS configuration files, use the **cable dynamic-secret-exclude** command to exclude them from the Dynamic Shared Secret checks.

You can exclude either a specific cable modem by its MAC address, or all of a vendor's cable modems by their OUI value. Excluded cable modems must still register according to the normal DOCSIS provisioning

procedures, but their DOCSIS configuration files are no longer verified by the Dynamic Shared Secret security checks.

Tip When a cable modem is excluded from the Dynamic Shared Secret feature, the Dynamic Secret field in its **show cable modem verbose**display shows “Excluded”.

Examples

The following example shows how to exclude a specific cable modem, with the MAC address of 00d0.45ba.b34b, from being processed by the Dynamic Shared Secret feature:

```
Router# configure terminal
Router(config)# cable dynamic-secret exclude modem 00d0.45ba.b34b
Router(config)# exit
Router#
```

The following example shows how to exclude all cable modems with a vendor OUI value 00.01.B4 from being processed by the Dynamic Shared Secret feature:

```
Router# configure terminal
Router(config)# cable dynamic-secret exclude oui 00.01.B4
Router(config)# exit
```

Related Commands

Command	Description
cable dynamic-secret	Enables the Dynamic Shared Secret feature, so that DOCSIS configuration files are verified with a MIC that has been created with a dynamically generated shared secret.
cable shared-secondary-secret	Configures one or more secondary shared secret keys that CMs can use to successfully process the DOCSIS configuration file and register with the CMTS.
cable shared-secret	Configures an authentication shared secret key that CMs must use to successfully process the DOCSIS configuration file and register with the CMTS.
cable tftp-enforce (for uBR series router)	Requires that all CMs on a cable interface attempt to download a DOCSIS configuration file using Trivial File Transfer Protocol (TFTP) through the cable interface before being allowed to register and come online.
clear cable modem lock	Resets the lock on one or more CMs, and reinitializes them, so that they can reregister with a valid DOCSIS configuration file.
show cable modem rogue	Displays a list of cable modems that have been marked, locked, or rejected because they failed the dynamic shared-secret authentication checks.

cable dynamic-secret tftp insert-upgrade-server

To dynamically insert the IPv4 or IPv6 TLV values in the Data-over-Cable Service Interface Specifications (DOCSIS) configuration file to complete firmware upgrade on cable modems, use the **cable dynamic-secret tftp insert-upgrade-server** command in the global configuration mode.

cable dynamic-secret tftp insert-upgrade-server
no cable dynamic-secret tftp insert-upgrade-server

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Dynamic Shared Secret feature must be configured before you can upgrade the firmware on cable modems. To enable this feature, execute the **cable dynamic-secret** command in the cable interface configuration mode.

Examples

The following example dynamically inserts the correct IPv4 or IPv6 TLV values from the DOCSIS configuration file to upgrade firmware on the cable modems.

```
Router(config)# cable dynamic-secret tftp insert-upgrade-server
Router(config)# end
```

Related Commands

Command	Description
cable dynamic-secret	Enables the Dynamic Shared Secret feature so that DOCSIS configuration files are verified with a Message Integrity Check (MIC) that has been created with a dynamically generated shared secret.
cable dynamic-secret exclude	Excludes one or more specific cable modems from being processed by the Dynamic Shared Secret feature.
clear cable modem lock	Resets the lock on one or more CMs, and re-initializes them, so that they can reregister with a valid DOCSIS configuration file.



Cable Commands: cable e through cable i

- cable enable-trap, on page 268
- cable event priority, on page 271
- cable event syslog-server, on page 274
- cable event throttle-adminStatus, on page 277
- cable event throttle-interval, on page 280
- cable event throttle-threshold, on page 282
- cable falcon-100g, on page 284
- cable fiber-node, on page 285
- cable filter group, on page 288
- cable flap-list aging, on page 295
- cable flap-list insertion-time, on page 297
- cable flap-list miss-threshold, on page 299
- cable flap-list power-adjust threshold, on page 301
- cable flap-list size, on page 303
- cable freq-range, on page 305
- cable frequency-exclusion-band, on page 310
- cable helper-address, on page 311
- cable host access-group, on page 315
- cable high-priority-call-window, on page 317
- cable igmp static-group, on page 319
- cable init-channel-timeout, on page 321
- cable insertion-interval, on page 322
- cable intercept, on page 324
- cable ip-init, on page 327
- cable ip-broadcast-echo, on page 328
- cable ip-multicast-echo, on page 330
- cable ipc-stats, on page 332
- cable ipc-watermark, on page 333
- cable ipv6 dhcp-insert, on page 334
- cable ipv6 dhcp-relay override, on page 336
- cable ipv6 source-verify, on page 337
- cable ipv6 source-verify dhcp ns-probe, on page 340
- cable ipv6 source-verify leasequery-filter downstream, on page 342

cable enable-trap

To permanently set four CISCO-DOCS-EXT-MIB MIB attributes that enable the sending of a trap when a CM changes between the online and offline states, use the **cable enable-trap** command in cable interface configuration mode. To return to the default settings found in the MIB, which disable the sending of these traps, use the **no** form of this command.

cable enable-trap [**cmonoff-notification** | **cmonoff-interval** *time-in-secs*]
no cable enable-trap [**cmonoff-notification** | **cmonoff-interval**]

Syntax Description

cmonoff-notification	Enables or disables the sending of the notification traps.
cmonoff-interval	Specifies the minimum interval that must pass before sending out a new trap for the same CM.
time-in-secs	Specifies the number of seconds. The range is from 0 to 86400. The default is zero.

Command Default

The default is to use the MIB defaults, which specify that traps must not be sent. The default value is zero seconds.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(13)SC	This command was introduced.
12.1(5)EC1	This command was added to the 12.1 EC train and support was added for the Cisco uBR7100 series routers.
12.2(4)BC1	This command was added to the 12.2 BC train and support was added for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets four attributes in the CISCO-DOCS-EXT-MIB MIB, so that the new values can be automatically loaded whenever the CMTS router powers on or reloads. To do so, put the appropriate commands in the configuration file and save it to the CMTS router's Flash memory. The CMTS router automatically sets the appropriate MIB values when it processes the configuration file at startup.

These commands affect whether the CM online/offline notification trap (cdxCmtsCmOnOffNotification) is sent, and if so, the minimum interval that must exist between traps that are sent for the same CM undergoing the same state changes. The following describes the relationship between these commands and the attributes in the CISCO-DOCS-EXT-MIB MIB:

- The **cable enable-trap cmonoff-notification** command sets the cdxCmtsCmOnOffTrapEnable attribute to 1 (true), which enables the sending of the CM online and offline traps.
- The **no cable enable-trap cmonoff-notification** command sets the cdxCmtsCmOnOffTrapEnable attribute to 2 (false), which disables the sending of the CM online and offline traps.
- The **cable enable-trap cmonoff-interval** command sets the cdxCmtsCmOnOffTrapInterval attribute to the specified time period (0 to 86400 seconds), which sets the minimum interval that must exist before the CMTS sends out the same trap for the same CM.

  For example, if the interval is set to 600 seconds, and the same CM goes offline three times and online twice in that time period, only one online trap and one offline trap is sent to the SNMP manager.
- The **no cable enable-trap cmonoff-interval** command sets the cdxCmtsCmOnOffTrapInterval attribute to 0, which means a trap will be sent for every CM online/offline transition.

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The cdxcmonoffnotification has been enhanced to retreive the following attribute details: • Fiber Node ID • RPD Mac Address • RPD Alias (RPD Name) • RPD upstream and downstream port • Modem Registration Time

Note cBR-8 does not support sending modem on/off event notifications to the syslog-server.

Note Setting the **cmonoff-interval** option and the cdxCmtsCmOnOffTrapInterval attribute has meaning only if cdxCmtsCmOnOffNotification traps have been previously enabled.

Examples

The following commands enable the sending of CM on or off traps, with a minimum interval of 1200 seconds between traps being sent for the same CM:

```
router(config)# interface c6/0

router(config-if)# cable enable-trap cmonoff-notification
router(config-if)# cable enable-trap cmonoff-interval 1200
router(config-if)# exit

router(config)#
```

The following commands disable the sending of CM on or off traps.

```
router(config)# interface c6/0
```

```
router(config-if)# no cable enable-trap cmonoff-notification
router(config-if)# exit

router(config)#
```

Related Commands

Command	Description
snmp-server enable traps cable	Enables traps for cable-related events.
snmp-server enable traps docsis-cmts	Enables traps for DOCSIS-related MAC-layer events.

cable event priority

To configure the event reporting flags for DOCSIS event messages, which determines how the Cisco CMTS reports these events, use the **cable event priority** command in global configuration mode. To return to the default settings found in the MIB, use the **no** form of this command.

cable event priority {**alert** | **critical** | **debug** | **emergency** | **error** | **informational** | **notice** | **warning**} *flags*

Syntax Description

alert	Sets the event reporting flag for alert system error messages. (Alert messages indicate that some type of system or connection failure has occurred and requires immediate attention.)
critical	Sets the event reporting flag for critical system error messages. (Critical messages indicate that an error occurred which requires immediate attention to avoid system or connection failure.)
debug	Sets the event reporting flag for debug system error messages. (Debug messages appear only when debugging has been enabled.)
emergency	Sets the event reporting flag for emergency system error messages. (Emergency messages indicate that the system has become unusable and requires immediate attention. This problem might also be affecting other parts of the network.)
error	Sets the event reporting flag for error system error messages. (Error messages indicate that an error condition occurred that requires attention to resolve. Failure to address this problem will result in some type of system or connection failure in the near future.)
informational	Sets the event reporting flag for informational system error messages. (Informational messages might or might not be significant to the system administrators.)
notice	Sets the event reporting flag for notice system error messages. (Notice messages indicate that a situation occurred that is normal but is significant enough that system administrators might want to notice.)
warning	Sets the event reporting flag for warning system error messages. (Warning messages indicate that a condition occurred that indicates attention is needed in near future to avoid potential problems. Failure to address this problem could result in some type of system or connection failure later on.)
flags	Sets the event reporting flags value, in hex, which specifies how this particular type of event message should be reported. The valid range is 0x0 through 0xF0, which is a bitmask specifying the types of reporting that should be done. See the Usage Guidelines for details.

Command Default

The defaults are configured as per the DOCSIS 1.1 Operations Support System Interface (OSSI) Specification:

- Emergency and alert messages = (0x10) (reported to the local volatile log)
- Critical, error, warning, and notice = (0x70) (reported to the local volatile log, and forwarded as traps and to the SYSLOG server)
- Information and debug = 0x0 (not reported)

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(8)BC1	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS 1.1 specifications require the CMTS to generate a set of messages for DOCSIS-specific events. These messages can be assigned one of eight priority levels, ranging from emergency (the highest level) to debug (the lowest level), and the CMTS can be configured to log each level of messages differently.

The Cisco CMTS supports the following types of logging, as defined by the DOCS-CABLE-DEVICE-MIB MIB (RFC 2669):

- none (0x0) = DOCSIS messages are not reported. (The corresponding Cisco IOS event messages, however, continue to be logged.)
- local-volatile (0x10) = DOCSIS messages are saved in a local log on the CMTS. This log can be limited in size and can automatically discard previous messages to make room for incoming messages.
- syslog (0x20) = DOCSIS messages are sent to a SYSLOG server (if one has been configured, using the **cable event syslog-server** command).
- traps (0x40) = DOCSIS messages are sent as SNMP traps to one or more SNMP managers.

These values can be added together to specify that the CMTS should report an event in more than one way. For example, a value of 0x70 specifies that the CMTS should record the event in its local volatile log, and also send it both as a trap and as a SYSLOG message.

Note If event messages are configured for traps or syslog reporting, they must also be configured for either local volatile or local non-volatile reporting. This means that values 0x20 (syslog-only), 0x40 (trap-only), and 0x60 (syslog and trap only) are not supported.

Use the **cable event priority** command to set the reporting flags for each type of event. This also configures the appropriate instance of the docsDevEvReporting attribute DOCS-CABLE-DEVICE-MIB MIB (RFC 2669) with the same value.

Note This command affects only the DOCSIS event messages, and does not affect how the Cisco IOS software handles event messages. If SYSLOG traps are enabled on the Cisco CMTS (using the **snmp-server enable traps syslog** command), they continue to be sent, regardless of the **cable event priority** configuration.

Examples

The following commands configure the Cisco CMTS so that it reports all emergency, alert, and critical messages as SNMP traps and SYSLOG messages, as well as logging it in the local volatile log:

```
Router# configure terminal
Router(config)# cable event priority alert 0x70
Router(config)# cable event priority critical 0x70
Router(config)# cable event priority emergency 0x70
```

The following commands configure the Cisco CMTS so that it reports the lowest priority messages only to the local volatile log and SYSLOG server:

```
Router# configure terminal
Router(config)# cable event priority debug 0x30
Router(config)# cable event priority informational 0x30
Router(config)# cable event priority notice 0x30
```

Related Commands

Command	Description
cable event syslog-server	Enables logging of DOCSIS event messages to a SYSLOG server.
cable event throttle-adminStatus	Configures how the Cisco CMTS throttles the SNMP traps and SYSLOG messages it generates for DOCSIS event messages.
cable event throttle-interval	Specifies the throttle interval, which helps control how often the Cisco CMTS generates SNMP traps and SYSLOG messages for DOCSIS event messages.
cable event throttle-threshold	Sets the maximum number of SNMP traps and SYSLOG messages that the Cisco CMTS can generate for DOCSIS event messages during the throttle interval.
snmp-server enable traps cable	Enables traps for cable-related events.
snmp-server enable traps docsis-cmts	Enables traps for DOCSIS-related MAC-layer events.

cable event syslog-server

To enabling logging of DOCSIS event messages to a SYSLOG server, use the **cable event syslog-server** command in global configuration mode. To disable the logging of a DOCSIS syslog server, use the **no** form of this command.

cable event syslog-server *ip-address*
no cable event syslog-server

Syntax Description

ip-address	Specifies the IPv4 or IPv6 address for the DOCSIS SYSLOG server, which is the docsDevEvSyslog attribute in the DOCS-CABLE-DEVICE-MIB (RFC 2669). If the IP address is 0.0.0.0 or 0:0:0:0::0, SYSLOG service is disabled for DOCSIS events.

Command Default

0.0.0.0 or 0:0:0:0::0 (No DOCSIS SYSLOG server is defined.)

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(8)BC1	This command was introduced.
12.2(33)SCA	This command was modified in Cisco IOS Release 12.2(33)SCA to support IPv6 addresses. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS 1.1 specifications require the CMTS router to generate a set of messages for DOCSIS-specific events. Use the **cable event syslog-server** command to enable DOCSIS SYSLOG services and to set the IP address for the DOCSIS SYSLOG server (which is the docsDevEvSyslog attribute in the DOCS-CABLE-DEVICE-MIB).

Note cBR-8 does not support sending modem on/off event notifications to the syslog-server.

You can also configure the server's IP address using SNMP commands to set the docsDevEvSyslog attribute directly. Setting the docsDevEvSyslog attribute also creates a matching **cable event syslog-server** command in the router's configuration.

When you specify the IP address for a DOCSIS SYSLOG server, either by using the **cable event syslog-server** command or by setting the docsDevEvSyslog attribute, the Cisco CMTS router begins generating event messages that conform to the DOCSIS 1.1 specifications. This format is similar to but not identical to the format that is used by the Cisco IOS software. For example, the following message is in the typical Cisco IOS software format:

```
%UBR7200-4-DCC_ACK_REJ_MSG_SYNTAX_ERROR: DCC-ACK rejected message syntax error
```

The same error message appears as follows when using the DOCSIS 1.1 format:

```
<133>CMTS[DOCSIS]:<67040500> DCC-ACK rejected message syntax error
```

To disable the sending of events to the DOCSIS SYSLOG server, use the **no cable event syslog-server** command, or specify an IP address of 0.0.0.0 (**cable event syslog-server 0.0.0.0**). Both commands set the docsDevEvSyslog attribute to 0.0.0.0 and disable DOCSIS SYSLOG service. However, this does not disable the Cisco IOS SYSLOG server (if it has been configured using the **logging** *ip-address* command).

Note You can use the same SYSLOG server for both Cisco IOS event messages and for DOCSIS-style event messages, but it might be more convenient to use separate servers for the two different message formats. Use the **logging** *ip-address* command in global configuration mode to set the IP address for the Cisco IOS SYSLOG server. The DOCSIS SYSLOG server collects only event messages for DOCSIS events using the DOCSIS format, while the Cisco IOS server collects all event messages (including DOCSIS events) using the standard Cisco IOS message format.

Tip For more information about DOCSIS SYSLOG services and event messages, see Section 4.4.2.2.2, SYSLOG Message Format, in the *DOCSIS 1.1 Operations Support System Interface (OSSI) Specification* (SP-OSSIv1.1-I06-020830). For more information about all cable-related event messages that can be generated on a Cisco CMTS router, see the *Cisco CMTS System Messages* guide.

Examples

The following command sets the docsDevEvSyslog attribute with an IPv4 address of 192.168.100.137:

```
cable event syslog-server 192.168.100.137
```

The following commands specifies different SYSLOG servers. The server at IPv4 address 192.168.100.137 receives the DOCSIS-style event messages, and the server at IPv4 address 192.168.100.138 receives the Cisco IOS style messages.

```
cable event syslog-server 192.168.100.137
logging 192.168.100.138
```

The following command sets the docsDevEvSyslog attribute to IPv4 address 0.0.0.0, which disables DOCSIS SYSLOG services:

```
no cable event syslog-server
```

Note You can also disable DOCSIS SYSLOG services with the **cable event syslog-server 0.0.0.0** command.

The following command specifies a DOCSIS SYSLOG server with an IPv6 address:

```
cable event syslog-server 2001:0DB8:0:ABCD::1
```

Related Commands

Command	Description
cable event priority	Configures the event reporting flags for DOCSIS event messages, which determines how the Cisco CMTS router reports these events.
cable event throttle-adminStatus	Configures how the Cisco CMTS router throttles the SNMP traps and SYSLOG messages it generates for DOCSIS event messages.
cable event throttle-interval	Specifies the throttle interval, which helps control how often the Cisco CMTS router generates SNMP traps and SYSLOG messages for DOCSIS event messages.
cable event throttle-threshold	Sets the maximum number of SNMP traps and SYSLOG messages that the Cisco CMTS router can generate for DOCSIS event messages during the throttle interval.
snmp-server enable traps cable	Enables traps for cable-related events.
snmp-server enable traps docsis-cmts	Enables traps for DOCSIS-related MAC-layer events.

cable event throttle-adminStatus

To configure how the Cisco CMTS router throttles the SNMP traps and syslog messages it generates for DOCSIS event messages, use the **cable event throttle-adminStatus** command in global configuration mode. To restore the default behavior, use the **no** form of this command.

cable event throttle-adminStatus {**inhibited** | **maintainBelowThreshold** | **stopAtThreshold** | **unconstrained**}
no cable event throttle-adminStatus

Syntax Description

inhibited	Supresses all SNMP traps and syslog messages for DOCSIS event messages.
maintainBelowThreshold	Performs throttling, so that SNMP traps and syslog messages are suppressed if they would otherwise exceed the throttle threshold. The Cisco CMTS resumes generating traps and messages at the start of the next throttle interval.
stopAtThreshold	Performs throttling, so that the Cisco CMTS stops generating all SNMP traps and syslog messages if they would exceed the throttle threshold. The Cisco CMTS does not resume generating traps and messages until directed to do so by repeating this command.
unconstrained	Specifies that the SNMP traps and syslog messages for DOCSIS event messages are not throttled.

Command Default

SNMP traps and syslog messages for DOCSIS event messages are not throttled (**unconstrained**).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(8)BC1	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the value of the docsDevEvThrottleAdminStatus attribute in the DOCS-CABLE-DEVICE-MIB MIB (RFC 2669), which controls whether the Cisco CMTS should throttle SNMP traps and syslog messages that are generated for DOCSIS event messages.

The DOCS-CABLE-DEVICE-MIB MIB supports the following threshold configurations:

- inhibited—The Cisco CMTS does not generate any SNMP traps or syslog messages for DOCSIS events.
- maintainBelowThreshold—Throttling is performed, and SNMP traps and syslog messages are suppressed if they would exceed the throttle threshold (as set by the **cable event throttle-interval** and **cable event**

throttle-threshold commands). The Cisco CMTS resumes generating traps and messages at the start of the next throttle interval.

- stopAtThreshold—Throttling is performed, and the Cisco CMTS stops generating all SNMP traps and syslog messages when they exceed the throttle threshold. The Cisco CMTS does not resume generating traps and messages until the threshold state is reset. This can be done by repeating the **cable event throttle-adminStatus** command, or by setting the docsDevEvThrottleAdminStatus attribute in the DOCS-CABLE-DEVICE-MIB MIB.
- unconstrained—All SNMP traps and syslog messages are transmitted without any throttling.



Tip For more information about DOCSIS syslog services and event messages, see Section 4.4.2.2.2, syslog Message Format, in the DOCSIS 1.1 Operations Support System Interface (OSSI) Specification (SP-OSSIv1.1-I06-020830). For more information about all cable-related event messages that can be generated on the Cisco CMTS router, see the Cisco CMTS Error Message manual.

Examples

The following commands configure the Cisco CMTS router to throttle SNMP traps and syslog messages according to the specified throttle interval and threshold:

```
Router# configure terminal
Router(config)# cable event throttle-interval 90
Router(config)# cable event throttle-threshold 30
Router(config)# cable event throttle adminStatus maintainBelowThreshold
```

The following commands configure the Cisco CMTS router for the default behavior, so that it does not throttle SNMP traps and syslog messages. The configured throttle interval and threshold are ignored.

```
Router# configure terminal
Router(config)# cable event throttle adminStatus unconstrained
```

Related Commands

Command	Description
cable event priority	Configures the event reporting flags for DOCSIS event messages, which determines how the Cisco CMTS reports these events.
cable event syslog-server	Enables logging of DOCSIS event messages to a syslog server.
cable event throttle-interval	Specifies the throttle interval, which helps control how often the Cisco CMTS generates SNMP traps and syslog messages for DOCSIS event messages.
cable event throttle-threshold	Sets the maximum number of SNMP traps and syslog messages that the Cisco CMTS can generate for DOCSIS event messages during the throttle interval.
snmp-server enable traps cable	Enables traps for cable-related events.

Command	Description
snmp-server enable traps docsis-cmts	Enables traps for DOCSIS-related MAC-layer events.

cable event throttle-interval

To specify the throttle interval, which controls how often the Cisco CMTS router generates SNMP traps and syslog messages for DOCSIS event messages, use the **cable event throttle-interval** command in global configuration mode. To restore the default behavior, use the **no** form of this command.

cable event throttle-interval *seconds*
no cable event throttle-interval

Syntax Description

seconds	Length of the throttle interval, in seconds. The range is from 0 to 2147483647. The default is 60.

Command Default

The throttle interval is 60 seconds (1 minute).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(8)BC1	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS 1.1 specifications require the CMTS to generate a set of messages for DOCSIS-specific events. In certain situations, such as a power outage that causes a mass reregistration of cable modems, this can generate such a large volume of event messages that it can impact system performance.

To avoid this possibility, use the **cable event throttle-interval** command, together with the **cable event throttle-threshold** command, to specify the maximum number of SNMP traps or syslog events that the Cisco CMTS can generate for DOCSIS events over a specific interval:

- **cable event throttle-interval**—Specifies the length of the throttle interval.
- **cable event throttle-threshold**—Specifies the maximum number of SNMP traps and syslog events that the Cisco CMTS can generate during that period.

The threshold value counts DOCSIS events, not SNMP traps or syslog messages. If a DOCSIS event generates both an SNMP trap and a syslog message, the Cisco CMTS counts it as only one event.



Note The **cable event throttle-interval** and **cable event throttle-threshold** commands do not have any effect unless the **cable event throttle-adminStatus** has been configured to allow the throttling of DOCSIS event messages.

Tip For more information about DOCSIS syslog services and event messages, see Section 4.4.2.2.2, syslog Message Format, in the DOCSIS 1.1 Operations Support System Interface (OSSI) Specification (SP-OSSIv1.1-I06-020830). For more information about all cable-related event messages that can be generated on the Cisco CMTS router, see the Cisco CMTS Error Message manual.

Examples

The following commands configure the Cisco CMTS router so that it can generate a maximum number of 30 SNMP traps and syslog messages for DOCSIS events over a 90-second period:

```
Router# configure terminal
Router(config)# cable event throttle-interval 90
Router(config)# cable event throttle-threshold 30
```

Related Commands

Command	Description
cable event priority	Configures the event reporting flags for DOCSIS event messages, which determines how the Cisco CMTS reports these events.
cable event syslog-server	Enables logging of DOCSIS event messages to a syslog server.
cable event throttle-adminStatus	Configures how the Cisco CMTS throttles the SNMP traps and syslog messages it generates for DOCSIS event messages.
cable event throttle-threshold	Sets the maximum number of SNMP traps and syslog messages that the Cisco CMTS can generate for DOCSIS event messages during the throttle interval.
snmp-server enable traps cable	Enables traps for cable-related events.
snmp-server enable traps docsis-cmts	Enables traps for DOCSIS-related MAC-layer events.

cable event throttle-threshold

To set the maximum number of SNMP traps and syslog messages that the Cisco CMTS router can generate for DOCSIS event messages during the throttle interval, use the **cable event throttle-threshold** command in global configuration mode. To restore the default number, use the **no** form of this command.

cable event throttle-threshold *number*
no cable event throttle-threshold

Syntax Description

number	Maximum allowable number of DOCSIS events for which the Cisco CMTS can generate SNMP traps and syslog messages during the throttle period. The range is from 0 to 2147483647. The default of 10.

Command Default

The default maximum is 10.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(8)BC1	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS 1.1 specifications require the CMTS to generate a set of messages for DOCSIS-specific events. In certain situations, such as a power outage that causes a mass reregistration of cable modems, this can generate such a large volume of event messages that it can impact system performance.

To avoid this possibility, use the **cable event throttle-threshold** command, together with the **cable event throttle-interval** command, to specify the maximum number of SNMP traps or syslog events that the Cisco CMTS can generate for DOCSIS events over a specific interval:

- **cable event throttle-interval**—Specifies the length of the throttle interval.
- **cable event throttle-threshold**—Specifies the maximum number of SNMP traps and syslog events that the Cisco CMTS can generate during that period.

The threshold value counts DOCSIS events, not SNMP traps or syslog messages. If a DOCSIS event generates both an SNMP trap and a syslog message, the Cisco CMTS counts it as only one event.



Note The **cable event throttle-interval** and **cable event throttle-threshold** commands do not have any effect unless the **cable event throttle-adminStatus** has been configured to allow the throttling of DOCSIS event messages.

Tip For more information about DOCSIS syslog services and event messages, see Section 4.4.2.2.2, syslog Message Format, in the DOCSIS 1.1 Operations Support System Interface (OSSI) Specification (SP-OSSIv1.1-I06-020830). For more information about all cable-related event messages that can be generated on the Cisco CMTS router, see the Cisco CMTS Error Message manual.

Examples

The following commands configure the Cisco CMTS router so that it can generate a maximum number of 25 SNMP traps and syslog messages for DOCSIS events over a two-minute period:

```
Router# configure terminal
Router(config)# cable event throttle-interval 120
Router(config)# cable event throttle-threshold 25
```

Related Commands

Command	Description
cable event priority	Configures the event reporting flags for DOCSIS event messages, which determines how the Cisco CMTS reports these events.
cable event syslog-server	Enables logging of DOCSIS event messages to a syslog server.
cable event throttle-adminStatus	Configures how the Cisco CMTS throttles the SNMP traps and syslog messages it generates for DOCSIS event messages.
cable event throttle-interval	Specifies the throttle interval, which helps control how often the Cisco CMTS generates SNMP traps and syslog messages for DOCSIS event messages.
snmp-server enable traps cable	Enables traps for cable-related events.
snmp-server enable traps docsis-cmts	Enables traps for DOCSIS-related MAC-layer events.

cable falcon-100g

To configure the falcon registers for the two falcon 100g modes, use the **cable falcon-100g** command in the cable falcon-100g configuration mode.

cable falcon-100g { **10-km-link** | **10-m-link** }

no cable falcon-100g

Syntax Description

10-km-link	Configures sup250 falcon 100g 10-km-link mode
10-m-link	Configures sup250 falcon 100g 10-m-link mode

Command Default

The default configuration is sup250 falcon 100g 10-km-link mode.

Command Modes

cable falcon-100g configuration mode (config-falcon)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was introduced.

The following example shows how to configure sup250 falcon 100g 10-km-link mode.

```
Router# configure terminal
Router(config)# cable falcon-100g 10-km-link
Router(config)# end
```

The following example shows how to configure sup250 falcon 100g 10-m-link mode.

```
Router# configure terminal
Router(config)# cable falcon-100g 10-m-link
Router(config)# end
```

The following example shows how to use the command **no cable falcon-100g**.

```
Router# configure terminal
Router(config)# no cable falcon-100g
Router(config)# end
```

cable fiber-node

To enter cable fiber-node configuration mode to configure a fiber node, use the **cable fiber-node** command in global configuration mode. To remove a fiber node configuration, use the **no** form of this command.

cable fiber-node *fiber-node-id*
no cable fiber-node *fiber-node-id*

Syntax Description

fiber-node-id	Specifies a unique numerical ID for the fiber node. The range is from 1 to 256.

Command Default

The command mode is unchanged.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.3(23)BC	This command was updated to allow an RF channel from the SPA or a Cisco uBR10-MC5X20 downstream channel can serve as a primary channel in a fiber node.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

In Cisco uBR series router, the **cable fiber-node** command allows the multiple service operator (MSO) or service provider to configure the CMTS to be more intelligent by making Cisco IOS aware of how the cable plant is wired. The downstream channels of the cable plant must be accurately configured in the CMTS fiber nodes. This allows the CMTS to accurately signal the wideband modems on which wideband channels are available to the modem.

In a cable network, a cable modem is physically connected to only one fiber node. Fiber node software configuration mirrors the physical topology of the cable network. When configuring fiber nodes with Cisco IOS CLI commands, a fiber node is a software mechanism to define the following:

- The set of downstream RF channels that will flow into the fiber node
- At least one primary downstream channel



Note In Cisco IOS Releases 12.3(21)BC and 12.3(21a)BC3, this is a traditional DOCSIS downstream channel for the fiber node. Beginning in Cisco IOS Release 12.3(23)BC, either an RF channel from the SPA or a Cisco uBR10-MC5X20 downstream channel can serve as a primary channel in a fiber node.

- The set of upstream channel ports on the cable interface line card that are connected to the fiber node and available as upstream channels

Use the **cable fiber-node** command to enter cable fiber-node configuration mode so that you can configure a fiber node.

For a wideband channel to work correctly, each fiber node must be configured as follows:

1. Use the **cable fiber-node** command to create the fiber node and to enter cable fiber-node configuration mode.
2. Use the **downstream** command to associate the fiber node with one or more primary downstream channels (traditional DOCSIS downstream channels).



Note Beginning in Cisco IOS Release 12.3(23)BC, if the primary downstream channel for this fiber node is assigned from a SPA RF downstream channel, then this command is not required.

3. Use the **upstream** command to specify the upstream channel ports for a fiber node.
4. Use the **downstream modular-cable rf-channel** command to make one or more SPA RF channels available for the fiber node.
5. Optionally, use the **description** (**cable fiber-node**) command to specify a description for the fiber node.

For each fiber node, a traditional DOCSIS downstream channel on the Cisco uBR10-MC5X20 cable interface line card is used to carry MAC management and signaling messages, and the associated traditional DOCSIS upstream channel is used for return data traffic and signaling. The traditional DOCSIS downstream channel used in this way is called the *primary downstream channel* . Beginning in Cisco IOS Release 12.3(23)BC, either an RF channel from the SPA or a Cisco uBR10-MC5X20 downstream channel can serve as a primary channel in a fiber node. If the fiber node does not have a Cisco uBR10-MC5X20 downstream channel, then make sure that at least one of the SPA RF channels specified in the **downstream modular-cable rf-channel** command is a primary-capable downstream channel.

Each wideband channel must be associated with at least one primary downstream channel and can be associated with multiple primary downstream channels. A wideband channel and its associated primary downstream channels must be belong to the same virtual bundle interface.

The maximum number of cable fiber nodes that can be configured is limited to 256 for each CMTS.

In Cisco cBR series router, for a wideband channel to work correctly, each fiber node must be configured as follows:

1. Use the **cable fiber-node** command to create the fiber node and to enter cable fiber-node configuration mode.
2. Use the **downstream integrated-cable** command to associate the fiber node with a downstream port, all the downstream channels on this port are included in the fiber node .
3. Use the **upstream upstream-cable** command to specify the a upstream port for the fiber node.

To map SG channel to the physical RF channel, use the following commands:

- **downstream sg-channel** *low high* **integrated-cable** *slot*/*subslot*/*port* **rf-channel** *low high*
- **upstream sg-channel** *low high* **upstream-controller** *slot*/*subslot*/*port* **us-channel** *low high*

Use the **service-group profile** *profile name* command to associate SG profile to a fiber-node, which will generate all the MAC domains, integrated-cable interfaces and wideband interfaces.

Examples

The following example shows how to enter configuration mode for fiber node 5.

Cisco IOS Release 12.3(21)BC

```
Router# configure terminal
```

```
Router(config)# cable fiber-node 5
Router(config-fiber-node)#
downstream Cable 6/0/0
downstream Modular-Cable 1/0/0 rf-channel 0-1
upstream cable 5/0 connector 0
```

Cisco IOS Release 12.3(23)BC

```
Router# configure terminal
Router#  cable fiber-node 5
Router(config-fiber-node)#
downstream Modular-Cable 1/0/0 rf-channel 0-3
upstream cable 5/0 connector 0
```

Cisco IOS-XE Release 3.15.0S

```
Router# configure terminal
Router(config)# cable fiber-node 5
Router(config-fiber-node)# downstream Integrated-Cable 3/0/0
```

Related Commands

Command	Description
description (cable fiber-node)	Specifies a description for a fiber node.
downstream cable	Assigns a primary downstream channel for a fiber node.
downstream modular-cable rf-channel	Specifies the RF channels that are available for wideband channels on a fiber node.
upstream cable connector	Specifies the upstream channel ports for a fiber node.

cable filter group

To create, configure, and activate a DOCSIS 1.1 filter group that filters packets on the basis of the TCP/IP and UDP/IP headers, use the **cable filter group** command in global configuration mode. To delete a filter group or to reset a particular option to its default value, use the **no** form of this command.

cable filter group *group-id* **index** *index-num* [*option option-value*]
no cable filter group *group-id* **index** *index-num* [*option option-value*]

Syntax Description

group-id	Specifies a unique group ID for this filter group. (For Cisco uBR Series Router) The range is from 1 to 254. 255 is reserved for use by the CMTS router. (For Cisco cBR Series Router) The range is from 1 to 254.
index-num	Specifies a unique index for this particular filter. The range is from 1 to 128 on a uBR7200 series router, and 1 to 255 on a uBR10012 router and cBR-8 router.
Specify one of the following options and option-values	
dest-ip *ip-address*	(Optional) Specifies the destination IP address that should be matched. The default IP address is 0.0.0.0. (IPv4 filters only)
dest-mac-addr *mac-address*	(Optional) Specifies the destination MAC address that should be matched. Cisco cBR-8 router does not have this option.
dest-mac-mask *mask*	(Optional) Specifies the mask for the destination MAC address that should be matched. Cisco cBR-8 router does not have this option.
dest-mask *mask*	(Optional) Specifies the mask for the destination address that should be matched. The *mask* is ANDed with the IP address specified by the **dest-ip** option and compared to the result of ANDing the *mask* with the packet's destination IP address. The filter considers it a match if the two values are the same. (IPv4 filters only) **Note** The default mask of 0.0.0.0 matches all IP addresses.
dest-port *port-number*	(Optional) Specifies the TCP/UDP destination port number that should be matched. The range is from 0 to 65535. The default value matches all TCP/UDP port numbers (IPv4 and IPv6 filters).
eth-proto-type *ethernet protocol type*	(Optional) Specifies the Ethernet protocol type number that should be matched. The range is from 0 to 65536. Cisco cBR-8 router does not have this option.

eth-protocol *ethernet protocol number*	(Optional) Specifies the Ethernet protocol that should be matched. The range is from 0 to 65536. Cisco cBR-8 router does not have this option.
ip-proto *proto-type*	(Optional) Specifies the IP protocol type number that should be matched. The range is from 0 to 256. The default is 256, which matches all protocols (IPv4 and IPv6 filters). Some commonly-used values are: • 1—ICMP, Internet Control Message Protocol. • 2—IGMP, Internet Group Management Protocol. • 4—IP in IP encapsulation. • 6—TCP, Transmission Control Protocol. • 17—UDP, User Datagram Protocol.
ip-tos *tos-mask tos-value*	(Optional) Specifies a type of service (TOS) mask and value to be matched (IPv4 and IPv6 filters): • *tos-mask*—8-bit value expressed in hexadecimal notation. The valid range is 0x00 through 0xFF. • *tos-value*—8-bit value expressed in hexadecimal notation. The valid range is 0x00 through 0xFF. The *tos-mask* is logically ANDed with the *tos-value* and compared to the result of ANDing the *tos-mask* with the packet's actual TOS value. The filter considers it a match if the two values are the same. **Note** The default values for both parameters matches all ToS values.
ip-version	(Optional) Specifies the IP version of the filter: • **ipv4**—Filter is an IP version 4 filter group (default). • **ipv6**—Filter is an IP version 6 filter group.
match-action {**accept** | **drop**}	(Optional) Specifies the action that should be taken for packets that match this filter (IPv4 and IPv6 filters): • **accept**—Packets that match the filter are accepted (default). • **drop**—Packets that match the filter are dropped.
range-dest-port *start-port number end-port number*	(Optional) Specifies the TCP/UDP destination port start range. The range is from 0 to 65535.
range-ip-tos *mask against TOS start value and end value*	(Optional) Specifies IP TOS byte range settings expressed in hexadecimal notation. The range is from 0x00 through 0xFF.
range-src-port *start-port number end-port number*	(Optional) Specifies TCP/UDP source port start range. The range is from 0 to 65535.

range-user-pri *low-priority value high-priority value*	(Optional) Specifies the user priority.The range for priority is from 0 to 8. The Priority field indicates the frame priority level from 0 (lowest) to 8 (highest), which prioritizes different classes of traffic (such as voice, video and data). Cisco cBR-8 router does not have this option.
src-ip *ip-address*	(Optional) Specifies the source IP address that should be matched. The default IP address is 0.0.0.0. (IPv4 filters only)
src-mac-addr *mac address*	(Optional) Specifies the source MAC address to be matched. Cisco cBR-8 router does not have this option.
src-mask *mask*	(Optional) Specifies the mask for the source address that should be matched. The *mask* is ANDed with the IP address specified by the **src-ip** option and compared to the result of ANding the *mask* with the packet's source IP address. The filter considers it a match if the two values are the same. (IPv4 filters only) **Note** The default mask of 0.0.0.0 matches all IP addresses.
src-port *port-number*	(Optional) Specifies the TCP/UDP source port number that should be matched. The range is from 0 to 65535. The default value matches all TCP/UDP port numbers (IPv4 and IPv6 filters).
status {**active** | **inactive**}	(Optional) Enables or disables the filter (IPv4 and IPv6 filters): • **active**—Enables the filter immediately (default). • **inactive** —Disables the filter immediately. **Note** You must create a filter group using at least one of the other options before you can use this command to enable or disable the filter.
tcp-flags *flags-mask flags-value*	(Optional) Specifies the TCP flag mask and value to be matched (IPv4 and IPv6 filters): • *flags-mask*—8-bit value expressed in hexadecimal notation. The valid range is 0x0 through 0x3F. • *flags-value*—8-bit value expressed in hexadecimal notation. The valid range is 0x0 through 0x3F.
v6-dest-address *ipv6-address*	(Optional) Specifies the IPv6 destination address that should be matched using the format X:X:X:X::X (IPv6 filters only).
v6-dest-pfxlen *prefix-length*	(Optional) Specifies the length of the network portion of the IPv6 destination address. The range is from 0 to 128 (IPv6 filters only).

v6-flow-label *flow-label value*	(Optional) Specifies the IPv6 flow label to be used by the source to label packets of a flow. The range is from 0 to 1048575. A flow label of zero is used to indicate packets not part of any flow.
v6-src-address *ipv6-address*	(Optional) Specifies the IPv6 source address that should be matched using the format X:X:X:X::X (IPv6 filters only).
v6-src-pfxlen *prefix-length*	(Optional) Specifies the length of the network portion of the IPv6 source address. The range is form 0 to 128 (IPv6 filters only).
vlan-id *vlan-id*	(Optional) Specifies the VLAN Identifier to be matched, which is a 12-bit field specfying the VLAN to which the packet belongs.The range is from 0 to 4094. Cisco cBR-8 router does not have this option.

Command Default

No filter groups are defined. When a filter group is created, it defaults to accepting all source and destination IP addresses and TCP/UDP ports, all protocol types, and all ToS and TCP flag values.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(6)EC1	This command was introduced on the Cisco uBR7100 series and Cisco uBR7200 series routers.
12.2(2)XF, 12.2(4)BC1	This command was supported on the Cisco uBR10012 routers.
12.2(8)BC2	The **status** option was added to allow filter groups to be activated and deactivated without removing the filter group's configuration.
12.2(33)SCA	The **v6-src-address**, **v6-dest-address**, **v6-src-pfxlen**, **v6-dest-pfxlen**, and **ip-version** keywords were added for support of IPv6 filter groups. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **dest-mac-addr**, **dest-mac-mask**, **eth-proto-type**, **eth-protocol**, **range-user-pri**, **src-mac-addr** and **vlan-id** keywords were removed.

Usage Guidelines

This command implements DOCSIS 1.1 packet filtering, as defined in the DOCS-SUBMGT-MIB . Each filter group can contain multiple filters, as defined by the different index numbers.

Note The DOCS-SUBMGT-MIB MIB is supported only on Cisco IOS Release 12.2(8)BC2 and later 12.2 BC releases. See the description of the docsSubMgtPktFilterTable table in this MIB for further information.

Note Before configuring layer 4 **src-port** and **dest-port** options, configure the IP protocol number using the **ip-proto** option. If a layer 4 IP protocol is not configured, the default value (256) is used and the filter groups configured with multiple filters will fail.

When matching the source or destination addresses, the filter ANDs the mask value with the filter's corresponding IP address. The filter then ANDs the mask with the packet's actual IP address and compares the two values. If they are the same, the filter matches the packet.

For example, if you specify a **src-ip** of 192.168.100.0 and a **src-mask** of 255.255.255.0, the filter matches all packets that have a source IP address in the range of 192.168.100.0 through 192.168.100.255. Use a mask value of 0.0.0.0 (default) to match all IP addresses. Use a mask value of 255.255.255.255 to match one specific IP address.

Similarly, when comparing TOS values, the filter ANDs the *tos-mask* parameter with the *tos-value* parameter and compares it to the result of ANDing the *tos-mask* parameter with the packet's actual TOS value. If the two values are the same, the filter matches the packet.

Note For the filter group to work for CMs, a CM must re-register after the CMTS router is configured.

Cable Subscriber Management Guidelines

Cable subscriber management is a DOCSIS 1.1 specification, whose functionality can be established using the following configuration methods:

- CMTS router configuration (via CLI)
- SNMP configuration
- DOCSIS 1.1 configuration file (TLVs 35, 36, and 37)

There are certain CMTS configuration requirements if the CM DOCSIS 1.1 configuration file is not used to activate cable subscriber management for the CPE. Specifically, if the docsSubMgtCpeActive object is not provisioned using TLVs 35, 36, and 37 in the DOCSIS 1.1 CM configuration file, then the object uses the docsSubMgtCpeActiveDefault object setting, which is false. This means that cable subscriber management functionality is disabled.

Therefore, if you do not provision TLVs 35, 36, and 37, then you must activate the functionality by specifying the **cable submgmt default active** global configuration command on the CMTS router.

Note Since TLVs 35, 36, and 37 do not apply to DOCSIS 1.0 CM configuration files, the only way to enable cable subscriber management for a DOCSIS 1.0 CM is to configure it explicitly on the CMTS router and activate it by using the **cable submgmt default active** global configuration command.

IPv6 Cable Filter Group Guidelines

Note When parallel eXpress forwarding (PXF) is configured on the Cisco ubR10012 router, either the interface ACL (**ip access-list** command) or the **cable filter group** commands can be used to filter the packets.

Consider the following restrictions and guidelines when configuring IPv6 cable filter groups:

- Chained IPv6 headers are not supported.
- If you need to support IPv4 and IPv6 filters for the same filter group, then you must use a separate index number with the same filter group ID, and configure one index as **ip-version ipv4**, and the other index as **ip-version ipv6**.

Examples

The following example shows configuration of an IPv4 filter group that drops packets with a source IP address of 10.7.7.7 and a destination IP address of 10.8.8.8, and a source port number of 2000 and a destination port number of 3000. All protocol types and ToS and TCP flag values are matched:

```
configure terminal
cable filter group 10 index 10 src-ip 10.7.7.7
cable filter group 10 index 10 src-mask 255.255.0.0
cable filter group 10 index 10 dest-ip 10.8.8.8
cable filter group 10 index 10 dest-mask 255.255.0.0
cable filter group 10 index 10 ip-proto 256
cable filter group 10 index 10 src-port 2000
cable filter group 10 index 10 dest-port 3000
cable filter group 10 index 10 tcp-flags 0 0
cable filter group 10 index 10 match-action drop
```

IPv6 Example

The following example shows the configuration of an IPv6 filter group that drops traffic from a specific IPv6 host (with source address 2001:33::20B:BFFF:FEA9:741F/128) behind a cable router to an IPv6 host on the network (with destination address 2001:1::224/128):

```
configure terminal
!
! Specify the filter group criteria using ID 254
!
cable filter group 254 index 128 v6-src-address 2001:33::20B:BFFF:FEA9:741F
cable filter group 254 index 128 v6-src-pfxlen 128
cable filter group 254 index 128 v6-dest-address 2001:1::224
cable filter group 254 index 128 v6-dest-pfxlen 128
!
! Specify that the filter group is IPv6
!
cable filter group 254 index 128 ip-version IPv6
!
! Specify the drop action for matching packets
!
cable filter group 254 index 128 match-action drop
!
! Apply the filter group with ID 254 to all CM upstream traffic
!
cable submgmt default filter-group cm upstream 254
```

Related Commands

Command	Description
show cable filter	Displays the DOCSIS 1.1 filter groups that are currently defined.

Command	Description
cable submgmt default	Sets the default values for attributes in the Subscriber Management MIB (DOCS-SUBMGT-MIB), and enables the Cisco Static CPE Override feature on the Cisco CMTS.

cable flap-list aging

To specify the number of days to keep a CM in the flap-list table before aging it out of the table, use the **cable flap-list aging** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable flap-list aging *minutes*
no cable flap-list aging

Syntax Description

minutes	Specifies how long, in minutes, that a CM remains in the flap list. The range is from 1 to 86400. The default is 10080.

Command Default

A CM is kept in the flap-list table for 10080 minutes (1 week).

Command Modes

Global configuration (config)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0(4)XA, 12.1 T, 12.1 EC	The *days* parameter was removed.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Flapping refers to the rapid disconnecting and reconnecting of a CM that is having problems holding its connection to the CMTS. A flap list is a table maintained by the Cisco CMTS for every modem (active or not) that is having communication difficulties. The flap list contains modem MAC addresses and logs the time of the most recent activity. You can configure the size and entry thresholds for the flap list.

Examples

The following example shows how to specify that the flap-list table retain 2400 minutes (40 hours) of performance for this CM:

```
Router(config)# cable flap-list aging 2400
```

Related Commands

Command	Description
cable flap-list insertion-time	Sets the insertion time interval that determines whether a CM is placed in the flap list.
cable flap-list miss-threshold	Specifies miss threshold for recording a flap-list event.

Command	Description
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a CM flap-list event.
cable flap-list size	Specifies the maximum number of CMs that can be listed in the flap-list table.
clear cable flap-list	Clears all the entries in the flap-list table.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
ping docsis	Sends a DOCSIS ping to a CM and increments the flap-list counters as appropriate.
show cable flap-list	Displays the current contents of the flap list.

cable flap-list insertion-time

To set the cable flap-list insertion time interval, use the **cable flap-list insertion-time** command in global configuration mode. To disable insertion time, use the **no** form of this command.

cable flap-list insertion-time *seconds*
no cable flap-list insertion-time

Syntax Description

seconds	Insertion time interval in seconds. The range is from 60 to 86,400. The default is 180.

Command Default

The default insertion time interval is 180 seconds (3 minutes).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1 T	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command controls the operation of a flapping modem detector. When a CM makes two or more initial Ranging Requests (also known as insertion or reinsertion requests) within the period of time defined by this command, the CM is placed in the flap list. A CM is not put into the flap list if the time between its two consecutive initial Ranging Requests is greater than the insertion time interval.

For example, if the CMTS is configured for the default insertion time of three minutes, and if the CM reinserts itself four minutes after its last insertion, the CM is not placed in the flap list. However, if the CM reinserts itself two minutes after its last insertion, the CM is placed in the flap list.

Also, a CM is put into the flap list only once for each insertion time interval, even if the CM reinserts itself multiple times. For example, if the CMTS is set for the default insertion time interval of 3 minutes, and the CM reinserts itself three times within that period, the flap list shows that the CM has flapped once. If the CM reinserts itself three times within the first 3 minute period and three more times within the next 3 minute period, the flap list shows that the CM has flapped twice.

Examples

The following example shows how to set the insertion time interval to 62 seconds:

```
Router(config)# cable flap-list insertion-time 62
```

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a CM in the flap-list table before aging it out of the table.
cable flap-list miss-threshold	Specifies miss threshold for recording a flap-list event.
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a CM flap-list event.
cable flap-list size	Specifies the maximum number of CMs that can be listed in the flap-list table.
clear cable flap-list	Clears all the entries in the flap-list table.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
ping docsis	Sends a DOCSIS ping to a CM and increments the flap-list counters as appropriate.
show cable flap-list	Displays the current contents of the flap list.

cable flap-list miss-threshold

To set the miss threshold for recording a flap-list event, use the **cable flap-list miss-threshold** command in global configuration mode. To disable this function, use the **no** form of this command.

cable flap-list miss-threshold *misses*
no cable flap-list miss-threshold

Syntax Description

misses	Specifies the number of consecutive MAC-layer keepalive (Station Maintenance) that can be missed before a CM is placed in the flap list. The range is from 1 to 12. The default is 6.

Command Default

The default number of station maintenance messages that can be missed is 6.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1 T	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

In a DOCSIS network, the CMTS regularly sends out MAC-layer keepalive messages, known as station maintenance messages, to each CM that is online. If a CM does not respond to a station maintenance message, the CMTS repeats sending these messages either until the CM responds or the CMTS reaches the maximum allowable number of messages that can be sent.

The **cable flap-list miss-threshold** command specifies how many consecutive station maintenance messages can be missed before the cable modem is placed in the flap list. A miss occurs when a CM does not reply to a station maintenance message.



Note Station maintenance messages are occasionally lost due to noise or congestion in a typical DOCSIS network, with a loss rate of approximately 8 percent considered nominal. A higher miss rate can indicate RF plant problems, such as intermittent upstream problems, fiber laser clipping, or common-path distortion.

Examples

The following example shows how to set the miss threshold to 5:

```
Router(config)# cable flap-list miss-threshold 5
```

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a CM in the flap-list table before aging it out of the table.
cable flap-list insertion-time	Sets the insertion time interval that determines whether a CM is placed in the flap list.
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a CM flap-list event.
cable flap-list size	Specifies the maximum number of CMs that can be listed in the flap-list table.
clear cable flap-list	Clears all the entries in the flap-list table.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
ping docsis	Sends a DOCSIS ping to a CM and increments the flap-list counters as appropriate.
show cable flap-list	Displays the current contents of the flap list.

cable flap-list power-adjust threshold

To specify the power-adjust threshold for recording a flap-list event, use the **cable flap-list power-adjust threshold** command in global configuration mode. To disable power-adjust thresholds, use the **no** form of this command.

cable flap-list power-adjust threshold *dB*
no cable flap-list power-adjust threshold

Syntax Description

dB	Specifies the minimum power adjustment, in decibels, that results in a flap-list event. The range is from 1 to 10.

Command Default

The default minimum power adjustment threshold is 2 dB.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1 T	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command controls the operation of a flapping modem detector. When the power adjustment of a CM exceeds the configured threshold value, the modem is placed in the flap list.

Note A power adjustment threshold of less than 2 dB might cause excessive flap-list event recording. Cisco recommends setting this threshold value to 3 dB or higher.

Note For underground HFC networks with 4 amplifier cascade length, a typical threshold value should be 3 dB. For overhead HFC networks with 4 amplifier cascade length, a typical threshold value should be 4 dB. Longer coaxial cascades without return path thermal gain control and sites with extreme daily temperatures will have larger threshold ranges.

Examples

The following example shows the power-adjust threshold being set to 5 dB:

```
Router(config)# cable flap-list power-adjust threshold 5
```

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a CM in the flap-list table before aging it out of the table.
cable flap-list insertion-time	Sets the insertion time interval that determines whether a CM is placed in the flap list.
cable flap-list miss-threshold	Specifies miss threshold for recording a flap-list event.
cable flap-list size	Specifies the maximum number of CMs that can be listed in the flap-list table.
clear cable flap-list	Clears all the entries in the flap-list table.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
ping docsis	Sends a DOCSIS ping to a CM and increments the flap-list counters as appropriate.
show cable flap-list	Displays the current contents of the flap list.

cable flap-list size

To specify the maximum number of CMs that can be displayed from the flap-list table, use the **cable flap-list size** command in global configuration mode. To reset it to the default flap-list table size, use the **no** form of this command.

cable flap-list size *number*
no cable flap-list size

Syntax Description

number	Maximum number of CMs to be displayed. The range is from 1 to 8191 depending on the type of line cards. The default is 100.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1 T	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

- The flap-list size is determined by the architecture of the CMTS and the cable line cards. Previously, the cable flap-list tables were stored on the Route Processors and Performance Routing Engine (PRE) modules.
- The legacy non-distributed cable line cards, Cisco uBR-MC16C/MC16E/MC16S line card and Cisco uBR-MC28C/MC28E line card did not store the flap-list tables in the line cards.
- The distributed line cards are designed such that they store the flap-list tables on the line cards. For a CMTS using distributed line cards, the flap-list size is the maximum size per line card.
- The distributed line cards supported on a Cisco uBR7200 router are Cisco uBR-MC28U/X and Cisco uBR-16U/16X.
- The distributed line cards supported on a Cisco uBR10012 router are Cisco uBR10-MC5X20S/U/H.
- You can calculate the flap list sizes using the following formulas:
  - For a Cisco uBR10012 router without line card high availability (LC-HA)—8191 * (Number of cable line cards)
  - For a Cisco uBR10012 router with line card high availability (LC-HA)—8191 * (Number of cable line cards - 1)
  - For a Cisco uBR72VXR router using legacy and distributed line cards—8191 * (1 + Number of distributed cable line cards)
- The flap-list tables sizes are as follows:
  - A fully loaded Cisco uBR10012 router

  With distributed line cards and no LC-HA configured—8191 * 8 = 65528 CMs.

  With distributed line cards and LC-HA configured—8191 * (8-1) = 57337 CMs.

Note: Legacy line cards behave as the distributed line cards on a Cisco uBR10012 router. Thus, the flap-list sizes are same as for distributed line cards.

- A fully loaded Cisco uBR7246VXR router

  With distributed line cards— 8191 * 6 = 49146 CMs.

  With legacy line cards—8191 * (1+0) = 8191 CMs.

  With legacy and distributed line cards— 8191 * (1 + no of the distributed line cards) CMs.

Examples

The following example shows how to display a maximum of 200 flap-list entries per downstream:

```
Router# configure terminal
Router(config)# cable flap-list size 200
Router(config)#
```

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a CM in the flap-list table before aging it out of the table.
cable flap-list insertion-time	Sets the insertion time interval that determines whether a CM is placed in the flap list.
cable flap-list miss-threshold	Specifies miss threshold for recording a flap-list event.
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a CM flap-list event.
clear cable flap-list	Clears all the entries in the flap-list table.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
ping docsis	Sends a DOCSIS ping to a CM and increments the flap-list counters as appropriate.
show cable flap-list	Displays the current contents of the flap list.

cable freq-range

To configure the Cisco CMTS router for the range of frequencies that are acceptable on upstreams, use the **cable freq-range** command in global configuration mode. To restore the default value (which is based on the cable interface and on the Annex A/B configuration), use the **no** form of this command.

cable freq-range [**european** | **japanese** | **north-american**]
no cable freq-range

Syntax Description

european	Configures the Cisco CMTS router to accept upstream frequency ranges that conform with the EuroDOCSIS specifications (5 MHz to 65 MHz).
japanese	Configures the Cisco CMTS router to accept upstream frequency ranges that conform to the extended range used in Japan (5 MHz to 55 MHz).
north-american	Configures the Cisco CMTS router to accept upstream frequency ranges that conform to the DOCSIS specifications (5 MHz to 42 MHz).

Command Default

no cable freq-range, which defaults to a frequency range based on the Annex configuration:

- Annex A = **european** (EuroDOCSIS, 5 MHz to 65 MHz)—Supported only on cable interfaces that support EuroDOCSIS
- Annex B = **north-american** (DOCSIS, 5 MHz to 55 MHz)—All cable interfaces support the 5 MHz to 42 MHz range. The 42 MHz to 55 MHz range is supported only on certain cable interfaces.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

In Cisco IOS Release 12.2(15)BC2 and later, the Cisco CMTS router supports three different modes of operation, depending on the cable interface line cards being used. The range of frequencies that are allowed in each mode are as follows:

- North American DOCSIS (Annex B)—Upstreams use frequencies between 5 MHz and 42 MHz. This range is supported by all cable interface line cards.
- European EuroDOCSIS (Annex A)—Upstreams use frequencies between 5 MHz and 65 MHz.
- Japanese Extended Range (Annex B)—Upstreams use frequencies between 5 MHz and 55 MHz.

Note The frequency range specified in this command does not apply to upstreams of the Cisco uBR-MC3GX60V cable interface line cards. To specify the upstream frequency for the Cisco uBR-MC3GX60V cable interface line card, use the **cable upstream frequency** command.

To configure the router so that it supports the proper range of upstream frequencies, use the **upstream freq-range** command. After you have configured the router with the **cable freq-range** command, the **cable upstream frequency** and **cable spectrum-group (interface configuration)** commands then accept only frequencies that are in the configured range.

Typically, the **upstream freq-range** command is not needed because the default behavior covers the most common configurations. However, this command can be used in the following situations:

- This command is required to enable EuroDOCSIS operations on the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cards.
- This command is never needed for the Cisco uBR-MC5X20U card nor for EuroDOCSIS cable interfaces (Cisco uBR-MC16E card, and the Cisco uBR7111E and Cisco uBR7114E routers), because these interfaces default to the EuroDOCSIS range of frequencies. However, if you have previously used this command to restrict the allowable range of frequencies, you must use the **european** option to re-enable the EuroDOCSIS range of frequencies.
- The **north-american** option is usually not needed, because this is the default mode of operations for all DOCSIS cable interfaces. However, this option can be useful on the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cards when noise exists on the frequencies above 42 MHz. In this situation, using the **north-american** option filters out the higher frequencies and reduces the impact of that noise.
- Similarly, the **japanese** option is not needed on those cable interface cards that support it, because this is the default configuration on those cards. However, if you have previously used the **north-american** option on an interface, you need to use the **japanese** option to re-enable the extended frequency range.
- Even when the **upstream freq-range** command is not needed to enable a frequency range, using it ensures that the **cable upstream frequency** and **cable spectrum-group** commands allow only frequencies that are within the desired range. This can help operators from assigning invalid frequencies to upstreams.

Tip If one or more cable interface line cards that are installed in the chassis do not support the frequency range that you select with this command, the command displays an informational warning message for each of those cable interface cards. Also, you cannot configure the router for a particular frequency range if an upstream or spectrum group on the router is currently configured for a frequency that is invalid for the new range. If you try to do so, the command is ignored and a warning message is printed prompting you to reconfigure the upstream or spectrum group before retrying the command.

Note This command configures only the range of frequencies that can be configured on an upstream. It does not configure the upstreams for the DOCSIS (Annex B) or EuroDOCSIS (Annex A) modes of operation, which is done using the **cable downstream annex** interface command. (Annex C mode is not supported.) You must configure the downstream for Annex A for EuroDOCSIS operations and Annex B for DOCSIS operations. You can configure certain cable interface cards (such as the Cisco uBR-MC28U) for both the DOCSIS Annex B mode and the EuroDOCSIS frequency range, but this violates the DOCSIS specifications and should not be used on standard DOCSIS networks.

The allowable range for the upstream channel frequency depends on the cable interface line card and Cisco IOS software release being used. See Table below for the currently supported values.

Table 5: Allowable Frequency Range for Cable Interface Line Cards

Frequency Range	Supported Cable Interfaces	Minimum Cisco IOS Releases
5 to 42 MHz	All cable interfaces	All releases supported for the Cisco CMTS
5 to 55 MHz	Cisco uBR-MC16E, Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, Cisco uBR-MC5X20U	Cisco IOS Release 12.2(15)BC2
5 to 65 MHz	Cisco uBR-MC16E, Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, Cisco uBR-MC5X20U, Cisco uBR7111E and Cisco uBR7114E routers	Cisco IOS Release 12.0(13)SC and 12.1(4)EC for Cisco uBR-MC16E Cisco IOS Release 12.1(5)EC1 for Cisco uBR711E and Cisco uBR7114E Cisco IOS Release 12.2(15)BC2 for Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR-MC5X20U

Note The **cable freq-range** command fails if any upstreams or spectrum groups on the router are currently configured for a frequency that is outside the new range being selected. You must reconfigure those upstreams or spectrum groups, using the **cable upstream frequency** or **cable spectrum-group** commands, for lower frequencies, and then repeat the **cable freq-range** command.

Examples

The following example shows how to configure the Cisco CMTS router to support the EuroDOCSIS upstream frequency range of 5 MHz to 65 MHz. The router then displays a list of the cable interface line cards, if any, that do not support this range. After giving this command, the **cable upstream frequency** command shows the valid range of upstream frequencies as being the EuroDOCSIS range:

```
Router# configure terminal

Router(config)# cable freq-range european

Interface Cable3/0 does not support European frequency range
Interface Cable3/1 does not support European frequency range
Interface Cable5/0 does not support European frequency range
Interface Cable5/1 does not support European frequency range
Router(config)# interface cable 6/0
 ! This cable interface supports EuroDOCSIS
Router(config-if)# cable upstream 0 frequency ?

  <5000000-65000000>  Return Frequency in HZ
Router(config-if)#
```

The following example shows how to configure the Cisco CMTS router to support the extended Japanese upstream frequency range of 5 MHz to 55 MHz. The router then displays a list of the cable interface line cards, if any, that do not support this range. After giving this command, the **cable upstream frequency** command shows the valid range of upstream frequencies as being the extended frequency range for Japanese networks:

```
Router# configure terminal

Router(config)# cable freq-range japanese

Interface Cable3/0 does not support Japanese frequency  range
Interface Cable4/0 does not support Japanese frequency  range
Interface Cable5/0 does not support Japanese frequency  range
Router(config)# interface cable 6/0
 ! This cable interface supports the Japanese range
Router(config-if)# cable upstream 0 frequency ?

  <5000000-55000000>  Return Frequency in HZ
```

The following example shows how to configure the Cisco CMTS router for its default configuration (DOCSIS upstream frequency range of 5 MHz to 42 MHz). (No warning messages are displayed with this configuration because all cable interface line cards support the basic DOCSIS frequency range.) After giving this command, the **cable upstream frequency** command shows the valid range of upstream frequencies as being the DOCSIS range:

```
Router# configure terminal

Router(config)# cable freq-range north-american

Router(config)# interface cable 3/0

Router(config-if)# cable upstream 0 frequency ?

  <5000000-42000000>  Return Frequency in HZ
```

The following example shows all of the commands that are needed to configure the cable interface and upstream on a Cisco uBR-MC28U/X cable interface line card to support a frequency in the EuroDOCSIS upstream frequency range of 5 MHz to 65 MHz:

```
Router# configure terminal

Router(config)# cable freq-range european

Router(config)# interface 3/0

Router(config-if)# cable downstream annex a

Router(config-if)# cable upstream 0 frequency 62500000
```

The following example shows the **cable freq-range** command failing because an upstream is configured for a frequency that is invalid for the new range. The upstream must be reconfigured before the **cable freq-range** command can be given successfully.

```
Router# configure terminal

Router(config)# cable freq-range japanese

%%Interface Cable 3/0/U0 has invalid frequency (62500000 Hz) for specified range
%%Set upstream frequencies within range prior to changing freq-range
Router(config)# interface 3/0

Router(config-if)# cable upstream 0 frequency 38600000

Router(config-if)# exit
```

```
Router(config)# cable freq-range japanese
```

Related Commands

Command	Description
cable downstream annex	Sets the Motion Picture Experts Group (MPEG) framing format for a downstream port on a cable interface line card.
cable upstream frequency	Configures a fixed frequency of the upstream radio frequency (RF) carrier for an upstream port.

cable frequency-exclusion-band

To exclude a frequency band from TaFDM, use the **cable frequency-exclusion-band** command in the configuration mode.

cable frequency-exclusion-band

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS XE Fuji 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If you want the SC-QAM to exclusively use a specific frequency range, configure Cisco cBR to exclude the band using the **cable frequency-exclusion-band** command.

The following example shows how to excule a frequency range:

```
controller Upstream-Cable slot/subslot/port
 cable frequency-exclusion-band 18700000 22100000
```

cable helper-address

To specify a destination IP address for User Datagram Protocol (UDP) broadcast Dynamic Host Configuration Protocol (DHCP) packets, use the **cable helper-address** command in cable interface or subinterface configuration mode. To disable this feature, use the **no** form of this command.

cable helper-address *IP-address* [**cable-modem** | **host** | **mta** | **stb** | **profile** *name*]
no cable helper-address *IP-address* [**cable-modem** | **host** | **mta** | **stb** | **profile** *name*]

Syntax Description

IP-address	The IP address of a DHCP server to which UDP broadcast packets will be sent.
cable-modem	(Optional) Specifies that only CM UDP broadcasts are forwarded.
host	(Optional) Specifies that only host UDP broadcasts are forwarded.
mta	(Optional) Specifies that only media terminal adapter (MTA) UDP broadcasts are forwarded.
stb	(Optional) Specifies that only set-top box (STB) UDP broadcasts are forwarded.
profile *name*	(Optional) Specifies that only UDP broadcasts with specific DHCP profile are forwarded.

Command Default

If no options are specified, both CM and host UDP broadcasts are forwarded.

Command Modes

Interface configuration—cable interface only (config-if)

Subinterface configuration—cable interface only (config-subif)

Command History

Release	Modification
12.1 T	This command was introduced.
12.1(3a)EC	This command was modified to add the subinterface support.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.3(33)SCB and the **mta** and **stb** keywords were added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.8.1	This command was modified to add the **profile** keyword.

Usage Guidelines

This command enables CMs and their attached CPE devices (hosts) to use separate DHCP servers, so that CMs and hosts receive their IP addresses from separate address pools. The **cable-modem** keyword specifies that only UDP DHCP broadcasts from CMs are forwarded to that particular destination IP address. The **host** keyword specifies that only UDP broadcasts from hosts (CPE devices) are forwarded to that particular destination IP address.

Note You must specify both the **cable-modem** or **host** options in separate commands, using separate IP addresses, if you decide to use them. If you specify only one option, then the other type of device (cable modem or host) will not be able to connect with a DHCP server. In addition, if you use the **cable-modem** or **host** option with the same IP address that was previously configured with this command, the new configuration overwrites the old configuration.

Note Starting with Cisco IOS Release 12.2(33)SCG, if you use the **cable-modem** or **host** option with the same IP address that was previously configured with this command on the Cisco uBR10012 and Cisco uBR7200 series routers, the new configuration does not overwrite the old configuration. It is configured under a bundle interface.

Tip If you configure different helper addresses on different sub-bundles within a bundle, the cable modem may not come online. We recommend that you use the same helper address on all sub-bundles within a bundle.

The **cable helper-address** command is similar to the **ip helper-address** command, but the **cable helper-address** command has been enhanced for cable interfaces and DOCSIS networks to allow separate helper addresses for CMs and hosts. Use only the **cable helper-address** command on cable interfaces, and use the **ip helper-address** command on all non-cable interfaces.

The **cable helper-address** command, as is the case with the **ip helper-address** command, cannot be used on subordinate interfaces, so these commands are automatically removed from an interface configuration when the interface is configured as a subordinate interface. Subordinate interfaces use the IP configuration of the primary interface, which includes not only the IP address for the interface itself, but also the helper addresses that have been configured on the primary interface.

Tip You can repeat this command to specify any number of helper addresses, but the Cisco IOS software uses only the first 16 valid addresses that are configured on each interface (using either the **cable helper-address** command or the **ip helper-address** command) when forwarding DHCP requests.

Examples

The following example shows how to forward UDP broadcasts from both CMs and CPE devices to the DHCP server at 172.23.66.44:

```
Router(config)# interface cable 1/0
Router(config-if)# cable helper-address 172.23.66.44
Router(config-if)# exit
Router(config)#
```

The following example shows how to forward UDP broadcasts from CMs and CPE devices to separate DHCP servers:

```
Router(config)# interface cable 6/0
Router(config-if)# cable helper-address 172.23.66.143 host
Router(config-if)# cable helper-address 172.23.66.144 cable-modem
```

```
Router(config-if)# exit
Router(config)#
```

The following example shows that when you specify the **cable-modem** and **host** options with the same IP address, the second command overwrites the first one:

```
Router(config)# interface cable 3/0
Router(config-if)# cable helper-address 10.10.10.13 host
Router(config-if)# cable helper-address 10.10.10.13 cable-modem
Router(config-if)# exit
Router(config)# exit

Router# show running-config | include helper-address
 cable helper-address 10.10.10.13 cable-modem
Router#
```

The following example shows that when you specify the **cable-modem** and **host** options with the same IP address on a Cisco uBR10012 router running Cisco IOS Release 12.2(33)SCG and later, it is configured under a bundle interface:

```
Router(config)# interface cable 3/0
Router(config-if)# cable helper-address 10.10.10.13 host
Router(config-if)# cable helper-address 10.10.10.13 cable-modem
Router(config-if)# end
Router# show running-config | include helper-address
cable helper-address 10.10.10.13 cable-modem
cable helper-address 10.10.10.13 host
Router#
```

The following example shows how to specify that only UDP broadcasts with specific DHCP profile are forwarded on Cisco cBR-8 router.

```
Router(config)# interface bundle 2
Router(config-if)# cable helper-address 2.2.2.2 profile DEVICE1
```

Related Commands

Command	Description
cable dhcp-giaddr	Modifies the GIADDR field of DHCPDISCOVER and DHCPREQUEST packets with a Relay IP address before they are forwarded to the DHCP server.
cable relay-agent-option	Enables the system to insert the CM MAC address into a DHCP packet received from a CM or host and forward the packet to a DHCP server.
cable source-verify	Turns on CM upstream verification.
cable telco-return spd dhcp-authenticate	Enforces the telco-return CM to use a specific Dynamic Host Configuration Protocol (DHCP) server.
cable telco-return spd dhcp-server	Identifies the IP address of the Dynamic Host Configuration Protocol (DHCP) server that the telco-return CM must access.
ip dhcp relay information option	Enables the system to insert the CM MAC address into a DHCP packet received from a CM or host and forward the packet to a DHCP server.

Command	Description
ip dhcp smart-relay	Monitors client retransmissions when address pool depletion occurs.

cable host access-group

To configure the access list for a customer premises equipment (CPE) device or host on the Cisco CMTS router, use the **cable host** command in privileged EXEC mode. To remove an access list, use this command with the **no access-group** option.

cable host {*ip-addressmac-address*} **access-group** {*access-listaccess-name*}
cable host {*ip-addressmac-address*} **no access-group**

Syntax Description

ip-address	IP address of the CPE device or host.
mac-address	MAC address of the CPE device or host.
access-group	Enables **access-group** options. The **no** form removes access-group specifications.
{*access-list* | *access-name*}	Specifies the IP access list (standard or extended), either by access-list number (1 to 199) or by access-list name.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.2(4)BC1	The functionality of this command was made identical to that of the **cable modem access-group** command, but both commands were retained for backwards compatibility.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For the **vrf** keyword of this command, only the *ip-address* option is supported.

An access list can be configured to deny access to any IP address other than the ones previously configured, using the **access-list** *access-list* **deny any any** command. Starting with Cisco IOS Release 12.2(33)SCD, when a CM is added to such an access list on the Cisco uBR10012 and Cisco uBR7200 series universal broadband routers, the ping fails. If the CM is reset, removed, or powered off, the ping succeeds after the CM comes online. However, the **show cable modem access-group** command displays that the CM does not belong to the access-group.

Note The **cable host** command, and its SNMP equivalent, cdxCmCpeAccessGroup, are not supported on the Cisco uBR10012 universal broadband router. On this router, use the standard DOCSIS MIB, DOCS-SUBMGT-MIB, instead.

Tip This command is equivalent to configuring cdxCmCpeAccessGroup in CISCO-DOCS-EXT-MIB.

Examples

The following example shows how to assign access list number 2 to the cable host with an IP address of 10.1.1.1:

```
Router# cable host 10.1.1.1 access-group 2
```

Related Commands

Command	Description
clear cable host	Clears the host from the internal address tables of the Cisco CMTS router.
cable device	Configures an access list for a CM device or host on the Cisco CMTS router.
cable modem access-group	Configures the access-group for a CM on the Cisco CMTS router.
show cable device access-group	Display the CMs and the hosts behind the CMs on the network on the Cisco CMTS router.
show cable host access-group	Displays the hosts behind the CMs on the network on the Cisco CMTS router.

cable high-priority-call-window

To set the call window (in minutes) during which the Cisco CMTS router maintains records of Emergency 911 calls, use the **cable high-priority-call-window** command in global configuration mode. To remove the call window configuration from the Cisco CMTS router, use the **no** form of this command:

cable high-priority-call-window *minutes*
no cable high-priority-call-window

Syntax Description

window	This value defines the length of time, in minutes, for which E911 Call History is to be maintained.

Command Default

This command and the PacketCable Emergency 911 Services Listing and History feature is disabled by default on the Cisco CMTS.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced supporting PacketCable Emergency 911 Services Listing and History on the Cisco CMTS: • Cisco uBR7246VXR router • Cisco uBR10012 router
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The following command example configures the call window on the Cisco uBR10012 router to be 1 minute in length:

```
Router(config)# cable high-priority-call-window 1
```

To observe Emergency 911 calls made within the configured window, use the **show cable calls** command in privileged EXEC mode:

The following command example illustrates that one Emergency 911 call was made on the Cable8/1/1 interface on the Cisco uBR10012 router during the window set for high priority calls:

```
Router# show cable calls
Interface   ActiveHiPriCalls  ActiveAllCalls  PostHiPriCallCMs  RecentHiPriCMs
Cable5/0/0  0                 0               0                 0
Cable5/0/1  0                 0               0                 0
Cable5/1/0  0                 0               0                 0
Cable5/1/1  0                 0               0                 0
Cable5/1/2  0                 0               0                 0
Cable5/1/3  0                 0               0                 0
Cable5/1/4  0                 0               0                 0
Cable6/0/0  0                 0               0                 0
```

```
Cable6/0/1  0                0                0                0
Cable7/0/0  0                0                0                0
Cable7/0/1  0                0                0                0
Cable8/1/0  0                0                0                0
Cable8/1/1  1                1                0                0
Cable8/1/2  0                0                0                0
Cable8/1/3  0                0                0                0
Cable8/1/4  0                0                0                0
Total       1                1                0                0
```

The following command example configures the call window on the Cisco cBR Series Converged Broadband Routers to be 2 minutes in length:

```
Router(config)# cable high-priority-call-window 2
```

Related Commands

Command	Description
show cable calls	Displays voice call history information and status for the PacketCable Emergency 911 Services Listing and History feature.
show cable modem calls	Displays voice call information for a particular cable modem.

cable igmp static-group

To configure cable per-physical-downstream static multicast support on the Cisco CMTS router, use the **cable igmp static-group** command in interface configuration mode.

cable igmp static-group *multicast-group-ip* [**source** *source-ip*] [*subinterface*]

Syntax Description

multicast-group-ip	IP address of the multicast group.
source *source-ip*	(Optional) Source IP address for SSM.
subinterface	(Optional) Subinterface number: • default: 0 for the main interface **Note** If the subinterface is configured at the virtual bundle interface, the subinterface number option for this CLI must be configured to match up with the desired subinterface devices.

Command Default

Cable per-physical-downstream static multicast support is not defined by default.

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.

Usage Guidelines

The Cable per-physical-downstream Static Multicast Support feature introduces the concept of a physical IGMP static group, which is an extension of the existing logical IGMP static group. The differences between the two IGMP static groups are:

- A cable bundle logical IGMP static group creates the IGMP static group for the logical IP domain and forwards multicast traffics for the configured multicast group to every subordinate interface in the same bundle.
- A cable bundle physical IGMP static group creates the IGMP static group on per-physical subordinate interface basis and will only forwards multicast traffics to only configured subordinate interfaces.

When an IGMP static group is configured on a primary interface, the IGMP static group will perform a check for each subordinate interface in the multicast group. If the multicast group is configured as a physical static group, then only the corresponding subordinate interfaces will be added to the cable bundle forwarding table. If the multicast group is configured as a logical static group, then all subordinate interfaces will be added to the cable bundle forwarding table.

Note When all remaining physical static groups are un-configured from the subordinate interface for a particular multicast group on a particular bundle, the Cisco CMTS router will revert back to the logical static group for that multicast group on that bundle.

The **cable igmp static-group** command will only appear in the output of the **show running-configuration** command if it is configured via the CLI. If it is configured by DSG, the **cable igmp static-group** command CLI will remain hidden for a particular multicast group. This is done in order to eliminate any confusion with the current DSG configurations.

Note Any multicast group being used by DSG (or CLI) within the same CMTS, should not be used for CLI (or DSG) configuration.

Examples

The following example shows the **cable igmp static-group** command on the Cisco CMTS router:

```
Router(config-if)# cable igmp static-group 230.1.1.1
```

The following example shows the **cable igmp static-group** command with the **source** option on the Cisco CMTS router:

```
Router(config-if)# cable igmp static-group 232.1.1.1 source 10.1.1.1
```

Related Commands

Command	Description
ip igmp static-group	Configure static group membership entries on an interface.

cable init-channel-timeout

To specify the maximum time that a CM can spend performing initial ranging on the upstream channels described in the Registration Response (REG-RSP) and Multipart Registration Response (REG-RSP-MP) messages, use the **cable init-channel-timeout** command in cable interface configuration mode. To disable this configuration, use the **no** form of this command.

cable init-channel-timeout *value*
no cable init-channel-timeout *value*

Syntax Description

value	Channel timeout value in seconds. The range is from 10 to 180. The default is 60.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to specify the channel timeout value on a cable interface at slot/subslot/port 5/1/0 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 5/1/0
Router(config-if)# cable init-channel-timeout 90
```

The following example shows how to specify the channel timeout value on a cable interface at slot/subslot/port 3/0/0 on a Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# interface cable 3/0/0
Router(config-if)# cable init-channel-timeout 90
```

cable insertion-interval

To configure the interval between consecutive initial ranging slots on an upstream, use the **cable insertion-interval** interface configuration command. To configure the automatic setting and ignore any minimum or maximum time settings, use the **no** form of this command.

cable insertion-interval {**fixed-intrvl** | **automatic** [*min-intrvl*] [*max-intrvl*]}
no cable insertion-interval

Syntax Description

fixed-intrvl	Fixed interval between initial ranging slots in milliseconds. The range is from 100 to 2000.
automatic	Causes the Cisco CMTS MAC scheduler for each upstream CM to vary the initial ranging times available to new CMs joining the network.
min-intrvl	(Optional) Minimum value in milliseconds between the initial ranging slots on the upstream. The range is from 20 to 120. The default is 60.
max-intrvl	(Optional) Maximum value in milliseconds between the initial ranging slots on the upstream. The range is from 240 to 1800. The default is 480.

Command Default

Automatic (dynamically varying the frequency of initial ranging upstream slots between 60 milliseconds and 480 milliseconds).

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
11.NA	This command was introduced.
12.1 T	This command was modified.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the minimum and maximum duration between initial ranging opportunities that appear in MAP messages sent by the Cisco CMTS router. MAP messages define the precise time intervals during which CMs can send.

The default insertion interval setting (**automatic**) configures the Cisco CMTS router to optimize the initial ranging times available to new CMs that attempt to join the network. The optimization algorithm automatically varies the initial ranging times between 60 and 480 milliseconds, depending on the number of CMs attempting to come online.

Use the **cable insertion-interval automatic** command to bring a large number of CMs online quickly (for example, after a major power failure). After the CMs have come online, you can override the **automatic** keyword by giving this command again and specifying a specific insertion interval.

Examples

The following example shows the default configuration, which is to specify automatic insertion intervals, using the default initial ranging intervals:

```
Router# configure terminal
Router(config)# interface cable 3/0
Router(config-if)# cable insertion-interval automatic
```

The following example shows how to set the minimum insertion interval to 100 ms:

```
Router# configure terminal
Router(config)# interface cable 5/1/0
Router(config-if)# cable insertion-interval 100
```

Related Commands

Command	Description
cable upstream data-backoff	Specifies automatic or fixed start and stop values for data backoff.
cable upstream range-backoff	Specifies automatic or configured initial ranging backoff calculation.

cable intercept

To allow the Cisco CMTS router to forward all traffic to and from a particular CPE to a data collector located at particular User Datagram Protocol (UDP) port, use the **cable intercept** command in cable interface configuration mode. To deactivate this function, use the **no** form of this command.

cable intercept *mac-address ip-address udp-port*
no cable intercept *mac-address*

Syntax Description

mac-address	Specifies the MAC address to be intercepted. For Cisco uBR10012 router, a maximum of 4095 MAC addresses can be configured. For Cisco uBR7200 series router, a maximum of 10 MAC addresses per interface can be configured.
ip-address	Specifies the IP address for the destination data collector.
udp-port	Specifies the destination UDP port number for the intercept stream at the data collector. The range is from 0 to 65535.

Command Default

Disabled

Command Modes

Interface configuration—cable interface only (config-if)

Starting from Cisco IOS Release 12.2(33)SCC,
Interface configuration—bundle interface only (config-if)

Command History

Release	Modification
12.0(5)T1	This command was introduced.
12.0(6)SC	This command was introduced on the 12.0 SC train.
12.1(2)EC	This command was introduced on 12.1 EC train.
12.1(11b)EC	Support was added to allow the data collector to be more than two hops from the Cisco CMTS router.
12.2(4)BC1	This command was integrated into Cisco IOS Release 12.2(4)BC1.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC	This command was modified. The command is now configured under bundle interface.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

When this command is activated, the Cisco CMTS router examines each packet for the desired MAC address; when a matching MAC address is found (for either the origination or destination endpoint), a copy of the

packet is encapsulated into a UDP packet, which is then sent to the specified server at the given IP address and port.

Note The data collecting system at the *ip-address* on the *udp-port* must be configured to listen for and capture the necessary data stream. An IP route to the specified IP address must exist, and IP connectivity to that device must be present for the traffic to be captured. Before Cisco IOS Release 12.1(11b)EC, the data collecting system must be within two routing hops of the Cisco CMTS.

For Cisco uBR10012 router, a maximum of 4095 MAC intercepts can be configured. This includes the MAC intercepts configured using the **cable intercept** command, and other lawful intercept features (such as Service Independent Intercept [SII]). The bandwidth used by each MAC intercept is also a deciding factor for the number of MAC intercepts that can be configured. High bandwidth usage by a MAC intercept might reduce the number of MAC intercepts that can be configured.

This command is originally designed to comply with the United States Federal Communications Assistance for Law Enforcement Act (CALEA) and other law enforcement wiretap requirements for voice communications. For additional information, see the *PacketCable Electronic Surveillance Specification* , which is available at the following URL at the PacketCable web site: http://www.packetcable.com.

Note For lawful intercept, it is recommended to use SII (through SNMPv3) instead of the **cable intercept** command.

Note Starting from Cisco IOS Release 12.2(33)SCC, the **cable intercept** command is configured under bundle interface.

Starting from Cisco IOS Release 12.2(33)SCH, the cable intercept command is not allowed to configure in Cable Interface, both in Cisco uBR7200 series and Cisco uBR10012 routers.

Examples

The following commands specify that a copy of all traffic for the CPE with the MAC address of 0080.fcaa.aabb should be forwarded to the data collector that is listening at UDP port 512 at the IP address of 10.12.13.8. The **show interface cable intercept** command displays which intercepts are currently active.

```
Router# configure terminal

Router#(config) interface cable 6/0

Router(config-if)# cable intercept 0080.fcaa.aabb 10.12.13.8 512
Router(config-if)# exit

Router(config)# exit

Router# show interface cable 6/0 intercept

                Destination   Destination
MAC Address     IP Address    UDP Port
0080.fcaa.aabb  3.12.13.8      512
```

The following example shows the behavior of the **cable intercept** command that is configured under bundle interface. The **show running interface** command displays which intercepts are currently active.

```
Router# configure terminal

Router#(config) interface bundle 10

Router(config-if)# cable intercept 0080.fcaa.aabb 10.12.13.8 512
Router(config-if)# exit

Router(config)# exit

Router# show running interface bundle 10 | i intercept

cable intercept 0080.fcaa.aabb 10.12.13.8 512
```

Related Commands

Command	Description
cable monitor	Enables the forwarding of selected packets on the cable interface to an external LAN analyzer.
show interface cable intercept	Displays the CMs for which cable intercept is currently active.

cable ip-init

To configure the IP provisioning mode supported by the cable interface on a Cisco CMTS router, use the **cable ip-init** command in interface or subinterface configuration mode or MAC domain profile configuration mode. To remove the IP provisioning configuration, use the **no** form of this command.

cable ip-init {**apm** | **dual-stack** | **ipv4** | **ipv6**}
no cable ip-init {**apm** | **dual-stack** | **ipv4** | **ipv6**}

Syntax Description

apm	Configures the interface to support Alternative Provisioning Mode (APM).
dual-stack	Configures the interface to support both IPv4 and IPv6 addressing.
ipv4	Configures the interface to support IPv4 address only.
ipv6	Configures the inerface to support IPv6 address only.

Command Default

None

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCC	This command was modified. The **apm** keyword was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable ip-init** command configures the cable interface for the IP addressing mode that it supports. This information is included in the IP initialization parameters of the MAC Domain Descriptor (MDD) message.

Examples

The following example shows how to configure a cable interface on a Cisco CMTS router to support both IPv4 and IPv6 addressing:

```
interface cable 5/0/1
 cable ip-init dual-stack
```

cable ip-broadcast-echo

To activate upstream IP broadcast echo so that the Cisco CMTS router can echo broadcast packets, use the **cable ip-broadcast-echo** command in cable interface or subinterface configuration mode. To disable the upstream IP broadcast echo, use the **no** form of this command.

cable ip-broadcast-echo
no cable ip-broadcast-echo

Syntax Description

This command has no arguments or keywords.

Command Default

Upstream IP broadcast echo is disabled.

Command Modes

Cable interface configuration (config-if)

Cable subinterface configuration (config-subif)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.1(3a) EC	The subinterface support was added.
12.1(5)EC	Support was added for the Cisco uBR7100 series routers.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

By default, broadcast IP packets that arrive on the upstream at the Cisco CMTS router are not forwarded on the downstream ports so that they would be delivered to the other CMs and CPE devices. This behavior prevents broadcast storms in which such packets are repeatedly looped through the network.

The **cable ip-broadcast-echo** command changes this behavior by forwarding such packets on the appropriate downstream ports, so that the packet is received by all CMs and CPE devices on that segment of the network. This allows the cable network to behave more like a standard Ethernet network, and support direct peer-to-peer communications using IP broadcasts.



Note This command should not be used in a typical service provider network.

Examples

The following example shows how to activate IP broadcast echo in the cable interface configuration mode:

```
Router(config-if)# cable ip-broadcast-echo
```

The following example shows how to activate IP broadcast echo in the cable subinterface configuration mode:

```
Router(config)# interface cable 6/0.1
Router(config-subif)# cable ip-broadcast-echo
```

Related Commands

Command	Description
cable ip-multicast-echo	Enables IP multicast echo so that the Cisco CMTS can echo multicast packets.

cable ip-multicast-echo

To enable IP multicast echo so that the Cisco CMTS can echo multicast packets, use the **cable ip-multicast-echo** command in cable interface configuration mode. To disable IP multicast echo, use the **no** form of this command.

cable ip-multicast-echo
no cable ip-multicast-echo

Syntax Description

This command has no arguments or keywords.

Command Default

IP multicast echo is disabled.

Command Modes

Cable interface configuration (config-if)

Command History

Release	Modification
11.3 XA	This command was introduced for Cisco uBR7200 series routers.
12.1(3a) EC	The subinterface support was added.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB	The command default is changed to disabled in Cisco IOS Release 12.2(33)SCB and later.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, multicast IP packets that arrive on the upstream at the Cisco CMTS are forwarded on the appropriate downstream ports so that they are delivered to the other CMs and CPE devices on that segment of the network. This allows the cable network to behave like a standard Ethernet network in terms of its handling of multicast IP traffic.

This behavior might not be appropriate for certain applications or networks, so the **no cable ip-multicast-echo** command changes this behavior by preventing the forwarding of multicast packets. Disabling multicast traffic can prevent some types of broadcast storms in which such packets are repeatedly looped through the network.

To verify if IP multicast echo has been activated or deactivated, enter the **show running-config** command and look for the cable interface configuration information.

If IP multicast echo is enabled, it appears in this output of the **show running-config** command.

If IP multicast echo is disabled, it is not displayed in the output **show running-config** command.

If you are having trouble, make sure that you have entered the correct slot and port numbers when you entered cable bundle interface configuration mode.



Note On the Cisco uBR10012 router, input access lists are not applied to the multicast traffic that is echoed on each downstream. To control the echoed multicast traffic, you therefore need to configure an output access list and apply it to each downstream interface.

Examples

The following example shows how to disable IP multicast echo in the bundle interface configuration mode:

```
Router(config-if)# no cable ip-multicast-echo
```

Related Commands

Command	Description
cable ip-broadcast-echo	Enables upstream IP broadcast echo so that the Cisco CMTS can echo broadcast packets.

cable ipc-stats

To enable the Cable IPC Statistics Collection tool on a Cisco CMTS router, use the **cable ipc-stats** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable ipc-stats
no cable ipc-stats

Syntax Description

This command has no arguments or keywords.

Command Default

The Cable IPC Statistics Collection tool is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The Cable IPC Statistics Collection tool provides debugging information about all IPC messages. We recommend that you enable this tool only when it is necessary as the tool consumes considerable amount of CPU memory while running on a Cisco CMTS router.

The **cable ipc-stats** command is synchronized on all cable interface line cards from the active RP. You do not have to use this command on cable interface line cards separately.

Examples

The following example shows how to enable the Cable IPC Statistics Collection tool on a Cisco CMTS router:

```
Router# configure terminal
Router(config)# cable ipc-stats
```

Related Commands

Command	Description
clear cable ipc-stats	Clears the active database and resets IPC statistics in the active database to zero.
show cable ipc-stats	Displays statistics of all the IPC messages on a Cisco CMTS router.

cable ipc-watermark

To set the IPC watermark level for the line cards on a Cisco CMTS router, use the **cable ipc-watermark** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable ipc-watermark {**clc***slot/subslot service-type low medium high* | **rp** *service-type low medium high* }
no cable ipc-watermark {**clc***slot/subslot service-type low medium high* | **rp** *service-type low medium high* }

Syntax Description

slot/subslot	• Specifies the slot number. The range is from 5 to 8. • Specifies the sub-slot number. The values are 0 and 1.
service-type	Specifies the IPC service type for the Cisco CMTS router. The values are: 0—Default 1—Inband 2—Expedite 3—Non-critical
low medium high	Specifies the low, medium, and high IPC watermark level. The range is from 1 to 8000.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCJ1	This command was introduced in Cisco uBR10012 router.

Examples

The following example shows how to set the IPC watermark level for the line cards on a Cisco CMTS router:

```
Router# configure terminal
Router(config)# cable ipc-watermark rp 0 1000 2000 4000
Router(config)# cable ipc-watermark clc 5/0 0 1000 2000 2000
```

Related Commands

Command	Description
show ipc node	Displays statistics of all the IPC nodes on a Cisco CMTS router.

cable ipv6 dhcp-insert

To configure the Cisco cBR-8 series routers to insert descriptors into DHCPv6 packets, use the **cable ipv6 dhcp-insert hostname** command in global configuration mode.

To configure the Cisco cBR-8 series routers to insert downstream description into the DHCPv6 packets, use the **cable ipv6 dhcp-insert downstream-description** command in global configuration mode.

To remove this configuration, use the **no** form of this command.

cable ipv6 dhcp-insert { **hostname | downstream-description** }

hostname	Appends received DHCPv6 packets with router hostnames.
downstream-description	Appends received DHCPv6 packets with downstream description.

Command Default

This configuration is disabled by default.

Command Modes

Interface configuration (config-if) and bundle interface configuration.

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.3.1x	This command is introduced.
Cisco IOS XE Cupertino 17.9.1x	The **downstream-description** option is introduced.

Usage Guidelines

The **cable ipv6 dhcp-insert** command is used to configure the following feature: DHCP, ToD, and TFTP Services for the CMTS Routers.

This feature enhances the DHCPv6 security potential and the Cable duplicate MAC address feature on the Cisco cBR-8 router.

The **cable ipv6 dhcp-insert** command specifies which descriptors to append to DHCPv6 packets. The DHCPv6 servers can then detect cable modem clones and extract geographical information.

The Cisco cBR-8 series router can use the DHCPv6 Relay Agent Information option to send particular information about a cable modem, such as its MAC address and the cable interface to which it is connected. If the DHCPv6 server cannot match the information with that belonging to a cable modem in its database, the Cisco cBR-8 series router identifies that the device is a CPE device. This allows the Cisco cBR-8 series router and DHCPv6 server to retain accurate information about which CPE devices are using which cable modems and whether the devices should be allowed network access.

Example: Configuration

The following example shows how to configure `downstream-description` and `hostname`:

```
router(config)#interface bundle 1
router(config-if)#cable ipv6 dhcp-insert downstream-description
router(config-if)#cable ipv6 dhcp-insert hostname

router(config)#interface cable 9/0/1
router(config-if)#cable downstream description node1-ca9/0/1
```

Use the following command to verify the configuration:

```
router#show running-config interface bundle 1 | inc insert
ip dhcp relay information option-insert
cable ipv6 dhcp-insert hostname
cable ipv6 dhcp-insert downstream-description
cable dhcp-insert hostname
cable dhcp-insert downstream-description
```

cable ipv6 dhcp-relay override

To configure the Cisco cBR-8 series routers to override Enterprise ID to 4491 in Vendor Specific Information when relaying DHCPv6 packets, use the **cable ipv6 dhcp-relay override** command in global configuration mode. This is the default behavior. To disable overriding of Enterprise ID in Vendor Specific Information during DHCPv6 relay, use the **no** form of this command.

cable ipv6 dhcp-relay override

no cable ipv6 dhcp-relay override

Command Default

This configuration is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1z2	This command was introduced.

Usage Guidelines

The command, **cable ipv6 dhcp-relay override** is enabled by default. When it releays DHCPv6 packets, cBR-8 overrides Enterprise ID to 4491 in Vendor Specific Information.

If you explicitly disable this command by using the **no cable ipv6 dhcp-relay override** command, cBR-8 does not change Enterprise ID in Vendor Specific Information during DHCPv6 relay.

cable ipv6 source-verify

To enable source verification of IPv6 packets received by a cable interface upstream on a Cisco CMTS router, use the **cable ipv6 source-verify** command in bundle interface or subinterface configuration mode. To disable IPv6 source verification, use the **no** form of this command.

cable ipv6 source-verify [**dhcp** [**server** *ip-address*] | **leasequery-filter upstream** *threshold interval* | **leasetimer** *value*]
no cable ipv6 source-verify

Syntax Description

dhcp	(Optional) Verifies IP address with the DHCPv6 server. • **server**—Enables the Leasequery server to send the DHCPv6 Leasequeries. • *ip-address*—IPv6 address of the Leasequery server.
leasequery-filter	(Optional) Filters the IPv6 Leasequery requests. • **upstream**—Indicates that the Leasequery requests are sent on cable upstream interfaces. • *threshold*—Maximum number of DHCP Leasequeries allowed per SID for each interval period. The range is from 0 to 55. • *interval*—Time period, in seconds, when Leasequeries should be monitored. The range is from 1 to 5.
leasetimer	(Optional) Specifies the time, in minutes, when the router should check its internal CPE database for IP addresses whose lease times has expired. • *value*—Lease time value. The range is from 1 to 240. The default is 60.

Command Default

IPv6 source verification is disabled.

Command Modes

Bundle interface configuration (config-if),

Bundle subinterface configuration (config-subif)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCF1	This command was modified. The **dhcp** keyword was added to verify IPv6 address with the DHCPv6 server. The **leasequery-filter** and **leasetimer** keywords were added to further filter the IPv6 Leasequery requests.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The IPv6 source verification feature is enabled on a cable bundle interface or subinterface.

When you enable IPv6 source verification on the Cisco CMTS bundle interface, the source verification routine is run to verify the MAC-SID-IP binding of the packet. If the source verification succeeds, the packet is forwarded. If the verification fails, then the packet is dropped.

When a cable modem (CM) is operating as a bridged modem device, then the Cisco CMTS router verifies the entire IPv6 address for that CM and the CPEs behind that CM.

When a CM is operating as a router modem device, then the Cisco CMTS router only verifies the network prefix for that CM and the CPEs behind that CM. To be successful, this means that all cable modem routers must have different prefixes assigned to them.

The **cable ipv6 source-verify** command only controls the source verification of IPv6 packets. For IPv4-based source verification, you must use the **cable source-verify** command, which also supports different options.



Note On the Cisco uBR10012 router in Cisco IOS Release 12.2(33)SCA, source verification of IPv6 packets occurs only on packets in the process-switched path of the route processor (RP).

Using the dhcp Option

If the **dhcp** option is used, the Cisco CMTS sends a DHCPv6 Leasequery message to the DHCP server to verify the IP address. If a valid response is received from the DHCP server, the Cisco CMTS updates its database with the new CPE device and allows future traffic through. If the DHCP server does not return a successful response, all traffic from the CPE is dropped.

If you are using the **dhcp** option, you have the option to specify an alternate DHCP server using its IP address. The **dhcp** option supports source verification from multiple dhcp servers.

For single DHCP server, use the **cable ipv6 source-verify dhcp** [**server** *ipv6-address*] command. For multiple DHCP servers use the **cable ipv6 source-verify dhcp** command.

Using the leasetimer Option

The **leasetimer** option adds another level of verification by activating a timer that periodically examines the lease times for the IP addresses for known CPE devices. If the Cisco CMTS discovers that the DHCP lease for a CPE device has expired, it removes that IP address from its database, preventing the CPE device from communicating until it makes another DHCP request. This prevents users from treating DHCP-assigned addresses as static addresses, as well as from using IP addresses that were previously assigned to other devices.

The **leasetimer** option takes effect only when the **dhcp** option is also used on an interface. Also, this option is supported only on the primary bundle interface and cannot be configured on subinterfaces. Configuring it for a primary bundle interface automatically applies it to all subinterfaces.

Using the leasequery-filter Option

To prevent a large volume of Leasequery requests on a cable interface, use the **cable ipv6 source-verify leasequery-filter** command. After configuring this command, the Cisco CMTS allows only the configured number of DHCPv6 Leasequery requests within the specified interval time period.

For example, the **cable ipv6 source-verify leasequery-filter 5 10** command configures the Cisco CMTS so that the Cisco CMTS allows a maximum of five DHCPv6 Leasequery requests every 10 seconds for each SID.

Examples

The following example shows how to enable IPv6 source verification on a Cisco CMTS router bundle interface by first configuring **cable ipv6 source-verify** at the bundle interface:

```
interface bundle 1
 cable ipv6 source-verify
```

After you configure the bundle interface, associate the bundle at the cable interface:

```
interface cable 6/0/2
 cable bundle 1
```

The following example shows how to configure the Cisco CMTS router to send DHCPv6 Leasequeries to verify unknown source IP addresses in upstream data packets. Both **cable ipv6 source-verify dhcp** and **no cable nd** commands must be configured on the Cisco CMTS bundle before the Cisco CMTS will issue any DHCPv6 Leasequery to recover an unknown IPv6 CPE to the Cisco CMTS.

```
configure terminal
 interface bundle 1
  cable ipv6 source-verify dhcp
  no cable nd
```

The following example shows how to configure the leasetimer option so that the Cisco CMTS checks the IP addresses in the CPE database for that particular interface for expired lease time:

```
configure terminal
 interface bundle 1
  cable ipv6 source-verify dhcp
  cable ipv6 source-verify leasetimer 120
```

The following example shows how to configure the Cisco CMTS router so that it allows a maximum of five DHCP Leasequery requests per SID over each 2-second interval on a particular cable interface.

```
configure terminal
 interface bundle 1
  cable ipv6 source-verify dhcp
  cable ipv6 source-verify leasequery-filter 5 2
```

Associated Features

The **cable ipv6 source-verify** command is used to configure the following feature:

- Cable DHCP Leasequery

Related Commands

Command	Description
cable source-verify	Enables verification of IPv4 addresses for CMs and CPE devices on an upstream.
cable ipv6 source-verify leasequery-filter downstream	Enables the Leasequery filter in the CMTS downstream for IPv6 packets.

cable ipv6 source-verify dhcp ns-probe

To send NS to CPE after source verify is successful, use the **cable ipv6 source-verify dhcp ns-probe** command in global configuration mode. To disable the configuration, use the **no** form of this command.

cable ipv6 source-verify dhcp ns-probe [**cpe | pd | interval** *seconds* { **retries** *number-of-probes* }]
no cable ipv6 source-verify dhcp ns-probe [**cpe | pd | interval** *seconds* { **retries** *number-of-probes* }]

Syntax Description

source-verify	IPv6 Source verification.
dhcp	DHCPv6 LQ.
ns-probe	NS Probe If a switch is present between CM and CPE router, for some CM firmware, the CPE router can't receive traffic until it sends traffic. Configure **ns-probe** to overcome this issue.
cpe	Send probe to any CPE
pd	Only send probe to CPE router
interval *seconds*	Interval between NS probes (seconds). Range is 10–60 seconds.
retries *number-of-probes*	Number of probes.

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Using the ns-probe option

If the **ns-probe** option is used, the Cisco CMTS sends NS probes to CPE or PD, after LQ succeeds.

Examples

The following example shows how to enable DHCPv6 LQ NS Probe IPv6 source verification on a Cisco CMTS router:

```
router#configure terminal
router(config)#cable ipv6 source-verify dhcp ns-probe pd interval 30 retries 3
```

Use the following command to verify the configuration:

```
router(config)#do sh run | i ns-probe
cable ipv6 source-verify dhcp ns-probe pd interval 20 retries 8
```

The following example shows how to configure the `no cable ipv6 source-verify dhcp ns` command:

```
router(config)#no cable ipv6 source-verify dhcp ns
router(config)#do sh run | i ns-probe
router(config)#end
```

Related Commands

Command	Description
cable source-verify	Enables verification of IPv4 addresses for CMs and CPE devices on an upstream.

cable ipv6 source-verify leasequery-filter downstream

To enable the Leasequery filter on the Cisco CMTS downstream for IPv6 packets, use the **cable ipv6 source-verify leasequery-filter downstream** command in global configuration mode. To disable the Leasequery filter on the Cisco CMTS downstream, use the **no** form of this command.

cable ipv6 source-verify leasequery-filter downstream *threshold interval*
no cable ipv6 source-verify leasequery-filter downstream

Syntax Description

downstream	Filters the IPv6 Leasequery requests on the Cisco CMTS downstream. • *threshold* —Maximum number of DHCP Leasequeries allowed for unknown SIDs for each interval period. The range is from 0 to 255. • *interval* —Time period, in seconds, when Leasequeries should be monitored. The range is from 1 to 10.

Command Default

IPv6 source verification for downstream is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF1	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable ipv6 source-verify leasequery-filter downstream** command to enable the Leasequery filter on the Cisco CMTS downstream for IPv6 packets.

Examples

The following example shows how to enable the Leasequery filter on the CMTS downstream for IPv6 packets on all downstream cable interfaces.

```
Router# configure terminal
Router(config)# cable ipv6 source-verify leasequery-filter downstream 10 5
```

Associated Features

The **cable ipv6 source-verify leasequery-filter downstream** command is used to configure the following feature:

- Cable DHCP Leasequery

Related Commands

Command	Description
cable ipv6 source-verify	Enables source verification of IPv6 packets received by a cable interface upstream on a Cisco CMTS router.



Cable Commands: cable l

- cable l2vpn, on page 345
- cable l2-vpn-service atm-vc, on page 346
- cable l2-vpn-service default-nsi, on page 347
- cable l2-vpn-service dot1q, on page 349
- cable l2-vpn-service xconnect, on page 351
- cable l2-vpn-service xconnect nsi dot1q interface port-channel, on page 353
- cable l2-vpn dot1q-nsi-redundancy force-switchover, on page 354
- xconnect backup force-switchover, on page 355
- cable l3-mobility, on page 356
- cable lcha partial-service-reset-timer, on page 358
- cable lcha sw-reset, on page 359
- cable license 100G-conversion, on page 360
- cable linecard auto-rommon-downgrade, on page 361
- cable linecard auto-rommon-upgrade, on page 362
- cable linecard critical-event-poweroff, on page 363
- cable load-balance d20-ggrp-default, on page 365
- cable load-balance d20 GLBG auto-generate, on page 368
- cable load-balance d30-ggrp-default, on page 370
- cable load-balance docsis-enable, on page 373
- cable load-balance docsis20-enable, on page 374
- cable load-balance docsis30-enable, on page 375
- cable load-balance docsis30-enable dynamic downstream, on page 378
- cable load-balance docsis30-enable static , on page 379
- cable load-balance docsis30-dynamic-enable, on page 380
- cable load-balance docsis-group, on page 381
- cable load-balance docsis-policy, on page 384
- cable load-balance exclude, on page 385
- cable load-balance fixed-primary-channel, on page 389
- cable load-balance group, on page 390
- cable load-balance group (interface), on page 395
- cable load-balance group (Supporting Dynamic Channel Change), on page 398
- cable load-balance group interval, on page 400
- cable load-balance group policy, on page 402

- cable load-balance group policy ugs, on page 404
- cable load-balance group threshold, on page 406
- cable load-balance group threshold (Supporting Dynamic Channel Change), on page 411
- cable load-balance method-utilization min-threshold, on page 413
- cable load-balance modem max-failures, on page 414
- cable load-balance restrict modem, on page 415
- cable load-balance rule, on page 416
- cable load-balance static cm-delay, on page 418
- cable logging badipsource, on page 419
- cable logging downstream-index, on page 422
- cable logging layer2events, on page 424

cable l2vpn

To enable the Ethernet Layer 2 Virtual Private Network (L2VPN) service and enter L2VPN configuration mode, use the **cable l2vpn** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable l2vpn *mac-address* [*customer-name*]
no cable l2vpn *mac-address* [*customer-name*]

Syntax Description

mac-address	MAC address of a CM.
customer-name	(Optional) Customer name. Only 0-9, a-z, A-Z, ., , -, _ can be used as the customer name.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable the Ethernet L2VPN service and enter L2VPN configuration mode:

```
Router# configure terminal
Router(config)# cable l2vpn 0000.396e.6a68 customer1
Router(config-l2vpn)#
```

Related Commands

Command	Description
service instance	Specifies an Ethernet service instance for a particular customer.

cable l2-vpn-service atm-vc

To enable the use of Layer 2 tunnels for the Customer Premises Equipment (CPE) traffic that is behind cable modems so that individual CPE traffic can be routed to a particular permanent virtual connection (PVC) on an Asynchronous Transfer Mode (ATM) interface, use the **cable l2-vpn-service atm-vc** command in global configuration mode. To disable the use of Layer 2 tunneling, use the **no** form of this command.

cable l2-vpn-service atm-vc
no cable l2-vpn-service atm-vc

Syntax Description

This command has no arguments or keywords.

Command Default

The use of Layer 2 tunneling for ATM PVC mapping is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(11)BC3	This command was introduced for Cisco uBR7100 series and Cisco uBR7200 series routers.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables the use of Layer 2 tunnels on all cable and ATM interfaces in the router—which in turn allows you to map cable modems, on the basis of their hardware (MAC) addresses, to particular PVCs on an ATM interface—using the **cable vc-map** command.

Examples

The following example shows how to enable the use of Layer 2 tunnels on a router so that cable modems can be mapped to particular PVCs on an ATM interface:

```
Router# config terminal
Router(config)# cable l2-vpn-service atm-vc
```

Related Commands

Command	Description
cable vc-map	Maps a cable modem to a particular PVC on an ATM interface.
debug cable l2-vpn	Displays debugging messages for the Layer 2 mapping of cable modems to a particular PVC on an ATM interface.
show cable l2-vpn vc-map	Displays the mapping of one or all cable modems to PVCs on the ATM interfaces.

cable l2-vpn-service default-nsi

Note Effective with Cisco IOS Release 12.2(33)SCC, the **cable l2-vpn-service default-nsi** command is replaced by the **cable l2-vpn-service xconnect** command. See the **cable l2-vpn-service xconnect** command for more information.

To configure an Ethernet Network System Interface (NSI) for Layer 2 VPN support over cable, use the **cable l2-vpn-service default-nsi** command in global configuration mode. To remove the interface, use the **no** form of this command.

cable l2-vpn-service default-nsi *type number*
no cable l2-vpn-service default-nsi *type number*

Syntax Description

type	Interface type. See the *Usage Guidelines* section for supported types.
number	Interface or subinterface number. For more information about the numbering syntax for your networking device, use the question mark (?) online help function.

Command Default

No NSI interface is configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCC	This command was replaced by the **cable l2-vpn-service xconnect** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS routers support only the configuration of a single L2VPN NSI per CMTS.

This command supports the following interface types:

- Cisco uBR100012 Universal Broadband Router—Gigabit Ethernet.
- Cisco uBR7246VXR Universal Broadband Router—Fast Ethernet or Gigabit Ethernet

Examples

The following example configures the Gigabit Ethernet line card located in slot 4/0/0 as an NSI for L2VPN using global configuration mode:

```
cable l2-vpn-service default-nsi GigabitEthernet4/0/0
```

Related Commands

Command	Description
show cable l2-vpn dot1q-vc-map	Displays the mapping of one or all cable modems to IEEE 802.1Q VLANs on the router's Ethernet interfaces.

cable l2-vpn-service dot1q

To enable the use of Layer 2 tunnels so that traffic for individual cable modems can be routed over a particular Virtual Local Area Network (VLAN), use the **cable l2-vpn-service dot1q** command in global configuration mode. To disable the use of Layer 2 tunneling, use the **no** form of this command.

cable l2-vpn-service dot1q
no cable l2-vpn-service dot1q

Syntax Description

This command has no arguments or keywords.

Command Default

Layer 2 tunneling is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for Cisco uBR7246VXR universal broadband routers.
IOS-XE 3.15.0S	This command was replaced by the **cable l2-vpn-service xconnect nsi dot1q** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables the use of Layer 2 tunnels, using IEEE 802.1Q VLAN tagging, on all cable interfaces in the router. This in turn allows you to map traffic to and from cable modems, on the basis of the modemsâ€™ hardware (MAC) addresses, to a particular VLAN on a particular WAN interface, using the **cable dot1q-vc-map** command.

Examples

The following example shows how to enable the use of IEEE 802.1Q Layer 2 tunnels on a router so that cable modems can be mapped to particular VLAN:

```
Router# config terminal
Router(config)# cable l2-vpn-service dot1q
Router(config)#
```

The following example shows how to disable the use of IEEE 802.1Q Layer 2 tunnels on a router. All mapping of cable modems to IEEE 802.1Q VLANs is halted (but any other Layer 2 mapping, such as the mapping of cable modems to ATM PVCs, is unaffected).

```
Router# config terminal
Router(config)# no cable l2-vpn-service dot1q
Router(config)#
```

Related Commands

Command	Description
cable dot1q-vc-map	Maps a cable modem to a particular Virtual Local Area Network (VLAN) on a local outbound Ethernet interface.
debug cable l2-vpn	Displays debugging messages for the Layer 2 mapping of cable modems to particular PVCs or VLANs.
show cable l2-vpn dot1q-vc-map	Displays the mapping of one or all cable modems to IEEE 802.1Q Virtual Local Area Networks (VLANs) on the routerâ€™s Ethernet interfaces.

cable l2-vpn-service xconnect

To enable Multiprotocol Label Switching (MPLS) tunnel traffic on the network side interface to support configuration of MPLS pseudowires for L2VPN service, use the **cable l2-vpn-service xconnect** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable l2-vpn-service xconnect nsi { **dot1q** | **mpls** }
no cable l2-vpn-service xconnect nsi { **dot1q** | **mpls** }
cable l2-vpn-service xconnect nsi dot1q interface *ethernet-interface*
no cable l2-vpn-service xconnect nsi dot1q interface *ethernet-interface*
cable l2-vpn-service xconnect nsi dot1q interface *ethernet-interface* **backup-interface** *ethernet-interface*
no cable l2-vpn-service xconnect nsi dot1q interface *ethernet-interface* **backup-interface** *ethernet-interface*
cable l2-vpn-service xconnect { **extended-mtu** | **mtu-auto-negotiation** }

Syntax Description

nsi	Specifies the network side interface (NSI).
dot1q	Specifies the usage of DOT1Q tunneling on the NSI for Ethernet L2VPN traffic.
mpls	Specifies the usage of MPLS tunneling on the NSI for Ethernet L2VPN traffic.
backup-interface	Specifies the backup WAN interface.
extended-mtu	Specifies a global MTU used by all D31 CMs to negotiate VC.
mtu-auto-negotiation	Enables the capability to match the remote MTU in VC negotiation, as long as the remote VC is not higher than the CM's capability. It overrides extended-mtu.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
12.2(33)SCJ	This command was modified. The **backup-interface** keyword was added.
IOS-XE 3.18.0S	This command was modified. The **backup-interface** keyword was added.
IOS-XE 17.3.1x	This command was modified. The **mtu-auto-negotiation** keyword was added.

Usage Guidelines

You must enable MPLS tunnel traffic on the network side interface using the **cable l2-vpn-service xconnect** command before provisioning MPLS pseudowires.

Examples

The following example shows how to enable the use of Layer 2 tunnels based on an AToM pseudowire on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# cable l2-vpn-service xconnect nsi mpls
```

The following example shows how to configure an ethernet interface on DOT1Q L2VPN on the Cisco CMTS router:

```
Router# configure terminal
Router(config)#  cable l2-vpn-service xconnect nsi dot1q interface Te4/0/1
```

The following example shows how to configure a backup WAN interface on DOT1Q L2VPN on the Cisco CMTS router:

```
Router# configure terminal
Router(config)#  cable l2-vpn-service xconnect nsi dot1q interface Te4/0/2 backup-interface
 Te4/0/3
```

The following example shows how to configure a global MTU used by all D31 CMs:

```
Router# configure terminal
Router(config)# cable l2-vpn-service xconnect extended-mtu ?
   <1500-2000>  Customized MTU
   <cr>         <cr>
```

The following example shows how to configure arbitrary Maximum Transmission Unit (MTU) for each D3.1 modem differently. This auto-negotiates the set up of L2VPN pseudowire automatically:

```
Router# configure terminal
Router(config)# cable l2-vpn-service xconnect mtu-auto-negotiation
  <cr>  <cr>
Router# show mpls l2transport vc 235 detail | in MTU
    MTU: local 1700, remote 1700         ..... CM default MTU 2000, remote MTU 1700, CBR
 will set CM MTU to 1700
```

Related Commands

Command	Description
cable l2vpn	Enables the Ethernet Layer 2 Virtual Private Network (L2VPN).

cable l2-vpn-service xconnect nsi dot1q interface port-channel

To configure the port-channel uplink port for DOCSIS L2VPN, use the **cable l2-vpn-service xconnect nsi dot1q interface port-channel** command in global configuration mode.

cable l2-vpn-service xconnect nsi dot1q interface port-channel *number*

Syntax Description

number	Port-channel interface number.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable l2-vpn-service xconnect nsi dot1q interface port-channel** command configures the port-channel uplink port for DOCSIS L2VPN.

The following example shows how to configure the port-channel uplink port for DOCSIS L2VPN:

```
router# configure terminal
router(config)#cable l2-vpn-service xconnect nsi dot1q interface port-channel
 64
```

cable l2-vpn dot1q-nsi-redundancy force-switchover

This command is designed for uplink redundancy feature, which allows you to configure a backup Network System Interface(NSI) interface and a default primary interface for dot1q L2VPN. When the primary NSI interface goes down, the backup NSI interface takes over and the traffic flows through the second interface.

When two uplink DOT1Q Ethernet NSI ports are UP, to manually switch over traffic flows from current active NSI port to another, use the **cable l2-vpn dot1q-nsi-redundancy force-switchover** command in privileged EXEC mode.

cable l2-vpn dot1q-nsi-redundancy force-switchover from *active-nsi*

Syntax Description

active-nsi	Specifies the active NSI.

Command Default

The current active uplink NSI port is not changed.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
12.2(33) SCJ	This command was introduces on the Cisco uBR Series Universal Broadband Routers
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

- This feature is applicable only for DOT1Q L2VPN and not Multiprotocol Label Switching (MPLS) L2VPN.
- This feature is configurable when both the DOT1Q NSI ports are UP.

The following example shows how to manually switch over active uplink NSI port from current active uplink port to the specified port:

```
Router# cable l2-vpn dot1q-nsi-redundancy force-switchover from Te4/0/1
```

Related Commands

Command	Description
show cable l2-vpn dot1q-nsi-redundancy	Displays the backup pair details and the current active uplink DOT1Q NSI port.

xconnect backup force-switchover

To manually force a switchover to a pseudowire peer, use the **xconnect backup force-switchover** command in privileged EXEC mode.

xconnect backup force-switchover peer *ip-address vcid*

Syntax Description

peer *ip-address vcid*	Specifies the IP address and virtual circuit (VC) ID of the pseudowire to be used for the switchover. • *ip-address*—IP address of the peer pseudowire. • *vcid*—Virtual circuit address of the peer pseudowire.

Command Default

The pseudowire is not changed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can perform a switchover only to an available member in the redundancy group. That is, if the member being specified in the **xconnect backup force-switchover** command is not available, the command will be rejected.

Examples

The following example shows how to manually switchover to a peer router.

```
Router# xconnect backup force-switchover peer 10.10.1.1 123
```

Related Commands

Command	Description
backup delay	Specifies how long a backup pseudowire VC should wait before taking over after the primary pseudowire VC goes down.
backup peer	Configures a redundant peer for a pseudowire VC.
show cable l2vpn xconnect	Displays information about the mapping between a Multiprotocol Label Switching (MPLS) pseudowire and its VCs.
show mpls l2transport vc	Displays information about Any Transport over MPLS (AToM) VCs and static pseudowires that have been enabled to route Layer 2 packets on a router
show xconnect all	Displays information about xconnect attachment circuits and pseudowires.

cable l3-mobility

To enable mobility for a particular IPv4 or IPv6 subnet, use the **cable l3-mobility** command in bundle or sub-bundle interface mode. To disable mobility, use the no form of this command.

cable l3-mobility {*IPv4-address mask IPv6 prefix*}
nocable l3-mobility { *IPv4-address mask IPv6 prefix*}

Syntax Description

IPv4-address	Specifies the IPv4 address of a CPE for which the mobility has to be enabled.
IPv6 prefix	Specifies the IPv6 prefix associated with a particular SAV group, specified in the X:X:X:X::/X format.
mask	Specifies the subnet mask for which the mobility has to enabled.

Command Default

The mobility of the IP address is disabled.

Command Modes

Bundle interface configuration (config-if)

Bundle sub-interface configuration (config-subif)

Command History

Release	Modification
12.2(33)SCH2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Mobility subnets should match with the IPv4 or IPv6 address configured on the bundle or sub-bundle interface.

If the IPv4 or IPv6 address does not match, the following warning message is displayed:

```
Mobility IP should match the IDB subnet!
```

If you remove the IPv4 or IPv6 address from the interface, the mobility scope is removed for the IP address and the following warning message is displayed.

```
IPv6 2001:40:3:111::1 removed from Mobility subnets on Bundle1
```

Examples

The following example shows how to enable the mobility for a particular IPv4 or IPv6 subnet in a bundle interface:

```
Router# configure terminal
Router(config)# interface Bundle 1
Router(config-if)#cable l3-mobility 192.173.82.1 255.255.255.0
```

The following example shows how to enable the mobility for a particular IPv4 or IPv6 subnet in a sub-bundle interface:

```
Router# configure terminal
```

```
Router(config)# interface Bundle 1
Router(config-if)#cable cable l3-mobility 192.173.82.1 255.255.255.0
```

Related Commands

Command	Description
show cablebundle	Displays the details of the cable bundle.
service divert-limitl3-mobility-counter	Sets the layer 3 mobility threshold limit.

cable lcha partial-service-reset-timer

Some Docsis 3.1 cable modems enter partial service mode (downstream or upstream) after LCHA. To configure a timer that starts running after LCHA is complete to reset any Docsis 3.1 cable modems that are in partial service mode after the line card switchover, use the **cable lcha partial-service-reset-timer** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable lcha partial-service-reset-timer *time*
no cable lcha partial-service-reset-timer *time*

Command Default

N/A

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables or disables the timer to reset the cable modem in partial service mode. It is recommended that a value of 120 or greater to be used for the timer.

Examples

The following example shows how to set the timer to reset the cable modem in partial service mode:

```
Router# config terminal
Router(config)# cable lcha partial-service-reset-timer 120
```

Related Commands

Command	Description
show cable flap-list reset-cm-list	Displays the Docsis 3.1 cable modem list that was reset by the partial service reset timer.

cable lcha sw-reset

To enable the software reset option in the normal LCHA scenario and reduce the time for linecard ISSU to complete, use the **cable lcha sw-reset enable** command in global configuration mode. To disable the software reset option, use the **cable lcha sw-reset disable** command in global configuration mode. To restore the pre-configured behavior, use the **no** form of this command.

cable lcha sw-reset {**disable** | **enable**}
no cable lcha sw-reset {**disable** | **enable**}

Command Default

N/A

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables or disables the software reset option in the normal LCHA scenario. It is only applicable to Docsis 3.1 Downstream Module with Micro firmware version 3.16 and higher.

Examples

The following example shows how to enable the software reset option:

```
Router# config terminal
Router(config)# cable lcha sw-reset enable
```

cable license 100G-conversion

The **cable license 100G-conversion** command configures he Cisco cBR to consume 100G WAN licenses for Supervisor 250G

cable license 100G-conversion

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Privileged EXEC (#)

Release	Modification
IOS-XE 16.8.1	This command was introduced.

Command	Description
cable license 100G-conversion	Configures the10G WAN license on the 100G WAN ports.
nocable license 100G-conversion	Disables the 10G WAN license for the 100G WAN ports.

cable linecard auto-rommon-downgrade

To enable the automatic ROM-Monitor (ROMMON) image downgrade on cable interface line cards, use the **cable linecard auto-rommon-downgrade** command in global configuration mode. To disable automatic ROMMON image downgrade on cable interface line cards, use the **no** form of this command.

cable linecard auto-rommon-downgrade
no cable linecard auto-rommon-downgrade

Syntax Description

This command has no arguments or keywords.

Command Default

The automatic ROMMON image downgrade is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The automatic ROMMON downgrade is disabled by default on all line cards, and we recommend that you do not change this default behavior.

Examples

The following example shows how to enable automatic ROMMON downgrade on all cable interface line cards:

```
Router(config
)# cable linecard auto-rommon-downgrade
```

The following example shows how to disable automatic ROMMON downgrade on all cable interface line cards:

```
Router(config
)# no cable linecard auto-rommon-downgrade
```

Related Commands

Command	Description
cable linecard auto-rommon-upgrade	Enables or disables automatic ROMMON image upgrade on cable interface line cards.

cable linecard auto-rommon-upgrade

To enable the automatic ROM-Monitor (ROMMON) image upgrade on cable interface line cards, use the **cable linecard auto-rommon-upgrade** command in global configuration mode. To disable automatic ROMMON upgrade on cable interface line cards, use the **no** form of this command.

cable linecard auto-rommon-upgrade
no cable linecard auto-rommon-upgrade

Syntax Description

This command has no arguments or keywords.

Command Default

The automatic ROMMON image upgrade is disabled.

Note Effective with Cisco IOS Release 12.2(33)SCF1, the automatic ROMMON image upgrade is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To perform automatic ROMMON upgrade on the cable interface line card, use the **cable linecard auto-rommon-upgrade** command to enable automatic ROMMON image upgrade on the line card and then reload the line card.

Examples

The following example shows how to enable automatic ROMMON image upgrade on all cable interface line cards:

```
Router(config
)# cable linecard auto-rommon-upgrade
```

The following example shows how to disable automatic ROMMON image upgrade on all cable interface line cards:

```
Router(config
)# no cable linecard auto-rommon-upgrade
```

Related Commands

Command	Description
cable linecard auto-rommon-downgrade	Enables or disables automatic ROMMON image downgrade on cable interface line cards.

cable linecard critical-event-poweroff

To power off the Cisco uBR-MC3GX60V cable interface line card when a device temperature reaches critical threshold values on the CMTS chassis, use the **cable linecard critical-event-poweroff** command in the global configuration mode. To disable this feature, use the **no** form of the command.

cable linecard critical-event-poweroff
no cable linecard critical-event-poweroff

Syntax Description

This command has no arguments or keywords.

Command Default

Enabled

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The PRE powers off the Cisco uBR-MC3GX60V line card if any of the device temperatures on the line card exceeds the critical threshold value. To disable this power off feature, user should configure the **no cable linecard critical-event-poweroff** command and save the configuration.

The temperature thresholds for the devices on the Cisco uBR-MC3GX60V line card are:

```
Router#show environment subslot 6/0
-------------------------------------------------------------------------
TEMPERATURE/POWER INFORMATION
-------------------------------------------------------------------------
Number of Temperature Sensors : 9
Sampling frequency            : 2 minutes
-------------------------------------------------------------------------
Sensor       | ID | Current     | Minor | Major | Critical | Alarm     |
             |    | Temperature |       Threshold          | Condition |
             |    |     degC    |          degC            |           |
-------------------------------------------------------------------------
Nickel 10G     1       69          84     89       94        Normal
Inlet #1       2       47          64     69       74        Normal
CPU            3       68          86     91       96        Normal
Raven          4       46          64     69       74        Normal
Santana        5       36          57     62       67        Normal
Coldplay       6       63          73     78       83        Normal
Waxbill        7       76          85     90       95        Normal
Fauna          8       70          77     82       87        Normal
Fluorine       9       62          70     75       80        Normal
-------------------------------------------------------------------------
Power: 146.216 watts
```

Examples

The following example allows the PRE to power off the Cisco uBR-MC3GX60V line card when the device temperature reaches critical threshold values.

```
Router# cable linecard critical-event-poweroff
```

Related Commands

Command	Description
show environment	Displays temperature, voltage, fan, and power supply information.

cable load-balance d20-ggrp-default

To configure a DOCSIS 2.0 general load balancing group (GLBG) that is created automatically for each fiber node (FN) configuration, use the **cable load-balance d20-ggrp-default** command in the global configuration mode. To disable the default values of the DOCSIS 2.0 GLBG, use the **no** form of this command.

cable load-balance d20-ggrp-default {**disable** | **init-tech-list** *tech-list* | **docsis-policy***0-0xffffffff* | **interval** *n* | **method** {*modemservice-flowsutilization*} | **threshold** {*load* [*minimum*]*pcmmpure-ds-loadugsus-across-ds*} | **us-method** {*modemservice-flowsutilization*}}
no cable load-balance d20-ggrp-default disable

Cisco cBR Series Converged Broadband Routers
cable load-balance d20-ggrp-default {**disable** | **init-tech-list** *tech-list* | **docsis-policy** *0-4294967295* | **interval** *n* | **method** {*modemutilization*} | **threshold** {*load* [*minimum*]*pcmmpure-ds-loadugsus-across-ds*} | **us-method** {*modemutilization*}}



Note The default values that are set using the command apply to DOCSIS 2.0 GLBGs created thereafter. Parameters for existing DOCSIS 2.0 GLBGs do not change.

Syntax Description

disable	Disables the default values of the DOCSIS 2.0 GLBG that are enabled by default.
init-tech-list *tech-list*	Sets the default DOCSIS 2.0 GLBG DCC and DBC initialization techniques.
docsis-policy *0-0xffffffff*	Sets the default DOCSIS 2.0 GLBG load balancing policy.
interval *n*	Sets the default interface polling interval in seconds. The range is 1to1000.
method	Sets the default load balancing method. It can have one of the following values: • modems—Number of modems. • (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) service-flows—Number of service flows. • utilization—Interface utilization.
policy	Sets the default policy on modems selection based on the type of service flow to be balanced. • pcmm—Enable balancing of modems with active PCMM service flows • pure-ds-load—Considers only DS utilization for load balancing • ugs—Enable balancing of modems with active UGS service flows • us-across-ds—Load balancing on US groups across DS, DS method will be ignored

threshold	Specifies the default threshold percentage of usage. Load balancing occurs after the threshold is exceeded. • load—Sets the default interface load threshold setting. • minimum—(Optional) Sets the minimum default interface load threshold setting. • pcmm—Sets the default PCMM service flow threshold. • stability—Sets the default threshold for stability detection. • ugs—Sets the default UGS service flow threshold. • n—Percentage of usage. The range is 1to100.
us-method	(Optional) Sets the default load balancing method to upstream. It can have one of the following values: • modems—Number of modems. • (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) service-flows—Number of service flows. • utilization—Interface utilization.

Command Default

no cable load-balance d20-ggrp-default disable

cable load-balance d20-ggrp-default init-tech-list *0-4*

cable load-balance d20-ggrp-default docsis-policy *0*

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCH	This command was modified. The interval, method, policy, and threshold keywords were introduced.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

The group parameters in the **cable load-balance d20-ggrp-default** command can be set as default values.

Examples

The following is a sample output of the **cable load-balance d20-ggrp-default** command.

```
Router(config)# cable load-balance d20-ggrp-default
Router(config)# cable load-balance d20-ggrp-default disable
Router(config)# cable load-balance d20-ggrp-default docsis-policy 2
Router(config)# cable load-balance d20-ggrp-default init-tech-list 1
Router(config)# cable load-balance d20-ggrp-default interval 1
Router(config)# cable load-balance d20-ggrp-default method modems
Router(config)# cable load-balance d20-ggrp-default policy ugs
Router(config)# cable load-balance d20-ggrp-default threshold load 10
Router(config)# cable load-balance d20-ggrp-default us-method
modems
```

Related Commands

Command	Description
cable load-balance d20-ggrp-default	Configures a DOCSIS 2.0 general load balancing group (GLBG) that is created automatically for each fiber node (FN) configuration.

cable load-balance d20 GLBG auto-generate

To automatically generate DOCSIS 2.0 general load balancing group (GLBG), use the **cable load-balance d20 GLBG auto-generate** command in previleged EXEC mode.

cable load-balance d20 GLBG auto-generate [**FN** *fnid*] [**renew | update**]

Syntax Description

FN *fnid*	(Optional) Specifies the fiber node ID number for which GLBG is automatically generated. The range is 1 - 256. If fnid is not specified, GLBG is created for all the fiber nodes.
renew	(Optional) Creates DOCSIS 2.0 GLBG for the current FN configuration after removing all DOCSIS load balancing groups with group IDs in the reserved range (0xff00 to 0xffff).
update	(Optional) Updates DOCSIS 2.0 GLBG with reserved group ID for the current FN configuration. See “Usage Guidelines” section for more information.

Command Default

Creates GLBG for all fiber nodes.

Command Modes

Previleged EXEC (#)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For **renew** keyword, the command executes as follows:

- If the reserved group range (0xff00 to 0xffff) has not been used for any GLBG, a new GLBG is created for the current fiber node.
- If the reserved group range has been used for any GLBG, the existing GLBG is removed and a new GLBG is created for the current fiber node configuration.
- If the reserved group ID has been used for a restricted load balancing group (RLBG), the command fails with a warning message.

For **update** keyword, the command executes as follows:

- If the reserved group range (0xff00 to 0xffff) has not been used for any GLBG, a new GLBG is created for that fiber node.
- If the reserved group range has been used for any GLBG, the GLBG is updated for the current fiber node configuration.
- If the reserved group ID has been used for a restricted load balancing group (RLBG), the command fails with a warning message.

This command is associated with Auto-generate DOCSIS 2.0 GLBG feature.

Examples

The following example shows how to configure the **cable load-balance d20 GLBG auto-generate** command:

```
Router#
Router# cable load-balance d20 GLBG auto-generate
 FN
 3
Router#
```

Related Commands

Command	Description
show cable load-balance docsis-group	Displays real time configurational, statistical, and operational information of the load balancing operations on the router.

cable load-balance d30-ggrp-default

To configure a DOCSIS 3.0 general load balancing group (GLBG) that is created automatically for each MD-CM-SG based on the fiber node (FN) configuration, use the **cable load-balance d30-ggrp-default** command in the global configuration mode. To disable the default values of the DOCSIS 3.0 GLBG, use the **no** form of this command.

cable load-balance d30-ggrp-default {**disable** | **init-tech-list** *tech-list* | **docsis-policy***0-0xffffffff* | **interval** *n* | **method** {*modemservice-flowsutilization*} | **threshold** {*load* [*minimum*]*pcmmpure-ds-loadugsus-across-ds*} | **us-method** {*modemservice-flowsutilization*}}
no cable load-balance d30-ggrp-default disable

Cisco cBR Series Converged Broadband Routers
cable load-balance d30-ggrp-default {**disable** | **init-tech-list** *tech-list* | **docsis-policy** *0-4294967295* | **interval** *n* | **method** {*modemutilization*} | **threshold** {*load* [*minimum*]*pcmmpure-ds-loadugsus-across-ds*} | **us-method** {*modemutilization*}}

Note The default values that are set using the command apply to DOCSIS 3.0 GLBGs created thereafter. Parameters for existing DOCSIS 3.0 GLBGs do not change.

Syntax Description

disable	Disables the default values of the DOCSIS 3.0 GLBG that are enabled by default.
init-tech-list *tech-list*	Sets the default DOCSIS 3.0 GLBG DCC and DBC initialization techniques.
docsis-policy *0-0xffffffff*	Sets the default DOCSIS 3.0 GLBG load balancing policy.
interval	Sets the default interface polling interval in seconds. The range is 1-1000.
method	Sets default load balancing method. It can have one of the following values: • modems—Number of modems. • (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) service-flows—Number of service flows. • utilization—Interface utilization.
policy	Sets the default policy for modems selection based on the type of service flow to be balanced. • pcmm—Enable balancing of modems with active PCMM service flows • pure-ds-load—Considers only DS utilization for load balancing • ugs—Enable balancing of modems with active UGS service flows • us-across-ds—Load balancing on US groups across DS groups

threshold	Specifies the default threshold percentage of usage. Load balancing occurs after the threshold is exceeded. • load—Sets the default interface load threshold setting. • minimum—(Optional) Sets the minimum default interface load threshold setting. • pcmm—Sets the default PCMM service flow threshold. • stability—Sets the default threshold for stability detection. • ugs—Sets the default UGS service flow threshold. • n—Percentage of usage. The range is 1to100.
us-method	(Optional) Sets the default load balancing method to upstream. It can have one of the following values: • modems—Number of modems. • (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) service-flows—Number of service flows. • utilization—Interface utilization.

Command Default

no cable load-balance d30-ggrp-default disable

cable load-balance d30-ggrp-default init-tech-list *0-4*

cable load-balance d30-ggrp-default docsis-policy *0*

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCH	This command was modified. The interval, method, policy, and threshold keywords were introduced.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

The group parameters in the **cable load-balance d30-ggrp-default** command can be set as default values.

Examples

The following is a sample output of the **cable load-balance d30-ggrp-default** command.

```
Router(config)# cable load-balance d30-ggrp-default
Router(config)# cable load-balance d30-ggrp-default disable
Router(config)# cable load-balance d30-ggrp-default docsis-policy 2
Router(config)# cable load-balance d30-ggrp-default init-tech-list 1
Router(config)# cable load-balance d20-ggrp-default interval 1
Router(config)# cable load-balance d20-ggrp-default method modems
Router(config)# cable load-balance d20-ggrp-default policy ugs
Router(config)# cable load-balance d20-ggrp-default threshold load 10
Router(config)# cable load-balance d20-ggrp-default us-method
modems
```

Related Commands

Command	Description
cable load-balance d20-ggrp-default	Configure a DOCSIS 2.0 general load balancing group (GLBG) that is created automatically for each fiber node (FN) configuration

cable load-balance docsis-enable

To enable or disable DOCSIS load balancing on the CMTS, use the **cable load-balance docsis-enable** command in the global configuration mode. To disable DOCSIS load balancing, use the **no** form of this command.

cable load-balance docsis-enable
no cable load-balance docsis-enable

Syntax Description

This command has no arguments or keywords.

Command Default

The command is disabled on all the routers.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When the **no cable load-balance docsis-enable** command is configured, cable modems do not participate in the load balancing operation after they are assigned to the correct Load Balancing Group (LBG).

However, the **no cable load-balance docsis-enable** command does not prevent the cable modems from moving to the correct LBG, therefore, the **show cable load-balance docsis-group pending** and **show cable load-balance** commands may display the movement of the cable modems while they are being assigned to the correct LBG. This is an expected behavior.

Examples

The following example shows how to enable DOCSIS load balancing on the CMTS using the **cable load-balance docsis-enable** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-enable
Config: Last Batch 0, 38 bytes
cable load-balance docsis-enable
end
Router(config)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical and operational information for load balancing operations on the router.

cable load-balance docsis20-enable

To enable dynamic downstream Load Balancing for DOCSIS 2.0 Cable Modems, use the **cable load-balance docsis20-enable** command in global configuration mode. Use the **no** form of this command to disable this feature.

cable load-balance docsis20-enable
no cable load-balance docsis20-enable

Syntax Description

This command has no arguments or keywords.

Command Default

This command is enabled by default.

Command Modes

Global configuration mode (config)

Release	Modification
IOS-XE 3.17.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Please provide some usage guidelines.

When the **no cable load-balance docsis20-enable** command is configured, cable modems which are narrow-band online does not participate in the load balancing operation after the correct Load Balancing Group (LBG) is assigned.

The following example show how to configure the enable dynamic downstream Load Balancing for DOCSIS 2.0 Cable Modems using the**no cable load-balance docsis20-enable** command:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# no cable load-balance docsis20-enable
Router(config)# end
```

Related Commands

Command	Description
show cable load-balance	Displays real-time configurational, statistical and operational information for load balancing operations on the router.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of the DOCSIS group operations on the router.

cable load-balance docsis30-enable

To enable DOCSIS 3.0 static modem count-based load balancing, use the **cable load-balance docsis30-enable** command in global configuration mode. To disable DOCSIS 3.0 static modem count-based load balancing, use the **no** form of this command.

cable load-balance docsis30-enable [**downstream-only**]
no cable load-balance docsis30-enable [**downstream-only**]

Cisco cBR Series Converged Broadband Routers
cable load-balance docsis30-enable
no cable load-balance docsis30-enable

Syntax Description

downstream-only	(For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) Enables only downstream load balancing without enabling upstream load balancing.

Command Default

By default, DOCSIS 3.0 static modem count-based load balancing is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF1	This command was introduced.
12.2(33)SCH1	This command was modified. The **downstream-only** keyword was added.
12.2(33)SCG6	This command was integrated into Cisco IOS Release 12.2(33)SCG6.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.
IOS-XE 3.17.0S	This command is implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **downstream-only** keyword to enable only the downstream load balancing. When the **downstream-only** keyword is used, upstream load balancing is disabled.

Examples

The following example shows how to disable DOCSIS 3.0 static modem count-based load balancing:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# no cable load-balance docsis30-enable
Router(config)#
```

The following example shows how enable only downstream load balancing, without enabling upstream load balancing:

```
Router# configure terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# cable load-balance docsis30-enable downstream-only
```

Router(config)#

The following example shows how to verify if the DOCSIS 3.0 static modem count-based load balancing is disabled:

```
Router# show cable load-balance | include DOCSIS 3
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Enabled: No
DOCSIS 3.0 General LB
```

The following example shows how to enable DOCSIS 3.0 static modem count-based load balancing:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# cable load-balance docsis30-enable
Router(config)#
```

The following example shows how to verify if DOCSIS 3.0 static modem count-based load balancing is enabled:

```
Router# show cable load-balance | include DOCSIS 3
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Enabled: Yes
DOCSIS 3.0 General LB
```

Effective with Cisco IOS Release 12.2(33)SCH1, the output of the **show cable load-balance** command shows the satus of the **downstream-only** keyword configuration. The following example shows how to verify if only downstream load balancing is enabled:

```
Router#show cable load-balance
Load for five secs: 0%/0%; one minute: 0%; five minutes: 0%
Time source is NTP, 20:22:33.307 UTC Wed Jul 17 2013
Legacy  Group  Interval  Method        DCC Init   Threshold
Group   Index                          Technique  Minimum  Static  Enforce  Ugs
  PCMM
1       513    30        modems        0          5        10%     ---      ---
  ---
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Downstream Enabled: Yes DOCSIS 3.0 LB U
pstream Enabled: No
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
Group      Index                /UCC                  DS/US  M/E/U/P/S
1          1     GE     30       0xF8(0)/N 5          m/m    5/10/70/70/50
2          2     RE     30       0x40(1)/N 1          m/m    2/2/70/70/50
DOCSIS 3.0 General LB
MD       FN  Group S Intv DCC mask  Policy     Mtd MD-CM-SG Threshold
             Index        /UCC                 D/U          M/E/U/P/S
Ca5/0/0  1   32768 E 30   0xF8(0)/N 0          m/m 0x101    5/10/70/70/50
Router#
```

The **cable load-balance docsis30-enable** command is used to configure the following features:

- Load Balancing, Dynamic Channel Change, and Dynamic Bonding Change on the Cisco CMTS Routers
- Restricted/General Load Balancing and Narrowband Dynamic Bandwidth Sharing with Downstream Dynamic Load Balancing

Related Commands

Command	Description
show cable load-balance	Displays real-time configurational, statistical and operational information for load balancing operations on the router.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of the DOCSIS group operations on the router.

cable load-balance docsis30-enable dynamic downstream

To enable utilization based dynamic downstream Load Balancing for DOCSIS 3.0 Cable Modems, use the **cable load-balance docsis30-enable dynamic downstream** command in global configuration mode. Use the **no** form of this command to disable this feature.

cable load-balance docsis30-enable dynamic downstream
no cable load-balance docsis30-enable dynamic downstream

This command has no arguments or keywords.

Command Default

The command is disabled by default.

Command Modes

Global configuration mode (config)

Release	Modification
IOS-XE 3.17.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When the **cable load-balance docsis30-enable dynamic downstream** command is configured, cable modems which are wide-band online participates in the dynamic downstream utilization based on load balancing operation after the correct Load Balancing Group (LBG) is assigned.

The following example shows how to enable utilization based dynamic downstream Load Balancing for DOCSIS 3.0 Cable Modems using the **cable load-balance docsis30-enable dynamic downstream** command:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# cable load-balance docsis30-enable dynamic downstream
endRouter(config)#
```

Related Commands

Command	Description
show cable load-balance	Displays real-time configurational, statistical and operational information for load balancing operations on the router.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of the DOCSIS group operations on the router.

cable load-balance docsis30-enable static

To enable static downstream Load Balancing for DOCSIS 3.0 Cable Modems, use the **cable load-balance docsis30-enable static** command in global configuration mode. Use the **no** form of this command to disable this feature.

cable load-balance docsis30-enable static
no cable load-balance docsis30-enable static

Syntax Description

static	Please provide a description.

Command Default

The command is enabled by default.

Command Modes

Global configuration mode (config)

Release	Modification
IOS-XE 3.17.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When the **cable load-balance docsis30-enable static**command is configured, cable modems which are wide-band online does not participate in the static modem count based load balancing operation after the correct Load Balancing Group (LBG) is assigned.

The following example shows how to enable static downstream Load Balancing for DOCSIS 3.0 Cable Modems using the **cable load-balance docsis30-enable static** command:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# no cable load-balance docsis30-enable static
Router(config)# end
```

Related Commands

Command	Description
show cable load-balance	Displays real-time configurational, statistical and operational information for load balancing operations on the router.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of the DOCSIS group operations on the router.

cable load-balance docsis30-dynamic-enable

To enable DOCSIS 3.0 dynamic load balancing on the downstream channels, use the **cable load-balance docsis30-dynamic-enable** command in the global configuration mode. To disable the DOCSIS 3.0 dynamic load balancing, use the **no** form of this command.

cable load-balance docsis30-dynamic-enable

no cable load-balance docsis30-dynamic-enable

Syntax Description

This command has no arguments or keywords.

Command Default

The DOCSIS 3.0 dynamic load balancing is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCI	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Before configuring the DOCSIS 3.0 dynamic load balancing on Cisco CMTS, you need to enable DOCSIS 2.0 and DOCSIS 3.0 load balancing on CMTS.

Example

The following example shows how to enable the DOCSIS 3.0 dynamic load balancing on the CMTS using the **cable load-balance docsis30-dynamic-enable** command.

```
Router>enable
Router# configure terminal
Router(config)# cable load-balance docsis30-dynamic-enable
Router(config)# exit
```

Related Commands

Command	Description
show cable load-balance	Displays real-time configuration, statistical and operational information for load balancing operations on the router.
clear cable load-balance error-statistics	Clears all the failure counters in error statistics.
show cable load-balance	Displays information of the DOCSIS 3.0 and DOCSIS 2.0 load balance failure.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of the DOCSIS group operations on the router.

cable load-balance docsis-group

To configure a DOCSIS load balancing group (LBG) on the CMTS, use the **cable load-balance docsis-group** command in the global configuration mode. To delete a DOCSIS load balancing group and to remove it from the CMTS configuration, use the **no** form of this command.

cable load-balance docsis-group *docsis-group-id*
no cable load-balance docsis-group *docsis-group-id*

Cisco uBR10012 Router
cable load-balance docsis-groupFN *fn-id* **MD** *cable slot/subslot/port*

Cisco uBR7225VXR and Cisco uBR7246VXR Routers
cable load-balance docsis-groupFN *fn-id* **MD** *cable slot/port*

Cisco cBR Series Converged Broadband Routers
cable load-balance docsis-groupFN *fn-id* **MD** *cable slot/subslot/port*

Syntax Description

docsis-group-id	DOCSIS load balance group ID. A valid DOCSIS load balance group ID ranges from 1 to 2147483647 and does not overlap with the legacy LBG ID. Therefore, both **cable load-balance group 1** and **cable load-balance docsis-group 1** commands can be configured. The DOCSIS load balance group ID ranging from 2147483648 to 2^32-1 is reserved for DOCSIS 3.0 general load balancing group (GLBG).
FN *fn-id*	Specifies the fiber node (FN) where certain DOCSIS 3.0 GLBG parameters, such as **disable**, **docsis-policy**, **init-tech-list**, **interval**, **method**, **policy**, and **threshold**, can be configured.
MD *cable slot/subslot/port*	Specifies the MAC domain interface of the fiber node. • *slot*—Slot where the line card resides. The permitted range is from 5 to 8. The permitted range is 0 to 9 in cBR. • *subslot*—Subslot where the line card resides. The available slots are 0 or 1. For cBR, only slot 0 is available. • *port*—The downstream controller number on the line card. The permitted *port* range is from 0 to 4. For cBR, the permitted range is 0 to 15.

MD *cable slot/port*	Specifies the MAC domain interface of the fiber node on the Cisco uBR7246VXR or Cisco uBR7225VXR router.
	• *slot*—Slot where the line card resides.
	  • Cisco uBR7225VXR router—The valid range is from 1 to 2.
	  • Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• *port*—Downstream controller number on the line card. The permitted *port* values are 0 or 1.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

The **cable load-balance docsis-group** command creates a DOCSIS LBG with the specified number and then enters the config-lb-group configuration mode. Use the config-lb-group configuration mode to configure the DOCSIS LBG.

- **disable**
- **docsis-policy**
- **downstream**
- **init-tech-list**
- **init-tech-ovr**
- **interval**
- **method**
- **policy**
- **restricted**
- **service-type-id**
- **tag**
- **threshold**
- **upstream**

Examples

The following example shows how to create a DOCSIS group numbered "1":

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# init-tech-list 1 ucc
Router(config-lb-group)# downstream Cable 1/1
Router(config-lb-group)# upstream Cable 1/0 2
Router(config-lb-group)# docsis-policy 0
Router(config-lb-group)# init-tech-ovr Cable 1/1 1 Cable 1/0 2 init-tech-list 1 ucc
Router(config-lb-group)# service-type-id ccc
Router(config-lb-group)# tag t1
Router(config-lb-group)# interval 10
Router(config-lb-group)# method modems us-method modems
Router(config-lb-group)# no policy us-across-ds pure-ds-load ugs

Router(config-lb-group)# restricted
Router(config-lb-group)# threshold pcmm 70 load 10 stability 50 ugs 70
Router(config-lb-group)#
```

The following example shows how to configure DOCSIS 3.0 GLBG parameters:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group FN 2 MD cable 1/0
```

Related Commands

Command	Description
docsis-policy	Assigns a policy to a group, which is the default policy assigned to the CM when the CM is not assigned a different policy.
downstream	Sets downstream RF channels.
upstream	Sets upstream channels.
init-tech-list	Sets the DCC/DBC initialization techniques that the CMTS uses to load balance cable modems. The **init-tech-list** command can also be used to determine whether UCC can be used for modems during dynamic upstream load balancing.
init-tech-ovr	(For Cisco uBR10012, uBR7225VXR and uBR7246VXR Series Routers) Sets DCC initialization techniques that overrides the physical upstream channel pair. The **init-tech-ovr** command can also be used to determine whether UCC can be used for modems during dynamic upstream load balancing. **Note** The **init-tech-list** command accepts an upstream that is not added into the load balancing group. The upstream channel pair is invalid until the upstream is added. When the load balancing group is removed, all upstream channel pairs are also removed.
interval	Sets the duration of time the CMTS waits before checking the load on an interface.
method	Selects the method the CMTS uses to determine the load. US methods can be different from DS methods.
policy	Selects modems, based on the type of service flow that will be balanced.
restricted	Selects the restricted group type. By default, the general group type is selected.
service-type-id	Adds a service type ID that is compared with the cable modem provisioned service type ID, to determine an appropriate restricted load balancing group (RLBG).
tag	Adds a tag to the load balancing group. The tag is used to assign the RLBG to the CMs that have the same tag name.
threshold	Specifies the threshold percentage of use exceeding which load balancing occurs.
cable tag	Configures the tag that gets added to the load balancing group.

cable load-balance docsis-policy

To create a DOCSIS policy and associate an existing rule and tag with the policy, use the **cable load-balance docsis-policy** command in global configuration mode. To remove a DOCSIS policy, rule, or tag from the policy, use the **no** form of this command.

cable load-balance docsis-policy *policy-id* [**rule** *rule-id* | **tag** *tag name* [**override**]]
no cable load-balance docsis-policy *policy-id* [**rule** *rule-id* | **tag** *tag name* [**override**]]

Syntax Description

policy-id	Specifies the DOCSIS policy to be created.
rule *rule-id*	Specifies the rule to be used with the DOCSIS policy.
tag *tag name*	Specifies the tag to be used with the DOCSIS policy.
override	Overrides all the policies in the CM that has the specified tag name.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCC	The **tag** parameter was added to the command.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command associates a rule with a policy. A policy is created only when a rule is associated with it. Similarly, the policy is removed if you remove the last rule associated with the policy.

Examples

The following example defines a DOCSIS policy, and associates a predefined rule and tag with this policy:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-policy 1 rule 1
Router(config)# cable load-balance docsis-policy 1 tag SPG override
Router(config)#
```

Related Commands

Command	Description
cable load-balance rule	Creates a rule to prevent CM from disabling or enabling load balancing.
cable tag	Creates a tag to associate it with DOCSIS policies and groups.

cable load-balance exclude

To exclude a particular cable modem, or all cable modems from a particular vendor, from one or more forms of load-balancing operations, use the **cable load-balance exclude** command in global configuration mode. To end the exclusion, so that these particular cable modems are subject to the load-balancing policies of the load-balance group to which they belong, use the **no** form of this command.

cable load-balance exclude {**device-class** *id* | **modem** *mac-address* | **oui** *word*} [*mask* | **assignment** | **enforce** | **static** | **strict**]
cable load-balance exclude {**device-class** *id* | **modem** *mac-address* | **oui** *word*}

Cisco cBR Series Converged Broadband Routers
cable load-balance exclude { **modem** *mac-address* | **oui** *word* }

Syntax Description

device-class *id*	(For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) Specifies the device class ID of the cable modems to be excluded in a bitmap format (0-ffff).
modem *mac-address*	Specifies the hardware (MAC) address of an individual cable modem to be excluded from load balancing. (You cannot specify a multicast MAC address.)
mask	(Optional) Specifies the mask for the range (group) of hardware (MAC) addresses, so that the cable modems with hardware (MAC) addresses in that range are excluded from load balancing.
oui *word*	Specifies the organization unique identifier (OUI) of a vendor, so that cable modems from this vendor are excluded from load balancing. The OUI must be specified as three hexadecimal bytes separated by either periods or colons.
assignment	(Optional) Excludes the cable modems that were moved into a load balancing group in assignment phase.
enforce	(Optional) Excludes the cable modems from dynamic load balancing, but they continue to participate in static load balancing.
static	(Optional) Excludes the cable modems from static load balancing, but they continue to participate in passive load balancing and dynamic load balancing.
strict	(Optional) Excludes the cable modems from all forms of load balancing.

Note Passive load balancing is not supported on cBR Series Converged Broadband Routers.

Command Default

By default, all cable modems on an interface are automatically included in all configured load-balancing operations when that cable interface is assigned to a load-balance group (**no cable load-balance exclude**). When a cable modem is excluded without any options specified, the cable modem is excluded from dynamic and static load balancing, but it continues to participate in passive load balancing.

Command Modes

Global configuration

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCH	This command was modified with the following argument and keywords: • *mask* • **assignment** • **device-class**
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

The **cable load-balance exclude** command allows you to specify that particular cable modems should not participate in one or more types of load-balancing operations. This might be done for cable modems that are currently provisioned for premium services, for cable modems that do not respond appropriately to upstream channel change (UCC) or channel override messages, or for other reasons.

In particular, you must use the **cable load-balance exclude** command to exclude cable modems that require specific upstream channels or downstream frequencies. Load balancing cannot be done when cable modems are assigned specific channels or frequencies in their DOCSIS configuration files.

The load balancing process has two phases.

- Assignment phase:

  When a modem is coming online in the assignment phase, the modem is moved to the load balance group by assigning it a load balancing group (LBG) ID. The assignment phase occurs only when a modem is coming online. Use the **assignment** option to exclude a modem during the assignment phase.

- Balancing phase:

  In the balancing phase, a modem is re-assigned to an LBG to balance the load. Use the **static** option to exclude a modem from static load balancing, the **enforce**, or **strict** options from dynamic load balancing, in the balancing phase.

You can use the **cable load-balance exclude** command to specify that these cable modems should not participate in the following types of load-balancing operations:

- Static load balancing—Load balancing is done at the time a cable modem registers by specifying the proper target channel in the Downstream Frequency Override or an Upstream Channel ID Override field in the registration response (REG-RSP) message that the Cisco CMTS sends to the cable modem. This is the default form of registration-based load balancing.
- Passive load balancing—Load balancing is done at the time a cable modem registers by ignoring a cable modem's registration request (REG-REQ) message until it uses the correct target channels. Use the **cable load-balance exclude** command to specify this form of load balancing for older cable modems that do not respond well to the active form of load balancing.



Note Passive load balancing is not supported on cBR Series Converged Broadband Routers.

- Dynamic load balancing—A form of traffic-based load balancing, in which cable modems are balanced among upstreams and downstreams after they come online, while they are passing traffic. (Dynamic load balancing is enabled using the **enforce** option with the **cable load-balance group threshold** command.)

Use the **cable load-balance exclude** command to exclude a cable modem from any combination of load-balancing operations. The table below shows which forms of load-balancing operations are excluded and which are enabled for each form of the **cable load-balance exclude** command:

Table 6: cable load-balance exclude Command

	Static	Passive [1]	Dynamic[2]
Default (**no cable load-balance exclude**)	Yes	Excluded	Yes
cable load-balance exclude	Excluded	Yes	Excluded
cable load-balance exclude enforce	Yes	Excluded	Excluded
cable load-balance exclude static	Excluded	Yes	Yes
cable load-balance exclude strict	Excluded	Excluded	Excluded
cable load-balance exclude static strict	Excluded	Excluded	Yes

1 Passive load balancing is not supported on cBR Series Converged Broadband Routers.
2 Dynamic load balancing must also be separately enabled for a load-balance group by using the enforce option with the cable load-balance group threshold command.

Note Excluding cable modems might be required for some cable modems that are not DOCSIS-compliant. Such cable modems can go offline for long periods of time when load balancing is attempted using DOCSIS MAC messages. If this is the case, use the **cable load-balance exclude** command to exclude such cable modems from load-balancing operations until the modem can be upgraded to DOCSIS-compliant software.

Effective with Cisco IOS Release 12.2(33)SCH, you can configure the **cable load-balance exclude** command once to exclude all the STBs, that do not support load balancing, using the mask argument. You can also move cable modems that were moved to a load balancing group in assignment phase, using the assignment option.

Examples

The following example shows how to exclude a particular cable modem with the MAC address of 0001.0203.0405 from active and dynamic load-balancing operations:

```
Router# config terminal
Router(config)# cable load-balance exclude mac 0001.0203.0405
```

The following example shows how to exclude all cable modems with the OUI of 00.00.0C from active and dynamic load-balancing operations:

```
Router# config terminal
Router(config)# cable load-balance exclude oui 00.00.0C
```

The following example shows how to exclude all cable modems with the OUI of 00.00.0C from dynamic load-balancing operations. These cable modems are still subject to static load-balancing operations.

```
Router# config terminal
Router(config)# cable load-balance exclude oui 00.00.0C enforce
```

The following example shows how to exclude a particular cable modem from all forms of load-balancing operations:

```
Router# config terminal
Router(config)# cable load-balance exclude mac 0001.0203.0405
 strict
```

The following example shows how to exclude all the cable modems with MAC address 0016.924f.82b4 and mask f000.0000.0000 which have been moved to the load balancing group in the assignment phase.

```
Router# configure terminal
Router(config)# cable load-balance exclude modem 0016.924f.82b4 f000.0000.0000 assignment
```

The following example shows how to exclude cable modems from DOCSIS load balance based on the cable modem device class:

```
Router# config terminal
Router(config)# cable load-balance exclude device-class 1
```

The **cable load-balance exclude** command is associated with the Excluding Cable Modems from a Load Balancing Group feature.

Related Commands

Command	Description
cable load-balance group (global configuration)	Creates and configures a load-balance group.
cable load-balance group (interface configuration)	Assigns a downstream to a load-balance group.
cable load-balance group interval	Configures the frequency of the load-balancing policy updates.
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable load-balance group threshold	Configures the threshold values that a load-balance group should use for load-balancing operations.
cable upstream load-balance group	Assigns an upstream to a load-balance group.
clear cable load-balance	Clears the counters or state machine used to track load-balancing operations.
show cable load-balance	Displays real-time statistical and operational information for load-balancing operations.

cable load-balance fixed-primary-channel

To reduce service outage while enabling dynamic load balancing, enable fixed primary channel movement, use the **cable load-balance fixed-primary-channel** command in global configuration mode.

DOCSIS 3.0 load balance does not change the modem's primary channel during dynamic movement when you enable fixed primary channel movement.

cable load-balance fixed-primary-channel

Command Default

Fixed primary channel for load balancing is not enabled by default on the Cisco CMTS.

Command Modes

Global configuration

Command History

Release	Modification
IOS-XE 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable fixed primary channel movement:

```
Router# config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# cable load-balance fixed-primary-channel
Router(config)# end
```

The following example shows how to check the enabled status of the fixed primary channel movement:

```
Router# show run
Router# show running-config | in fixed
cable load-balance fixed-primary-channel
```

Related Commands

Command	Description
cable load-balance docsis30-enable dynamic downstream	Enables utilization based dynamic downstream Load Balancing for DOCSIS Cable Modems

cable load-balance group

To create a load-balance group and configure the type of load-balancing to be used, use the **cable load-balance group** command in global configuration mode. To delete a load-balance group, use the **no** form of this command. To reset a load-balance group to its default configuration, use the **default** form of this command.

cable load-balance group *n* [**method utilization** | **method modem** | **method service-flows**]
no cable load-balance group *n*

Syntax Description

n	Specifies the number of the load balance group. In Cisco IOS Release 12.2(33)SCE3 and earlier, the valid range is from 1 to 80. In Cisco IOS Release 12.2(33)SCE4 and later, the valid range is from 1 to 256.
method modem	(Optional) Specifies that the load-balance group should use the number of active cable modems on an interface to determine the current load (default). This method does not take into account the amount of traffic flowing through those particular cable modems.
method service-flows	(Optional) Specifies that the load-balance group should use the number of active service flow IDs (SFIDs) on an interface to determine the current load.
method utilization	(Optional) Specifies that the load-balance group should use an interface's current percentage of utilization to determine the current load. **Tip** The **utilization** method does not begin moving cable modems for load balancing until the utilization of the interface is at 25 percent or more. This is done to avoid the unnecessary moving of cable modems due to temporary spikes in an interface's utilization rates.

Command Default

No load-balance groups are created. By default, a load-balance group uses the actual number of cable modems online each interface to determine load balancing needs (**modem** option).

Note If you do not create any load-balance groups, the Cisco CMTS defaults to using a form of registration-based load balancing that attempts to equally distribute cable modems among upstreams at the time the cable modems register and come online. No load balancing is done for downstreams or for cable modems that are already online.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCE4	The valid range for the load balance group was changed.

Release	Modification
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable load-balance group** command is used to configure the following features:

- IGMP-Triggered Dynamic Channel Change Load Balancing for DOCSIS 2.0 Cable Modems
- Load Balancing and Dynamic Channel Change on the Cisco CMTS Routers
- Restricted/General Load Balancing and Narrowband Dynamic Bandwidth Sharing with Downstream Dynamic Load Balancing

The **cable load-balance** command creates a load-balance group, which can then be assigned to a number of upstream and downstream cable interfaces to allow the Cisco CMTS to load balance cable modems as needed. The Cisco CMTS can use the load-balance groups for static, passive, and dynamic load balancing of both upstream and downstream channels. You can configure downstreams and upstreams to use the same load balancing parameters, or you can configure upstreams and downstreams separately.



Note You can create a maximum of 20 load-balance groups on each chassis. However, you can reuse those load-balance groups on different sets of cable interfaces, as long as they are in different domains. If downstreams are not included in a load-balance group, then each downstream can be considered a separate domain.

Use the **cable load-balance group (global configuration)** command to initially create and configure a load-balance group. Then use the **cable load-balance group (interface configuration)** command to assign this load-balance group to an upstream or downstream, so that the cable interface will begin participating in load-balancing operations.

You can configure a load-balance group to use one of the following types of load-balancing methods:

- Modem Method—Uses the number of active cable modems on an interface.
- Service Flow Method—Uses the number of active Service Flow IDs (SFIDs) on an interface.
- Utilization Method—Uses an interface's current percentage of utilization.

See the following sections for more information about each method.

Modem Method

The **modem** method of load-balancing uses the number of active cable modems on an interface to determine the current load. This is a form of distribution-based load balancing, in which the absolute numbers of modems are used to determine whether interfaces are load balanced.

This method does not take into account the amount of traffic flowing through the cable modems, but the system does take into account the relative bandwidth of the channels being used, so that channels with higher bandwidths are allocated higher numbers of cable modems. This means that when interfaces are using different channel widths or modulation profiles, the system can assign different numbers of cable modems to the interfaces to achieve a balanced load. For example:

- Channel widths— If two upstreams are being load balanced, and one upstream is configured with a channel width of 1.6 MHz and the other upstream is configured for a channel width of 3.2 MHz, the Cisco CMTS allocates twice as many cable modems to the second upstream, because its channel width is twice as large as the first upstream's channel width.

- Modulation profiles— If one downstream is configured for 64-QAM and the other downstream is configured for 256-QAM, the Cisco CMTS allocates a proportionately larger number of cable modems to the second downstream so as to achieve a balanced load.

When both the channel width and different modulation profile are set differently on two interfaces, the system calculates a "weight" value to use as a guide to determine the relative bandwidths of the interfaces.



Tip In a system with balanced loads, the interfaces will contain the same number of cable modems only when the interfaces are configured with the same modulation parameters.

Service Flow Method

The **service-flows** method of load balancing uses the number of active service flow IDs (SFIDs) on an interface to determine the current load. This is a form of distribution-based load balancing, in which the absolute numbers of service flows are used to determine whether interfaces are load balanced.

This method does not take into account the amount of traffic flowing on each SFID, but the system does take into account the relative bandwidth of the channels being used, so that channels with higher bandwidths are allocated higher numbers of SFIDs. This means that when interfaces are using different channel widths or modulation profiles, the system can assign different numbers of SFIDs to the interfaces to achieve a balanced load. For example:

- Channel widths— For example, if two upstreams are being load balanced, and one upstream is configured with a channel width of 1.6 MHz and the other upstream is configured for a channel width of 3.2 MHz, the Cisco CMTS allocates twice as many SFIDs to the second upstream, because its channel width is twice as large as the first upstream's channel width.
- Modulation profiles— For example, if one downstream is configured for 64-QAM and the other downstream is configured for 256-QAM, the Cisco CMTS allocates a proportionately larger number of SFIDs to the second downstream so as to achieve a balanced load.

When both the channel width and different modulation profile are set differently on two interfaces, the system calculates a "weight" value to use as a guide to determine the relative bandwidths of the interfaces.



Tip In a system with balanced loads, the interfaces will contain the same number of SFIDs only when the interfaces are configured with the same modulation parameters.

Utilization Method

The **utilization** method uses an interface's current percentage of utilization to determine the current load. This method uses the amount of traffic being sent over an interface, in the form of the percentage of total bandwidth being used. (To avoid unnecessary movement of cable modems, the **utilization** method does not perform load balancing until an interface is at least 25 percent of utilization.)



Note Do not use the **utilization** method of load balancing on cable interfaces that have a small number of cable modems and where a single modem is responsible for the majority of the interface load. In this condition, the Cisco CMTS could end up continually moving cable modems from one interface to another in an endless attempt to load balance the interfaces. To avoid this, configure the utilization threshold to a value that is higher than what can be caused by any single cable modem.

When using the **utilization** method, the system takes into account the relative throughput and bandwidth (as determined by the modulation profiles and channel widths) of each interface when evaluating the load on those interfaces. For example, if two upstreams are being load-balanced using the utilization method, and the first upstream has twice the bandwidth of the second upstream, the two upstreams are considered balanced when they reach the same percentage of utilization. The first upstream is carrying more traffic than the second upstream because it has a larger capacity for traffic, but the percentage of utilization will be the same.



Note Certain conditions can cause a system instability that could result in the Cisco CMTS endlessly attempting to load balance the interfaces. For example, this situation could occur in noisy environments, where cable modems drop offline on a regular basis, or when cable modems are repeatedly trying to register because the provisioning system has sent them the wrong DOCSIS configuration files. If the Cisco CMTS detects such unstable situations, it does not load balance cable modems from those interfaces until the system stabilizes. However, if the system instability persists, you should increase the threshold values using the **cable load-balance group threshold** command until you can solve the stability problems.

Use the **no** form of this command to delete a load-balance group. Deleting a load-balance group also automatically removes all upstream and downstream channel associations that were made with that group using the **cable load-balance** and **cable upstream load-balance** commands.



Tip To exclude individual cable modems from one or more types of load balancing, use the **cable load-balance exclude** command.

Examples

The following example shows how to create a load-balance group numbered 10, using the default method of **modem**, which specifies that the Cisco CMTS uses the actual number of cable modems that are online to determine load-balancing operations.

```
Router# config terminal
Router(config)# cable load-balance group 10

Router(config)#
```

The following example shows how to create a load-balance group numbered 1, which uses the number of active SFIDs on an interface to determine the current load on the interface:

```
Router# config terminal
Router(config)# cable load-balance group 1 method service-flows

Router(config)#
```

Related Commands

Command	Description
cable load-balance exclude	Excludes a particular cable modem, or all cable modems from a particular vendor, from one or more types of load-balancing operations.
cable load-balance group (interface configuration)	Assigns a downstream to a load-balance group.

Command	Description
cable load-balance group interval	Configures the frequency of the load-balancing policy updates.
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable load-balance group threshold	Configures the threshold values that a load-balance group should use for load-balancing operations.
cable upstream load-balance group	Assigns an upstream to a load-balance group.
clear cable load-balance	Clears the counters or state machine used to track load-balancing operations.
show cable load-balance	Displays real-time statistical and operational information for load-balancing operations.

cable load-balance group (interface)

To assign a downstream cable interface to a load balance group, use the **cable load-balance group** command in interface configuration mode. To remove a downstream from a load balance group, use the **no** form of this command.

cable load-balance group *n*
no cable load-balance group *n*

Syntax Description

n	Specifies the number of the load balance group to which the downstream should be assigned. In Cisco IOS Release 12.2(33)SCE3 and earlier, the range is from 1 to 80. In Cisco IOS Release 12.2(33)SCE4 and later, the range is from 1 to 256.

Command Default

A downstream is not assigned to a load balance group. When you use this command to add a downstream to a group, it also automatically adds all the associated upstreams to the same group, unless you have also used the **cable upstream load-balance group** command to assign the upstreams to different groups.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCE4	The valid range for the load balance group was changed.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable load-balance group** command is used to configure the following features:

- IGMP-Triggered Dynamic Channel Change Load Balancing for DOCSIS 2.0 Cable Modems
- Load Balancing and Dynamic Channel Change on the Cisco CMTS Routers
- Restricted/General Load Balancing and Narrowband Dynamic Bandwidth Sharing with Downstream Dynamic Load Balancing

After you have used the **cable load-balance group (global configuration)** command to initially create and configure a load balance group, use the **cable load-balance group (interface configuration)** command to assign this load balance group to a downstream. This enables the cable interface to begin participating in load-balancing operations.



Tip Use the **cable upstream load-balance group** command to assign this load balance group to an upstream.

The following rules apply when creating and assigning load balance groups:

- A downstream or upstream can belong to only one load balance group.
- All downstreams and upstreams in a load balance group must share physical radio frequency (RF) connectivity to the same group of cable modems. Downstreams can be in a separate load balance group

than upstreams, but all downstreams or all upstreams that have the same RF physical connectivity must be members of the same load balance group. You cannot distribute downstreams or upstreams that share physical connectivity across multiple load balance groups.

Note If both downstreams and upstreams are assigned to the same load balance group, the Cisco CMTS attempts to balance both the downstream and upstream values when it moves cable modems.

- If the load balance group includes downstream interfaces, you must also configure the downstream center frequency on those interfaces, using the **cable downstream frequency** cable interface command. This command is informational-only on cable interfaces that use an external upconverter, but it is required for load balancing, so that the Cisco CMTS knows where to move cable modems when it is load balancing downstreams.
- Load balancing is done only on a per-chassis basis—all interfaces in a load balance group must be in the same chassis.

Note In Cisco IOS Release 12.2(15)BC1, you can configure an interface for both load balancing and Hot-Standby Connection-to-Connection (HCCP) N+1 redundancy, but load balancing does not continue after a switchover from a Working to a Protect interface. Load balancing resumes when the Cisco CMTS switches back to the Working interface.

Examples

The following example shows how to assign the first downstream on the cable interface line in slot five to load balance group 5:

```
Router# configure terminal
Router(config)# interface cable 5/0
Router(config-if)# cable load-balance group 5

Router(config-if)#
```

Related Commands

Command	Description
cable load-balance exclude	Excludes a particular cable modem, or all cable modems from a particular vendor, from one or more types of load-balancing operations.
cable load-balance group (global configuration)	Creates and configures a load balance group.
cable load-balance group interval	Configures the frequency of the load balancing policy updates.
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable load-balance group threshold	Configures the threshold values that a load balance group should use for load-balancing operations.

Command	Description
cable upstream load-balance group	Assigns an upstream to a load balance group.
clear cable load-balance	Clears the counters or state machine used to track load balancing operations.
show cable load-balance	Displays real-time statistical and operational information for load balancing operations.

cable load-balance group (Supporting Dynamic Channel Change)

To set multiple parameters for Load Balancing with Dynamic Channel Change (DCC), use the following command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable load-balance group *group-num* {**dcc-init-technique** | **interval** | **method** | **policy** | **threshold**}
no cable load-balance group *group-num* {**dcc-init-technique** | **interval** | **method** | **policy** | **threshold**}

Syntax Description

dcc-init-technique	Sets DCC initialization technique
interval	Sets interface polling interval
method	Sets upstream load balancing type/method
policy	Sets load balancing policy
threshold	Load balancing threshold in percentage

Command Default

Load balancing is not configured by default on the Cisco CMTS.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(17a)BC	This command was introduced on the Cisco uBR10012 router and the Cisco uBR7246VXR router, with supporting broadband processing engines (BPEs) or cable interface line cards on the respective routers.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example illustrates configuration of the initialization techniques specified for DCC:

```
Router(config)# cable load-balance group 1 dcc-init-technique 4
```

For further examples of this command, and related keywords, refer to related commands, and refer also to *Configuring Load Balancing and Dynamic Channel Change (DCC) on the Cisco CMTS* .

Usage Guidelines

This command is subject to the restrictions and prerequisites described in *Configuring Load Balancing and Dynamic Channel Change (DCC) on the Cisco CMTS* .

Related Commands

Command	Description
cable load-balance group dcc-init-technique (Supporting Dynamic Channel Change)	Sets the initialization technique for Dynamic Channel Change (DCC) for Load Balancing.

Command	Description
cable load-balance group policy (Supporting Dynamic Channel Change)	Sets the type of service flow for use with Load Balancing and DCC, whether PacketCable MultiMedia (PCMM) or Unsolicited Grant Service (UGS).
cable load-balance group threshold (Supporting Dynamic Channel Change)	Sets the threshold levels for corresponding service flow types for the specified Load Balancing group, supporting Dynamic Channel Change (DCC)
show controllers cable	Displays statistics for Dynamic Channel Change (DCC) for load balancing.
test cable dcc (Supporting Dynamic Channel Change)	Performs testing functions for Load Balancing with DCC

cable load-balance group interval

To configure the frequency of the load-balancing policy updates, use the **cable load-balance group interval** command in global configuration mode. To reset the frequency of the policy updates to its default values, use the **no** form of this command.

cable load-balance group *n* **interval** *interval*
no cable load-balance group *n* **interval**

Syntax Description

n	Specifies the number of the load balance group. In Cisco IOS Release 12.2(33)SCE3 and earlier, the range is from 1 to 80. In Cisco IOS Release 12.2(33)SCE4 and later, the range is from 1 to 256.
interval	Specifies the frequency, in seconds, for how often the Cisco CMTS router should determine the current load on each cable interface. This also determines the minimum time between when cable modems can be moved to load balance the interfaces. One cable modem at most is moved during each interval time period. The range is from 1 to 1000. The default is 10 in Cisco IOS Release 12.2(33)SCE and earlier. The default is 30 in Cisco IOS Release 12.2(33)SCE1 and later.

Command Default

Each load balance group uses the default interval value, if the interval time period is not specified.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCE1	The default value for the **interval** keyword was changed from 10 seconds to 30 seconds.
12.2(33)SCE4	The valid range for the load balance group was changed.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable load-balance group interval** command is used to configure the following feature:

- Load Balancing and Dynamic Channel Change on the Cisco CMTS Routers

To perform load balancing, the Cisco CMTS must determine the actual load on an interface on a periodic basis. This frequency of the updates also determines how frequently cable modems can be moved to achieve balanced loads. One cable modem, at most, is moved during each update period.

The more often these updates are performed, the more accurate the Cisco CMTS can be in performing its load balancing operations. As a general rule, begin with the default frequency value, and then adjust the value accordingly, in small increments, as load balancing conditions or performance levels might require. The default interval value was changed in Cisco IOS Release 12.2(33)SCF to reduce thrashing of cable modems when utilization-based method is used with DOCSIS load balancing.



Note Having too small an interval could result in cable modems being constantly moved to achieve balanced loads during peak usage times when load balance could spike to transient heavy traffic. Also, more frequent updates can have a performance impact, especially on routers with a large number of active interfaces and cable modems.

Examples

The following example shows how to configure load-balance group 3 so that it performs a policy update every 30 seconds:

```
Router# configure terminal
Router(config)# cable load-balance group 3 interval 30

Router(config)#
```

The following example shows how to reset load-balance group 10 to its default update frequency of 10 seconds:

```
Router# configure terminal
Router(config)# no cable load-balance group 10 interval
Router(config)#
```

Related Commands

Command	Description
cable load-balance exclude	Excludes a particular cable modem, or all cable modems from a particular vendor, from one or more types of load-balancing operations.
cable load-balance group (global configuration)	Creates and configures a load-balance group.
cable load-balance group (interface configuration)	Assigns a downstream to a load-balance group.
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable load-balance group threshold	Configures the threshold values that a load-balance group should use for load-balancing operations.
cable upstream load-balance group	Assigns an upstream to a load-balance group.
clear cable load-balance	Clears the counters or state machine used to track load-balancing operations.
show cable load-balance	Displays real-time statistical and operational information for load-balancing operations.

cable load-balance group policy

The following command is introduced to the Cisco CMTS starting in Cisco IOS Release 12.2(17b)BC4.

To set the type of service flow policy for use with Load Balancing, use the following command in global configuration mode. This enhancement synchronizes the pending statistic between different cable interface line cards in the load balancing group. The result is an alternative downstream load balancing scheme that makes use of per-upstream loads rather than total downstream loads.

To remove this configuration, use the **no** form of this command.

cable load-balance group *ds-lb-group-id* **policy** *us-groups-across-ds*
no cable load-balance group *ds-lb-group-id* **policy** *us-groups-across-ds*

Syntax Description

ds-lb-group-id	Specifies the load balancing group being configured. This downstream group includes the upstream segment in load balancing decisions.
us-groups-across-ds	Specifies the upstream group to be distributed in load balancing decisions for the downstream group specified.

Command Default

By default, this load balancing configuration is not enabled on the Cisco CMTS.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(17b)BC4	This command was introduced on the Cisco uBR10012 router and the Cisco uBR7246VXR router, with supporting broadband processing engines (BPEs) or cable interface line cards on the respective routers.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example illustrates this command and one supported implementation:

```
Router(config)# cable load-balance group 1 policy 2
Router(config)#
```

In this example, a cable modem that comes online on the interface cable 5/0 Upstream 2 could potentially come online on the following interfaces:

- cable 3/0 upstream 2
- cable 4/0 upstream 2
- cable 6/0 upstream 2
- nowhere else, however

With downstream load balancing prior to Cisco IOS Release 12.2(17b)BC4, having 100 cable modems per segment would be possible in an extreme case that distributes cable modems as follows:

```
        U0      U1      U2      U3     Downstream
3/0     97       1       1       1        100
4/0      1      97       1       1        100
5/0      1       1      97       1        100
6/0      1       1       1      97        100
```

Usage Guidelines

This command is subject to the restrictions and prerequisites described in *Configuring Load Balancing and Dynamic Channel Change (DCC) on the Cisco CMTS* .

Cisco IOS Release 12.2(17b)BC4 enables the optional operation of making downstream load balancing decisions as follows:

- The target downstream segment is in the same downstream load balancing group as the source downstream segment.
- The upstream load balancing group can be set for the corresponding channel on which a cable modem is balanced.
- The Cisco CMTS automatically locates the upstream segment for a load balancing group and processes the upstream group status on the source interface that has the lowest load.
- The target downstream segment must have an upstream channel set in the upstream load balancing group.
- The highest target upstream segment must carry less load than any other potential target —the highest upstream segment on other interfaces.

This command enables an alternative downstream load balancing scheme that makes use of per-upstream loads rather than total downstream loads.

This enhancement performs downstream load balancing that accounts upstream channel loads in the same upstream load balancing group, rather than on the basis of the entire downstream channel load. Prior Cisco IOS releases may not have distributed cable modems evenly over individual upstream channels, nor in a way that accounted for downstream and upstream together.

This enhancement applies when downstream load balancing occurs on a headend system with separate upstream load balancing segments; the upstream segments are spread over multiple downstreams segments.

This optional configuration supports output of the **show cable load-balance** command so that the command displays more information about loads on channels that are configured on external or remote cable interface line cards.

Related Commands

Command	Description
show cable load-balance	Displays information about loads on channels that are configured on external or remote cable interface line cards, to include integrated per-upstream load balancing information.

cable load-balance group policy ugs

To configure whether the Cisco CMTS should load balance cable modems with Unsolicited Grant Service (UGS) service flows (which are typically used for active voice calls), use the **cable load-balance group policy ugs** command in global configuration mode. To reset the load-balance group to its default policy setting, use the **no** form of this command.

cable load-balance group *n* **policy ugs**
no cable load-balance group *n* **policy ugs**

Syntax Description

n	Specifies the number of the load-balance group. In Cisco IOS Release 12.2(33)SCE3 and earlier, the valid range is from 1 to 80. In Cisco IOS Release 12.2(33)SCE4 and later, the valid range is from 1 to 256.

Command Default

Cable modems with active UGS service flows can be moved for load-balancing (**cable load-balance group** *n* **policy ugs**)

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCE4	The valid range for the load balance group was changed.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable load-balance group policy ugs** command determines whether a load-balance group can move cable modems with UGS service flows, so as to enforce dynamic load balancing policies. Because most voice calls use UGS service flows to allow real-time traffic, this option is primarily used to determine whether the Cisco CMTS will move cable modems with active voice calls.

If you disable this option (**no cable load-balance group policy ugs**), the Cisco CMTS does not move cable modems with active UGS service flows to a new upstream or downstream. This prevents some possible interruptions of service to these customers, but it could result in denial of service conditions for other customers if the interface starts becoming overloaded.

To avoid this, the default configuration (**cable load-balance group policy ugs**) of this command allows the Cisco CMTS to move cable modems to a new upstream or downstream, even if they have active UGS service flows. This enables the Cisco CMTS to perform optimum load balancing, but it could cause a momentary interruption in the voice call—users on the voice call might hear a momentary drop during the call, but the call should not be terminated.



Note The **cable load-balance group policy ugs** command affects only dynamic load-balancing operations and does not affect static and passive load-balancing operations. Dynamic load balancing is enabled using the **enforce** option with the **cable load-balance group threshold** command.

Examples

The following example shows how to enable the UGS policy on a load-balance group (the default configuration), so that the Cisco CMTS can move cable modems with active UGS service flows as needed to enforce the current dynamic load balancing policy:

```
Router# config terminal
Router(config)# cable load-balance group 13 policy ugs

Router(config)#
```

The following example shows how to configure a load-balance group so that the Cisco CMTS does not move cable modems with active UGS service flows (default configuration):

```
Router# config terminal
Router(config)# no cable load-balance group 100 policy ugs

Router(config)#
```

The **cable load-balance group policy ugs** command is used to configure the following feature:

- Load Balancing and Dynamic Channel Change on the Cisco CMTS Routers

Related Commands

Command	Description
cable load-balance exclude	Excludes a particular cable modem, or all cable modems from a particular vendor, from one or more types of load-balancing operations.
cable load-balance group	Creates and configures a load-balance group.
cable load-balance group (interface)	Assigns a downstream to a load-balance group.
cable load-balance group interval	Configures the frequency of the load-balancing policy updates.
cable load-balance group threshold	Configures the threshold values that a load-balance group should use for load-balancing operations.
cable upstream load-balance group	Assigns an upstream to a load-balance group.
clear cable load-balance	Clears the counters or state machine used to track load-balancing operations.
show cable load-balance	Displays real-time statistical and operational information for load-balancing operations.

cable load-balance group threshold

To configure the threshold values that a load-balance group should use for load-balancing operations, use the **cable load-balance group threshold** command in global configuration mode. To reset the load-balance group to its default threshold values, use the **no** form of this command.

cable load-balance group *n* **threshold** {**load** *load-value* [**enforce** *threshold*] | **load minimum** *number* | **stability** *percent* | **ugs** *band-value*}

Syntax Description

n	Specifies the number of the load-balance group. In Cisco IOS Release 12.2(33)SCE3 and earlier, the valid range is from 1 to 80. In Cisco IOS Release 12.2(33)SCE4 and later, the valid range is from 1 to 256.
load *load-value*	Specifies the maximum load difference, as expressed in a percentage of total load, that can exist between interfaces in a load-balance group before the Cisco CMTS performs load balancing. If the load between interfaces is greater than the value specified by *load-value* , cable modems that are registering are assigned to the lesser-utilized interface until the load difference is once again below this value. The valid range for *load-value* is 1 to 100 percent, with a default of 10 percent. **Note** The default of 10 percent is the minimum recommended threshold. Do not set this threshold below 10 percent unless you have been instructed to do so by Cisco TAC.
enforce *threshold*	(Optional) Enables dynamic load balancing, which moves online cable modems after their initial registration to achieve load balancing of the cable interfaces in a load-balance group. Cable modems that are currently online are moved when the load difference between two interfaces in the load-balance group exceeds this percentage. Modems continue to be moved until the load difference falls below this value. The possible valid range for *threshold* is 1 to 100 percent, but the *threshold* must be equal to or greater than the percentage specified with the *load-value* option. For this reason, the actual minimum for *threshold* is the current setting of the *load-value* option. The default is also the same value as the *load-value* parameter.
load minimum *number*	(Optional) Specifies that cable modems should be moved only if the load between the two interfaces is greater than the specified number of cable modems or service flows (valid only when the method is the number of modems or service flows). The valid range is 1 to 100, with a default of 5.
stability *percent*	Specifies the threshold to be used to determine whether a channel or interface is unstable, in terms of the percentage of successful ranging requests. The *percent* value specifies the minimum percentage of successful ranging requests that is acceptable; otherwise, the CMTS begins moving CMs. The valid range is 1 to 100 percent, with a default of 50 percent.

ugs *band-value*	Specifies that the Cisco CMTS should move cable modems with active UGS service flows when the current UGS usage reaches the percentage of total bandwidth available that is specified by the *band-value* parameter. The valid range for *band-value* is 0 to 100 percent, with a default of 70 percent. **Note** This option is effective only when the **enforce** option has also been used to enable dynamic load balancing, and the Cisco CMTS has been authorized to move cable modems with active UGS service flows (using the **cable load-balance group policy ugs** command).

Command Default

The **load** parameter defaults to 10 percent, the **load minimum** parameter defaults to 5, the **stability** parameter defaults to 50 percent, and the **ugs** parameter defaults to 70 percent. By default, only static load balancing is done (**no enforce** option). If the **enforce** option is given without a threshold value, it defaults to the same value as the **load** parameter.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCE4	The valid range for the load balance group was changed.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable load-balance group threshold** command is used to configure the following feature:

- Load Balancing and Dynamic Channel Change on the Cisco CMTS Routers

The **cable load-balance group threshold** command configures a load-balance group for the threshold values that it should use to determine when a cable modem should be moved to a new downstream or upstream. You can specify the following different thresholds:

- **load**—Specifies the maximum load usage that can exist between interfaces in a load-balance group before the Cisco CMTS begins static load-balancing operations. The default value of *load-value* is 10 percent, which means that two upstreams or two downstreams can have usage rates that vary up to 10 percent before the Cisco CMTS begins rebalancing the load usage. This rebalancing, however, is done only when cable modems first register with the Cisco CMTS—the Cisco CMTS does not switch cable modems that are already online.

For example, if the **load** value is 10 percent, and upstream 1 is at 23 percent and upstream 2 is at 30 percent, no cable modems are moved. However, if load usage for upstream 2 reaches 35 percent, the Cisco CMTS begins assigning new cable modems, as they register, to upstream 1 until the difference in load usage between the two upstreams falls below 10 percent.

Note The default of 10 percent is the minimum recommended threshold. Do not set this threshold below 10 percent unless you have been instructed to do so by Cisco TAC.

- **enforce**—Enables dynamic load balancing, so that the Cisco CMTS can move cable modems that are already online. This option has its own threshold value, which specifies the difference in load usage that must exist between two interfaces in a group before the Cisco CMTS begins moving online cable modems. The Cisco CMTS continues to move cable modems until the difference in load usage rates falls below the threshold value.

When using dynamic load balancing and an upstream channel is overloaded, the Cisco CMTS sends an Upstream Channel Change (UCC) request to a cable modem to instruct it to move to another upstream. The cable modem should move to the new upstream channel, without going offline or having to reregister with the CMTS.

When using dynamic load balancing and a downstream channel is overloaded, the Cisco CMTS sends an stop response to a cable modem's ranging request (RNG-REQ) message. When the cable modem sends a new REG-REQ message, the Cisco CMTS specifies the new downstream channel in the Downstream Frequency Override field in its REG-RSP message. The cable modem must go offline and reregister on the new downstream channel, so as to conform to the DOCSIS 1.0 specifications.



Note In Cisco IOS Release 12.2(15)BC1, the dynamic load balancing method results in cable modems going offline and having to reregister whenever the modems are moved between downstreams. This is because the DOCSIS 1.0 specification requires cable modems to reregister whenever the downstream is changed using the Downstream Frequency Override message. Cable modems should not go offline when moved between upstreams.

The Cisco CMTS also continues to enforce the load threshold value to perform static load balancing as well. Therefore, the *threshold* percentage should be equal to or greater than the percentage specified with the **load** *load-value* option.

For example, if you specify **load 10 enforce 15**, the Cisco CMTS monitors the load usage between cable interfaces in the load-balance group. If upstream 1 reaches 33 percent and upstream 2 reaches 45 percent, the Cisco CMTS begins static load-balancing operations by assigning new cable modems to upstream 1 when they register. If the difference still continues to grow, and upstream 2 reaches 50 percent, the Cisco CMTS also begins dynamic load-balancing operations by moving online cable modems, until the difference in load usage falls below 15 percent. The Cisco CMTS then continues static load-balancing operations until the difference falls below 10 percent.



Tip The **enforce** threshold is not displayed in the configuration file if it is the same as the **load** threshold. For example, if you enter the **cable load-balance group 1 threshold load 50 enforce 50** command, it appears as **cable load-balance group 1 threshold load 50 enforce** in the configuration file.

- **load minimum**—Specifies that cable modems should be moved only if the load between the two interfaces is greater than the specified number of cable modems or service flows. This option is valid only when you have configured the load-balance group using either the **method modem** or **method service-flows** options with the **cable load-balance group** command. It is not used with the **utilization** method.
- **stability**—Specifies the minimum percentage of ranging requests that are successful before the Cisco CMTS determines that the interface or channel is unstable. When the channel has fewer than this percentage of cable modems responding to periodic ranging requests over a one-minute period, the Cisco CMTS begins moving modems to other channels in the load-balance group. For example, when set to 75 percent, the Cisco CMTS begins moving modems when fewer than 75 percent of modems are replying to ranging requests.

- **ugs**—Specifies a threshold for when the Cisco CMTS should move cable modems that have active UGS service flows, which are typically used for active voice calls. This option goes into force only when dynamic load balancing has been enabled (using the **enforce** option), and the Cisco CMTS has been allowed to move cable modems with active UGS service flows (using the **cable load-balance group policy ugs** command). The *band-value* threshold specifies the maximum usage of UGS service flows that should exist before the Cisco CMTS begins moving calls.

For example, if the band-value threshold is at its default of 70 percent, the Cisco CMTS does not begin moving cable modems with active UGS service flows until UGS usage on an upstream or downstream reaches 70 percent of the total available bandwidth. The Cisco CMTS continues moving cable modems that are online with active UGS service flows until the UGS usage on the interface falls below 70 percent.



Note Certain conditions can cause a system instability that could result in the Cisco CMTS endlessly attempting to load balance the interfaces. For example, this situation could occur in noisy environments, where cable modems drop offline on a regular basis, or when cable modems are repeatedly trying to register because the provisioning system has sent them the wrong DOCSIS configuration files. If the Cisco CMTS detects such unstable situations, it does not load balance cable modems from those interfaces until the system stabilizes. However, if the system instability persists, you should increase the threshold values using the **cable load-balance group threshold** command until the system stabilizes.

Examples

The following example shows how to configure load-balance group 2 so that it performs static load balancing when the difference between two cable interfaces in the group is 20 percent or more.

```
Router# config terminal
Router(config)# cable load-balance group 2 threshold load 20
Router(config)#
```

The following example shows how to configure load-balance group 5 so that it performs static load balancing when the difference in usage between two cable interfaces in the group is 20 percent or more, and so that it performs dynamic load balancing when the difference in usage is 30 percent or more. The Cisco CMTS will also begin moving cable modems with active UGS service flows when UGS service flows reach 60 percent of the total bandwidth available on the upstream channel.

```
Router(config)# cable load-balance group 5 threshold load 20 enforce 30

Router(config)# cable load-balance group 5 threshold ugs 60

Router(config)# cable load-balance group 5 policy ugs

Router(config)#
```



Note You must configure the load-balance group with the **cable load-balance group policy ugs** command before the Cisco CMTS begins enforcing the threshold that was set with the **cable load-balance group threshold ugs** command.

Related Commands

Command	Description
cable load-balance exclude	Excludes a particular cable modem, or all cable modems from a particular vendor, from one or more types of load-balancing operations.
cable load-balance group	Creates and configures a load-balance group.
cable load-balance group (interface)	Assigns a downstream to a load-balance group.
cable load-balance group interval	Configures the frequency of the load-balancing policy updates.
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable upstream load-balance group	Assigns an upstream to a load-balance group.
clear cable load-balance	Clears the counters or state machine used to track load-balancing operations.
show cable load-balance	Displays real-time statistical and operational information for load-balancing operations.

cable load-balance group threshold (Supporting Dynamic Channel Change)

To set the threshold levels and corresponding service flow types for the specified Load Balancing group, supporting Dynamic Channel Change (DCC) on the Cisco router, use the following command in global configuration mode. To remove threshold settings, use the **no** form of this command.

cable load-balance group *n* **threshold** {**load** | **pcmm** | **stability** | **ugs**} {*0-100*}
cable load-balance group *n* **threshold ugs** *<1-100>*
cable load-balance group *n* **threshold load** *<1-100>* {**minimum**}
cable load-balance group *n* **threshold load 75** {**enforce**}

Syntax Description

n	Specifies the number of the load balance group. In Cisco IOS Release 12.2(33)SCE3 and earlier, the valid range is from 1 to 80. In Cisco IOS Release 12.2(33)SCE4 and later, the valid range is from 1 to 256.
load	Interface load threshold settings
pcmm	PCMM service flow threshold
stability	Threshold for stability detection
ugs	UGS service flow threshold
1-100	Interface utilization threshold in percentage of interface capacity.
load	Interface load threshold settings
1-100	Threshold value in percentage
minimum	Set minimum number of modems/flows difference before loadbalancing starts
enforce	Enters the enforce threshold

Command Default

Load balancing is not configured by default on the Cisco CMTS.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(17a)BC	This command was introduced on the Cisco uBR10012 router and the Cisco uBR7246VXR router, with supporting broadband processing engines (BPEs) or cable interface line cards on the respective routers.
12.2(33)SCE4	The valid range for the load balance group was changed.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following command specifies the reserved bandwidth threshold. Above this level, cable modems with active PCMM service flows participate in load balancing, and the default threshold is 70%. Note that if UGS is used for PCMM, the UGS threshold needs to be crossed as well. The default UGS threshold is 70%)

```
Router(config)# cable load-balance group 4 threshold pcmm <pcmm-value>
```

Usage Guidelines

In Cisco IOS releases prior to Cisco IOS Release 12.3(17a)BC, the load balancing default setting is UGS. This is not the case with Cisco IOS Release 12.3(17a)BC. In this latter release, and subsequent releases, configuration is required if the cable modems with active UGS flows are desired to participate in load balancing.

This command is subject to the restrictions and prerequisites described in *Configuring Load Balancing and Dynamic Channel Change (DCC) on the Cisco CMTS* .

The **cable load-balance group threshold** command is used to configure the following feature:

- Load Balancing and Dynamic Channel Change on the Cisco CMTS Routers

Related Commands

Command	Description
cable load-balance group (Supporting Dynamic Channel Change)	Sets multiple parameters for Load Balancing with DCC.
cable load-balance group dcc-init-technique (Supporting Dynamic Channel Change)	Sets the initialization technique for Dynamic Channel Change (DCC) for Load Balancing.
cable load-balance group policy (Supporting Dynamic Channel Change)	Sets the type of service flow for use with Load Balancing and DCC, whether PacketCable MultiMedia (PCMM) or Unsolicited Grant Service (UGS).
show controllers cable	Displays statistics for Dynamic Channel Change (DCC) for load balancing.

cable load-balance method-utilization min-threshold

To configure the minimum threshold for initiating load balancing under the utilization method , use the **cable load-balance method-utilization min-threshold** command in global configuration mode.

cable load-balance method-utilization min-threshold *min_threshold*

Syntax Description

min_threshold	(Optional) Specifies the minimum threshold value in percentage, of utilization to initiate load balancing. The valid range is from 10 to 90. The default value is 25.

Command Default

The minimum utilization threshold is 25 percent.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the **cable load-balance method-utilization min-threshold** *min_threshold command*:

```
Router# enable
Router(config)# cable load-balance method-utilization min-threshold
 40
Router(config)# exit
```

Related Commands

Command	Description
cable load-balance group threshold	Configures the threshold values that a load-balance group should use for load-balancing operations

cable load-balance modem max-failures

To configure the number of times a CM can fail before the CM is removed from the dynamic load balancing group, use the **cable load-balance modem max-failures** command in the global configuration mode. To remove the configured number for a CM to fail, use the **no** form of this command.

cable load-balance modem max-failures*0-100*
no cable load-balance modem max-failures

Syntax Description

0-100	Specifies the maximum number of failures before a CM is removed from the dynamic LB. However, if you give the value 0, the **cable load-balance modem max-failures** command gets disabled. **Note** The CM is excluded from the dynamic load balance operations after it has failed the specified number of times, however it still belongs to a LBG.

Command Default

The default value is 10.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure CM using the **cable load-balance modem max-failures** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
cable load-balance modem max-failures 10
Router(config)#
```

cable load-balance restrict modem

To configure a list of cable modems statically provisioned at the CMTS to a restricted load balancing group (RLBG) or a service type ID, use the **cable load-balance restrict modem** command in the global configuration mode. To remove the configured list of cable modems, use the **no** form of this command.

cable load-balance restrict modem *index mac-addr* [*mac-mask*] {**docsis-group** *docsis-group-id* | **service-type-id** *string*}
no cable load-balance restrict modem *index mac-addr* [*mac-mask*] {**docsis-group** *docsis-group-id* | **service-type-id** *string*}

Syntax Description

index	Assigns an index number ranging from 1 to 4294967295.
mac-addr	Specifies the MAC address of the modem that is restricted.
mac-mask	Specifies the MAC mask of the modem that is restricted.
docsis-group *docsis-group-id*	Restricts modems to a DOCSIS load balancing group.
service-type-id *string*	Restricts modems to a service type ID.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to assign a group of modems with a common MAC mask to a group or a service type ID using the **cable load-balance restrict modem** command. To assign the modem to a LBG, you can either specify the LBG ID or the service type ID.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance restrict modem 1 001a.c30c.7eee FFFF.FFFF.0000 docsis-group
 100
Router(config)#
```

cable load-balance rule

To create a rule that prevents cable modem (CM) from disabling or enabling load balancing, use the **cable load-balance rule** command in cable global configuration mode. To remove a defined rule, a rule from all policies, or the policy itself if it is the last rule of that policy, use the **no** form of this command.

cable load-balance rule *rule-id* {**disable-period dis-start** *start-time* **dis-period** *disable-period* | **disable-throughput-lowerbound** {**ds** *n* | **us** *n*} | **disabled** | **enabled** | **vdoc-enabled**}
no cable load-balance rule *rule-id*

Cisco cBR Series Converged Broadband Routers
cable load-balance rule *rule-id* {**disable-period dis-start** *start-time* **dis-period** *disable-period* | **disable-throughput-lowerbound** {**ds** *n* | **us** *n*} | **disabled** | **enabled**}

Syntax Description

rule-id	Specifies the rule to load balance CM.
disable-period	Specifies the number of seconds to prevent CM from load balancing at a given start time.
dis-start *start-time*	Specifies the start time to disable CM from load balancing. The dis-start is the start time ranging from 0 to 86400 seconds from midnight.
dis-period *disable period*	Specifies the period to disable CM from load balancing. The dis-period is the duration time ranging from 0 to 86400 seconds from midnight.
disable-throughput-lowerbound	Disables load balancing if CM throughput is lower than a threshold.
ds *n* | **us** *n*	Specifies downstream or upstream channels throughput lowerbound in kbps, ranging from 0 to 1000000.
disabled	Disables the CM from load balancing.
enabled	Enables load balancing on CM.
vdoc-enabled	(For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) Enables the video over DOCSIS (VDOC) load balancing for static multicast groups.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCC	The **disable-throughput-lowerbound** parameter was added in the command.
12.2(33)SCD5	The **vdoc-enabled** parameter was added in the command.

Release	Modification
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

The **cable load-balance rule** *rule-id* **disable-period dis-start** *start-time* **dis-period** *disable-period* command can be used for a 24 hours period.



Important You cannot disable load balancing and enable it for the next day using a single rule. You must configure two separate rules using the **cable load-balance rule** *rule-id* **disable-period dis-start** *start-time* **dis-period 0** command to disable it and the **cable load-balance rule** *rule-id* **disable-period dis-start 0 dis-period** *disable-period* command to enable it for the next day.

The **no** form of this command supports the following actions:

- Remove a defined rule.
- Remove the rule from all policies.
- Remove the policy itself if it is the last rule of that policy.



Note Static multicast groups must be configured on the specific bundle interface as well as on the correct forwarding interfaces to enable the **vdoc-enabled** rule.

Examples

The following example shows how to create a rule:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance rule 1 disable-period dis-start 40 dis-period  50
Router(config)# cable load-balance rule 1 disable-throughput-lowerbound ds 2500
Router(config)# cable load-balance rule 1 disabled
Router(config)# cable load-balance rule 2 enabled
Router(config)# cable load-balance rule 1 vdoc-enabled
Router(config)#
```

Related Commands

Command	Description
cable load-balance docsis-policy	Creates a DOCSIS policy and associates a new or existing rule with the policy.

cable load-balance static cm-delay

To configure the delay time to trigger static load balancing on the cable modem after registration hold-off time ends, use the **cable load-balance static cm-delay** command.

cable load-balance static cm-delay *delay*

Syntax Description

delay	Cable modem delay time in seconds for static load balancing to trigger after registration hold. Valid delay range is 0–65535.

Command Default

By default, the cable modem delay time is 600 seconds.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1w	This command was introduced.

Usage Guidelines

When you set cable modem delay time to 0, successful registration triggers static load balancing instantly after registration hold off time ends.

Examples

The following example shows how to set load balancing cm-delay to 60 seconds.

```
Router#configure terminal
Router(config)#cable load-balance static cm-delay 60
Router(config)#end
```

cable logging badipsource

To log error messages about bad IP source addresses on the cable interfaces to a separate log buffer, use the **cable logging badipsource** command in global configuration mode. To turn off the logging function and clear out the buffer, so that any error messages are logged to the console or current system log, use the **no** form of this command.

cable logging badipsource [*buffer-size*]
no cable logging badipsource

Syntax Description

buffer-size	Specifies the total size of the buffer that contains the logged error messages, in bytes. The range is from 4096 to 1048576 (4 KB to 1 MB). The default is 4096. **Note** The maximum buffer size is limited by the amount of actual unused memory that is available on the Cisco CMTS.

Command Default

Error messages for bad IP source addresses are logged to the console or current system log. The default logging buffer size is 4096 entries.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(13)EC	This command was introduced for the Cisco uBR7100 series and Cisco uBR7200 series universal broadband routers.
12.2(11)CY	Support was added for the Cisco uBR10012 universal broadband router.
12.2(11)BC2	Support was added to the Release 12.2 BC train for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
12.2(15)BC1, 12.2(15)CX	The maximum buffer size was adjusted to 1 MB, which can contain approximately 2000 error messages. Also, if the requested amount of memory is not available in a contiguous block, the CMTS displays an error message and does not change the buffer size.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable source-verify** command enables service providers to verify that the IP addresses being used on the cable interface have been properly assigned by the provider's DHCP servers. When a bad IP address is detected, the Cisco CMTS generates a BADIPSOURCE error message in the console logs.

In previous Cisco IOS releases, the Cisco CMTS generated these particular error messages for every IP packet that contained a bad IP source address. This can create a large volume of error messages that can make it difficult to see other error messages in the console logs.

To create a separate log for these error messages, use the **cable logging badipsource** command. You can also specify the size of the buffer that contains these error messages. When the buffer becomes full, the oldest

messages are deleted to make room for newer messages, so choose a buffer size that allows you to retain all messages until you can examine them.

On the Cisco uBR10012 router, this command includes only the BADIPSOURCE error messages generated by the PRE module. The cable interface line cards also generate their own error messages, but because these error messages are typically duplicates of the ones generated by the PRE module, they are not included in the separate log.

Tip If you find that the current buffer is too small to contain the current volume of error log messages, you can issue this command again with a larger buffer size. However, doing so automatically clears out all messages currently in the buffer, so ensure that you have viewed all the current messages before giving a second **cable logging badipsource** command.

Note Be cautious when specifying the buffer size, because the Cisco CMTS could run out of memory for other tasks. Use the **show memory EXEC** command to display the maximum available processor memory, and set the buffer size for this command to a value well within that maximum value.

To display the contents of this error log, use the **show cable logging** command. To clear the buffer after you have viewed the error messages, use the **clear cable logging** command. You can also use the **service timestamps log** command to add a timestamp to the messages in the log.

To print the BADIPSOURCE messages to the console or syslog server, use the **no cable logging badipsource** command (which is the default configuration). Note that this configuration does not turn off the generation of BADIPSOURCE messages, but only configures the system for the default log message behavior.

Tip If you do not want to see any BADIPSOURCE messages at all, use the **cable logging badipsource 4096** command so that these messages go to a separate buffer with the smallest possible size. You will then not see these error messages unless you explicitly use the **show cable logging** command to display them.

Examples

The following example shows how to enable the logging of bad IP source address error messages, using a buffer size of 524,288 bytes (512 KB):

```
Router# configure terminal

Router(config)# cable logging badipsource 524288

Router(config)#
```

Tip You must also use the **cable source-verify** command to enable verification of source IP addresses before the buffer contains any error messages about bad IP source addresses. If you do not use the **cable source-verify** command, you can still use the **cable logging badipsource** command to create a buffer, but the buffer always remains empty.

The following example shows how to enlarge the current buffer for bad IP source address error messages by giving the **cable logging badipsource** command a second time. Because this will empty

out the buffer of all current messages, be sure to display the current buffer contents before giving the command a second time.

```
Router# configure terminal

Router(config)# cable logging badipsource 8192
Router(config)# exit

Router# show cable logging badipsource

<<buffer contents omitted>>
Router# configure terminal

Router(config)# cable logging badipsource 256000
```

The following example shows how to stop the logging of bad IP source address error messages to a separate buffer. This clears out all error messages from the buffer and removes the buffer from memory, and future error messages for bad IP source addresses are logged to the console or to the current system log, if any.

```
Router# configure terminal

Router(config)# no cable logging badipsource

Router(config)#
```

Related Commands

Command	Description
cable source-verify	Enables verification of IP addresses for CMs and CPE devices on the upstream.
clear cable logging	Removes all error messages about bad IP source addresses on the cable interfaces from the error log buffer.
show cable logging	Displays the log of error messages about bad IP source addresses on the cable interfaces.

cable logging downstream-index

To enable logging for downstream indexes, use the **cable logging downstream-index** command in global configuration mode. To turn off logging and clear the buffer, use the **no** form of this command.

cable logging downstream-index [*buffer-size*]
no cable logging downstream-index [*buffer-size*]

Syntax Description

buffer-size	Total size of the buffer that contains the logged downstream indexes, in bytes. The range is from 4096 to 4121440. The default is 4096. **Note** The maximum buffer size is limited by the amount of actual unused memory that is available on the Cisco CMTS.

Command Default

The downstream indexes are logged on the line card on which this configuration is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable logging downstream-index** command is configured on the Cisco uBR-MC3GX60V or Cisco UBR-MC20X20V cable line cards or on the line card that is configured to be the modular-host for a SPA. The downstream index logging may be enabled on the cable line card that has the MAC domain.

Note This command is used to collect data only when requested by Cisco TAC.

Caution Be cautious when specifying the buffer size because the Cisco CMTS could run out of memory for other tasks. Use the **show memory EXEC** command to display the maximum available processor memory, and set the buffer size for this command to a value well within the maximum value.

To display the contents of the downstream index log, use the **show cable logging downstream-index** command. To clear the buffer after you have viewed the log, use the **clear cable logging downstream-index** command. You can also use the **service timestamps log** command to add a timestamp to the messages in the log.

Examples

The following example shows how to enable downstream index logging:

```
Router> enable
Router# configure terminal
Router(config)# cable logging downstream-index 4096
```

Related Commands

Command	Description
clear cable logging	Removes all downstream index log messages.
show cable logging	Displays all downstream index log messages

cable logging layer2events

To save selected (low priority) DOCSIS events that are specified in CMTS MIB Registry to the cable logging buffer (instead of to the general logging buffer), use the **cable logging layer2events** command in global configuration mode. To disable the logging of DOCSIS events to the cable logging buffer, use the **no** form of this command.

cable logging layer2events
no cable logging layer2events

Syntax Description

This command has no arguments or keywords.

Command Default

The DOCSIS events are saved to the general logging buffer on the Cisco CMTS. The default logging buffer size is 4096 entries.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(9a)BC	This command was introduced on the Cisco uBR10012 and Cisco uBR7246VXR universal broadband routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable logging** command to check whether the logging feature is enabled and the status of the logging buffer.

Examples

The following example shows how to clear the log buffer that contains a bad IP source address error messages:

```
Router# show cable logging summary
Cable logging: BADIPSOURCE Enabled
Total buffer size (bytes): 1000000
Used buffer size (bytes) : 36968
Logged messages : 231
Router# clear cable logging badipsource
Router# show cable logging summary
Cable logging: BADIPSOURCE Enabled
Total buffer size (bytes): 1000000
Used buffer size (bytes) : 0
Logged messages : 0
```

Related Commands

Command	Description
cable logging badipsource	Logs error messages about bad IP source addresses on the cable interfaces to a separate log buffer,

Command	Description
show cable logging	Indicates whether the logging feature is enabled and the status of the logging buffer.



Cable Commands: cable m to n

- cable map-advance, on page 429
- cable match address, on page 431
- cable max-hosts, on page 433
- cable mc-link-stat ignore, on page 435
- cable metering data-per-session, on page 436
- cable metering destination, on page 438
- cable metering filesystem, on page 442
- cable metering ipdr, on page 445
- cable metering ipdr-d3, on page 447
- cable metering localtime , on page 449
- cable metering source-interface, on page 450
- cable modem access-group, on page 453
- cable modem change-frequency, on page 455
- cable modem max-cpe, on page 456
- cable modem max-hosts, on page 458
- cable modem opt0, on page 460
- cable modem qos profile, on page 461
- cable modem remote-query, on page 463
- cable modem service-class-name, on page 466
- cable modem v6-max-cpe-prefix, on page 468
- cable modem vendor, on page 469
- cable modulation-profile, on page 471
- cable modulation-profile global-scheme, on page 481
- cable mod-profile-ofdma, on page 483
- cable mod-profile-ofdma data-iuc modulation pilot-pattern cwerr-downgrade-iuc, on page 485
- cable monitor, on page 487
- cable mrc-mode, on page 491
- cable mtc-mode, on page 493
- cable multicast auth enable default-action, on page 495
- cable multicast auth profile-name, on page 496
- cable multicast group-encryption, on page 497
- cable multicast group-qos, on page 498
- cable multicast group-qos default, on page 500

- cable multicast mdf-disable, on page 501
- cable multicast qos group, on page 503
- cable multicast ses-cache, on page 505
- cable multicast source, on page 507
- cable nd, on page 508
- cable nd timeout, on page 509
- cable nd validate, on page 510

cable map-advance

To configure the dynamic map advance algorithm, use the **cable map-advance** command in cable interface configuration mode or MAC domain profile configuration mode. To disable this function, use the **no** form of this command.

cable map-advance [**dynamic** [*safety*] | **static**] [*max-delay*]
no cable map-advance

Syntax Description

dynamic *safety*	Enables the dynamic MAP advance algorithm that automatically tunes lookahead time in MAPs based on the current farthest CM on a particular upstream port. • *safety*—Specifies a safety factor for the dynamic map advance algorithm in microseconds. This value controls the amount of extra lookahead time in MAPs to account for inaccuracies of the measurement system and internal software latencies. The range is from 300 to 1500. The default is 1000. **Note** Using larger safety factors increases the run time lookahead in MAPs, but reduces the upstream performance.
static	Enables the static map advance algorithm that uses a fixed lookahead time value in MAPs based on the worst-case propagation delay of 100 mile HFC cable network.
max-delay	Specifies the maximum round trip delay between the cable plant and furthest CM in microseconds. The range is from 100 to 2000. The default is 1800. The typical delay for a mile of coaxial cable is approximately 7 microseconds. The typical delay for a mile of fiber cable is approximately 8 microseconds.

Command Default

Dynamic map advance with a safety factor of 1000 microseconds and a maximum round trip delay of 1800 microseconds.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.1T	This command was introduced.
12.0 (9)SC, 12.1(2)EC1	The **dynamic** option was added.
12.1(10)EC	The *max-delay* option was added. The dynamic MAP algorithm was also enhanced so that it can quickly determine whether the furthest CM is now offline, so that the MAP advance algorithm can be updated accordingly.
12.2(8)BC1	The range for the *max-delay* option was changed to the current values of between 100 and 2000 microseconds.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The *max-delay* option, which was introduced in Cisco IOS Release 12.1(10)EC, specifies the maximum possible round-trip delay between the cable plant and furthest CM in the cable network. A CM is not allowed to exceed the maximum timing offset given by the *max-delay* value (in **static** mode) or given by the combination of the *max-delay* and *safety* values (in **dynamic** mode). If a CM reports a timing offset beyond the maximum value, the CMTS resets its offset to the maximum value and puts an exclamation point (!) next to its offset value in the **show cable modem** display.

In dynamic MAP operation, Cisco IOS 12.1(10)EC also implements a regular polling of the furthest CM, to determine if that CM is now offline. If the furthest CM has gone offline, the CMTS scans the currently online CMs to determine which CM is now the furthest offline and updates the dynamic MAP advance algorithm with the new value.

Examples

The following example shows how to configure the dynamic map advance to 1500 microseconds:

```
router(config-if)# cable map-advance dynamic 1500
```

Related Commands

Command	Description
show cable modem	Displays statistics for the connected CMs.

cable match address

To specify that IP multicast streams be encrypted, use the **cable match address** command in cable interface configuration mode. To specify that multicast streams should not be encrypted, use the **no** form of this command.

cable match address *access-list*
no cable match address

Syntax Description

access-list	Specifies that the IP multicast streams defined by the access list be encrypted. Access lists can be IP access list numbers or an IP access list name. Valid access list numbers are from 100 to 199.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.1 T	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable match address** command binds an access-list to a cable interface, allowing multicast encryption to be performed on traffic through that interface. To configure the access list, use the **ip access-list** command.

Note This command is not available for cable subinterfaces.

Note This command is available only on images that support Baseline Privacy Interface (BPI) and Baseline Privacy Interface Plus (BPI+) encryption.

Examples

The following example shows how to specify that the multicast stream defined by the access list named **reno** be encrypted on cable interface 3/0:

```
Router(config)# interface c3/0

Router(config-if)# cable match address reno
```

The following example shows how to specify that the multicast stream defined by the access list number 102 be encrypted:

```
Router(config)# interface c3/0

Router(config-if)# cable match address 102
```

Related Commands

Command	Description
ip access-list	Defines an IP access list by name.

cable max-hosts

To specify the maximum number of hosts that can be attached to a subscriber's CM, use the **cable max-hosts** command in cable interface configuration mode. To reset the allowable number of hosts attached to a CM to the default value of 0 hosts, use the **no** form of this command.

cable max-hosts *n*
no cable max-hosts

Syntax Description

n	Specifies the maximum number of hosts that can be attached to a CM on this interface. The range is from 0 to 255. The default is 0.

Command Default

The maximum number of hosts that can be attached to a CM is 0.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
12.0(6)SC, 12.1(2)EC1	Support was added on the Cisco IOS 12.0 SC and 12.1 EC release trains.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS uses three commands set the maximum number of hosts for a particular CM, for all CMs on a particular cable interface, or for all CMs using the Cisco CMTS router:

- **cable modem max-hosts**—Sets the maximum number of hosts for a particular CM.
- **cable max-hosts**—Sets the maximum number of hosts for all CMs on a particular cable interface.
- **cable modem max-cpe**—Sets the maximum number of hosts for all CMs using the Cisco CMTS router.

The more specific commands override the settings of the less specific commands. For example, if you use the **cable modem max-cpe** command to set the maximum number of hosts to 2 for all CMs, you can still use the **cable modem max-hosts** command to give a particular CM a larger maximum host value.



Note The CMTS assigns the MAX Host value to a cable modem at the time that the cable modem registers with the CMTS. Changing any of the MAX Host commands affects only cable modems that register after the change.

Examples

The following example shows how to set the maximum hosts for CMs on this particular cable interface to 15:

```
Router(config)# interface c6/0

Router(config-if)# cable max-hosts 15
```

Related Commands

Command	Description
cable modem access-group	Specifies an access group for a CM.
cable modem change-frequency	Changes the downstream frequency or upstream channel ID.
cable modem max-cpe	Sets the maximum number of hosts for all CMs using the Cisco CMTS router.
cable modem max-hosts	Sets the maximum number of hosts for a particular CM.
show cable modem	Displays CM configuration settings.

cable mc-link-stat ignore

To ensure that whenever the Downstream External PHY Interface (DEPI) Ethernet port goes down, the module interface or the mc-link does not go down, use the **cable mc-link-stat ignore** command in global configuration mode.

cable mc-link-stat ignore

Syntax Description

This command has no arguments or keywords.

Command Default

Whenever DEPI Ethernet port goes down, the module interface or the mc-link also goes down. That is, the **no cable mc-link-stat ignore** command is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.

Examples

The following example shows how to ensure that the module interface does not go down whenever DEPI ethernet port goes down:

```
Router(config)# cable mc-link-stat ignore
```

cable metering data-per-session

To view the number of cable metering data flows per session for a cable modem termination system, use the **cable metering data-per-session** command in the global configuration mode. To disable this feature, use the **no** form of this command.

cable metering data-per-session *data-per-session* **timer** *timer value*
no cable metering data-per-session *data-per-session* **timer** *timer value*

Syntax Description

data-per-session	Specifies the number of data flows per session in KB. The range is from 3 to 30. The default is 5.
timer	Displays the cable line card timer to wake up.
timer value	Specifies the timer wake up interval value in milliseconds. The range is from 8 to 500. The default is 100.

Command Default

The cable metering data flow values are not visible.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB1	This command was introduced.
12.3(23)BC7	This command was integrated into Cisco IOS Release 12.3(23)BC7.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable metering data-per-session** command allows users to view the number of cable metering data flows per session. The command limits or throttles the data collection between the cable line card and the route processor.

Examples

The following example displays the number of cable metering data flows per session:

```
Router# configure terminal

Router(config)# cable metering data-per-session 8 timer 100

Router# show run | include metering

cable metering destination 2.7.36.88 6789 0 15 non-secure
cable metering data-per-session 8 timer 100
```

Related Commands

Command	Description
show cable metering-status	Displays information about the most recent successful usage-based billing operation.
cable metering destination	Enables usage-based billing and to stream the billing records to an external collection server,

cable metering destination

To enable usage-based billing and to stream the billing records to an external collection server, use the **cable metering destination** command in global configuration mode. To disable usage-based billing, use the **no** form of this command.

cable metering destination *ip-address port* [*ip-address2 port2*] *retries minutes* {**non-secure** | **secure**} [**cpe-list-suppress**] [**flow-aggregate**] [**full-records**]
no cable metering

Syntax Description

ip-address port	Address and TCP port number for the billing application on the external server: • *ip-address*— IP address for the external collection server. • *port*—TCP port number for the billing collection application on the server. The range is from 0 to 65535, but the port should not be one of the widely-used TCP port numbers (0 to 1024).
ip-address2 port2	(Optional) IP address and TCP port number for a billing application on a secondary external server that is used if the primary server fails to respond: • *ip-address2*— IP address for the secondary external server. • *port2*— TCP port number for the billing collection application on the secondary server. The range is from 0 to 65535, but the port should not be one of the widely-used TCP port numbers (0 to 1024).
retries	Number of retry attempts that the Cisco CMTS makes to establish a secure connection with the external server before using the secondary server (if configured) and sending an SNMP trap about the failure. The range for *n* is from 0 to 5. The default is 1 retry attempt.
minutes	Frequency of the billing records streamed to the external server in minutes. The range is 2 to 1440 (24 hours), with no default. **Note** We recommend a minimum interval of 30 minutes.
non-secure	Specifies that the Cisco CMTS should use an unencrypted TCP connection when connecting with the billing application on the external server.
secure	Specifies that the Cisco CMTS should use a secure socket layer (SSL) TCP connection when connecting with the billing application on the external server. **Note** This option is available only on the Cisco CMTS software images that support Baseline Privacy Interface (BPI) encryption.
cpe-list-suppress	(Optional) Eliminates the customer premises equipment (CPE) IP addresses from the billing records to improve performance. **Note** The default is for CPE addresses to be included in the billing record, up to a maximum of five CPE IP addresses for each cable modem.

flow-aggregate	(Optional) Combines all information for an individual cable modem into one record. Separate counters are maintained for upstream and downstream traffic, but those counters include all service flows in that direction.
full-records	(Optional) Provides information about full service flow (active and idle) records.

Command Default

Usage-based billing is disabled. When enabled, CPE IP addresses (a maximum of five per cable modem) are included in the billing records by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(9a)BC	This command was introduced. **Note** In Cisco IOS Release 12.3(9a)BC, this command supports the monitoring of all service flows for DOCSIS 1.0, DOCSIS 1.1, and DOCSIS 2.0 cable modems: • upstream and downstream • primary • secondary • dynamic
12.2(33)SCD2	This command was modified to add the **full-records** keyword. **Note** In Cisco IOS Release 12.2(33)SCD2 and later releases, this command is also supported on DOCSIS 3.0 cable modems.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable metering destination** command enables usage-based filling and configures it for streaming mode, where the Cisco CMTS creates the billing records and regularly sends them to an external server for use by the billing application.

The Cisco CMTS attempts to establish a connection with the first (primary) external server, and if this fails, the CMTS sends an SNMP trap about the failure. The Cisco CMTS retries the connection for the number of times specified in the **cable metering destination** command, and if all of those attempts fail, the Cisco CMTS switches to the secondary external server, if configured. The Cisco CMTS repeats this sequence at every interval, and always tries to connect to the primary server first before attempting to use the secondary server.



Note You can enable usage-based billing using either the **cable metering filesystem** or **cable metering destination** command, but not both. If you give these commands twice, the second command overwrites the first.

If the CMTS cannot transmit the billing record to the external server, and if metering traps have been enabled using the **snmp-server enable traps cable metering** command, the CMTS sends an SNMP trap to the SNMP manager describing the reason for the failure. Typically, the reason is either that a timeout occurred with the

external server, or that the billing record no longer exists on the local filesystem. An SNMP trap is sent for each connection failure.

To disable usage-based billing, use the **no cable metering** command. This immediately stops the collection of billing information, except when the billing records are currently being streamed to the external server. If a billing operation is in progress when you give the **no cable metering** command, the system displays the message "CMTS Metering in progress. Ignoring current config." Wait until the billing operation is finished and then reenter the **no cable metering** command.



Note If the **show cable metering-status** command displays the status of a streaming operation as "success" but the records were not received on the billing application server, verify that the Cisco CMTS and server are configured for the same type of communications (non-secure TCP or secure SSL). If the Cisco CMTS is configured for non-secure TCP and the server is configured for secure SSL, the Cisco CMTS transmits the billing record successfully, but the server discards all of the data, because it did not arrive in a secure SSL stream.

Examples

The following example shows how to enable usage-based billing for streaming mode, with the CMTS transmitting the billing records every 60 minutes to the server at the IP address of 10.10.10.37 and TCP port of 5215, using a secure socket layer (SSL) TCP connection. A secondary external service is also defined. The CMTS will retry the connection three times before giving up and switching to the secondary server, as well as sending an SNMPv3 trap to notify the SNMP management system of the failure:

```
U7246VXR# configure terminal
U7246VXR(config)# cable metering destination 10.10.10.37 5215 10.10.10.41 5215 3 60 secure
U7246VXR(config)#
```

The following example shows how to enable usage-based billing for streaming mode, with the CMTS transmitting the billing records every 30 minutes to the server at the IP address of 10.10.10.37 and TCP port of 8181, using an unencrypted TCP connection. No secondary server is defined. The CMTS will retry the connection only once before giving up and sending an SNMPv3 trap to notify the SNMP management system of the failure:

```
Router# configure terminal
Router(config)# cable metering destination 10.10.10.37 8181 1 30 non-secure
Router(config)#
```

The following example shows how to enable usage-based billing, using the same configuration as above, except that the billing records do not include the IP addresses for the CPE devices:

```
Router# configure terminal
Router(config)# cable metering destination 10.10.10.37 8181 1 30 non-secure cpe-list-suppress

Router(config)#
```

The following example shows how to enable usage-based billing, using an unencrypted TCP connection, including the IP addresses for the CPE devices, and enabling the **full-records** option:

```
Router# configure terminal

Router(config)# cable metering destination 10.10.10.37 11 1 222 non-secure full-records
cpe-list-suppress
Router#
```

Related Commands

Command	Description
cable metering filesystem	Enables usage-based billing and writes the billing records to a file on a local file system.
cable metering ipdr	Enables usage-based billing using the IPDR and SP2.1 protocol.
cable metering ipdr-d3	Enables usage-based billing on DOCSIS 3.0 cable modems.
cable metering source-interface	Enables debugging of usage-based billing operations.
show cable metering-status	Displays information about the most recent usage-based billing operation.
snmp-server enable traps cable	Ensures that the Simple Network Management Protocol (SNMP) traps are sent for cable-related events.

cable metering filesystem

To enable usage-based billing and to write the records to a file on a local file system, use the **cable metering filesystem** command in global configuration mode. To disable usage-based billing, use the **no** form of this command.

cable metering filesystem *filesystem* [**cpe-list-suppress**] [**flow-aggregate**] [**full-records**]
no cable metering

Syntax Description

filesystem	File system where the billing record file is written. The *filesys* parameter has a maximum length of 25 characters and must specify a valid file system on the router (such as slot0, disk1, or flash). **Note** The system writes the billing records to this file system using a file name that contains the hostname of the router followed by a timestamp when the record was written.
cpe-list-suppress	(Optional) Eliminates the customer premises equipment (CPE) IP addresses from the billing records to improve performance. **Note** If this option is not selected, a maximum of five CPE IP addresses are included in the billing record for each cable modem.
flow-aggregate	(Optional) Combines all information for an individual cable modem into one record. Separate counters are maintained for upstream and downstream traffic, but those counters include all service flows in that direction.
full-records	(Optional) Provides information about full service flow (active and idle) records.

Command Default

Usage-based billing is disabled. When usage-based billing is enabled, CPE IP addresses (a maximum of five) are included in the billing records by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(9a)BC	This command was introduced. **Note** In Cisco IOS Release 12.3(9a)BC, this command supports the monitoring of all service flows for DOCSIS 1.0, 1.1, and 2.0 cable modems: • • upstream and downstream • primary • secondary • dynamic

Release	Modification
12.2(33)SCD2	This command was modified to add the **full-records** keyword. **Note** In Cisco IOS Release 12.2(33)SCD2 and later releases, this command is also supported on the DOCSIS 3.0 cable modems.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable metering filesystem** command enables usage-based filling and configures it for file mode, where the CMTS writes the billing records to the local file system. The system writes the billing record to the filesystem specified by this command, using a file name that consists of the router's hostname followed by a timestamp for when the file was created.

When the CMTS writes a billing record, it can also optionally send an SNMPv3 trap to notify the billing application that a billing record is available for pickup. The billing application can then log into the Cisco CMTS and use the File Transfer Protocol (FTP) or Secure Copy (SCP) to pick up the file.



Note You can enable usage-based billing using either the **cable metering filesystem** or **cable meteringdestination** command, but not both. If you give these commands twice, the second command overwrites the first.

If the CMTS cannot write the billing record to the local filesystem, and if metering traps have been enabled using the **snmp-server enable traps cable metering** command, the CMTS sends an SNMP trap to the SNMP manager describing the reason for the failure. Typically, the reason is either that the disk is full or that an disk error occurred (such as no PCMCIA card in the slot).

To disable usage-based billing, use the **no cable metering** command. This immediately stops the collection of billing information, except when the billing records are currently being written to the local file system. If a billing operation is in progress when you give the **no cable metering** command, the system displays the message "CMTS Metering in progress. Ignoring current config." Wait until the billing operation is finished and then reenter the **no cable metering** command.

Examples

The following example shows how to enable usage-based billing, writing the records to a file on the disk0: device.

```
U7246VXR# configure terminal

U7246VXR(config)# cable metering filesystem disk0:
U7246VXR(config)#
```



Note Do not use **nvram** as the file system. For example, do not use: Router(config)# **cable metering filesystem nvram:**

The following example shows how to enable usage-based billing, writing the records to files on the disk2 device on an NPE-G1 processor:

```
Router# configure terminal

Router(config)# cable metering filesystem disk2:
Router(config)#
```

The following example shows how to enable usage-based billing, writing the records to files in Flash Memory. The IP addresses for the CPE devices are not included in the billing records.

```
Router# configure terminal

Router(config)# cable metering filesystem flash: cpe-list-suppress
Router(config)#
```

The following example shows how to enable usage-based billing, writing the records to files in Flash Memory, and enabling the full-records option:

```
Router# configure terminal
Router(config)# cable metering filesystem disk2:xyz full-records
Router#
```

Related Commands

Command	Description
cable metering destination	Enables usage-based billing and streams the billing records to an external server.
cable metering ipdr	Enables usage-based billing using the IPDR and SP2.1 protocol.
cable metering ipdr-d3	Enables usage-based billing on DOCSIS 3.0 cable modems.
cable metering source-interface	Enables debugging of usage-based billing operations.
show cable metering-status	Displays information about the most recent usage-based billing operation.
snmp-server enable traps cable	Enables the sending of Simple Network Management Protocol (SNMP) traps for cable-related events.

cable metering ipdr

To configure the Subscriber Account Management Interface Specification (SAMIS) and enable usage-based billing on DOCSIS 2.0 cable modems, use the **cable metering ipdr** command in global configuration mode. To disable usage-based billing, use the **no** form of this command.

cable metering ipdr *interval* **session** *session-id* [**flow-aggregate**] [**full-records**]
no cable metering

Cisco cBR Series Converged Broadband Routers
cable metering ipdr *interval* **session** *session-id* **{full-records}**

Syntax Description

interval	Specifies the Metering data streaming interval in minutes. The interval is the time between the completion of one export and the beginning of another. The range is from 2 to 1440 (24 hours).
session *session id*	IP Detail Records (IPDR) session ID. The session ID range is from 1 to 255.
flow-aggregate	(Optional) Combines all information for an individual cable modem into one record. Separate counters are maintained for upstream and downstream traffic, but those counters include all service flows in that direction. (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers)
full-records	(Optional) Provides information about full service flow (active and idle) records. (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers)

Command Default

Usage-based billing is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCA	This command was introduced. **Note** In Cisco IOS Release 12.2(33)SCA, this command is supported on DOCSIS 1.0, DOCSIS 1.1, and DOCSIS 2.0 cable modems.
12.2(33)SCD2	The command was modified to include the **full-records** keyword. **Note** In Cisco IOS Release 12.2(33)SCD2 and later releases, this command is also supported on DOCSIS 3.0 cable modems.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **flow-aggregate** keyword was removed.

Usage Guidelines

The **cable metering ipdr** command configures how SAMIS data is exported. This command is used for DOCSIS 2.0 SAMIS schema.

When **flow-aggregate** is enabled, the service flows are combined into one record per cable modem:

- ServiceClassName element always returns a null value in IPDR records, even when service flows on the cable modem have a valid service class name.
- ServiceIdentifier element always returns a zero value.

Examples

The following example shows how to enable usage-based billing for IPDR, with the billing record interval set to every 60 minutes with full-records and flow-aggregate options enabled:

```
Router# configure terminal
Router(config)# cable metering ipdr 60 session 111 full-records flow-aggregate
Router(config)#
```

Related Commands

Command	Description
cable metering destination	Enables usage-based billing, and streams the billing records to an external server.
cable metering filesystem	Enables usage-based billing and writes the billing records to a file on a local file system.
cable metering source-interface	Enables debugging of usage-based billing operations.
show cable metering-status	Displays information about the most recent usage-based billing operation.
snmp-server enable traps cable	Ensure that the Simple Network Management Protocol (SNMP) traps are sent for cable-related events.

cable metering ipdr-d3

To configure the Subscriber Account Management Interface Specification (SAMIS) and enable usage-based billing on DOCSIS 3.0 cable modems, use the **cable metering ipdr-d3** command in global configuration mode. To disable usage-based billing, use the **no** form of this command.

cable metering ipdr-d3 session *session-id* **type** *type* [**flow-aggregate**] [**full-records**]
no cable metering

Syntax Description

session *session id*	Specifies the IPDR session ID. The range is from 1 to 255.
type *type*	Specifies the IPDR DOCSIS 3.0 service definition type of metering. The range is from 1 to 2.
flow-aggregate	(Optional) Combines all information for an individual cable modem into one record. Separate counters are maintained for upstream and downstream traffic, but those counters include all service flows in that direction. (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers)
full-records	(Optional) Provides information about full service flow (active and idle) records. (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers)

Command Default

Usage-based billing is disabled, by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable metering ipdr-d3** command configures how the SAMIS data is exported. This command is used for DOCSIS 3.0 SAMIS schema (including type 1 and type 2).

When **flow-aggregate** is enabled, the service flows are combined into one record per cable modem:

- ServiceClassName element always returns a null value in IPDR records, even when service flows on the cable modem have a valid service class name.
- ServiceIdentifier element always returns a zero value.

Examples

The following example shows how to enable usage-based billing for IPDR DOCSIS 3.0, with full-records and flow-aggregate options enabled:

```
Router# configure terminal
Router(config)# cable metering ipdr-d3 session 111 type 2 full-records flow-aggregate
Router(config)#
```

Related Commands

Command	Description
cable metering destination	Enables usage-based billing, and streams the billing records to an external server.
cable metering filesystem	Enables usage-based billing and writes the billing records to a file on a local file system.
cable metering source-interface	Enables debugging of usage-based billing operations.
cable sflog max-entry	Enables service flow logging and configuring the number and duration of entries in the log.
show cable metering-status	Displays information about the most recent usage-based billing operation.
snmp-server enable traps cable metering	Ensures that Simple Network Management Protocol (SNMP) traps are sent for cable-related events.

cable metering localtime

To provide usage records with local time timestamping, use **cable metering localtime** command in global configuration mode.

cable metering localtime

Syntax Description

This command has no arguments or keywords.

Command Default

This command is not configured by default.

Command Modes

Global configuration(config)

Command History

Release	Modification
12.2(33)SCI2	This command was introduced.

Usage Guidelines

When the **cable metering localtime** command is configured, the timestamp in metering output is local time, e.g. "2015-03-03T16:26:07", otherwise it's the UTC time, e.g. "2015-03-03T16:26:07Z" (with a "Z" indicating that the time is UTC/GMT).

Examples

The following example configures usage records with local time timestamping:

```
Router(config)#cable metering localtime
Router(config)#
```

Related Commands

Command	Description
cable metering destination	Enables usage-based billing and streams the billing external server.
cable metering ipdr	Enables usage-based billing using the IPDR and SP2.1 protocol.
cable metering ipdr-d3	Enables usage-based billing on DOCSIS 3.0 cable modems.
cable metering source-interface	Enables debugging of usage-based billing operations.
show cable metering-status	Displays information about the most recent usage-based billing operation.
cable metering file-system	Enables usage-based billing and writes the billing records to a file on a local file system.

cable metering source-interface

To enable specification of the source-interface for the billing packets, use the **cable metering source-interface** command in privileged EXEC mode. To turn off the specified source-interface, use the **no** form of this command.

cable metering source-interface *interface*
no cable metering source-interface *interface*

Syntax Description

interface	Specifies the source of the usage-based billing packets originated by the router using the **cable metering source-interface** command. This is often used to set the source-interface as the IP address of the loopback interface.

Command Default

Usage billing is disabled. When enabled, CPE IP addresses (a maximum of five per cable modem) are included in the billing records by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable metering source-interface** command enables the user to specify the source-interface of the usage-based billing packets. All billing packets are usually automatically assigned a source-interface, but users using the **cable metering source-interface** command can set the source-interface to be the IP address of the loopback interface.

If the user does not specify the source-interface configuration, SAMIS picks the highest IP address of the loopback interface as the source interface. If the loopback interface is not available, then SAMIS selects the highest IP of the physical interface for source interface.

Note If a loopback interface is specified, the MAC address is that of the management interface in the docID in the billing packet.

Note The option of specifying the source-interface for metering is available only after the metering mode is configured.

If the **cable metering source-interface** command is used when the Usage-Based Billing feature is operating in the File Mode, the CMTS IP address in the billing packets are changed to the IP address of the source-interface specified using the **cable metering source-interface** command or through setting the

ccmtrCollectionSrcIfIndex object. The MAC address in the billing packets' header is also changed to the MAC address of the source-interface.

If the **cable metering source-interface** command is used when the Usage-Based Billing feature is operating in the Streaming Mode, the CMTS IP address in the billing packets, as well as the source IP address of the billing packets, are changed to the IP address of the source-interface specified using the **cable metering source-interface** command or through setting the **ccmtrCollectionSrcIfIndex** object. The MAC address in the billing packets' header is also changed to the MAC address of the source-interface.

When defining the source-interface, the following possible error checks can be performed to determine if the source-interface that the user has defined is a valid source-interface for metering:

1. Verify that the interface specified is up and has an IP address.
2. Verify that the IP address is in the same subnet/majornet as that of the destination address.



Note Even after performing these error checks, there are no guarantees that the billing packets will be sent out since the TCP connection may not succeed due to the absence of a physical connection between the CMTS and the collection server.

Examples

The following is an example where the source-interface specified was a loopback interface and it had a mac-address of 000C31F6F400 and an ip address of 1.100.100.100.

```
Router# configure terminal

Router(config)# cable metering source-interface loopback 1.100.100.100
<?xmlversion="1.0"encoding="UTF8"?><IPDRDocxmlns="http://www.ipdr.org/namespaces/ipdr"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="DOCSIS-3.5-A.0.xsd"
 docId="C7B1B20E-0000-0000-0000-000C31F6F400" creationTime="2006-03-02T18:03:58Z"
IPDRRecorderInfo="VXR3" version="3.5-A.0"><IPDR
xsi:type='DOCSIS-Type'><IPDRcreationTime>2006-03-02T18:03:58Z</IPDRcreationTime><CMTShostname>VXR3</CMTShostname><CMTSipAddress>1.100.100.100</CMTSipAddress><CMTSsysUpTime>18867

<redacted>

xsi:type='DOCSIS-Type'><IPDRcreationTime>2006-03-02T18:03:58Z</IPDRcreationTime><CMTShostname>VXR3</CMTShostname><CMTSipAddress>1.100.100.100</CMTSipAddress><CMTSsysUpTime>18867

<redacted>
 count="2" endTime="2006-03-02T18:03:59Z"/></IPDRDoc>
Router(config)#
```

The following is an example where the source-interface specified was a loopback interface and it had a mac-address of 00027D67DC0 and an ip address of 2.90.100.100.

```
Router# configure terminal

Router(config)# cable metering source-interface loopback 2.90.100.10
Accept  2.90.100.100:42380
<?xmlversion="1.0"encoding="UTF8"?><IPDRDocxmlns="http://www.ipdr.org/namespaces/ipdr"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="DOCSIS-3.5-A.0.xsd"
 docId="C7B701D1-0000-0000-0000-00027D67DC00" creationTime="2006-03-06T18:45:37Z"
IPDRRecorderInfo="ubr7246-R7427" version="3.5-A.0"><IPDR
xsi:type='DOCSIS-Type'><IPDRcreationTime>2006-03-06T18:45:37Z</IPDRcreationTime><CMTShostname>ubr7246-R7427</CMTShostname><CMTSipAddress>2.90.100.100</CMTSipAddress><CMTSsysUpTime>37272

<redacted>

xsi:type='DOCSIS-Type'><IPDRcreationTime>2006-03-06T18:45:37Z</IPDRcreationTime><CMTShostname>ubr7246-R7427</CMTShostname><CMTSipAddress>2.90.100.100</CMTSipAddress><CMTSsysUpTime>37272
```

```
 count="2" endTime="2006-03-06T18:45:37Z"/></IPDRDoc>
Closing socket 2.90.100.100:42380
Router(config)#
```

Related Commands

Command	Description
cable metering source-interface	Enables usage-based billing and streams the billing records to an external server.
cable metering filesystem	Enables usage-based billing and writes the billing records to a file on a local file system.
debug cable remote-query	Turns on debugging to gather information from remote CMs.
show cable metering-status	Displays information about the most recent usage-based billing operation.
snmp-server enable traps cable	Enables the sending of Simple Network Management Protocol (SNMP) traps for cable-related events.

cable modem access-group

To configure the access-group for a CM, use the **cable modem access-group** command in privileged EXEC mode. To disable the specification, use the **no access-group** form of this command.

cable modem {*mac-addrip-addr*} **access-group** [*access-listaccess-name*]
cable modem {*mac-addrip-addr*} **no access-group**



Note The **cable modem access-group** command is not supported on the Cisco uBR10012 universal broadband router.

Syntax Description

ip-addr	Specifies the IP address for the CM.
mac-address	Specifies the MAC address for the CM.
access-list	Specifies the IP access list (standard or extended). The range is from 1 to 199.
access-name	Specifies the access-list name.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3(8) NA	This command was introduced.
12.2(4)BC1	The functionality of this command was made identical to that of the **cable host access-group** command, but both commands were retained for backwards compatibility.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows the **cable modem access-group** command assigning access-list 1 to the CM with the MAC address of **abcd.ef01.2345**:

```
Router# cable modem abcd.ef01.2345 access-group 1

Router#
```

Related Commands

Command	Description
cable host access-group	Configures the access list for a host.
cable modem change-frequency	Changes the downstream frequency or upstream channel ID.

Command	Description
cable modem max-hosts	Specifies the maximum hosts for a CM.
cable modem qos profile	Specifies the QoS profile for a CM.
show cable modem	Displays CM configuration settings.

cable modem change-frequency

To override the frequency used by a CM, use the **cable modem change-frequency** command in privileged EXEC mode.

cable modem {*mac-addrip-addr*} **change-frequency** {*ds-frequency-hz* [*us-channel-id*]*us-channel-id*}

Syntax Description

ip-addr	Specifies the IP address for the CM.
mac-address	Specifies the MAC address for the CM.
ds-frequency-hz	Specifies the downstream frequency for the CM (in Hertz).
us-channel-id	Specifies the upstream channel ID.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the CMTS administrator to change the downstream frequency for a CM, overriding the DOCSIS configuration file setting. This command is not applicable on Cisco IOS Release 12.1(3a)EC.

Examples

The following example shows how to change the downstream frequency of the CM having IP address 172.172.172.12 to 570 MHz:

```
Router# cable modem 172.172.172.12 change-freq 57000000
Router#
```

Related Commands

Command	Description
cable modem access-group	Specifies an access group for a CM.
cable modem max-hosts	Specifies the maximum hosts for a CM.
cable modem qos profile	Specifies the QoS profile for a CM.
show cable modem	Displays CM configuration settings.

cable modem max-cpe

To specify a maximum number of permitted hosts per modem (overriding the max-cpe value in the CM configuration file), use the **cable modem max-cpe** command in global configuration mode.

cable modem max-cpe [*n* | **unlimited**]

Syntax Description

n	Specifies the configuration file value. The range is from 1 to 255.
unlimited	Specifies the maximum CPE value to be unlimited.

Command Default

The **max-cpe** value provided in the configuration file is used by the CMTS to limit the number of hosts connected to a single CM (**no cable modem max-cpe**).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(10)SC, 12.1(2)EC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The CMTS enables up to *n* number of hosts for a modem.When set to **unlimited**, or *n* is greater than the **max-cpe** value in the configuration file of a CM, the **max-cpe** value in the configuration file of the CM is used.

Note When the the maximum number of CPEs, set by the **cable modem max-cpe** command in the Cisco CMTS, is smaller than the maximum number of CPEs set in the configuration file of the CMs, the number set by the **cable modem max-cpe** command overrides the number set in the configuration file of the CMs.

Note When setting to **unlimited** or *n* is greater than the **max-cpe** value in the configuration file of a CM, the CM must control the maximum number of hosts, and the DHCP server must control the number of IP addresses assigned to hosts behind a single CM.

Caution Use of this command might open a security hole in the system by enabling denial of service attacks. Specifically, it might enable a user to obtain a large number of IP addresses, thereby taking down the entire network, after all the available IP addresses have been reserved by this single user. Cisco recommends that, if this command is enabled, the number of IP addresses assigned to hosts behind a single modem be strictly controlled by the DHCP server.

The Cisco CMTS uses three commands to set the maximum number of hosts for a particular CM, for all CMs on a particular cable interface, or for all CMs using the Cisco CMTS router:

- **cable modem max-hosts**—Sets the maximum number of hosts for a particular CM.
- **cable max-hosts**—Sets the maximum number of hosts for all CMs on a particular cable interface.
- **cable modem max-cpe**—Sets the maximum number of hosts for all CMs using the Cisco CMTS router.

The more specific commands override the settings of the less specific commands. For example, if you use the **cable modem max-cpe** command to set the maximum number of hosts to 2 for all CMs, you can still use the **cable modem max-hosts** command to give a particular CM a larger maximum host value.



Note The CMTS assigns the MAX Host value to a cable modem at the time that the cable modem registers with the CMTS. Changing any of the MAX Host commands affects only cable modems that register after the change.



Note The "Number of CPEs" field in the **show cable modem** command shows the maximum CPE value for the CM, not the value for the CMTS that is set by the **cable modem max-cpe** command.

Examples

The following example shows how to override the **max-cpe** setting in a CM configuration file:

```
Router(config)# cable modem max-cpe unlimited
```

Related Commands

Command	Description
cable max-hosts	Sets the maximum number of hosts for all CMs on a particular cable interface.
cable modem access-group	Specifies an access group for a CM.
cable modem change-frequency	Changes the downstream frequency or upstream channel ID.
cable modem max-hosts	Sets the maximum number of hosts for a particular CM.
cable modem qos profile	Specifies the QoS profile for a CM.
show cable modem	Displays CM configuration settings.

cable modem max-hosts

To specify the maximum number of customer premises equipment (CPE) devices (hosts) that can be supported by a specific CM, use the **cable modem max-hosts** command in privileged EXEC mode.

cable modem {*mac-addrip-addr*} **max-hosts** {*n* | **default**}

Syntax Description

ip-addr	Specifies the IP address for the CM.
mac-address	Specifies the MAC address for the CM.
max-hosts {*n* | **default**}	Specifies either the maximum number of hosts supported by the CM (from 0 to 255), or specifies the default value of 0.

Command Default

0

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS uses three commands to set the maximum number of hosts for a particular CM, for all CMs on a particular cable interface, or for all CMs using the Cisco CMTS router:

- **cable modem max-hosts**—Sets the maximum number of hosts for a particular CM.
- **cable max-hosts**—Sets the maximum number of hosts for all CMs on a particular cable interface.
- **cable modem max-cpe**—Sets the maximum number of hosts for all CMs using the Cisco CMTS router.

The more specific commands override the settings of the less specific commands. For example, if you use the **cable modem max-cpe** command to set the maximum number of hosts to 2 for all CMs, you can still use the **cable modem max-hosts** command to give a particular CM a larger maximum host value.



Note The CMTS assigns the MAX Host value to a cable modem at the time that the cable modem registers with the CMTS. Changing any of the MAX Host commands affects only cable modems that register after the change.

Examples

The following example shows sets the CM with the IP address of 172.172.172.12 to a maximum of 40 attached CPE devices:

```
Router# cable modem 172.172.172.12 max-hosts 40
```

Related Commands

Command	Description
cable modem access-group	Specifies an access group for a CM.
cable modem change-frequency	Changes the downstream frequency or upstream channel ID.
cable max-hosts	Sets the maximum number of hosts for all CMs on a particular cable interface.
cable modem max-cpe	Sets the maximum number of hosts for all CMs using the Cisco CMTS router.
cable modem qos profile	Specifies the QoS profile for a CM.
show cable modem	Displays CM configuration settings.

cable modem opt0

To collect Receive Modulation Error Ratio (RxMER) data from the cable modem on-demand, use the **cable modem opt0** command in privileged EXEC mode.

cable modem {*mac-addrip-addr*} **opt0**

Syntax Description

ip-addr	IP address for the CM.
mac-address	address for the CM.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.1SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable modem opt0** command to collect RxMER data from the CM. Based on the RxMER values collected from a modem, the CMTS finds among the existing profiles the one that may provide the highest speed, and yet at the same time may have sufficient Signal to Noise Ratio (SNR) margin for the modem to receive code words with acceptable error.

Examples

The following example shows how to collect RxMER data from the CM:

```
Router# cable modem fc52.8d5e.84e1 opt0

Router#
```

cable modem qos profile

To force a DOCSIS 1.0 CM to use a specific quality-of-service (QoS) profile, use the **cable modem qos profile** command in privileged EXEC mode.

cable modem {*mac-addrip-addr*} **qos profile** *qos-profile-index* [**no-persistence**]

Syntax Description

ip-addr	IP address for the CM.
mac-address	address for the CM.
qos-profile-index	QoS profile index values. The range is from 1 to 255, with no default. In Cisco IOS Release 12.2(15)BC1 and later releases, this profile must be created on the Cisco CMTS using the **cable qos profile** command. In addition, this profile should specify a maximum upstream bandwidth equal to or less than the current bandwidth. If the new profile specifies a higher bandwidth, it is ignored, and the cable modem continues to use the bandwidth that was specified at registration time. The range is from 1 to 1023 on the Cisco cBR series routers.
no-persistence	(Optional) Specifies that the QoS profile should not remain in force when a cable modem reboots. Instead, when a cable modem reboots, it uses the QoS profile specified in its DOCSIS configuration file. The default is without this option, so that the QoS profile remains in force for cable modems across reboots.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
12.1(11)EC	This command was supported on Cisco IOS Release 12.1 EC.
12.2(8)BC1	This command was enhanced to allow a DOCSIS 1.1 CMTS to temporarily change the QoS profile for DOCSIS 1.0 and 1.0+ CMs.
12.2(15)BC1	This command was changed so that it does not have any effect unless both the QoS profile specified by this command and the QoS profile specified for the CM in its DOCSIS configuration file are already created on the Cisco CMTS. This restriction did not exist in previous releases.
12.2(15)BC2	The **no-persistence** option was added. Also, the restriction on changing CM-created profiles that was implemented in Cisco IOS Release 12.2(15)BC1 was removed, so that this command can again be used to change the profile of a CM that is using a CM-created profile, as was the case in earlier releases.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

On a Cisco CMTS running DOCSIS 1.0 software, the **cable modem qos profile** command forces a CM to use a specific QoS profile.

On a Cisco CMTS running DOCSIS 1.1 software, the **cable modem qos profile** command temporarily forces a DOCSIS 1.0 or DOCSIS 1.0+ CM to use a specific QoS profile, without forcing the CM to first go off-line and re-register. For DOCSIS 1.0+ CMs, this command affects only the primary SID on the CM.



Note In Cisco IOS Release 12.2(15)BC1, this command has an effect only when the profile that it specifies and the original QoS profile on the CM have been created already on the Cisco CMTS, using the **cable qos profile** command. In Cisco IOS Release 12.2(15)BC2 and later releases, this restriction is removed and this command can also be used to change the profile for a CM even when it is using a CM-created QoS profile.

This command does not affect DOCSIS 1.1 CMs, which support dynamic service change messages that allow the QoS profile to be changed dynamically.



Note This command acts as a toggle. Give the **cable modem qos profile** command once to enforce a QoS profile. Give the same command again with the same parameters to cancel the enforcement of that profile (the CM will return to using its registered profile.)

When the **no-persistence** option is specified, the QoS profile is not applied when a cable modem reboots. Instead, the Cisco CMTS allows the cable modem to use the QoS profile that is specified in its DOCSIS configuration file.

The **no-persistence** option can be used when initially when identifying potential problem applications and users. When repeat offenders are identified, the service provider can remove the **no-persistence** option, so that these users continue to use the specified QoS profile even if they reboot their cable modems.

Examples

The following example shows how to specify a QoS profile index to a CM:

```
Router# cable modem qos profile 255

Router#
```

Related Commands

Command	Description
cable modem access-group	Specifies an access group for a CM.
cable modem change-frequency	Changes the downstream frequency or upstream channel ID.
cable modem max-hosts	Specifies the maximum hosts for a CM.
show cable modem	Displays CM configuration settings.

cable modem remote-query

To enable and configure the remote query feature to gather cable modem performance statistics on the Cisco CMTS router, use the **cable modem remote-query** command in global configuration mode. To disable the gathering of cable modem statistics, use the **no** form of this command.

cable modem remote-query [*polling-interval community-string*] [**src-ip** *ip-address*]
no cable modem remote-query [**src-ip** *ip-address*]

Syntax Description

polling-interval	(Optional) The delay between each poll that the Cisco CMTS router makes to collect cable modem statistics, in seconds. When the Cisco CMTS router completes one remote query poll, the router waits this time period before beginning another poll. The range is from 1 to 86,400. The recommended default value is 30.
community-string	(Optional) The Simple Network Management Protocol (SNMP) community string. **Note** If resetting a configured SNMP community string value, first disable the remote query feature with the **no** form of this command, then set the new community string using the **cable modem remote-query** command when the polling delays is timed out.
src-ip *ip-address*	(Optional) Specifies the source IP address for SNMP requests. **Note** You should enable the remote query feature before configuring **src-ip** option.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(7)XR, 12.1(2)T	This command was introduced.
12.1(2)EC1	Support for this command was added to the 12.1 EC train. **Note** This command is not supported on Cisco IOS Release 12.1(3a)EC1 but is supported on Cisco IOS Release 12.1(4)EC and later 12.1 EC releases.
12.2(4)BC1b	Support for this command was added to the 12.2 BC train.
12.2(15)BC1, 12.2(15)CX	The sysDescr field is now obtained for each cable modem when the remote query feature is enabled. (This value can be displayed using the **verbose** option of the **show cable modem** command.
12.3(23)BC	Support for the **scr-ip** option was added to this release.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To use the remote query feature, you must configure the cable modem and Cisco CMTS as follows:

- Configure a read-only SNMP community string on the cable modem for use with the remote query feature. This should be a separate community string from the read-write string used to remotely monitor and configure the cable modem.
- Configure a matching community string on the Cisco CMTS using the **snmp-server community** *community-string* and **snmp-server manager** commands.
- Enable the remote query feature on the Cisco CMTS with the **cable modem remote-query** command. The *polling-interval* should be chosen so that the statistics can be obtained in a timely manner without seriously impacting system performance. Cisco recommends initially setting the *polling-interval* to 30 seconds and adjusting that time period as needed.



Note If the remote query feature is enabled, the Cisco CMTS router consumes extra memory per cable modem and takes additional CPU time. We recommend that you do not configure this feature on routers that have lower free memory or a large number of cable modems.

The *polling-interval* time period determines only how long the Cisco CMTS router waits after completing one polling cycle before beginning a new polling cycle. It does not indicate how long the router spends in each polling cycle, which depends on the number of cable modems being polled. To calculate the approximate time for a polling cycle, assume 4 to 5 CMs per second (100 to 200 milliseconds per CM). Also take into account the possibility that one or more cable modems might not respond, with an approximate timeout period of 90 seconds.

You must specify matching community strings for the cable modem, the **snmp-server community** *community-string* command, and the **cable modem remote-query** command.

You can reissue the **cable modem remote-query** command to change the polling interval at any time, and the change becomes effective immediately. However, to change the SNMP community string, you must first disable remote polling with the **no snmp manager** and **no cable modem remote-query** commands. Then reconfigure the new community string with the **snmp-server community** *community-string*, **snmp-server manager**, and **cable modem remote-query** commands.

You must configure the remote query feature before configuring the **scr-ip** option.



Tip After enabling the remote query feature, you can display the collected statistics with the **show cable modem remote-query** command. You can also display these statistics by querying the attributes in the CISCO-DOCS-REMOTE-QUERY-MIB .

Resetting the Community String for Cable Modem Remote Query

In Cisco IOS Release 12.3BC and later releases, if you wish to reconfigure the SNMP *community string* for the cable modem remote query feature, perform these brief steps.

1. Disable the remote query feature with the **no** form of this command.
2. Reset the timers on the Cisco CMTS router with short timeout values for the polling interval, so that timeout commences quickly. Use the **cable modem remote-query** command in privileged EXEC mode, using a very low value for the *polling interval* value.
3. Once time-outs are applied, reset the *community string* value with the **cable modem remote-query** command.

4. Change the *polling interval* timers on the Cisco CMTS router back to preferred levels using the **cable modem remote-query** command in privileged EXEC mode.

Examples

The following example illustrates how to set the polling interval to 5 seconds and the SNMP community string to **private**:

```
Router# configure terminal

Router(config)# cable modem remote-query 5 private

Router(config)# snmp-server community private

Router(config)# snmp-server manager
```

The following example demonstrates how to change the remote query configuration, by first deleting the existing configuration and then giving the new configuration:

```
Router# configure terminal

Router(config)# no cable modem remote-query

Router(config)# no snmp-server manager

Router(config)# cable modem remote-query 10 public

Router(config)# snmp-server community public
Router(config)# snmp-server manager
```

Related Commands

Command	Description
debug cable remote-query	Turns on debugging to gather information from remote CMs.
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem phy	Displays DOCSIS PHY layer information for one or more CMs.
show cable modem remote-query	Displays the statistics accumulated by the remote query feature.
snmp-server enable traps cable	Enables traps that are sent when the remote polling of CMs has been completed.

cable modem service-class-name

To change a QoS service class for a particular cable modem (CM), use the **cable modem service-class-name** command in privileged EXEC mode.

cable modem {*ip-addressmac-address*} **service-class-name** *name*

Syntax Description

ip-address	Specifies the IP address of the CM to be assigned the named service class.
mac-address	Specifies the MAC address of the CM to be assigned the named service class.
name	Specifies the name of the QoS service class.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command has the following restrictions:

- The **no** form of the command is not supported, as the CMTS does not cache the service class parameters of the modem.
- The command is supported only on DOCSIS 1.1 CMs primary service flows.
- You can specify this command only after the CM has been online for at least 200 seconds.
- The parameters defined by the named service class should be a subset of the admitted qos parameters. Normally, the admitted and the active parameters have the same QoS parameters. However, it is better to ensure that the following parameters are a subset of the original or registered set of parameters: **priority**, **max-rate**, **max-burst**, **min-rate**, **max-latency**, **min-packet-size**, **act_timeout**, or **adm_timeout**. Also, ensure that the values of **required_mask**, **forbidden_mask**, and **aggregate_mask** are the same.

Examples

The following example changes the QoS parameter set for the CM with MAC address aaaa.bbbb.cccc to the service class named “test”:

```
Router# cable modem aaaa.bbbb.cccc service-class-name test
```

Related Commands

Command	Description
cable service class	Sets parameters for a DOCSIS 1.1 cable service class.
service-class (enforce-rule)	Identifies a particular service class for cable modem monitoring in an enforce-rule.

cable modem v6-max-cpe-prefix

To specify the maximum number of IPv6 addresses per modem, use the **cable modem v6-max-cpe-prefix** command in global configuration mode. To set the default value of the command, use the **no** form of this command.

cable modem v6-max-cpe-prefix [*n*]
no cable modem v6-max-cpe-prefix [*n*]

Syntax Description

n	Specifies the maximum number of IPv6 addresses per modem. The range is from 0 to 1023. The default is 16.

Command Default

The default number of IPv6 addresses per modem is 16.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCH1	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **cable submgmt default max-ipv6-cpe** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to check the IPv6 Global Unicast Address (GUA), link-local address (LLA) and IPv6 Prefix Delegation (PD) of the CPE.

Examples

The following example shows how to specify the maximum number of the IPv6 addresses per modem:

```
Router> enable
Router# configure terminal
Router(config)# cable modem v6-max-cpe-prefix 10
Router(config)# cable submgmt default active
Router(config)# exit
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered cable modems.

cable modem vendor

To associate the name of a vendor with its Organizational Unique Identifier (OUI), use the **cable modem vendor** command in global configuration mode. To remove the association of the vendor name with its OUI, use the **no** form of this command.

cable modem vendor *OUI* [*vendor-name*]
no cable modem vendor *OUI* [*vendor-name*]

Syntax Description

OUI	Specifies the Organizational Unique Identifier (OUI). An OUI is the first 3 octets (3 bytes, 6 hexadecimal digits) of the CM MAC address and typically indicates the vendor for the CM. The octets can be specified as one string (for example, 000102), or each octet can be separated by a hyphen, period, or colon (for example, 00-01-02 or 00:01:02 or 00.01.02). **Note** You can use either a period or colon as the separator between octets when manually entering this command, but the command that is written to the running and startup configuration files always uses a period.
vendor-name	(Optional) Specifies an arbitrary string identifying the vendor for this OUI.

Command Default

A default database contains approximately 300 OUIs associated with approximately 60 vendor names.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(8)BC2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable modem vendor** command allows you to associate an arbitrary string with an OUI to identify the vendor of the associated CM. The vendor name is then displayed as part of the **show cable modem vendor** command.

The **show cable modem vendor** command uses a default database of approximately 300 OUIs. If the OUI and vendor are not in that database, the **show cable modem vendor** command displays the OUI as the vendor name, but you can use the **cable modem vendor** command to associate a vendor name with the new OUI.

If you specify an OUI with the **cable modem vendor** command that already exists in the OUI database, the previous value is overwritten with the new value. You can use the **default** prefix to restore the original value for an OUI in the default database.

You can also use the **no cable modem vendor** command to remove the association between an OUI and a vendor name. The **show cable modem vendor** command then displays only the OUI as the vendor name.

Tip The Institute of Electrical and Electronics Engineers (IEEE) is the official issuer of OUI values.

Examples

The following shows several examples of the **cable modem vendor** command using Cisco OUIs:

```
Router(config)# cable modem vendor 00:01:42 Cisco
Router(config)# cable modem vendor 00:01:43 Cisco
Router(config)# cable modem vendor 00:01:63 Cisco
Router(config)# cable modem vendor 00:01:64 Cisco
Router(config)# cable modem vendor 00:0A:41 Cisco
Router(config)# cable modem vendor 00:0A:42 Cisco
Router(config)#
```

The following shows an example of the **default cable modem vendor** command being used to restore the original association between Cisco and its company OUI of 00:00:0C. Any previous user-defined vendor name is deleted from the OUI database.

```
Router(config)# default cable modem vendor 00000C
```

The following shows an example of the **no cable modem vendor** command being used to remove the association between Cisco and an OUI of 00:0A:42. If any CMs exist with that OUI, the **show cable modem vendor** command displays the OUI ("00:0A:42") as the vendor name.

```
Router(config)# no
 cable modem vendor 00:0A:42 Router(config)#
```

Related Commands

Command	Description
show cable modem vendor	Displays the vendor name or Organizational Unique Identifier (OUI) for the CMs on each cable interface.

cable modulation-profile

To define a modulation profile for use on the router, use the **cable modulation-profile** command in global configuration mode. To remove the entire modulation profile or to reset a default profile to its default values, use the **no** form of this command.

DOCSIS 1.0 and 1.1 Mixed Mode:
cable modulation-profile *profile* {**mix** | **qam-16** | **qpsk** | **robust-mix**}
no cable modulation-profile *profile* {*iuc* | **mix** | **qam-16** | **qpsk** | **robust-mix**}
cable modulation-profile *profile iuc fec-tbytes fec-len burst-len guard-t mod scrambler seed diff pre-len last-cw uw-len*

DOCSIS 1.x/2.0 Mixed Mode:
cable modulation-profile *profile* {**mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-16** | **qpsk** | **robust-mix-high** | **robust-mix-mid** | **robust-mix-qam**}
no cable modulation-profile *profile* {*iuc* | **mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-16** | **qpsk** | **robust-mix-high** | **robust-mix-mid** | **robust-mix-qam**}
cable modulation-profile *profile iuc fec-tbytes fec-len burst-len guard-t mod scrambler seed diff pre-len last-cw uw-len*

DOCSIS 2.0 A-TDMA Mode:
cable modulation-profile *profile* {**mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-8** | **qam-16** | **qam-32** | **qam-64** | **qpsk** | **robust-mix-high** | **robust-mix-low** | **robust-mix-mid**}
no cable modulation-profile *profile* {*iuc* | **mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-8** | **qam-16** | **qam-32** | **qam-64** | **qpsk** | **robust-mix-high** | **robust-mix-low** | **robust-mix-mid**}
cable modulation-profile *profile iuc fec-tbytes fec-len burst-len guard-t mod scrambler seed diff pre-len last-cw uw-len*

Cisco IOS Release 12.2(33)SCC and Later

DOCSIS 2.0 A-TDMA Mode and DOCSIS 2.0 S-CDMA Mode:
cable modulation-profile *profile* {**mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-16** | **qpsk** | **robust-mix-high** | **robust-mix-low** | **robust-mix-mid**}
no cable modulation-profile *profile* {*iuc* | **mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-16** | **qpsk** | **robust-mix-high** | **robust-mix-low** | **robust-mix-mid**}
cable modulation-profile *profile iuc fec-tbytes fec-len burst-len guard-t mod scrambler seed diff pre-len last-cw uw-len*

Cisco cBR Series Converged Broadband Routers

DOCSIS 1.x TDMA Mode:
cable modulation-profile *profile* **tdma** {**mix** | **qam-16** | **qpsk** | **robust-mix**}
no cable modulation-profile *profile* **tdma** {*iuc* | **mix** | **qam-16** | **qpsk** | **robust-mix**}
cable modulation-profile *profile* **tdma** *iuc fec-tbytes fec-len burst-len guard-t mod scrambler seed diff pre-len last-cw uw-len*

DOCSIS 1.x/2.0 TDMA-ATDMA Mixed Mode:
cable modulation-profile *profile* **mixed** {**mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-16** | **qpsk** | **robust-mix-high** | **robust-mix-mid** | **robust-mix-qam**}

no cable modulation-profile *profile* **mixed** {*iuc* | **mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-16** | **qpsk** | **robust-mix-high** | **robust-mix-mid** | **robust-mix-qam**}
cable modulation-profile *profile* **mixed** *iuc fec-tbytes fec-len burst-len guard-t mod scrambler seed diff pre-len last-cw uw-len*

DOCSIS 2.0 A-TDMA Mode:
cable modulation-profile *profile* **atdma** {**mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-8** | **qam-16** | **qam-32** | **qam-64** | **qpsk** | **robust-mix-high** | **robust-mix-low** | **robust-mix-mid**}
no cable modulation-profile *profile* **atdma** {*iuc* | **mix-high** | **mix-low** | **mix-mid** | **mix-qam** | **qam-8** | **qam-16** | **qam-32** | **qam-64** | **qpsk** | **robust-mix-high** | **robust-mix-low** | **robust-mix-mid**}
cable modulation-profile *profile* **atdma** *iuc fec-tbytes fec-len burst-len guard-t mod scrambler seed diff pre-len last-cw uw-len*

Syntax Description

profile	Specifies the modulation profile number. The valid values for the profile number depend on the cable interface being used and the upstream's mode of operation. The range is 1 to 400 on the Cisco cBR series routers. In Cisco IOS Release 12.2(15)CX and later releases, you can create a maximum of 10 profiles for each mode of operation, for a total of 30 profiles on the Cisco uBR10012 and Cisco uBR7200 series routers. In earlier software releases, you can create a maximum of 8 profiles only for DOCSIS 1.0 and DOCSIS 1.1 mode.
mix	(DOCSIS 1.0 and DOCSIS 1.1 mode only) Creates a default QPSK/16-QAM mix modulation profile where short and long grant bursts are sent using 16-QAM, while request, initial ranging, and station maintenance bursts are sent using QPSK). The burst parameters are set to their default values for each burst type.
mix-high	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 modes only) Creates a default QPSK/64-QAM modulation profile.
mix-low	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 modes only) Creates a default QPSK/16-QAM modulation profile.
mix-mid	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 A-TDMA modes only) Creates a default QPSK/32-QAM modulation profile.
mix-qam	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 A-TDMA modes only) Creates a default 16-QAM/64-QAM modulation profile.
qam-8	(DOCSIS 2.0 A-TDMA mode only) Creates a default 8-QAM modulation profile. This modulation profile is available in hidden and internal mode only from Cisco IOS Release 12.2(33)SCC and Cisco IOS-XE Release 3.15.0S onwards.
qam-16	Creates a default 16-QAM modulation profile.
qam-32	(DOCSIS 2.0 A-TDMA mode only) Creates a default 32-QAM modulation profile. This modulation profile is available in hidden and internal mode only from Cisco IOS Release 12.2(33)SCC and Cisco IOS-XE Release 3.15.0S onwards.

qam-64	(DOCSIS 2.0 A-TDMA mode only) Creates a default 64-QAM modulation profile. This modulation profile is available in hidden and internal mode only from Cisco IOS Release 12.2(33)SCC and Cisco IOS-XE Release 3.15.0S onwards.
qpsk	Creates a default QPSK modulation profile.
robust-mix	(DOCSIS 1.0 and DOCSIS 1.1 mode only) Creates a default QPSK/16-QAM modulation profile with a longer preamble that is more robust and more able to deal with noise on the upstream better than the **mix** profile.
robust-mix-high	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 A-TDMA modes only) Creates a default QPSK/64-QAM mixed modulation profile with a longer preamble that is more robust and more able to deal with noise on the upstream better than the **mix-high** profile.
robust-mix-low	(DOCSIS 2.0 A-TDMA mode only) Creates a default QPSK/16-QAM modulation profile with a longer preamble that is more robust and better able to deal with noise on the upstream than the **mix-low** profile.
robust-mix-mid	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 A-TDMA modes only) Creates a default QPSK/32-QAM modulation profile with a longer preamble that is more robust and better able to deal with noise on the upstream than the **mix-mid** profile.
robust-mix-qam	(DOCSIS 1.x/2.0 mixed mode only) Creates a default 16-QAM/64-QAM mixed modulation profile with a longer preamble that is more robust and better able to deal with noise on the upstream than the **mix-qam** profile.
iuc	Interval usage code. Valid entries depend on the mode of operation: • If the upstream is configured for DOCSIS 1.0 and DOCSIS 1.1 modulation profiles, the valid values are **initial**, **long**, **request**, **reqdata**, **short**, or **station**. • If the upstream is configured for DOCSIS 1.x and DOCSIS 2.0 mixed modulation profiles, the valid values are **a-long**, **a-short**, **a-ugs**, **initial**, **long**, **request**, **reqdata**, **short**, or **station**. • If the upstream is configured for DOCSIS 2.0 A-TDMA modulation profiles, the valid values are **a-long**, **a-short**, **a-ugs**, **initial**, **long**, **request**, **reqdata**, **short**, or **station**. The **reqdata** burst type is included as a placeholder for scripts that might reference it, but the DOCSIS MAC scheduler on the Cisco CMTS does not use this type of burst. When you are using the **initial** and **station** bursts for DOCSIS 2.0 A-TDMA mode, **qam-8**, **qam-32**, and **qam-64** modulation profiles are available in hidden mode only.
preamble	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 A-TDMA modes only, for **a-long** and **a-short** options) Specifies the preamble format. Valid values are **qpsk0** and **qpsk1**.
rs-interleave-depth	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 A-TDMA modes only, for **a-long** and **a-short** options) Specifies the RS interleave depth. The valid range is from 0 to 114.
rs-interleave-block	(DOCSIS 1.x/2.0 mixed and DOCSIS 2.0 A-TDMA modes only, for **a-long** and **a-short** options) Specifies the RS interleave block size. The valid range is from 18 to 2048.

fec-tbytes	The number of bytes that can be corrected per FEC code word. For DOCSIS 1.0 and DOCSIS 1.1 mode, valid values are from 0 to 10 (decimal), where 0 means no FEC. For DOCSIS 2.0 A-TDMA mode, the valid values are from 0 to 16 (decimal), where 0 means no FEC.
fec-len	FEC code-word length. Valid values are from 16 to 253.
burst-len	Maximum burst length in minislots. Valid values are from 0 to 255, where 0 means no limit.
guard-t	Guard time in symbols. The time between successive bursts, with a range from 22 to 255. (In Cisco IOS Release 12.2(15)BC2 and earlier releases, the minimum guard time was 0 symbols, but we do not recommend using a guard time smaller than 22 symbols.)
mod	Modulation. Valid entries are **16qam** and **qpsk** for DOCSIS 1.0 and DOCSIS 1.1 upstreams. Valid entries are **8qam**, **16qam**, **32qam**, **64qam**, and **qpsk** for DOCSIS 2.0 upstreams. The **qam-8**, **qam-32**, and **qam-64** modulation profiles are available in hidden and internal modes only from Cisco IOS Release 12.2(33)SCC and Cisco IOS-XE Release 3.15.0S onwards.
scrambler	Enable or disable scrambler. Valid entries are **scrambler** and **no-scrambler**.
seed	(Required if **scrambler** option used) Scrambler seed in hexadecimal format. Valid values are from 0x0 to 0x7FFF.
diff	Enable or disable differential encoding. Valid entries are **diff** and **no-diff**. In DOCSIS 2.0 mode, differential encoding cannot be enabled for the 8-QAM, 32-QAM, and 64-QAM modulations. The **qam-8**, **qam-32**, and **qam-64** modulation profiles are available in hidden and internal modes only from Cisco IOS Release 12.2(33)SCC and Cisco IOS-XE Release 3.15.0S onwards.
pre-len	Preamble length in bits. Valid values are from 2 to 256.
last-cw	Handling of FEC for last code word. Valid entries are **fixed** for fixed code-word length and **shortened** for shortened last code word.
uw-len	Upstream unique word length. Enter **uw8** for 8-bit unique code words or **uw16** for 16-bit unique code words.

Command Default

Modulation profile 1 is defined as a **qpsk** Time Division Multiple Access (TDMA) profile.

In Cisco IOS Release 12.2(15)CX, Release 12.2(15)BC2 and later releases, additional modulation profiles are defined as the default mixed TDMA/A-TDMA profile and the default Advanced TDMA (A-TDMA) profile.

Command Modes

Global configuration (config)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0(7)XR2	This command was supported.
12.0(6)SC and 12.1(3a)EC1	The **mix**, **qpsk**, and **qam-16** options were added.
12.2(8)BC2	Support was added for the Cisco uBR10012 router.
12.2(11)CY	Support was added for the Cisco uBR-MC5X20S cable interface line card. This includes creating default modulation profile 21 for the card.
12.2(15)CX	Support was added for the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line card, including support for DOCSIS 2.0 A-TDMA and mixed modulation profiles on this card. The **robust** predefined modulation profiles were also added for all modes of operation. The robust profiles use a longer preamble to provide better handling of noise on the upstream, but they also consume more bandwidth at the PHY layer than the other profiles.
12.2(15)BC2	Support was added for the Cisco uBR10-MC5X20S/U cable interface line cards, including support for DOCSIS 2.0 A-TDMA and mixed modulation profiles. Support for the IUC-11 burst profile (Advanced UGS, **a-ugs**) was also added for mixed TDMA/A-TDMA modulation profiles.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC. Support was added for the Cisco uBR10-MC5X20H cable interface line card.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC	This command was modified. Moved **qam-8**, **qam-32**, and **qam-64** options to hidden and internal mode only. Support was added for Synchronous Code Division Multiple Access (S-CDMA) modulation profiles.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A modulation profile is a collection of at least six burst profiles that are sent out in an upstream channel descriptor (UCD) message to configure a modem's transmit parameters.

You can use the **no cable modulation-profile** command to remove all modulation profiles except the default modulation profiles (1, 21, 41, 101, 121, 201, 221, 241, and 321, depending on the cable interface line cards being used). In the case of the default modulation profiles, the **no cable modulation-profile** command resets the default profile to its default values.

We recommend that you use the predefined profiles instead of manually specifying the individual bursts for a modulation profile. The predefined profiles are optimized for the default of 32 symbols per minislot for each particular modulation scheme. The **robust** predefined profiles use a longer preamble for better handling of noise on the upstream, but at the cost of consuming more PHY layer bandwidth than the other non-robust profiles.

If you want to manually specify the individual bursts, enter a line with all parameters for each upstream burst type. Then repeat this command for each burst type, which also must be fully specified. A profile with incomplete or missing bursts can cause unreliable operation or loss of modem connectivity.

Caution Changes to modulation profiles causes changes to the physical layer. Because changing physical layer characteristics affects router performance and function, this task should be reserved for expert users who have a thorough understanding of DOCSIS systems and how each parameter affects the network.

Note The **reqdata** burst type is included as a placeholder for SNMP scripts that might reference it, but it has no effect. You can use this command (and SNMP commands) to specify the **reqdata** types, but the DOCSIS MAC scheduler on the Cisco CMTS does not use this type of burst.

From Cisco IOS Release 12.2(33)SCC and Cisco IOS-XE Release 3.15.0S onwards, the **qam-8**, **qam-32**, and **qam-64** modulation profiles are available in hidden and internal modes only. When you are using the **initial** and **station** bursts for DOCSIS 2.0 A-TDMA mode, **qam-8**, **qam-32**, and **qam-64** modulation profiles are available in hidden mode only. However, these modulation profiles are available for **a-long**, **a-short**, **a-ugs**, **long**, **request**, **reqdata**, and **short**.

Modulation Profile Ranges

The valid range for modulation profiles depends on the cable interface being used and the type of modulation profile being created. The table below lists the valid ranges according to cable interface and modulation type.

Table 7: Allowable Ranges for Modulation Profiles

Cable Interface	DOCSIS 1.X (TDMA)	Mixed DOCSIS 1.X/2.0	DOCSIS 2.0 (A-TDMA)	DOCSIS 2.0 (S-CDMA)
Cisco uBR7100 series	1 to 10[3], default=1	N/A	N/A	N/A
Cisco uBR-MC16C	1 to 10, default=1	N/A	N/A	N/A
Cisco uBR-MC16S	1 to 10, default=1	N/A	N/A	N/A
Cisco uBR-MC28C	1 to 10, default=1	N/A	N/A	N/A
Cisco uBR-MC5X20S, Cisco uBR-MC5X20U, Cisco uBR-MC5X20H	21 to 30, default=21	121 to 130, default=121	221 to 230, default=221	321 to 330 (default is 321)
Cisco uBR-MC16U/X, Cisco uBR-MC28U/X	41 to 50, default=41	141 to 150, default=141	241 to 250, default=241	N/A
Cisco cBR-8 CCAP	1 to 400, default=21	1 to 400, default=121	1 to 400, default=221	N/A

[3] Only 8 modulation profiles are supported in Cisco IOS software releases before 12.2(15)BC1, so in these releases the valid range is from 1 to 8.

DOCSIS 1.0 and DOCSIS 1.1 Support

For DOCSIS 1.0 and 1.1 cable modems, the following burst types are required: request, request data, initial maintenance, station maintenance, short grant, and long grant. You must issue the **cable modulation-profile** command six times for each individual burst type to correctly create a new modulation profile.

The three default profiles can be used to quickly create modulation profiles, without having to specify the parameters for each individual burst: **mix**, **qpsk**, and **qam-16**. The burst parameters for the request, initial, station maintenance, short, and long bursts are set to their default values for each burst type. (The **reqdata** burst type is not created when using the default modulation profiles because it is not used by the MAC scheduler.)

The default profiles allow basic profiles to be implemented for initial network connectivity. As the characteristics of a cable plant become better known, the profiles can then be adjusted accordingly.



Note Do not use the **qam-16** mode unless you have verified that your cable plant can support that modulation profile. Most cable plants should instead use the **qpsk** or **mix** modulation profile for the primary profile.



Caution Turning the scrambler off can cause packet loss and is used only in lab testing environments.

Errors or incompatible configurations in the burst profiles cause cable modems to drop connectivity, to drop short or long data packets, or to fail to connect to the network. It is possible to build a burst profile set for which no implementation of a DOCSIS receiver is capable of receiving the modem's transmission.

Data rates of 160 Ksymbol/sec and 2560 Ksymbol/sec are highly sensitive to unique word length, preamble length, and FEC sizing. Incorrect choices for these values can cause poor, or no, connectivity at these symbol rates.

DOCSIS 2.0 Support

Cisco IOS Release 12.2(11)CY, 12.2(15)BC1, 12.3BC, 12.2(33)SCA, 12.2(33)SCC, and later releases support 10 modulation profiles for each of the three DOCSIS modes (DOCSIS 1.X, DOCSIS 2.0, and mixed mode) on the Cisco uBR10012 and Cisco uBR7200 series routers, for a total maximum of 30 modulation profiles. In addition, the router also creates several default modulation profiles (1, 21, 41, 101, 121, 141, 201, 221, 241, and 321, depending on the cable interface line cards that are installed).

Examples

The following example shows how to create a mixed modulation profile, using 16-QAM for the short and long grant bursts and QPSK for the request, initial ranging, and station maintenance bursts on a Cisco uBR10012 router. The burst parameters are set to their default values for each burst type.

```
Router(config)# cable modulation-profile 8 mix
Router(config)# exit

Router# show cable modulation-profile 8

Mod IUC     Type Preamb Diff FEC    FEC   Scrambl Max  Guard Last Scrambl Preamb
                 length enco T      CW    seed    B    time  CW           offset
                              BYTES  size          size size  short
8   request qpsk 64     no   0x0    0x10  0x152   0    8     no   yes     0
8   initial qpsk 128    no   0x5    0x22  0x152   0    48    no   yes     0
8   station qpsk 128    no   0x5    0x22  0x152   0    48    no   yes     0
8   short   qam  144    no   0x6    0x4B  0x152   6    8     yes  yes     0
8   long    qam  160    no   0x8    0xDC  0x152   0    8     yes  yes     0
Router#
```

Note The above example shows the default values for the burst parameters. The main differences in the default values between 16-QAM and QPSK bursts are in the Type and Preamble Length fields.

The following example shows how to define the burst parameters for profile 2 with the following parameters: 0 fec-tbytes, 16 kbytes fec-len, a burst-len of 1, a guard time of 8, a mod value of **qpsk**, scrambler enabled with a seed value of 152, differential encoding disabled, a preamble length of 64 bits, a fixed code-word length, and 8-bit unique words for upstream unique word length a Cisco uBR10012 router.

```
Router(config)# cable modulation-profile 2 request 0 16 1 8 qpsk scrambler 152 no-diff 64
fixed uw8
Router(config)# cable modulation-profile 2 reqdata 0 16 1 8 qpsk scrambler 152 no-diff 64
fixed uw8
Router(config)# cable modulation-profile 2 initial 5 34 0 48 qpsk scrambler 152 no-diff 128
 fixed uw16
Router(config)# cable modulation-profile 2 station 5 34 0 48 qpsk scrambler 152 no-diff 128
 fixed uw16
Router(config)# cable modulation-profile 2 short 6 75 6 8 16qam scrambler 152 no-diff 144
fixed uw8
Router(config)# cable modulation-profile 2 long 8 220 0 8 16qam scrambler 152 no-diff 160
fixed uw8
```

Note You must create all of the bursts (request, initial, station, short and long) for this modulation profile, using the **cable modulation-profile** command. The **reqdata** burst is optional.

The following example shows an example of a DOCSIS 1.X/DOCSIS 2.0 mixed modulation profile a Cisco uBR10012 router:

```
Router# configure terminal

Router(config)# cable modulation-profile 142 request 0 16 0 8 qpsk scrambler 152 no-diff
64 fixed uw8

Router(config)# cable modulation-profile 142 initial 5 34 0 48 qpsk scrambler 152 no-diff
32 fixed uw16

Router(config)# cable modulation-profile 142 station 5 34 0 48 qpsk scrambler 152 no-diff
32 fixed uw16

Router(config)# cable modulation-profile 142 short 5 75 6 8 qpsk scrambler 152 no-diff 72
shortened uw8

Router(config)# cable modulation-profile 142 long 8 220 0 8 qpsk scrambler 152 no-diff 80
shortened uw8

Router(config)# cable modulation-profile 142 a-short qpsk0 0 18 5 99 10 8 64qam scrambler
152 no-diff 128 shortened uw8

Router(config)# cable modulation-profile 142 a-long qpsk0 0 18 15 200 0 8 64qam scrambler
152 no-diff 128 shortened uw8

Router(config)#
```

The following example shows an example of a DOCSIS 2.0 A-TDMA modulation profile a Cisco uBR10012 router:

```
Router# configure terminal

Router(config)# cable modulation-profile 242 request qpsk0 0 0 0 16 0 8 qpsk scrambler 152
 no-diff 64 fixed uw8

Router(config)# cable modulation-profile 242 initial qpsk0 0 0 5 34 0 48 qpsk scrambler 152
 no-diff 32 fixed uw16

Router(config)# cable modulation-profile 242 station qpsk0 0 0 5 34 0 48 qpsk scrambler 152
 no-diff 32 fixed uw16

Router(config)# cable modulation-profile 242 short qpsk0 0 0 5 75 6 8 qpsk scrambler 152
no-diff 72 shortened uw8

Router(config)# cable modulation-profile 242 long qpsk0 0 0 8 220 0 8 qpsk scrambler 152
no-diff 80 shortened uw8

Router(config)# cable modulation-profile 242 a-short qpsk0 0 18 5 99 10 8 64qam scrambler
152 no-diff 128 shortened uw8

Router(config)# cable modulation-profile 242 a-long qpsk0 0 18 15 200 0 8 64qam scrambler
152 no-diff 128 shortened uw8

Router(config)#
```

The following example shows an example of a DOCSIS 2.0 S-CDMA modulation profile:

```
Router# configure terminal

Router(config)# cable modulation-profile 324 request 0 16 10 16qam scrambler 152 no-diff
64 fixed qpsk0 spreader 12 12 no-tcm
Router(config)# cable modulation-profile 324 initial 0 16 10 16qam scrambler 152 no-diff
64 fixed qpsk0 off-spreader 12 12 no-tcm
Router(config)# cable modulation-profile 324 station 0 16 10 16qam scrambler 152 no-diff
64 fixed qpsk0 off-spreader 12 12 no-tcm
Router(config)# cable modulation-profile 324 a-short 0 16 10 16qam scrambler 152 no-diff
64 fixed qpsk0 off-spreader 12 12 no-tcm
Router(config)# cable modulation-profile 324 a-long 16 10 16qam scrambler 152 no-diff 64
fixed qpsk0 off-spreader 12 12 no-tcm

Router(config)# cable modulation-profile 324 a-ugs 16 10 16qam scrambler 152 no-diff 64
fixed qpsk0 off-spreader 12 12 no-tcm
Router(config)#
```

The following example shows how to create TDMA modulation profiles on a Cisco cBR series router:

```
Router# configure terminal
Router(config)# cable modulation-profile 24 tdma qam-16
Router(config)# cable modulation-profile 25 tdma qpsk
Router(config)# cable modulation-profile 26 tdma request 0 16 0 8 qpsk scrambler 152 no-diff
 68 fixed
```

The following example shows how to create TDMA/A-TDMA mixed modulation profiles on a Cisco cBR series router:

```
Router# configure terminal
Router(config)# cable modulation-profile 125 mixed qam-16
```

```
Router(config)# cable modulation-profile 127 mixed request 0 16 0 8 qpsk scrambler 152
no-diff 68 fixed
Router(config)# cable modulation-profile 127 mixed initial 5 34 0 48 qpsk scrambler 152
no-diff 128 fixed
```

The following example shows how to create A-TDMA mixed modulation profiles on a Cisco cBR series router:

```
Router# configure terminal
Router(config)# cable modulation-profile 225 atdma qam-64
Router(config)# cable modulation-profile 227 atdma request 0 16 0 8 qpsk scrambler 152
no-diff 68 fixed qpsk0 1 2048
Router(config)# cable modulation-profile 227 atdma initial 0 16 0 0 qpsk no-scrambler no-diff
 2 fixed qpsk1 0 18
```

See the **show cable modulation-profile** command for a description of the output display fields.

Related Commands

Command	Description
cable upstream modulation-profile	Assigns a modulation profile to an interface.
show cable modulation-profile	Displays a modulation profile group's information.

cable modulation-profile global-scheme

To define a global modulation profile for use on the router, use the **cable modulation-profile global-scheme** command in global configuration mode. To remove the newly created modulation profile or to reset to the legacy profile mode, use the **no** form of this command.

cable modulation-profile global-scheme *profile*
no cable modulation-profile global-scheme

Syntax Description

profile	Modulation profile number. The profile number range is from 1 to 400.

Command Default

The global modulation profile scheme is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Using the global modulation profile scheme, you can assign any number between 1 to 400 to any modulation profiles. It eliminates the number space restriction and increases the number of modulation profiles that can be created per DOCSIS mode. The global modulation profile mode allows you to create and configure DOCSIS 3.0 channel type 4SR (scdma-d3). When an upstream DOCSIS mode is changed to scdma-d3 , it is initially assigned to the system created default modulation profile.

Note Though you can assign any number between 1 to 400 to any modulation profile, the default modulation profile number assigned to an upstream channel for a given channel type will remain the same. That is, modulation profile numbers 21, 121, 221, 321, and 381 will be applicable for TDMA, mixed, A-TDMA, S-CDMA, and DOCSIS 3.0 S-CDMA channel types.

All the existing and previously defined modulation profiles are converted to the new format. However, all the newly created modulation profiles, which are outside of the legacy number space range, are lost when you revert to the legacy modulation profile.

Note The default profiles cannot be deleted. Using the **no cable modulation global** command on the default profiles resets them to their original, default values.

Modulation Profile Ranges

The valid range for modulation profiles depends on the cable interface being used and the type of modulation profile being created.

The table below lists the valid ranges according to cable interface and modulation type:

Table 8: Allowable Ranges for Modulation Profiles

Cable Interface	DOCSIS 2.0 (S-CDMA)	DOCSIS 3.0 (S-CDMA)
Cisco UBR-MC20X20V	321 to 330 (default is 321)	1 to 400 (default is 381)

Examples

The following example shows how to create a global modulation profile scheme:

```
Router(config)# cable modulation-profile global-scheme
```

Related Commands

Command	Description
cable upstream modulation-profile	Assigns a modulation profile to an interface.
show cable modulation-profile	Displays modulation profile information of a group.

cable mod-profile-ofdma

To define the OFDMA modulation profile for OFDMA channels, **cable mod-profile-ofdma** command in the global configuration mode.

cable mod-profile-ofdma *id*

Syntax Description

data-iuc	Configures the data IUC (Interval Usage Codes) profile.
fine-rng-subcarrier	Configures the number of subcarriers for fine ranging.
initial-rng-preamble	Configures the number of symbols per subcarrier for initial ranging preamble.
initial-rng-subcarrier	Configures the number of subcarriers for initial ranging.
subcarrier-spacing	Defines the subcarrier spacing.
ofdma-prof-mgmt downgrade rxmer min-iuc *value*	Defines the data IUC below which the OFDMA channel will be downgraded to partial mode.

Command Default

The default OFDMA modulation profile for subcarrier spacing 25KHz is 421. The default OFDMA modulation profile for subcarrier spacing 50KHz is 461. In these two modulation profiles, the default IUC is IUC 13.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Amsterdam 17.3.1w	This command was updated. **ofdma-prof-mgmt downgrade rxmer min-iuc** option was added.

Usage Guidelines

Use this command to define the OFDMA modulation profile that can be applied to OFDMA channels. The OFDMA modulation profile is used to configure initial ranging, fine ranging, and data IUC parameters.

Configuring OFDMA Modulation Profile

The following example shows how to configure OFDMA modulation profile.

```
Router# enable
Router# configure terminal
Router(config)# cable mod-profile-ofdma 466
Router(config-ofdma-mod-profile)# subcarrier-spacing 50KHz
Router(config-ofdma-mod-profile)# initial-rng-subcarrier 64
Router(config-ofdma-mod-profile)# fine-rng-subcarrier 128
Router(config-ofdma-mod-profile)# data-iuc 13 modulation 1024-QAM pilot-pattern 2
Router(config-ofdma-mod-profile)# exit
Router(config)# cable mod-profile-ofdma 423
Router(config-ofdma-mod-profile)# subcarrier-spacing 25KHz
Router(config-ofdma-mod-profile)# initial-rng-subcarrier 64
```

```
Router(config-ofdma-mod-profile)# fine-rng-subcarrier 128
Router(config-ofdma-mod-profile)# data-iuc 6 modulation 1024-QAM pilot-pattern 8
Router(config-ofdma-mod-profile)# data-iuc 9 modulation 1024-QAM pilot-pattern 8
Router(config-ofdma-mod-profile)# data-iuc 10 modulation 512-QAM pilot-pattern 8
Router(config-ofdma-mod-profile)# data-iuc 11 modulation 256-QAM pilot-pattern 8
Router(config-ofdma-mod-profile)# data-iuc 12 modulation 128-QAM pilot-pattern 9
Router(config-ofdma-mod-profile)# data-iuc 13 modulation 64-QAM pilot-pattern 9
```

cable mod-profile-ofdma data-iuc modulation pilot-pattern cwerr-downgrade-iuc

To downgrade to a particular IUC directly, use the **cable mod-profile-ofdma** *data-iuc-type* **data-iuc** *data-iuc-type* **modulation** *modulation* **pilot-pattern** *pilot-pattern-id* **cwerr-downgrade-iuc** *cwerr-downgrade-iuc* command in the global configuration mode, to downgrade to this a particular IUC directly.

cable mod-profile-ofdma *data-iuc-type* **data-iuc** *data-iuc-type* **modulation** *modulation* **pilot-pattern** *pilot-pattern-id* **cwerr-downgrade-iuc** *cwerr-downgrade-iuc*

Syntax Description

data-iuc	Configure the data IUC (Interval Usage Codes) profile. The valid options are 10, 11, 12, 13, 5, 6, or 9.
modulation *modulation*	Configure the data IUC modulation. The valid options are 1024-QAM, 128-QAM, 16-QAM, 2048-QAM, 256-QAM, 32-QAM, 4096-QAM, 512-QAM, 64-QAM, 8-QAM, BPSK, NONE, or QPSK.
pilot-pattern *pilot-pattern-id*	Configure the data IUC pilot pattern. The valid range is: • **Regular**: 1-4 and 8-11 • **Boosted**: 5-7 and 12-14
cwerr-downgrade-iuc *cwerr-downgrade-iuc*	Configure to downgrade to this IUC directly. The valid options are 10, 11, 12, 13, 5, 6, or 9.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	This command is introduced on Cisco cBR-8 Series Converged Broadband Routers.

Configuring OFDMA Modulation Profile

Here is a sample configuration for manually configuring IUC downgrade:

```
Router# configure terminal
Router(config)# cable mod-profile-ofdma 461
Router(config-ofdma-mod-profile)# subcarrier-spacing 50KHz
Router(config-ofdma-mod-profile)# initial-rng-subcarrier 32
Router(config-ofdma-mod-profile)# fine-rng-subcarrier 100
Router(config-ofdma-mod-profile)#
data-iuc 5 modulation 1024-QAM pilot-pattern 1 cwerr-downgrade-iuc 10
Router(config-ofdma-mod-profile)#
data-iuc 6 modulation 512-QAM pilot-pattern 1 cwerr-downgrade-iuc 10
Router(config-ofdma-mod-profile)#
data-iuc 9 modulation 256-QAM pilot-pattern 2 cwerr-downgrade-iuc 13
Router(config-ofdma-mod-profile)# data-iuc 10 modulation 128-QAM pilot-pattern 2
cwerr-downgrade-iuc 13
```

```
Router(config-ofdma-mod-profile)#
data-iuc 11 modulation 64-QAM pilot-pattern 3 cwerr-downgrade-iuc 13
Router(config-ofdma-mod-profile)# data-iuc 12 modulation 32-QAM pilot-pattern 3
Router(config-ofdma-mod-profile)# data-iuc 13 modulation 16-QAM pilot-pattern 4
Router(config-ofdma-mod-profile)# end
```

cable monitor

To enable the forwarding of selected packets on the cable interface to an external LAN analyzer, use the **cable monitor** command in cable interface configuration mode. To disable this function, use the **no** form of this command.

cable monitor [**incoming** | **outbound**] [**timestamp**] **interface interface** {**slot**/ {**subslot** | **bay**} /**port**} [**access-list** {**name** | **number**} | **mac-address address** | **sid sid-number** | **upstream number** | **packet-type** {**data docsis** | **data ethernet** | **mac** [**type type**]}]

cable monitor outbound downstream {**modular-cable** | **Integrated-cable** | **wideband-cable**} **slot**/ {**subslot** | **bay**} /**controller : channel**

no cable monitor

Syntax Description

incoming	Forwards only packets being received on the upstream.
outbound	Forwards only packets being transmitted on the downstream.
timestamp	Enables packet time-stamping by appending a four-byte value to the forwarded packets. The timestamp value is in hundredths of a second.
interface *interface*	Specifies the WAN interface to which an external LAN analyzer is attached, and to which packets should be forwarded. *interface*—Specifies the interfaces such as Ethernet, Fast Ethernet, Gigabit Ethernet, or Ten Gigabit Ethernet interface.
slot	Slot where the line card resides. • Cisco uBR7246VXR router—The range is from 3 to 6. • Cisco uBR7225VXR router—The range is from 1 to 2. • Cisco uBR7100 series router—The value is 1.
subslot | bay	(Cisco uBR10012 only) Secondary subslot of the cable interface line card or bay of the SPA. The subslot values are 0 or 1 for the cable line card. The values for bay are from 0 to 3.
port	*Specifies the WAN interface number.*
access-list *name* | *number*	(Optional) Specifies the IP access list name or number (1 to 2699).
mac-address *address*	(Optional) Specifies the MAC address of the device being monitored.
sid *sid-number*	(Optional) Specifies the service ID for the packets that should be forwarded (1 to 16384). **Note** This option is supported only in Cisco IOS releases that support DOCSIS 1.1 operations.

upstream *number*	(Optional) Specifies the upstream interface. Valid values for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards range from 0 to 3
packet-type	(Optional) Specifies whether data or MAC packets are forwarded.
data docsis	Specifies that complete DOCSIS packets (both the DOCSIS header and the complete Ethernet frame) should be forwarded. **Note** Enabling this option can result in %LINK-4-TOOBIG messages being generated if the original Ethernet frame is at or near the maximum Ethernet size of 1500 bytes. This is because this option adds additional bytes (the DOCSIS header) to the Ethernet frame, which can result in a total frame size that exceeds the maximum size that is allowed for standard Ethernet frames.
data ethernet	Specifies that the DOCSIS header should be stripped from the packet and that only the Ethernet frame should be forwarded.
mac [**type** *type*]	Specifies that only DOCSIS MAC-layer packets should be forwarded. If you are using the **sid** option, you can also optionally specify the **type** option with one of the following keywords to indicate that only the specific type of MAC-layer traffic should be forwarded: • **dsa**—Dynamic service addition • **dsc**—Dynamic service change • **dsd**—Dynamic service deletion • **map-grant**—Grants • **map-req**—Requests
outbound downstream	Enables cable monitor on the specified downstream interface.

controller: channel	Identifies the controller.
	• Valid range for Cisco uBR-MC3GX60V line card is from 0 to 2.
	  • RF channel—The range is from 0 to 23.
	  • Bonding group—The range is from 0 to 31.
	• Valid range for Cisco UBR-MC20X20 line card is 0 to 4.
	  • RF channel—The range is from 0 to 3.
	  • Bonding group—The range is from 0 to 5.
	• Valid value for Cisco Wideband SPA is 0.
	  • RF channel—The range is from 0 to 23.
	  • Bonding group—The range is from 0 to 31.

Command Default

Both upstream (**incoming**) and downstream (**outbound**) traffic is forwarded.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.1(3a)EC	This command was introduced.
12.1(4)CX	The **sid** option was added for DOCSIS 1.1 support.
12.2(4)XF	Support was added for the Cisco uBR10012 universal broadband router.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
12.3(13a)BC	Supports the Cisco MC5x20U-D broadband processing engine (BPE) and the Cisco MC28U cable interface line card.
12.3(17a)BC	• Access Control Lists are now supported on the Cisco uBR-MC5X20U/D and Cisco uBR-MC28U cable interface line cards • Unconditional downstream sniffing now enables downstream packets to be monitored, either for MAC or data packets. This enhancement supports both DOCSIS and Ethernet packet encapsulation.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB	Support was added for the Ten Gigabit Ethernet interface type.
12.2(33)SCE	Support was added for the Cisco UBR-MC3XG60V line cards.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable monitor** command is used to configure the Cable Monitor and Intercept Features on the Cisco CMTS Routers feature.

The **cable monitor** command allows an external LAN packet analyzer to monitor inbound and outbound data packets for specific types of traffic between the Cisco CMTS and the CMs on a cable interface. This feature enables the CMTS administrator to analyze traffic problems with customer data exchanges.

The interface used for forwarding packets can be used only for the external LAN analyzer; and cannot be used for other purposes.

The **cable monitor outbound downstream** command can be enabled:

- • only one mac-domain on a line card at a time
  • for one modular-cable or intergrated-cable interface per line card at one time
  • for one wideband-cable interface per line card at one time



Tip One possible software utility you can use for decoding the DOCSIS MAC frames is Wireshark software, which is available for Windows and Unix systems at http://www.wireshark.org .

Examples

The following example shows how to configure the Cisco CMTS so that it monitors incoming MAC-layer packets for the CM with the MAC address of 0123.4567.89ab and forwards copies of the packets to the LAN analyzer on the Ethernet interface in slot 1, port 2:

```
Router(config-if)# cable monitor incoming interface e1/2 mac-address 0123.4567.89ab
packet-type mac
```

The following example shows how to configure a Cisco CMTS running DOCSIS 1.1 software so that it monitors incoming MAC-layer packets of type DSA for the CM identified by SID 173 and forwards copies of the packets to the LAN analyzer on the Ethernet interface in slot 1, port 2:

```
Router(config-if)# cable monitor incoming interface e1/2 sid 173 packet-type mac type dsa
```

The following example shows how to configure a mac domain to monitor all packets on a modular primary downstream and forward copies of the packets to a Gigabit Ethernet interface:

```
Router# configure terminal
Router(config)# interface cable 5/0/0
Router(config-if)# cable monitor outbound downstream Modular-Cable 5/1/0:21
Router(config-if)# cable monitor outbound interface GigabitEthernet3/0/0
Router(config-if)# exit
```

The following example shows how to configure a mac domain to monitor all packets on a particular downstream bonding group and forward copies of the packets to a Gigabit Ethernet interface:

```
Router# configure terminal
Router(config)# interface cable 5/0/0
Router(config-if)# cable monitor outbound downstream Wideband-Cable 5/1/2:30
Router(config-if)# cable monitor outbound interface GigabitEthernet3/0/0
Router(config-if)# exit
```

The following example shows how to configure a mac domain to monitor all packets on a particular bonding group destined to a specific modem and forward copies of the packets to a Gigabit Ethernet interface:

```
Router# configure terminal
Router(config)# interface cable 5/0/0
Router(config-if)# cable monitor outbound downstream Wideband-Cable 5/1/2:30
Router(config-if)# cable monitor outbound interface GigabitEthernet3/0/0 mac-address
0123.4567.89ab
Router(config-if)# exit
```

Related Commands

Command	Description
cable intercept	Allows the CMTS to forward all traffic to and from a particular CM to a data collection server located at particular User Datagram Protocol (UDP) port.
show interface cable monitor	Displays monitor flow information on the upstream port.

cable mrc-mode

To enable Multiple Receive Channel (MRC) mode for a Media Access Control (MAC) interface during or after the cable modem (CM) registration, use the **cable mrc-mode** command in cable interface configuration mode or MAC domain profile configuration mode. To disable this configuration, use the **no** form of this command.

cable mrc-mode
no cable mrc-mode

Syntax Description

This command has no arguments or keywords.

Command Default

The MRC mode is enabled by default on a downstream bonding capable cable interface line card.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When you enable or disable the MRC mode, cable modems switch the operation to or from the MRC mode only after the reinitialization of cable modems. You cannot enable the MRC mode on a non-upstream bonding capable cable interface line card.

Examples

The following example shows how to enable the MRC mode for a MAC interface:

```
Router# configure terminal
Router(config)# interface cable 7/1/0
Router(config-if)# cable mrc-mode
```

The following example shows how to enable the MRC mode for a MAC interface on a Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# interface cable 3/0/1
Router(config-if)# cable mrc-mode
```

Related Commands

Command	Description
cable mtc-mode	Enables or disables the Multiple Transmit Channel mode (MTC) for a MAC interface.

cable mtc-mode

To enable Multiple Transmit Channel (MTC) mode for a Media Access Control (MAC) interface during or after the cable modem (CM) registration, use the **cable mtc-mode** command in cable interface configuration mode or MAC domain profile configuration mode. To disable this configuration, use the **no** form of this command.

cable mtc-mode [**required-attribute**]
no cable mtc-mode [**required-attribute**]

Cisco cBR Series Converged Broadband Routers
cable mtc-mode[**required-attribute**]
no cable mtc-mode[**required-attribute**]

Syntax Description

required-attribute	(Optional) Specifies the per-CM basis MTC mode configuration.

Command Default

The MTC mode is enabled by default with the required attribute. With this default configuration, the Cisco CMTS router enables the MTC mode on a per-CM basis by looking at the configuration file of each cable modem.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **required-attribute** keyword was removed.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **required-attribute** keyword was added.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Multiple Transmit Channel mode is a CM capability that enables CMs to send upstream traffic on multiple upstream channels. You can enable the MTC mode on a cable interface line card in two ways:

- MTC mode on a per-CM basis—By default, the MTC mode is enabled with the required attribute. With this default configuration, the Cisco CMTS router enables MTC mode on a per-CM basis by looking at each CM's configuration file. When the CM configuration file has the bonded-bit (bit-0) on in type-length-value (TLV) 43.9.3 (cable modem upstream required attribute mask), the Cisco CMTS router lets the CM come online in the MTC mode. If the CM configuration file does not have the bonded-bit on, the CM comes online in non-MTC mode.

- MTC mode for all cable modems in a MAC domain—The MTC mode for all cable modems in a MAC domain is disabled by default on an upstream bonding capable cable interface line card. You can enable the MTC mode for all cable modems in a MAC domain using the **cable mtc-mode** command in cable interface configuration mode.



Note You do not have to use the **required-attribute** keyword to enable the MTC mode for all cable modems in a MAC domain. You can use the **no** form of this command with the **required-attribute** keyword to disable the default per-CM basis configuration.

You cannot enable the MTC mode on a non-upstream bonding capable cable interface line card.

Examples

The following example shows how to enable the MTC mode for all cable modems in a MAC domain:

```
Router# configure terminal
Router(config)# interface cable 7/1/0
Router(config-if)# cable mtc-mode
```

The following example shows how to enable the MTC mode for all cable modems in a MAC domain on a Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# interface cable 3/0/1
Router(config-if)# cable mtc-mode
```

The following example shows how to configure the required CM attribute on USCB in a MAC domain on a Cisco cBR Series Converged Broadband Router:

```
Router# configure terminal
Router(config)# interface cable 3/0/1
Router(config-if)# cable mtc-mode required-attribute
Router(config-if)#
```

Related Commands

Command	Description
cable mrc-mode	Enables the Multiple Receive Channel mode (MRC) for a MAC interface.

cable multicast auth enable default-action

To enable cable multicast authorization profile and set the maximum sessions limit, use the **cable multicast auth enable default-action** command in global configuration mode. To disable a cable multicast authorization profile, use the **no** form of this command.

cable multicast auth enable default-action {*permitdeny*} **max-sessions** [*limit*]
no cable multicast auth enable

Syntax Description

permit	Specifies packets to forward.
deny	Specifies packets to reject.
limit	Specifies the maximum number of dynamic multicast sessions allowed per CM. No default value. Max value allowed is 65535.

Command Default

Cable multicast authorization is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.

Usage Guidelines

This command is used to enable cable multicast authorization profile feature and defines the default value. However, it does not define the actual authorization files.

Examples

The following example shows how to enable the default multicast authorization profile:

```
Router(config
)# cable multicast auth enable default-action  deny  max-sessions 10
```

Related Commands

Command	Description
cable multicast authorization profile-name	Defines the cable multicast authorization profile.
show cable multicast authorization	Displays the list of defined multicast authorization profiles and all CMs associated with corresponding profiles.

cable multicast auth profile-name

To define a cable multicast authorization profile, and to set it as the default profile, use the **cable multicast auth profile-name** command in global configuration mode. To disable a cable multicast authorization profile, use the **no** form of this command.

cable multicast auth profile-name *name* [**default**]
no cable multicast auth profile-name *name* [**default**]

Syntax Description

name	Specifies the name of the authorization profile to be used.
default	(Optional) Specifies that the profile name should be treated as the default profile.

Command Default

Cable multicast authorization is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCC	The optional **default** keyword was added.

Usage Guidelines

This command defines a cable multicast authorization profile, and optionally sets it as the default profile. If the **default** keyword is not used while modifying the profile, the profile is automatically converted to a non-default profile. Similarly, if the **default** keyword is added while modifying a profile, the profile is treated as a default profile.

Examples

The following example shows how to use the selected multicast authorization profile:

```
Router(config
)# cable multicast auth profile-name GOLD default
```

Related Commands

Command	Description
cable multicast authorization enable default-action	This command enables the cable multicast authorization features. If the multicast authorization feature is disabled, all defined authorization profiles are ineffective.
match rule	This command configures the match rule, rule priority and related action in the selected cable multicast authorization profile

cable multicast group-encryption

To configure a group encryption profile for a multicast group, use the **cable multicast group-encryption** command in global configuration mode. To disable a group encryption profile, use the **no** form of this command.

cable multicast group-encryption *number* **algorithm 56bit-des**
no cable multicast group-encryption *number* **algorithm 56bit-des**

Syntax Description

number	Specifies the number of a specific cable multicast QoS group encryption profile. The range is from 1 to 255.
algorithm 56bit-des	Specifies that the data encryption standard (DES) is 56 bits.

Command Default

Cable multicast group encryption is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.

Usage Guidelines

To apply encryption rules to a cable multicast QoS group, you must first enable and identify an encryption group.

Examples

The following example enables encryption, identifies encryption group 12, and applies the encryption rule to QoS group 2:

```
Router(config)# cable multicast group-encryption 12 algorithm 56bit-des
Router(config)# cable multicast qos group 2 priority 7 global
Router(config-mqos)# group-encryption 12
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface bundle multicast-sessions	Displays multicast session information for a specific virtual cable bundle.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

cable multicast group-qos

To configure a QoS profile for a QoS group, use the **cable multicast group-qos** command in global configuration mode. To disable a QoS profile, use the **no** form of this command.

cable multicast group-qos *number* **scn** *service-class-name* **control** {**single** | **aggregate** [**limit** *max-sessions*]} [**override**]
no cable multicast group-qos *number* **scn** *service-class-name* **control** {**single** | **aggregate** [**limit** *max-sessions*]} [**override**]

Cisco cBR Series Converged Broadband Routers
cable multicast group-qos *number* **scn** *service-class-name* {**single** | **aggregate** [**limit** *max-sessions*]} [**override**]
no cable multicast group-qos *number* **scn** *service-class-name* {**single** | **aggregate** [**limit** *max-sessions*]} [**override**]

Syntax Description

number	Specifies the QoS profile number for the cable multicast QoS group. The range is from 1 to 255. If a multicast group does not match the group QoS classifiers, a default group-QoS option is applied to the multicast flow.
scn *service-class-name*	Specifies a service class name for the QoS profile.
control	Specifies the type of control to the service flow.
single	Specifies that a separate service flow is created for each session.
aggregate	Specifies that service flows are grouped for sessions in the same multicast QoS group.
limit *max-sessions*	(Optional) Specifies the Internet Group Management Protocol (IGMP) session limit for aggregate service flows. The range is from 1 to 255.
override	(Optional) Specifies the additional multicast session admitted and forwarded as best effort traffic, else disallows any additional multicast session once the max-sessions limit is reached.

Command Default

The QoS profile for a QoS group is not enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCB	This command was modified with the addition of **override** keyword.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **control** keyword was removed.

Usage Guidelines

If a QoS profile number is not specified, a default QoS profile is applied. The default group QoS configuration creates a default multicast service flow for each cable interface that is used when a multicast session does not match any classifiers of a GC on the interface.

Examples

The following example configures QoS profile 5 with a service name of name1 and a control of single to indicate that a separate service flow is created for each session. QoS profile 5 is then assigned to QoS group 2 on the Cisco uBR 10012 router:

```
Router(config)# cable multicast group-qos 5 scn name1 control single
Router(config)# cable multicast qos group 2 priority 7 global
Router(config-mqos)# cable multicast group-qos 5
Router(config)# cable multicast group-qos 1 scn mcast1 aggre lim 2 ?
override Allow sessions when limit is exceeded with Default qos sessions
Router(config)# cable multicast group-qos 1 scn mcast1 aggre lim 2
```

The following example configures QoS profile 5 with a service name of name1 and specifies that a separate service flow is created for each session. QoS profile 5 is then assigned to QoS group 2 on a Cisco cBR-8 router:

```
Router(config)# cable multicast group-qos 5 scn name1 single
Router(config)# cable multicast qos group 2 priority 7 global
Router(config-mqos)# group-qos 5
```

The following example configures QoS profile 1 with a service name of mcast1 and specifies that service flows are grouped for sessions in the same multicast QoS group on a Cisco cBR-8 router:

```
Router(config)# cable multicast group-qos 1 scn mcast1 aggregate limit 2 ?
override Allow sessions when limit is exceeded with Default qos sessions
Router(config)# cable multicast group-qos 1 scn mcast1 aggregate limit 2 override
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

cable multicast group-qos default

To configure the service class name of the default multicast quality of service (MQoS) for the QoS profile, use the **cable multicast group-qos default** command in global configuration mode. To disable the service class name of the default MQoS for the QoS profile, use the **no** form of this command.

cable multicast group-qos default scn *service-class-name* **aggregate**
no cable multicast group-qos default scn *service-class-name* **aggregate**

Syntax Description

scn *service-class-name*	Specifies a service class name for the QoS profile.
aggregate	Specifies that service flows are grouped for sessions in the same MQoS group.

Command Default

The default MQoS profile is not configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC1	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If you configure the service class name with the DOCSIS Setup Gateway (DSG) tunnel when no default MQoS exists, the configuration is rejected and you are prompted to configure the default MQoS.

The CMTS selects the primary downstream channel to forward the multicast traffic when the default MQoS is configured and there is no matching MQoS group configuration. Otherwise, the wideband interface is used to forward the multicast traffic.



Note If you configure or unconfigure the default MQoS while the CMTS is sending multicast traffic, duplicate traffic is generated for approximately 3 minutes (or 3 times the query interval).

Examples

The following example configures the default MQoS profile with the service class name name1.

```
Router(config)# cable multicast group-qos default scn name1 aggregate
```

Related Commands

Command	Description
cable multicast group-qos	Configures a QoS profile for a QoS group.
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

cable multicast mdf-disable

To disable Multicast DSID-based Forwarding (MDF) capability of all cable modems associated with a Cisco CMTS router, use the **cable multicast mdf-disable** command in global configuration mode. To enable MDF on the cable modem, use the **no** form of this command.

cable multicast mdf-disable [**wb-incapable-cm** | **dsg**]
no cable multicast mdf-disable [**wb-incapable-cm** | **dsg**]

Syntax Description

wb-incapable-cm	(Optional) Disables MDF on all DOCSIS 2.0 hybrid cable modems.
dsg	(Optional) Disables MDF capability of all DSG embedded cable modems, including DOCSIS 3.0 DSG and DOCSIS 2.0 DSG hybrid modems.

Command Default

By default, MDF is not always enabled on the cable modem because it is dependent on the cable modem hardware.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD3	This command was introduced.
12.2(33)SCE4	The **wb-incapable-cm** keyword was added.
12.2(33)SCF2	The **dsg** keyword was added, and behavior of the **wb-incapable-cm** keyword was changed to include only non-DSG DOCSIS 2.0 hybrid cable modems.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable multicast mdf-disable** command is associated with the DOCSIS 3.0 Multicast Support on the CMTS Routers feature.

In Cisco IOS Release 12.2(33)SCE4, the **wb-incapable-cm** keyword was added to the **cable multicast mdf-disable** command to disable MDF on all DOCSIS 2.0 hybrid cable modems, including DOCSIS 2.0 DSG embedded cable modems. In Cisco IOS Release 12.2(33)SCF2, the **wb-incapable-cm** keyword was changed to include only non-DSG DOCSIS 2.0 hybrid cable modems.

After disabling MDF capability, you must run **clear cable modem reset** command to bring all DSG embedded cable modems online.

Examples

The following example shows how to disable MDF capability on all cable modems:

```
Router# configure terminal
Router(config)# cable multicast mdf-disable
```

The following example shows how to disable MDF capability of all non-DSG DOCSIS 2.0 hybrid cable modems:

```
Router# configure terminal
Router(config)# cable multicast mdf-disable wb-incapable-cm
```

The following example shows how to disable MDF capability of all DSG embedded cable modems:

```
Router# configure terminal
Router(config)# cable multicast mdf-disable dsg
```

Related Commands

Command	Description
ip multicast-routing	Enables multicast routing globally or on a particular virtual routing and forwarding (VRF) interface.
ip multicast-routing distributed	Enables Multicast Distributed Switching (MDS)

cable multicast qos group

To specify and configure a cable multicast QoS group and enter multicast QoS configuration mode, use the **cable multicast qos group** command in global configuration mode. To disable a cable multicast QoS group, use the **no** form of this command.

cable multicast qos group *id* **priority** *value* [**global**]
no cable multicast qos group *id* **priority** *value* [**global**]

Syntax Description

id	Specifies the number of the cable multicast QoS group. The range is from 1 to 255.
priority *value*	Specifies the priority of the cable multicast QoS group. The range is from 1 to 255. Starting with Cisco IOS Release 12.2(33)SCC and Cisco IOS-XE Release 3.15.0S, the range is from 1 to 63 and from 192 to 255. The values from 64 to 191 are used internally by the Cisco CMTS.
global	(Optional) Specifies that the multicast QoS group configuration is applied to all cable interfaces.

Command Default

A cable multicast QoS group is not identified.

Command Modes

Global configuration (config)

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must configure a group QoS profile using the **cable multicast group-qos** command, and a group encryption profile using the **cable multicast group-encryption** command before you configure a cable multicast QoS group.

Examples

The following example specifies multicast QoS group 2 with a priority of 6 and global application. Application ID, group encryption, group QoS, session range, ToS, and VRF options are configured for QoS group 2.

```
Router(config)# cable multicast qos group 2 priority 6 global
Router(config-mqos)# application-id 44
Router(config-mqos)# group-encryption 4
Router(config-mqos)# group-qos 3
Router(config-mqos)# session-range 224.10.10.01 255.255.255.254
Router(config-mqos)# tos 1 6 15
Router(config-mqos)# vrf name1
```

Related Commands

Command	Description
application-id	Specifies an application type to allow admission control to be applied to a group configuration.
cable multicast group-encryption	Configures a group encryption profile for a multicast group.
cable multicast group-qos	Configures a group QoS profile for a multicast QoS group.
session-range	Identifies the multicast QoS group session range.
show interface bundle multicast-sessions	Displays multicast session information for a specific virtual cable bundle.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.
tos	Sets the type of service (ToS) low byte, high byte, and mask values within a multicast QoS group.
vrf	Specifies the name for a virtual routing and forwarding (VRF) instance.

cable multicast ses-cache

To enable multicast replication session on the forwarding interface, use the **cable multicast ses-cache** command in global configuration and interface configuration mode. To disable, use the **no cable multicast ses-cache** command.

cable multicast ses-cache *value*
no cable multicast ses-cache *value*

Syntax Description

value	Sets the value for the multicast replication session cache. The valid range is from 0 to 500. The default value is 0.

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Multicast replication session cache feature helps reducing CPU utilization by reusing multicast replication sessions stored in the cache. The sessions are cached and reused later when a new IGMP join request is received.

Note Only IPv4 IGMP multicast replication sessions can be cached and reused.

The multicast replication session cache can be configured at a global level for all the interfaces on the Cisco uBR10012 router or at an interface level for a forwarding interface. The session cache value configured at the interface shall override the global configuration.

The **cable multicast ses-cache** command is supported on the integrated-cable, modular-cable, and wideband-cable interfaces.

Note Ensure that the session cache value being configured is lower than that the current value.

- Changing the multicast replication session cache value from 10 to 0 clears the current cache.

The **cable multicast ses-cache** command is used with the multicast replication session cache feature:

- DOCSIS 3.0 Multicast Support on the CMTS Routers

Examples

The following example sets the multicast replication session cache to 100 at the global level on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# cable multicast ses-cache 100
Router(config)# exit
```

The following example sets the multicast replication session cache on the integrated interface to 10:

```
Router# configure terminal
Router(config)# interface Integrated-Cable 8/1/0:0
Router(config-if)# cable multicast ses-cache 10
```

Related Commands

Command	Description
clear cable multicast ses-cache	Clears the cached multicast replication sessions on the interfaces on the Cisco uBR10012 router.
show cable multicast ses-cache	Displays the multicast replication session cache information both at the global and interface level of the forwarding interface.

cable multicast source

To configure a multicast session range for a PacketCable Multimedia (PCMM) multicast group on a Cisco CMTS router, use the **cable multicast source** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable multicast source pcmm
no cable multicast source pcmm

Syntax Description

pcmm	Specifies the PCMM client and enters the multicast session range configuration mode.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced in Cisco IOS Release 12.2(33)SCE.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure a multicast session range for a PCMM multicast group on a Cisco CMTS router:

```
Router# configure terminal
Router(config)# cable multicast source pcmm
Router(config-msrc)# session-range 229.0.0.0 255.0.0.0
```

Related Commands

Command	Description
show packetcable gate multimedia summary	Displays information about the total number of PCMM multicast gates.

cable nd

To enable the IPv6 Neighbor Discovery (ND) Gleaning feature on the Cisco CMTS router, use the **cable nd** command in bundle interface configuration mode. To disable IPv6 ND gleaning, use the **no** form of this command.

cable nd
no cable nd

Syntax Description

This command has no arguments or keywords.

Command Default

The IPv6 ND Gleaning feature is enabled by default.

Command Modes

Bundle interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable nd** command is associated with the IPv6 ND Gleaning feature.

The **cable nd** command adds a CPE (host behind a cable modem) to the Cisco CMTS subscriber database. This command does not impact the IPv6 ND protocol operation on the Cisco CMTS router.

The **cable ipv6 source-verify** and **cable nd** commands are not compatible with each other in Cisco IOS Release 12.2(33)SCE and later. You must disable IPv6 ND gleaning using the **no** form of the **cable nd** command before configuring IPv6 source verification using the DHCPv6 Leasequery feature.

Examples

The following example shows how to configure IPv6 ND gleaning on the Cisco CMTS router:

```
Router# configure terminal
Router(config)# interface bundle 1
Router(config-if)# cable nd
```

Related Commands

Command	Description
cable ipv6 source-verify	Enables source verification of IPv6 packets on the Cisco CMTS router.

cable nd timeout

To delete corresponding IPv6 address from the subscriber database after IPv6 Neighbor Discovery (ND) timeout , use the **cable nd timeout** command in bundle interface configuration mode. To disable this feature, use the **no** form of this command.

cable nd timeout
no cable nd timeout

Syntax Description

This command has no arguments or keywords.

Command Default

The IPv6 ND Gleaning feature is enabled by default.

Command Modes

Bundle interface configuration (config-if)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, the **cable nd timeout** command is configured. When configured, if the ND cache of an CPE IPv6 address is timed out, the corresponding IPv6 address will be removed from CMTS subscriber DB. In the **no cable nd timeout** configuration, the ND cache timeout will not cause the removal of CPE IPv6 address from the subscriber DB.

Examples

The following example shows how to configure IPv6 ND timeout on the Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# interface bundle 1
Router(config-if)# cable nd timeout
```

Related Commands

Command	Description
cable nd	Enables the IPv6 Neighbor Discovery (ND) Gleaning feature on the Cisco CMTS routers.

cable nd validate

To enable validation checks of neighbor discovery messages (both NA and NS) to ensure that the messages will be processed, use the **cable nd validate** command in bundle interface configuration mode. To disable this feature, use the **no** form of this command.

cable nd validate
no cable nd validate

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Bundle interface configuration (config-if)

Command History

Release	Modification
IOS XE 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure IPv6 ND validate on the Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# interface bundle 1
Router(config-if)# cable nd validate
```

Related Commands

Command	Description
cable nd	Enables the IPv6 Neighbor Discovery (ND) Gleaning feature on the Cisco CMTS routers.



Cable Commands: cable o through cable r

- cable ofdm-rf-change-trigger, on page 514
- cable ofdma-frequency-exclusion-band , on page 516
- cable ofdma-frequency-unused-band, on page 517
- cable oudp-leak-detect, on page 518
- cable oob, on page 523
- cable power, on page 524
- cable pre-equalization exclude, on page 527
- cable primary-sflow-qos11 keep, on page 530
- cable privacy, on page 532
- cable privacy bpi-plus-enforce, on page 536
- cable privacy bpi-plus-exclude, on page 538
- cable privacy bpi-plus-policy, on page 539
- cable privacy clone-detect, on page 541
- cable privacy eae-exclude, on page 543
- cable privacy eae-policy, on page 544
- cable privacy encrypt-alg-priority, on page 546
- cable privacy hotlist, on page 548
- cable privacy kek, on page 550
- cable privacy non-mtc-aes128, on page 552
- cable privacy revocation crl skip-sig-check, on page 553
- cable privacy revocation enable, on page 554
- cable privacy revocation ocsp skip-sig-check, on page 555
- cable privacy revocation skip-cm-cert, on page 556
- cable privacy revocation timeout, on page 557
- cable privacy tek, on page 558
- cable profile, on page 560
- cable profile rpd-event, on page 565
- cable proxy-arp, on page 567
- cable qos enforce-rule, on page 569
- cable qos permission, on page 572
- cable qos pre-registration, on page 574
- cable qos pro max-ds-burst, on page 575
- cable queue-limit, on page 578

- cable ranging cm packet, on page 580
- cable ranging upstream packet , on page 581
- cable rate-limit-algorithm min-plus-excess, on page 582
- cable rcc-template, on page 583
- cable rcc-templates frequency-based , on page 584
- cable rcp-control, on page 585
- cable rcp-id, on page 587
- cable reconciliation enable , on page 589
- cable reconciliation time , on page 590
- cable reduction-mode energy-management dynamic-channel-percent, on page 591
- cable reduction-mode energy-management enable, on page 592
- cable reduction-mode energy-management process-queue-size, on page 593
- cable reduction-mode energy-management ranging-init-technique, on page 594
- cable reduction-mode mta-battery , on page 595
- cable redundancy hashfilter, on page 597
- cable redundancy myid, on page 599
- cable redundancy node, on page 600
- cable redundancy node frequency, on page 602
- cable redundancy target, on page 603
- cable redundancy threshold, on page 605
- cable registration-timeout, on page 607
- cable relay-agent-option, on page 608
- cable resiliency cm-max-rbg-moves, on page 610
- cable resiliency exclude, on page 611
- cable resiliency ds-bonding, on page 613
- cable resiliency free-interval, on page 614
- cable resiliency idle-interval, on page 615
- cable resiliency rbg-throttle, on page 616
- cable resiliency traps-interval, on page 619
- cable rf-adapt timer, on page 620
- cable rf-bandwidth-percent, on page 622
- cable rf-change-dampen-time, on page 625
- cable rf-change-trigger, on page 626
- cable rf-change-up-multiplier, on page 628
- cable rf-channel, on page 629
- cable rf-channels , on page 634
- cable rfswitch copy, on page 636
- cable rfswitch delete, on page 637
- cable rfswitch reboot, on page 638
- cable rfswitch set-active, on page 639
- cable rpd, on page 640
- cable rpd period-fft (exec mode), on page 642
- cable rpd external-core, on page 643
- cable rphy static-route, on page 645
- cable rphy gcp, on page 647
- cable rphy gcp keepalive timeout, on page 649

- cable rphy rpd-capability reject-mismatch , on page 651
- cable rphy statistics session update-freq, on page 653
- cable rphy supso suppress-rpd, on page 654
- cable rsvp default-scn, on page 656

cable ofdm-rf-change-trigger

To configure the trigger thresholds specific to OFDM RF impairment, use the **cable ofdm-rf-change-trigger** command in global configuration mode.

cable ofdm-rf-change-trigger { **count** *number* | **percent** *value* | **prof-zero-fail dampen-time** *seconds* **recovery-multiplier** *number* } [**no-ncp**] [**no-plc**]

Syntax Description

count *number*	Specifies the number of cable modems that must report that a particular non-primary OFDM RF downstream channel is down before that channel is suspended from the downstream bonding groups. The default is 0.
no-ncp	If you configure this option, the DOCSIS3.1 Downstream Resiliency feature does not take any action when cable modem reports CM-STATUS-EVENT 20.
no-plc	If you configure this option, the DOCSIS3.1 Downstream Resiliency feature does not take any action when cable modem reports CM-STATUS-EVENT 21.
percent *value*	Indicates the percentage of cable modems that must report that a particular non-primary OFDM RF channel is down before that channel is suspended from the bonding group. The valid range is 1 to 100. The default is 0.
prof-zero-fail	Configure Profile 0 Failure as an Impairment
dampen-time	Configure the time in seconds for a non-primary RF downstream channel status change to persist. The valid range is 1 to 65535. There is no default value.
recovery-multiplier	Multiplier of *dampen-time* for recovery. Use this option to set an event-specific recovery delay that is equal to the *dampen-time* in seconds times the *recovery-multiplier* value. The valid range is 1 to 100. There is no default value.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	The *dampen-time* and *recovery-multiplier* options are added.
Cisco IOS XE Everest 16.10.1d	You can exclude NCP and PLC reports separately by configuring **no-ncp** or **no-plc**. This replaces the **no-ncp-plc** option.
Cisco 1x2 / Compact Shelf RPD Software 4.1	This command was modified on the Cisco Remote PHY Device to add a **no-ncp-plc** option.
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Cisco IOS XE Dublin 17.12.1z and later:

The following example shows how to configure Downstream Resiliency for profile 0:

```
Router# configure terminal
Router(config)# cable ofdm-rf-change-trigger prof-zero-fail dampen-time 20 recovery-multiplier
 2
```

The following example shows how to disable Downstream Resiliency for profile 0:

```
Router# configure terminal
Router(config)# no cable ofdm-rf-change-trigger
```

Disabling downstream resiliency for profile 0, resets *dampen-time* and *recovery-multiplier* values to 0.

Cisco IOS XE Dublin 17.12.1y and earlier:

This command is optional and the configured trigger thresholds apply to non-primary OFDM channels only. If this command is not configured, the trigger thresholds that are configured by the command **cable rf-change-trigger percent**is used for the non-primary OFDM channels.

With **no-ncp-plc** configured in the command, DOCSIS3.1 Downstream Resiliency for RPHY feature does not take any action when cable modem reports CM-STATUS-EVENT 20 or 21.

The following example shows how to configure DOCSIS3.1 Downstream Resiliency for RPHY:

```
Router# configure terminal
Router(config)# cable ofdm-rf-change-trigger percent 75 count 10
```

Related Commands

Command	Description
cable rf-change-trigger	Specifies the amount of time an event must persist before it triggers an action for the reporting cable modem.

cable ofdma-frequency-exclusion-band

To exclude the range of frequencies from all OFDMA channels on a port, use the **cable ofdma-frequency-exclusion-band** command in controller configuration mode.

cable ofdma-frequency-exclusion-band *start value end value*

Syntax Description

start value	Specify the start value of the frequency range.
end value	Specify the end value of the frequency range.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Exclusion bands apply to OFDMA channels only. OFDMA channel does not use frequencies in exclusion band set by the **cable ofdma-frequency-exclusion-band** command. So the legacy SC-QAM channel can be placed in this band.

Related Commands

Command	Description
cable ofdma-frequency-unused-band	Set the frequency range in the unsed band.

cable ofdma-frequency-unused-band

To configure frequencies in unused band, use the **cable ofdma-frequency-unused-band** command in controller configuration mode.

cable ofdma-frequency-unused-band *start value end value*

Syntax Description

start value	Specify the start value of the frequency range.
end value	Specify the end value of the frequency range.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Unused bands apply to OFDMA channels only. OFDMA channel does not use frequencies in unused band set by the **cable ofdma-frequency-unused-band** command for data traffic, but can send probes in them.

Related Commands

Command	Description
cable ofdma-frequency-exclusion-band	Set the frequency range to be excluded from all OFDMA channels on a port.

cable oudp-leak-detect

See the OFDMA OUDP Leak Detection Configuration section in the configuration guide for the EXEC, Global configuration, Configuration and Show commands.

To configure OUDP leakage test sessions on one or more upstream OFMDA channels simultaneously, use the **cable oudp-leak-detect session-id** *OUDP parent test session id* **session create** command.

cable oudp-leak-detect *OUDP parent test session id* **session** { **create** | **delete** | **stop** | **reset** }

Syntax Description

create	Creates a new OUDP Parent test session assigning a new parent session ID.
delete	Deletes the specified OUDP parent test session and frees the parent session ID and all children sessions and IDs.
stop	Stops the specified OUDP test session in ACTIVE state. Stopping a parent session stops all child sessions.
reset	Resets an OUDP Parent Test Session. Removes all child sessions, deletes all stats, clears the parent start and stop time, and sets the session status back to CONFIGURING. This CLI is intended to allow a COMPLETED parent test session to be reused.

Command Modes

Privileged EXEC (#)

Release	Modification
17.6.1z	This command was introduced.

Usage Guidelines

The **show cable oudp-leak-detectsession-id** *OUDP parent test session id* **session create** command is used to configure OUDP leakage test sessions on one or more upstream OFMDA channels simultaneously.

Examples

The following example shows how to create a OUDP parent test session for leak detection:

```
Router#cable oudp-leak-detect session-id 99 session create
Create Session : 99 (parent) success
```

cable oudp-leak-detect session-id

To specify the date and time for the test session to start and stop, use the **cable oudp-leak-detect session-id start datetimestop datetime** command.

cable oudp-leak-detect session-id *OUDP parent test session id* { **start datetime** *datetime* | **stop datetime** *datetime* }

cable oudp-leak-detect session-id *OUDP parent test session id* { **start now** | **stop never** }

cable oudp-leak-detect session-id *OUDP parent test session id* **frequency start** *hertz* **end** *hertz*

cable oudp-leak-detect session-id *OUDP parent test session id* **transmit burst duration** *no. of frames* **gap** *no. of frames* { **cycle-gap** *no. of frames* | **fixed-bursts-per-cycle** *no. of frames* | **cycle-time** *milliseconds* }

cable oudp-leak-detect session-id *OUDP parent test session id* **controller upstream-cable** *[slot][subslot][ctrlr]* **us-channel** *us-chan*

cable oudp-leak-detect session-id *OUDP parent test session id* **interface cable** *[slot][subslot][md-idx]*

cable oudp-leak-detect session-id *OUDP parent test session id* **cm** { **add** | **delete** } *mac-address*

cable oudp-leak-detect session-id *OUDP parent test session id* **strict-cm-list**

cable oudp-leak-detect session-id *OUDP parent test session id* **reserved-probe-pct** *percentage*

cable oudp-leak-detect session-id *OUDP parent test session id* **clear** { **cm-list** | **cm-stats** | **interface** | **strict-cm-list** }

cable oudp-leak-detect session-id *OUDP parent test session id* **session preview**

cable oudp-leak-detect session-id *OUDP parent test session id* **session supha-recover**

cable oudp-leak-detect delete all

cable oudp-leak-detect clear system-boot-holdoff

Syntax Description

start datetime	Date-and-Time Format [YY]YY-[M]M-[D]D,[h]h:mm:ss.0,[+|-][T]T:ZZ
stop datetime	Date-and-Time Format [YY]YY-[M]M-[D]D,[h]h:mm:ss.0,[+|-][T]T:ZZ
start now stop never	In lieu of specifying the Date-and-Time format, the option start now and stop never are supported. A test session that is stop never must be manually stopped or deleted by the administrator.
frequency start*hertz* **end***hertz*	Sets the start and end frequencies of the OUDP parent test session. The OUDP child test session includes all minislots, which include the parent test session frequency range. The valid range is 4500000-204500000 Hz.

transmit burst duration *no. of frames* **gap** *no. of frames* { **cycle-gap** *no. of frames* | **fixed-bursts-per-cycle** *no. of frames* | **cycle-time** *milliseconds* }	Sets the OUDP parent test session OUDP transmit burst parameters for burst duration, burst gap and either cycle-gap or cycle-time. Cycle-Gap complies with the OSSI specifications for OUDP testing. The OUDP test cycle repeat interval is measured in frames. Cycle-Time provides a time-based repeat interval for the OUDP test cycle that is compatible with RF-detectors requiring a minimum repeat burst interval.
controller upstream-cable*[slot][subslot][ctrlr]***us-channel***us-chan*	Sets the OUDP parent test session interface to specify an upstream-cable controller, or upstream-cable controller channel. A controller upstream-cable interface may expand to include up to two OFDMA channels/child test session. A controller upstream-cable channel specifies a single OFDMA channels/child session. A controller upstream-cable channel specifies a single OFDMA channels/child session.
interface Cable*[slot][subslot][md-idx]*	Sets the OUDP parent test session interface to specify a mac-domain. A Cable MAC domain interface may expand to include up to four OFDMA channels/child sessions.
cm-add *mac-address*	Adds the MAC address to the parent test session CM-List.
cm-delete *mac-address*	Removes the MAC address from the parent test session CM-List.
strict-cm-list	Requires the child test sessions to preserve the CM-List position of modems in the parent test session CM-List.
reserved-probe-pct *percentage*	Reserves a percentage of frames in the OUDP test cycle for OFDMA channel upstream profile management probes. The default value is 3%.
clear { cm-list | cm-stats | interface | strict-cm-list }	Clears the specified item.

session preview	Allows the system admin to preview the child test session create from an OUDP parent test session prior to the pretest setup time. Child test sessions and modems are created based on the current state of the system, and are not guaranteed to be the same at the actual pretest setup time when child test sessions are rebuilt for the actual test start.
session supha-recover	Provides a mechanism for the child test sessions to be restored to the Active SUP. Existing child test sessions are deleted and all CLC line cards update the SUP with their current child test sessions.
delete all	Deletes all OUDP test sessions regardless of state.
clear system-boot-holdoff	Allows the administrator to manually terminate the OUDP system-boot-holdoff timer. OUDP test sessions are started based on the state of the OFDMA channels and modems.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

cable oudp-leak-detect

You can use the Global configuration mode to execute the **cable oudp-leak-detect** commands.

cable oudp-leak-detect pre-test-setup-time *seconds*

cable oudp-leak-detect system-boot-holdoff *minutes*

cable oudp-leak-detect reserved-probe-pct *percentage*

cable oudp-leak-detect ccap-modem-select allow-late-cm-join

cable oudp-leak-detect ccap-modem-select allow-late-cm-join { **all** | **icmts** | **none** }

Syntax Description

pre-test-setup-time *seconds*	The valid range is 10-300 seconds. The default value is 60 seconds.
expire-age *days*	The valid range is 1-7 days. The default value is 3 days.

system-boot-holdoff *minutes*	
reserved-probe-pct *percentage*	The valid range is 0-10 percent. The default value is 3 percent.
modem-selectallow-late-cm-join	Enables modems to join child test sessions after they reach the active state. Normal rules for CM-List and interface modem participation apply.
adjust-test-time { **all** | **icmts** | **none** }	OUDP tests are scheduled based on the PTP/GPS clock time. The CLC line card scheduler uses the DOCSIS frame clock. This command enables a timing adjustment between the GPS clock and the DOCSIS clock. Normally RPHY will not require the time adjustment, whereas iCMTS does. The default value is icmts.

Command Default None.

Command Modes Global Configuration (config)

cable oudp-leak-detect

You can use the Configuration mode to execute the **cable oudp-leak-detect** commands.

cable oudp-leak-detect burst-profile *number*

cable oudp-leak-detect burst-profile *number* **start datetime** *datetime*

cable oudp-leak-detect burst-profile *number* **start now stop never**

cable oudp-leak-detect schedule recurring weekday *days* **start timeofday** *time* **stop timeofday** *time*

Syntax Description

burst-profile *number*	Creates a OUDP burst profile and enters the burst profile configuration sub-mode. The valid range is 1-9999.
burst-profile*number***start datetime***datetime*	Creates a persistent one-time scheduled test session.
cable oudp-leak-detect burst-profile*number***start now stop never**	Creates a persistent 24x7 OUDP test session.
cable oudp-leak-detect schedule recurring weekday*days***start timeofday***time***stop timeofday***time*	Creates a persistent weekly test session that runs at the same time, each day, on configured weekdays (“SuMoTuWeThFrSa”). One or more weekdays, for example, "MoWeFr” must be specified.

Command Default None.

Command Modes Configuration (config)

cable oob

To enter the out of band (OOB) configuration mode, use the **cable oob** command in global configuration mode. To void the OOB configuration, use the **no** form of this command.

cable oob

no cable oob

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the OOB configuration mode.

Examples

The following example shows how to enter the OOB configuration mode:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)#
```

Related Commands

Command	Description
virtual-arpd	Defines a virtual advanced return path demodulator configuration.
virtual-om	Defines a virtual OOB modulator configuration.

cable power

To manually power a cable interface line card on or off on a Cisco uBR10012 router, use the **cable power** command in privileged EXEC mode.

cable power [**on** | **off**] *slot/card*

Syntax Description

on	Turns on power to the specified cable interface line card.
off	Turns off power to the specified cable interface line card. Power to that particular card slot remains off until power is turned back on using the **cable power on** version of this command.
slot/card	Specifies the slot and card number for the desired cable interface card number. The valid range for *slot* is 5 to 8 and for *card* is 0 or 1.

Command Default

Cable interface line cards are powered on by default when the card is inserted into the chassis slot.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(4)BC1b	This command was introduced for the Cisco uBR10012 router.
12.2(8)BC1	This command is disabled if a working TCC+ card is not present in the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is typically not used during normal operations, but it can be used for lab, diagnostic, and troubleshooting purposes. For example, using this command to first power off and then power on a card is functionally equivalent to performing an online insertion and removal (OIR) of the card.

Be aware of the following points when using this command:

- Using the **cable power off** command is functionally equivalent to disconnect the cables from the card's upstream and downstream connectors and then removing the card from the chassis. When you use this command to turn off power to a card, the output for the **show interface cable** command for that card will display the message "Hardware is not present."



Note You can also use the LC Power off Status Reg and Line Card Presence Status Reg fields in the **show controllers clock-reference** command to determine whether a cable interface line card is actually present in the chassis and whether it has been powered on or off.

- Powering off a cable interface line card automatically drops all sessions with the cable modems that are using that card's upstreams and downstreams. Do not use this command on a live network unless this is what you intend.
- All cards are powered on when you upgrade to a new software image for the Cisco uBR10012 router, even if a card had previously been powered off using the **cable power off** command.
- You can turn power both on and off to a cable interface line card slot, even if a card is not physically present in the slot.
- This is the only CLI command that actually powers off a card. The **hw module reset** command appears to perform a similar function, but it performs only the equivalent of issuing the **shutdown** and **no shutdown** commands on the card.
- When power is turned off for a cable interface line card, the power to that card slot will remain off until the **cable power on** command is used to turn the power back on. If you insert a cable interface card in to a slot that had been previously powered down, you will have to use the **cable power on** command to turn on power before being able to use the card.
- This command requires that a working TCC+ card be present because the TCC+ card controls and monitors the operation of the cable interface line cards. In Cisco IOS Release 12.2(8)BC1 and later, this command is disabled if a working TCC+ card is not present in the router.



Note The Cisco uBR10012 router requires a working TCC+ card for normal operations. Using the router without a working TCC+ card is not a supported configuration.

Examples

The following example shows how to power off the first cable interface card in a Cisco uBR10012 chassis (card 5, slot 0). It also shows the output from the **show interface cable** command, with a line that indicates that the hardware is not present.

```
router# cable power off 5/0

Line Card 5/0 is POWERED OFF
router# show int c5/0/0

Cable5/0/0 is down, line protocol is down
  Hardware is not present
  Hardware is UBR10012 CLC, address is 0005.00e0.2f14 (bia 0005.00e0.2f14)
  Internet address is 10.20.42.1/24
  MTU 1500 bytes, BW 27000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
...
router#
```



Note The **show interface cable**command will not display output for a card that is not physically present, so if you can use the **show interface cable** command but it indicates that the hardware is not present, this usually means that power to the card has been turned off using the **cable power off**command.

The following example shows the error message that results when you attempt to power on or off a cable interface card that is not physically present in the chassis:

```
router# cable power off 6/1
```

```
Line Card 6/1 is not present
router#
```



Note Power is still turned on or off to a cable interface line card slot, even when the card is not physically present in that slot.

Related Commands

Command	Description
hw module reset	Resets a line card, performing the equivalent of the **shutdown**, **no shutdown** commands.
show controllers clock-reference	Displays status information from the TCC+ card, including whether a line card is physically present and whether power has been turned off to its slot.
show interface cable	Displays configuration and status information for a cable interface line card.
show version	Displays the basic configuration of the router, including whether an active TCC+ card is present.
shutdown	Disables or enables the interface on a line card.

cable pre-equalization exclude

To exclude a cable modem (CM) from pre-equalization during registration with the Cisco CMTS router, use the **cable pre-equalization exclude**command in global configuration mode. To remove exclusion for the specified cable modem or interface, use the **no** form of this command.

cable pre-equalization exclude {**modem** *mac-addr* | **oui** *id*}
no cable pre-equalization exclude {**modem** *mac-addr* | **oui** *id*}

Syntax Description

modem *mac-addr*	Excludes the cable modem with the specified MAC address from pre-equalization during cable modem registration.
oui *id*	Excludes the specified Organizational Unique Identifier (OUI) from pre-equalization during cable modem registration.

Command Default

Pre-equalization is disabled by default on a Cisco CMTS router, and for cable modems that have a valid and operational DOCSIS configuration file.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(17a)BC	This command was introduced to the Cisco uBR10012 router and the Cisco uBR7246VXR router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable pre-equalization exclude** command to disable pre-equalization for DOCSIS 1.1 CMs that claim pre-equalization support but do not properly implement pre-equalization functions.

To enable pre-equalization, use the **cable upstream equalization-coefficient** interface configuration command. Pre-equalization starts when a cable modem that supports DOCSIS 1.1 or above sends the CMTS router a ranging request message indicating that pre-equalization is possible.

The following example of output from the **show cable modem verbose** command shows which modems are indicating pre-equalizer support during the DOCSIS registration process. In this example, the first two modems are capable of pre-equalization support, and the last two modems support DOCSIS 1.0, which does not support pre-equalization. You do not need to use the **cable pre-equalization exclude** command for DOCSIS 1.0 CMs.

```
Router# show cable modem verbose | include MAC Address|Equalizer
MAC Address                          : 0019.474a.c4b0
Transmit Equalizer Support           : {Taps/Symbol= 1, Num of Taps= 24}
MAC Address                          : 0019.474a.c498
Transmit Equalizer Support           : {Taps/Symbol= 1, Num of Taps= 24}
MAC Address                          : 0020.40dc.4ce4
Transmit Equalizer Support           : {Taps/Symbol= 0, Num of Taps= 0}
```

```
MAC Address                          : 0020.4077.21a0
Transmit Equalizer Support           : {Taps/Symbol= 0, Num of Taps= 0}
```

Exclusion is supported for a specified DOCSIS 1.1 cable modem, or for a specified OUI value for the entire interface. Removing the **cable pre-equalization exclude** configuration returns the cable modem or interface to normal pre-equalization processes during cable modem registration.

Examples

The following example configures pre-equalization to be excluded for the specified cable modem. Pre-equalization data is not sent for the corresponding cable modem:

```
Router(config)# cable pre-equalization exclude modem 1111.2222.3333
```

The following example configures pre-equalization to be excluded for the specified OUI value of the entire interface. Pre-equalization data is not sent for the corresponding OUI value of the entire interface:

```
Router(config)# cable pre-equalization exclude oui
 00.09.04
```

The following series of commands configures pre-equalization on the Cisco uBR10012 router with MC5X20U BPEs. On the PRE Console, configure the following commands.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable pre-equalization exclude oui 00.09.04
Router(config)# end
Router# show run
Router# show running-config | include oui
cable pre-equalization exclude oui 00.09.04
Router#
```

On the line card console for the same Cisco uBR10012 router, verify the configuration with the following command:

```
Linecard# show running-config | include oui
cable pre-equalization exclude oui 00.09.04
```

The following series of commands configures pre-equalization on the Cisco uBR7246VXR router with MC28U cable interface line cards. On the Network Processing Engine (NPE) console, configure and verify with the following commands.

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# cable pre-equalization exclude oui 00.09.24
Router(config)# end
Router#show run
02:58:10: %SYS-5-CONFIG_I: Configured from console by consolen
Router# show running-config | include oui
cable pre-equalization exclude oui 00.09.24
```

On the line card console for the same Cisco uBR7246VXR router, verify the configuration with the following command:

```
Linecard# show running-config | include oui
cable pre-equalization exclude oui 00.09.24
```

After either of these exclusion methods for pre-equalization are configured, you can verify that all ranging messages do not include pre-equalization data. Use the following **debug** commands in global configuration mode:

- **debug cable range**
- **debug cable interface** *cx/x/x mac-addr*

Verify the ranging message for the non-excluded cable modems include pre-equalization data, and for the excluded cable modems, the ranging messages do not include such data.

The following example removes pre-equalization exclusion for the specified OUI and interface. This results in the cable modem or OUI to return to normal pre-equalization functions. Ranging messages resume sending pre-equalization data.

```
Router(config)# no cable pre-equalization exclude {modem mac-addr | oui id}
```

You can verify removal of this feature using the **debug cable interface**command.

Related Commands

Command	Description
debug cable interface	Verifies pre-equalization data and configurations.
debug cable range	Verifies ranging messages for pre-equalization.

cable primary-sflow-qos11 keep

To preserve the traffic counters for primary service flows after a CM that was provisioned for DOCSIS 1.1 quality of service (QoS) goes offline, use the **cable primary-sflow-qos11 keep** command in global configuration mode. To return to the default configuration and reset the counters to zero when a DOCSIS 1.1-provisioned CM goes offline, use the **no** form of this command.

cable primary-sflow-qos11 keep {**all** | **snmp-only**}
no cable primary-sflow-qos11 keep

Syntax Description

all	Preserves all primary service flow traffic counters when a DOCSIS 1.1-provisioned CM goes offline. This includes the counters displayed by CLI commands and counters that are obtained through SNMP requests.
snmp-only	Preserves only the primary service flow traffic counters that are obtained through SNMP requests. The counters displayed by CLI commands are reset to zero when a DOCSIS 1.1-provisioned CM goes offline.

Command Default

Primary service flow traffic counters are not preserved after a DOCSIS 1.1-provisioned CM goes offline (**no cable primary-sflow-qos11 keep**). Service-flow information is always preserved for DOCSIS 1.0-provisioned CMs, regardless of the configuration of this command.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)CX, 12.2(15)BC2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, when a CM that is provisioned for DOCSIS 1.1 quality of service (QoS) service flows goes offline, the CMTS deletes all service flow information, including traffic counters, that correspond to that CM. The **cable primary-sflow-qos11 keep** command preserves the service flow traffic counters after a DOCSIS 1.1-provisioned CM goes offline and then comes back online. This allows service providers to track the total usage of CMs over a period of time, regardless of the number of times the CMs go offline and reboot.



Note This command affects only CMs that are provisioned for DOCSIS 1.1 operations and that are currently online all cable interfaces on the Cisco CMTS. Information is not preserved for DOCSIS 1.1-provisioned CMs that went offline before this command was given. The service-flow information for CMs that are provisioned for DOCSIS 1.0 operations is always preserved, regardless of how this command is configured.

Examples

The following example shows how to preserve both the CLI and SNMP service flow counters when a DOCSIS 1.1-provisioned CM goes offline:

```
Router(config)# cable primary-sflow-qos11 keep all
Router(config)#
```

The following example shows how to preserve only the SNMP-based service flow counters when a DOCSIS 1.1-provisioned CM goes offline. The CLI-based counters are still reset to zero when this CM goes offline.

```
Router(config)# cable primary-sflow-qos11 keep snmp-only
Router(config)#
```

The following example shows how to disable this command and return to the default behavior, which is to reset all CLI-based and SNMP-based counters when a DOCSIS 1.1-provisioned CM goes offline.

```
Router(config)# no cable primary-sflow-qos11 keep
Router(config)#
```

Related Commands

Command	Description
cable sflog	Enables service flow logging and configures the number and duration of entries in the log.
show cable modem counters	Displays downstream and upstream traffic counters for one or more CMs.

cable privacy

To enable and configure BPI or BPI+ encryption, use the **cable privacy** command in cable interface configuration mode or MAC domain profile configuration mode. To disable privacy or to remove a particular configuration, use the **no** form of this command.

Cisco uBR Series Router
cable privacy [**accept-self-signed-certificate** | **authenticate-modem** | **authorize-multicast** | **mandatory** | **oaep-support** | **dsx-support** | **retain-failed-certificates** | **skip-validity-period**]
no cable privacy [**accept-self-signed-certificate** | **authenticate-modem** | **authorize-multicast** | **mandatory** | **oaep-support** | **dsx-support** | **retain-failed-certificates** | **skip-validity-period**]

Cisco cBR Series Router
cable privacy [**accept-self-signed-certificate** | **mandatory** | **oaep-support** | **dsx-support** | **retain-failed-certificates** | **skip-validity-period**]
no cable privacy [**accept-self-signed-certificate** | **mandatory** | **oaep-support** | **dsx-support** | **retain-failed-certificates** | **skip-validity-period**]

Syntax Description

accept-self-signed-certificate	(Optional) Allows cable modems to register using self-signed manufacturer certificates, as opposed to a manufacturer certificate that is chained to the DOCSIS root certificate.
authenticate-modem (for uBR series router)	(Optional) Uses AAA protocols in conjunction with BPI to authenticate all CMs.
authorize-multicast (for uBR series router)	(Optional) Uses AAA protocols with baseline privacy interface (BPI) to authorize all multicast stream (IGMP) join requests.
mandatory	(Optional) Requires baseline privacy be active for all CMs with BPI/BPI+ enabled in their DOCSIS configuration files or the CMs are forced to go offline. If a CM does not have BPI enabled in its DOCSIS configuration file, it will be allowed online without BPI.
oaep-support	(Optional) Enables Optimal Asymmetric Encryption Padding (OAEP) BPI+ encryption.
dsx-support	(Optional) Enables encryption for dynamic services SIDs.
retain-failed-certificates	(Optional) Allows to retain failed certificates.
skip-validity-period	(Optional) Enables to skip certificate validity period.

Command Default

The encryption priority defaults to 128bit AES, 56bit DES, 40bit DES depending on modem capability. The CMTS treats self-signed manufacturer certificates as untrusted. Untrusted certificates are not retained by the CMTS.

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.1 T	This command was introduced.
12.1(4)CX, 12.2(1)XF1, 12.2(4)BC1	Added the **dsx-support**and**oaep-support** keywords as part of support for BPI+ encryption.
12.2(11)BC1	Changed the **accept-self-signed-certificate** option from a global configuration option to a cable interface option.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	This command was modified. Added the **retain-failed-certificates** and **skip-validity-period** keywords. Removed the **40-bit-des** keyword.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **authenticate-modem** and **authorize-multicast** keywords were removed.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is applicable only on images that support BPI or BPI+ encryption.

Note The **cable privacy accept-self-signed-certificate** command affects only those CMs that register after you give the command. For example, if you give the **no cable privacy accept-self-signed-certificate** command so that CMs cannot register using self-signed certificates, you must then issue the **clear cable modem all reset** command to force all CMs reregister using certificates that are chained to the DOCSIS root certificate.

Providing Self-Signed Certificates

Cisco IOS Release 12.2(33)SCC and later releases allow self-signed CA certificates to be programmed on the file system to allow specific modems to authenticate. This is frequently used for test equipment and modems that are not DOCSIS compliant.

To provide self-signed CA certificates, perform the following steps:

1. Acquire the CA certificate in Distinguished Encoding Rules (DER) format. This can be supplied by the manufacturer or retrieved from the cable modem.
2. Store the self-signed CA certificate in the bootflash by naming it “trusted-cert-scert n”, for example “trusted-cert-scert1” or “trusted-cert-scert2”.
3. Ensure that **cable privacy accept-self-signed-certificate** command is not enabled.
4. Save the configuration.
5. Reboot the router.

The router reads the new files and the self-signed cable modem comes online.

Examples

The following example shows how to force baseline privacy interface (BPI) to be used for all CMs on a particular cable interface:

```
Router(config)# interface cable 6/0/0
Router(config-if)# cable privacy mandatory
```

The following example shows how to turn on the BPI modem authentication for an interface:

```
Router(config)# interface cable 6/0/1
Router(config-if)# cable privacy authenticate-modem
```

The following example shows how to turn on BPI multicast authorization on a particular cable interface on Cisco uBR series router:

```
Router(config)# interface cable 1/0
Router(config-if)# cable privacy authorize-multicast
```

The following example shows how to allow CMs to register with self-signed certificates on a particular cable interface:

```
Router(config)# interface cable 7/0/0
Router(config-if)# cable privacy accept-self-signed-certificate
```

The following example shows how to allow CMs to enable privacy DSX support on a particular cable interface:

```
Router(config)# interface cable 6/0/0
Router(config-if)# cable privacy dsx-support
```

The following example shows how to allow CMs to enable OAEP support on a particular cable interface:

```
Router(config)# interface cable 6/0/0
Router(config-if)# cable privacy oaep-support
```

The following example shows how to allow CMs to retain failed certificates on a particular cable interface:

```
Router(config)# interface cable 6/0/0
Router(config-if)# cable privacy
retain-failed-certificates
```

The following example shows how to allow CMs to skip certificate validity period on a particular cable interface:

```
Router(config)# interface cable 6/0/0
Router(config-if)# cable privacy
skip-vailidity-period
```

Related Commands

Command	Description
cable privacy eae-policy	Selects Early Authentication and Encryption policy.
cable privacy hotlist	Adds a CM certificate to the DOCSIS hotlist so that it is no longer accepted.

Command	Description
cable privacy kek	Sets key encryption keys and timeout periods.
cable privacy tek	Sets traffic encryption keys and timeout periods.
show cable privacy	Displays information about BPI status and operation.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy bpi-plus-enforce

Note Effective with Cisco IOS Release 12.2(33)SCD5, the **cable privacy bpi-plus-enforce** command is replaced with the **cable privacy bpi-plus-policy** command. For more information, see the **cable privacy bpi-plus-policy** command.

To mandate that a cable modem provisioned in DOCSIS 1.1 or higher must register with DOCSIS Baseline Privacy Interface Plus (BPI+), and not use the earlier DOCSIS BPI, use the **cable privacy bpi-plus-enforce** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cable privacy bpi-plus-enforce
no cable privacy bpi-plus-enforce

Syntax Description

This command has no arguments or keywords.

Command Default

The **cable privacy bpi-plus-enforce** command is not enabled by default, but must be configured for optimal DOCSIS BPI+ security.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
12.2(33)SCD5	This command was replaced with the **cable privacy bpi-plus-policy command.**
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable privacy bpi-plus-enforce** command enables the Cisco CMTS router to detect cloned cable modems and eliminate denial-of-service (DOS) attacks that are caused by cloned cable modems.

If the cable modem is not provisioned to use DOCSIS BPI or BPI+ security certificates, then the existing behavior of the Cisco CMTS router remains unchanged. The Cisco CMTS router does not attempt to distinguish between two cable modems if neither is provisioned for BPI+ security.

Note The non-DOCSIS compliant cable modems that are commonly available contain an option to force registration in DOCSIS BPI, as opposed to DOCSIS BPI+ mode, even in DOCSIS 1.1-provisioned networks.

Examples

The following example illustrates logging messages that are created with the detection of cloned cable modems:

```
SLOT 7/0: Nov 14 12:07:26: %UBR10000-6-CMMOVED: Cable modem 0007.0e03.3e71 has been moved
from interface Cable7/0/1 to interface Cable7/0/0.
```

```
Nov 14 12:07:57: %UBR10000-5-CLONED_CM_DETECTED: Cloned CM with MAC address 0013.7116.e726
 access detected at Cable7/0/0 interface
```

Related Commands

Command	Description
cable logging layer2events	Saves selected (low priority) DOCSIS events that are specified in the Cisco CMTS MIB registry to the cable logging buffer (instead of to the general logging buffer).
cable privacy bpi-plus-policy	Configures the BPI+ enforcement policies on a Cisco CMTS router.
show cable logging	Displays the log of messages about bad IP source addresses or DOCSIS layer events on the cable interfaces.
show cable modem	Displays information for registered and non-registered cable modems on the Cisco CMTS.

cable privacy bpi-plus-exclude

To exclude cable modems from the Baseline Privacy Interface Plus (BPI+) enforcement policies configured on a Cisco CMTS router, use the **cable privacy bpi-plus-exclude** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable privacy bpi-plus-exclude *mac-address* [*address-mask*]
no cable privacy bpi-plus-exclude *mac-address* [*address-mask*]

Syntax Description

mac-address	Cable modem MAC address.
address-mask	(Optional) Cable modem subnet.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD5	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can exclude individual cable modems, which are compliant with DOCSIS 1.0 and later versions, from the BPI+ enforcement policy based on their MAC addresses on a per-MAC domain basis. If a cable modem is added to the exclusion list, the Cisco CMTS router does not enforce the BPI+ enforcement policy on that cable modem. You can exclude a maximum of 30 cable modems per MAC domain.

Examples

The following example shows how to exclude a cable modem from the BPI+ enforcement policy based on its MAC address:

```
Router# configure terminal
Router(config)# cable privacy bpi-plus-exclude 0010.9571.03ab
```

Related Commands

Command	Description
cable privacy bpi-plus-policy	Configures the BPI+ enforcement policy on a Cisco CMTS router.
show interface cable privacy	Displays baseline privacy information.

cable privacy bpi-plus-policy

To configure the Baseline Privacy Interface Plus (BPI+) enforcement policies on a Cisco CMTS router, use the **cable privacy bpi-plus-policy** command in cable interface configuration mode. To disable this configuration, use the **no** form of this command.

cable privacy bpi-plus-policy {**capable-enforcement** | **d11-enabled-enforcement** | **d11-enforcement** | **total-enforcement**}
no privacy bpi-plus-policy {**capable-enforcement** | **d11-enabled-enforcement** | **d11-enforcement** | **total-enforcement**}

Syntax Description

capable-enforcement	Specifies that BPI+ enforcement is required on all BPI+ capable cable modems that are BPI+ enabled and provisioned with DOCSIS1.1 configuration file (Policy 1).
d11-enabled-enforcement	Specifies that BPI+ enforcement is required on all cable modems that register with a DOCSIS 1.1 configuration file with parameters indicating BPI+ is enabled with or without TLV 29 (Policy 2).
d11-enforcement	Specifies that BPI+ enforcement is required on all cable modems that are compliant with DOCSIS 1.1 and later versions (Policy 3).
total-enforcement	Specifies that BPI+ enforcement is required on all cable modems (Policy 4).

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

Command History

Release	Modification
12.2(33)SCD5	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable privacy bpi-plus-policy** command replaced the **cable privacy bpi-plus-enforce** command in Cisco IOS Relase12.2(33)SCD5. If you upgrade from an earlier Cisco IOS Release to Cisco IOS Release 12.2(33)SCD5 and later, the existing BPI+ enforcement configuration is disabled by default during the upgrade. You must reconfigure the BPI+ enforcement policy using the **cable privacy bpi-plus-policy** command.

You can configure only one enforcement policy at a time per MAC domain. If you configure one policy after another, the latest policy supersedes the already existing policy. For example, if you want Policy 2 to take over Policy 1, you can directly configure the former without disabling the latter.

Examples

The following example shows how to configure BPI+ enforcement policies on the cable interface 3/0 on the Cisco uBR7246VXR router:

```
Router# configure terminal
```

```
Router(config)# interface cable 3/0
Router(config-if)# cable privacy bpi-plus-policy capable-enforcement
Router(config-if)# cable privacy bpi-plus-policy d11-enabled-enforcement
Router(config-if)# cable privacy bpi-plus-policy d11-enforcement
Router(config-if)# cable privacy bpi-plus-policy total-enforcement
```

Related Commands

Command	Description
cable privacy bpi-plus-exclude	Excludes individual cable modems from BPI+ enforcement policies based on their MAC addresses.
show interface cable privacy	Displays baseline privacy information.

cable privacy clone-detect

To enable the clone modem functionality for a cable modem, use the **cable privacy clone-detect** command in global configuration mode. To disable clone modem functionality, use the **no** form of this command.

cable privacy clone-detect
no cable privacy clone-detect

Syntax Description

This command has no keywords or arguments.

Command Default

The clone modem functionality is enabled .

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable the clone modem functionality, so that the cloned cable modems cannot register with the CMTS:

```
Router# configure terminal
Router(config)# cable privacy clone-detect
```

Related Commands

Command	Description
cable privacy	Enables and configures BPI+ encryption on a cable interface.
(Not supported for Cisco uBR10K Series and cBR Series Converged Broadband Routers) **cable privacy bpi-plus-enforce**	Specifies that a cable modem provisioned in DOCSIS 1.1 or higher must register with DOCSIS BPI+, and not use the earlier DOCSIS BPI.
cable logging layer2events	Saves selected (low priority) DOCSIS events that are specified in the Cisco CMTS MIB registry to the cable logging buffer (not of the general logging buffer).
show cable logging	Displays the log of messages, about bad IP source addresses or DOCSIS-layer events, on the cable interfaces.
show cable modem	Displays information for registered and non-registered cable modems on the Cisco CMTS.

Command	Description
show running-config interface cable	Displays the bundles that are configured on a Cisco CMTS router showing the running configuration for each of the cable interfaces.

cable privacy eae-exclude

To force a cable modem to register without an Early Authentication and Encryption (EAE) and add it to the EAE exclusion list, use the **cable privacy eae-exclude** command in global configuration mode. To remove a particular CM from the exclusion list, use the **no** form of this command.

cable privacy eae-exclude *cm-mac-address* [*mask*]
no cable privacy eae-exclude *cm-mac-address* [*mask*]

Syntax Description

cm-mac-address	Hardware (MAC) address of a specific cable modem to be added to the EAE exclusion list.
mask	(Optional) Mask value for the cable modem.

Command Default

The EAE exclusion list does not contain any MAC address.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The exclusion list is mainly used to debug issues with specific cable modems.

Examples

The following example shows how to add a CM with the MAC address of 00C0.8345.de51 to the EAE exclusion list, so that this particular CM cannot register with the CMTS:

```
Router# configure terminal
Router(config)# cable privacy eae-exclude 00C0.8345.de51
Router(config)#
```

Related Commands

Command	Description
cable privacy	Enables and configures BPI+ encryption on a cable interface.
cable privacy kek	Sets key encryption keys and timeout periods.
cable privacy tek	Sets traffic encryption keys and timeout periods.
show cable privacy	Displays information about BPI status and operation.

cable privacy eae-policy

To enable the Early Authentication and Encryption (EAE) policy, use the **cable privacy eae-policy** command in cable interface configuration mode or MAC domain profile configuration mode. To disable the EAE policy, use the **no** form of this command.

cable privacy eae-policy {**capability-enforcement** | **disable-enforcement** | **ranging-enforcement** | **total-enforcement**}
no cable privacy eae-policy {**capability-enforcement** | **disable-enforcement** | **ranging-enforcement** | **total-enforcement**}

Syntax Description

capability-enforcement	Enforces EAE on capable modems.
disable-enforcement	Disables EAE thereby preventing the CMTS from enforcing EAE on any cable modem.
ranging-enforcement	Enforces EAE only on DOCSIS 3.0 modems.
total-enforcement	Enforces EAE on all cable modems.

Command Default

EAE policy is disabled.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The EAE policy is applied on a MAC domain and the policies are mutually exclusive. The CMTS enforces EAE only on CMs that initialize on a downstream channel on which the CMTS is transmitting MAC Domain Descriptor (MDD) messages.

The EAE exclusion list is a global list and is created on all line cards as part of the DOCSIS 3.0 specifications. Cable modems in the EAE exclusion list are always exempted from EAE enforcement. If the CMTS receives an authorization request before the CM is registered in the EAE exclusion list, the CMTS rejects that request.

Note When Early Authentication and Encryption is enabled in Cisco cBR-8 router, BPI will revert back to DES-56 even if the hardware supports AES-128.

Examples

The following example shows how to enforce EAE policy on capable modems:

```
Router(config)# interface cable 3/0/0
Router(config-if)# cable privacy eae-policy capability-enforcement
```

The following example shows how to disable EAE policy so that the CMTS does not enforce EAE policy on any cable modem:

```
Router(config)# interface cable 3/0/0
Router(config-if)# cable privacy eae-policy disable-enforcement
```

The following example shows how to enforce EAE policy on DOCSIS 3.0 modems only:

```
Router(config)# interface cable 3/0/0
Router(config-if)# cable privacy eae-policy ranging-enforcement
```

The following example shows how to enforce EAE policy on all cable modems:

```
Router(config)# interface cable 3/0/0
Router(config-if)# cable privacy eae-policy total-enforcement
```

Related Commands

Command	Description
cable privacy exe-exclude	Adds the CM to be excluded from EAE policy enforcement.
cable privacy hotlist	Adds a CM certificate to the DOCSIS hotlist so that it is no longer accepted.
cable privacy kek	Sets key encryption keys and timeout periods.
cable privacy tek	Sets traffic encryption keys and timeout periods.
show cable privacy	Displays information about BPI status and operation.

cable privacy encrypt-alg-priority

To specify the order in which to use the Advanced Encryption Standard (AES) and Data Encryption Standard (DES) encryption algorithm, use the **cable privacy encrypt-alg-priority** command in global configuration mode. To remove the encryption algorithm and revert to the default priority, use the **no** form of this command.

cable privacy encrypt-alg-priority {**aes128-des40-des56** | **aes128-des56-des40** | **des40-aes128-des56** | **des40-des56-aes128** | **des56-aes128-des40** | **des56-des40-aes128**}
no cable privacy encrypt-alg-priority

Syntax Description

aes128-des40-des56	Specifies the order of the encryption algorithm priority. AES with a 128-bit block is given the highest priority, followed by DES with 40-bit block size, and DES with 56-bit block size.
aes128-des56-des40	Specifies the order of the encryption algorithm priority. AES with a 128-bit block size is given the highest priority, followed by DES with 56-bit block size, DES with 40-bit block size.
des40-aes128-des56	Specifies the order of the encryption algorithm priority. DES with 40-bit block size is given the highest priority, followed by AES with a 128-bit block size, and DES with 56-bit block size.
des40-des56-aes128	Specifies the order of the encryption algorithm priority. DES with 40-bit block size is given the highest priority, followed by DES with 56-bit block size and AES with 128-bit block size.
des56-aes128-des40	Specifies the order of the encryption algorithm priority. DES with 56-bit block size is given the highest priority, followed by AES with a 128-bit block size, and DES with 40-bit block size.
des56-des40-aes128	Specifies the order of the encryption algorithm priority. DES with 56-bit block size is given the highest priority, followed by DES with 40-bit block size, and AES with a 128-bit block size.

Command Default

Default value is aes128-des56-des40.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the order of the encryption algorithm priority.

When Early Authentication and Encryption is enabled in Cisco cBR-8 router, BPI will revert back to DES-56 even if the hardware supports AES-128.

Examples

The following example shows how to assign AES the highest priority, followed by 40-bit DES, and 56-bit DES.

```
Router# configure terminal
Router(config)# cable privacy encrypt-alg-priority aes128-des40-des56
Router(config)#
```

Related Commands

Command	Description
cable privacy	Enables and configures BPI+ encryption on a cable interface.
cable privacy kek	Sets key encryption keys and timeout periods.
cable privacy tek	Sets traffic encryption keys and timeout periods.
show cable privacy	Displays information about BPI status and operation.

cable privacy hotlist

To mark a manufacturer's or CM certificate as untrusted and add them to the CMTS hotlist of invalid certificates, thereby preventing those CMs or host's from registering, use the **cable privacy hotlist** command in global configuration mode. To remove a particular CM or manufacturer's certificate from the hotlist, use the **no** form of this command.

cable privacy hotlist {**cm** *mac-address* | **manufacturer** *cert-serial-number*}
no cable privacy hotlist {**cm** *mac-address* | **manufacturer** *cert-serial-number*}

Cisco cBR Series Converged Broadband Routers
cable privacy hotlist {**cm** *mac-address* | **host** *mac-address* }
no cable privacy hotlist {**cm** *mac-address* | **host** *mac-address* }

Syntax Description

cm *mac-address*	Specifies the MAC address for the CM to be added to the hotlist. The *mac-address* should be specified as a hexadecimal string, without periods or other separators. In Cisco IOS Release 12.2(15)BC2 and later releases, you can also specify it as three sets of hexadecimal digits, separated by periods.
manufacturer*cert-serial-number*	Specifies the serial number for the particular manufacturer CA certificate. The *cert-serial-number* should be specified as a hexadecimal string up to 32 bytes in length. Enter multiple lines as needed, and use a blank line to terminate the string.
host *mac-address*	Specifies the MAC address for the host to be added to the hotlist. The *mac-address* should be specified as a hexadecimal string, without periods or other separators. In Cisco IOS Release 12.2(15)BC2 and later releases, you can also specify it as three sets of hexadecimal digits, separated by periods.

Command Default

The CMTS hotlist does not contain any certificates.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(7)CX, 12.2(1)XF1, 12.2(4)BC1	This command was introduced for the Cisco uBR7100 series and Cisco uBR7200 series routers.
12.2(11)BC1	The **accept-self-signed-certificate** option was moved to the **cable privacy** cable interface command.
12.2(15)BC2	The mac-address can be specified in the canonical form of three pairs of hexadecimal digits, separated by periods (for example, 0000.0001.0002).
12.2(33)SCB5	This command was integrated into the 12.2SC release train.

Release	Modification
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **host** keyword was added.

Usage Guidelines

The **cable privacy hotlist** command is used to configure the following features:

- DOCSIS 1.1 for the Cisco CMTS Routers

This command is applicable only on images that support BPI or BPI+ encryption.



Note The **cable privacy hotlist** command is not supported on the Cisco uBR10012 router running Cisco IOS releases prior to Cisco IOS release 12.3(23)BC9, Cisco IOS release 12.2(33)SCB5, and Cisco IOS release12.2(33)SCC. To add a manufacturer's or CM certificate to the hotlist on the Cisco uBR10012 router, use SNMP commands to set the appropriate attributes in DOCS-BPI-PLUS-MIB.

Examples

The following command adds the CM certificate with the MAC address of 00C0.8345.de51 to the hotlist, so that this particular CM cannot register with the CMTS:

```
Router# configure terminal
Router(config)# cable privacy hotlist cm 00C08345de51
Router(config)#
```

The following example adds a manufacturer CA certificate into the BPI+ hotlist, so that the CMTS will reject any CM attempting to register with a certificate from that particular manufacturer:

```
Router# configure terminal
Router(config)# cable privacy hotlist manufacturer 3435414631413439383335453731423733333643
```

Related Commands

Command	Description
cable privacy	Enables and configures BPI+ encryption on a cable interface.
option	Determines whether a specific CM is online.
cable privacy kek	Sets key encryption keys and timeout periods.
cable privacy tek	Sets traffic encryption keys and timeout periods.
show cable privacy	Displays information about BPI status and operation.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy kek

To set key encryption keys (KEKs) life-time values for baseline privacy on an HFC network, use the **cable privacy kek** command in cable interface configuration mode or MAC domain profile configuration mode. To restore the default values, use the **no** form of this command.

Note This command is applicable only on images that support BPI or BPI+ encryption.

cable privacy kek life-time [*seconds*]
no cable privacy kek life-time

Syntax Description

life-time*seconds*	(Optional) Length of the key encryption life-time in seconds. The valid range is 300 to 604,8000. The default is 604,800 seconds (7 days).

Command Default

The **life-time** option to 604,800 seconds (7 days).

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.1(4)CX, 12.2(1)XF1, 12.2(4)BC1	The valid range for both options was changed to support DOCSIS 1.1 and BPI+ encryption.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Baseline privacy on an HFC network is configured with key encryption keys (KEKs) and traffic encryption keys (TEKs). The encryption is based on 40-bit or 56-bit data encryption standard (DES) encryption algorithms.

A KEK is assigned to a cable modem based on the cable modem service identifier (SID) and permits the cable modem to connect to the Cisco CMTS when baseline privacy is activated. KEKs can be set to expire based a life-time value.

The **life-time** keyword is used to assign a more permanent key to a cable modem.

A cable modem that has a life-time key assigned by the Cisco CMTS requests a new key before the current one expires.

Examples

The following example shows how to set the KEK privacy life-time to 750,000 seconds:

Note CableLabs recommended operational KEK life time is:

- Minimum 1 day
- Normal 7 days
- Maximum 70 days and
- 300 seconds for integration testing alone

```
Router(config)# interface cable c3/0/0
Router(config-if)# cable privacy kek life-time 750000
Router(config-if)#
```

Related Commands

Command	Description
cable privacy	Enables and configures BPI+ encryption on a cable interface.
cable privacy tek	Sets traffic encryption keys and timeout periods.
option	Determines whether a specific CM is online.
privacy	Configures the BPI or BPI+ configuration parameters in a DOCSIS configuration file.
show cable privacy	Displays information about BPI status and operation.
show interface cable privacy	Displays the current values of the KEK and TEK timers for an interface.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy non-mtc-aes128

To allows DOCSIS3.0 cable modem working on non-MTC mode to use AES-128 as BPI encryption algorithms, use the **cable privacy non-mtc-aes128** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable privacy non-mtc-aes128
no cable privacy non-mtc-aes128

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.1SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to add a CM with the MAC address of 00C0.8345.de51 to the EAE exclusion list, so that this particular CM cannot register with the CMTS:

```
Router# configure terminal
Router(config)# cable privacy non-mtc-aes128
Router(config)#
```

cable privacy revocation crl skip-sig-check

To allow the Cisco CMTS router to skip the certification revocation list (CRL) response signature check, use the **cable privacy revocation crl skip-sig-check** command in global configuration mode. To enable CRL signature check, use the **no** form of this command.

cable privacy revocation crl skip-sig-check
no cable privacy revocation crl skip-sig-check

Syntax Description

This command has no keywords or arguments.

Command Default

The CRL response signature check is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable privacy revocation crl skip-sig-check** command allows you to use the CRL response from the CRL server without validating the signature of the response.

Examples

The following example shows how to skip the CRL response signature check:

```
Router(config)# cable privacy revocation crl skip-sig-check
```

Related Commands

Command	Description
cable privacy revocation ocsp skip-sig-check	Allows to skip the OCSP response signature check.
cable privacy revocation skip-cm-cert	Allows to disable checking of the CM certificates.
cable privacy revocation timeout	Sets the timeout value of CRL or OCSP response time.
cable privacy revocation enable	Allows to quickly enable privacy revocation checking.
show cable privacy	Displays information about BPI status and operation.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy revocation enable

To quickly enable privacy revocation checking, use the **cable privacy revocation enable** command in global configuration mode. To disable privacy revocation checking, use the **no** form of this command.

cable privacy revocation enable
no cable privacy revocation enable

Syntax Description

This command has no keywords or arguments.

Command Default

The privacy revocation checking is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows you to quickly enable or disable revocation checking. When you enable revocation checking, it creates the trustpoints for both the EU and US certificates.

Examples

The following example shows how to enable revocation checking:

```
Router(config)# cable privacy revocation enable
```

Related Commands

Command	Description
cable privacy revocation ocsp skip-sig-check	Allows to skip the OCSP response signature check.
cable privacy revocation skip-cm-cert	Allows to disable checking of the CM certificates.
cable privacy revocation timeout	Sets the timeout value of CRL or OCSP response time.
show cable privacy	Displays information about BPI status and operation.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy revocation ocsp skip-sig-check

To allow the Cisco CMTS router to skip the Online Certificate Status Protocol (OCSP) response signature check, use the **cable privacy revocation ocsp skip-sig-check** command in global configuration mode. To enable OCSP signature check, use the **no** form of this command.

cable privacy revocation ocsp skip-sig-check
no cable privacy revocation ocsp skip-sig-check

Syntax Description

This command has no keywords or arguments.

Command Default

OCSP response signature check is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable privacy revocation ocsp skip-sig-check** command allows you to use the OCSP response from the OCSP responder without validating the signature of the response.

Examples

The following example shows how to skip the OCSP response signature check:

```
Router(config)# cable privacy revocation ocsp skip-sig-check
```

Related Commands

Command	Description
cable privacy revocation enable	Allows to quickly enable privacy revocation checking.
cable privacy revocation skip-cm-cert	Allows to disable checking of the CM certificates.
cable privacy revocation timeout	Sets the timeout value of CRL or OCSP response time.
show cable privacy	Displays information about BPI status and operation.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy revocation skip-cm-cert

To disable checking of the CM certificates, use the **cable privacy revocation skip-cm-cert** command in global configuration mode. To enable checking of CM certificates, use the **no** form of this command.

cable privacy revocation skip-cm-cert
no cable privacy revocation skip-cm-cert

Syntax Description

This command has no keywords or arguments.

Command Default

CM certificate checking is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Note Checking CM certificates requires a lot of processing power, which impacts the router performance.

Examples

The following example shows how to disable checking of CM certificates:

```
Router(config)# cable privacy revocation skip-cm-cert
```

Related Commands

Command	Description
cable privacy revocation enable	Allows to quickly enable privacy revocation checking.
cable privacy revocation ocsp skip-sig-check	Allows to skip the OCSP response signature check.
cable privacy revocation timeout	Sets the timeout value of CRL or OCSP response time.
show cable privacy	Displays information about BPI status and operation.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy revocation timeout

To set the timeout value of certification revocation list (CRL) or Online Certificate Status Protocol (OCSP) response time for authorization “reply” or “reject” messages, use the **cable privacy revocation timeout** command in global configuration mode. To return to the default timeout value, use the **no** form of this command.

cable privacy revocation timeout
no cable privacy revocation timeout

Syntax Description

This command has no keywords or arguments.

Command Default

The default timeout value is 1 second.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command only takes effect if **cable privacy revocation enable** command is configured. The timeout value for authorization “reply” or “reject” messages in the CM configuration file must be greater than the revocation timeout value.

Examples

The following example shows how to set the timeout value for CRL or OCSP response:

```
Router(config)# cable privacy revocation timeout 15
```

Related Commands

Command	Description
cable privacy revocation enable	Allows to quickly enable privacy revocation checking.
cable privacy revocation ocsp skip-sig-check	Allows to skip the OCSP response signature check.
cable privacy revocation skip-cm-cert	Allows to disable checking of the CM certificates.
show cable privacy	Displays information about BPI status and operation.
debug cable privacy	Displays debug messages for BPI operation.

cable privacy tek

To set traffic encryption keys (TEKs) life-time values for baseline privacy on an HFC network, use the **cable privacy tek** command in cable interface configuration mode or MAC domain profile configuration mode. To restore the default value, use the **no** form of this command.

Note This command is applicable only on images that support BPI or BPI+ encryption.

cable privacy tek life-time [*seconds*]
no cable privacy tek life-time

Syntax Description

life-time *seconds*	(Optional) Length of the traffic encryption life-time in seconds. The range is 180 to 604,8000. The default is 43,200.

Command Default

The **life-time** option to 43200 seconds (12 hours).

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.1(4)CX, 12.2(1)XF1, 12.2(4)BC1	The valid range for both options was changed to support DOCSIS 1.1 and BPI+ encryption.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Baseline privacy on an HFC network is configured with key encryption keys (KEKs) and traffic encryption keys (TEKs). The encryption is based on 40-bit or 56-bit data encryption standard (DES) or 128-bit AES encryption algorithms.

The TEK is assigned to a CM when its KEK has been established. The TEK is used to encrypt data traffic between the CM and the Cisco CMTS. TEKs can be set to expire based a life-time value.

The **life-time** keyword is used to assign a more permanent key to a CM.

Note CableLabs recommended operational TEK life time is:

- Minimum 30 minutes
- Normal 12 hours
- Maximum 7 days and
- 180 seconds for integration testing alone

A CM that has a life-time key assigned by the Cisco CMTS requests a new key before the current one expires.

Examples

The following example shows how to set the traffic encryption key life-time to 800000 seconds:

```
Router(config)# interface cable c3/0/0
Router(config-if)# cable privacy tek life-time 800000
Router(config-if)#
```

Related Commands

Command	Description
cable privacy	Enables and configures BPI+ encryption on a cable interface.
cable privacy kek	Sets key encryption keys and timeout periods.
option	Determines whether a specific CM is online.
privacy	Configures the BPI or BPI+ configuration parameters in a DOCSIS configuration file.
show cable privacy	Displays information about BPI status and operation.
show interface cable privacy	Displays the current values of the KEK and TEK timers for an interface.
debug cable privacy	Displays debug messages for BPI operation.

cable profile

To create and configure common profile for service group based configuration of layer 2 (L2) interfaces, use the **cable profile** command. To remove a common profile use the **no** form of the command with the appropriate key words and variables.

cable profile *profile-type profile-name*

Syntax Description

profile-type	Configures the profile type for configuration. • mac-domain — Selects a MAC domain common profile for configuration. • downstream — Selects a downstream interface common profile to configure. • wideband-interface — Selects a wideband interface common profile to configure. • service-group — Creates fiber-node service group profile.
profile-name	Configures the profile name.

Command Default

Not configured.

Command Modes

Privileged Configuration Mode (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This following statements are introduced for the **cable profile mac-domain** command: • **shutdown** • **cable upstream resiliency [change-channel-set | channel-down-detect | data-burst | modem-offline-detect | on-failure | sf-move]**
Cisco IOS-XE 3.17.0S	This command is introduced on theCisco cBR Series Converged Broadband Routers.

Usage Guidelines

Feature—Service Group Profile Based Configuration for DOCSIS interfaces and fiber nodes.

Use this command to configure the three common profiles — MAC domain, primary downstream channel profile and wideband-cable interface profile. When you enter the profile configuration mode, configure the parameters for the profile. These parameters will be applied when this profile is added to a specific service group profile. This command is used to create the service group profile.

MAC Domain Common Profile

When you enter the MAC domain common profile configuration mode, configure the following using the **cable** command:

- **cable ip-init [apm | dual-stack | ipv4 | ipv6]**

- **cable mrc-mode**
- **cable mtc-mode**
- **cable dynamic-secret [lock | mark | reject]**
- **cable shared-secret [0 | 7 | LINE]**
- **cable privacy bpi-plus-policy [capable-enforcement | d11-enabled-enforcement | d11-enforcement | total-enforcement]**
- **cable privacy mandatory**

Primary Downstream Channel Common Profile

When you enter the primary downstream channel common profile configuration mode, configure the following using the **cable** command:

- **cable rf-bandwidth-percent** *percent* [**remaining ratio** *percent*]
- **cable attribute-mask** *mask*

Wideband Interface Common Profile

When you enter the wideband interface common profile configuration mode, configure the following using the **cable** command:

- **cable downstream attribute-mask** *mask*

Global Service Group Profile

When you enter the global service group configuration mode, use the following commands:

- Enter the MAC domain mode using **mac-domain** *mac-domain id* **profile***mac-domain profile name*
- In the MAC domain mode:
  - Configure the downstream service group channels using the **downstream sg-channel** *group list* **profile** *ds profile name* **upstream** *group list*
  - Configure the upstream service group channels using the **upstream** *Id* **sg-channel** *sg channel Id*
  - Configure the upstream bonding group by entering the upstream bonding group configuration mode using the **us-bonding-group** *Id* command.
    - In the upstream bonding group configuration mode, use the **upstream** *Id* command to add the upstream channels.
    - In the upstream bonding group configuration mode, use the **attribute** *mask* command to add attribute mask for this upstream bonding group .
- Enter the wideband interface configuration group using the **wideband-interface** *Id* **profile** *BG profile name*
  - In the wideband interface configuration mode, use the **downstream sg-channel** *group list* **rf-bandwidth-percent** *percent* command to add the upstream channels.

MAC Domain Common Profile

This example shows how to configure a MAC domain common profile using the **cable profile** command.

```
Router(config)#cable profile mac-domain md1
Router(config-profile-md)#cable dynamic-secret mark
Router(config-profile-md)#cable shared-secret 0
Router(config-profile-md)#cable ip-init ipv4
Router(config-profile-md)#cable mtc-mode
Router(config-profile-md)#cable mrc-mode
Router(config-profile-md)#cable privacy mandatory
Router(config-profile-md)#cable privacy bpi-plus-policy total-enforcement

Router(config-profile-md)#exit
Router(config)#
```

Primary Downstream Channel Common Profile

This example shows how to configure a primary downstream channel common profile using the **cable profile** command. Set the attribute mask value and the RF bandwidth percentage for the primary downstream channel profile.

```
Router(config)#cable profile downstream ds1
Router(config-profile-ds)# cable attribute-mask mask
Router(config-profile-ds)# cable rf-bandwidth-percent percent

Router(config-profile-ds)#exit
Router(config)#
```

Wideband Interface Common Profile

This example shows how to configure a wideband interface common profile using the **cable profile** command. Set the attribute mask value for the wideband interface profile using the **downstream** keyword.

```
Router(config)#cable profile wideband-interface BG1
Router(config-profile-wb)# cable downstream attribute-mask mask
Router(config-profile-wb)#exit
Router(config)#
```

Configuring DSG on Service-Group Profile

This example shows how to configure a DSG on service-group profile using the **cable profile service-group <name>** command:

```
Router(config)# cable profile service-group SG-16x8-1_1
```

```
cable bundle bundle ID
mac-domain mac-domain ID profile mac-domain profile name
downstream sg-channel grouplist profile downstream interface
cable downstream dsg chan-list 111
cable downstream dsg timer 1
cable downstream dsg vendor-param 2
cable downstream dsg tg 4500
cable downstream dsg tg 4500 priority 2
cable downstream dsg tg 4500 vendor-param 2
cable downstream dsg tg 4500 ucid 1 2
```

Global Service Group Profile

This example shows how to configure a global service group profile using the **cable profile** command. Configure the required MAC domain and wideband interface parameters in the global service group profile configuration mode.

```
Router(config)#cable profile service-group SG-16x8-1_1
Router(config-profile-sg)#cable bundle bundle ID
Router(config-profile-sg)#mac-domain mac-domain ID profile mac-domain profile name
Router(config-profile-sg-md)#downstream sg-channel grouplist profile downstream interface
profile ID
 upstream grouplist
Router(config-profile-sg-md)#upstream  Id sg-channel sg channel Id
Router(config-profile-sg-md)#us-bonding-group bonding group ID
Router(config-profile-sg-md-usbg)#upstream  Id
Router(config-profile-sg-md-usbg)#attributes mask
Router(config-profile-sg-md-usbg)#exit
Router(config-profile-sg-md)#exit
Router(config-profile-sg)#

Router(config-profile-sg)#wideband-interface downstream bonding group id profile
downstream bonding group id
Router(config-profile-sg-bg)#downstream sg-channel grouplist rf-bandwidth-percent
 bandwidth percent
Router(config-profile-sg-bg)#end
Router#
```

Configuring mac-domain with shutdown

```
Router#  show run  |  sec cable profile mac-domain MD1
cable profile mac-domain MDI
 shutdown

Router# show run int c2/0/0
Building configuration...

Current configuration : 112 bytes
!
interface Cable2/0/0
 shutdown
 cable mac-domain-profile MD1
 cable bundle 1
 cable managed fiber-node 1
end

Router# show derive int c2/0/0
Building configuration...
```

```
Derived configuration : 487 bytes
!
interface Cable2/0/0
 shutdown
 downstream Integrated-Cable 2/0/0 rf-channel 0 profile DS
 upstream 0 Upstream-Cable 2/0/0 us—channel  0
 upstream 1 Upstream-Cable 2/0/0 us-channel 1
 upstream 2 Upstream-Cable 2/0/0 us-channel 2
 upstream 3 Upstream-Cable 2/0/0 us-channel 3
 cable mac-domain-profile MD1
 cable upstream bonding-group 1
   upstream 0
   upstream 1
   attributes 88000000
 cable bundle 1
 cable ip-init ipv4
 cable managed fiber-node 1
 cable mtc-mode
 cable mrc-mode
end
```

Configuring mac-domain with cable upstream resiliency

```
Router# show cable profile mac-domain MD1
cable profile mac-domain MD1
  cable upstream resiliency on-failure reset-modem
  cable upstream resiliency channel -down-detect 50
  cable upstream resiliency sf-move RTPS
  cable upstream resiliency sf-move NRTPS
  cable upstream resiliency sf-move UGS
  cable upstream resiliency sf-move UGS-AD
  cable upstream resiliency data-burst snr 10 ufec 15 cfec 20 hysteresis 10

Router# show derive int c2/0/0
Building configuration...

Derived configuration : 814 bytes
!
interface Cable2/0/0
  downstream Integrated-Cable 2/0/0 rf-channel 0 profile DS
  upstream 0 Upstream-Cable 2/0/0 us-channel 0
  upstream 1 Upstream-Cable 2/0/0 us-channel 1
  upstream 2 Upstream-Cable 2/0/0 us-channel 2
  upstream 3 Upstream-Cable 2/0/0 us-Channel 3
  Cable mac-domain-profile MD1
  cable upstream resiliency on-failure reset-modem
  cable upstream resiliency channel-down-detect 59
  cable upstream resiliency st-move RTPS
  cable upstream resiliency st-move NRTPS
  cable upstream resiliency st-move UGS
  cable upstream resiliency sf-move UGS-AD
  cable upstream resiliency data-burst snr 10 ufec 15 cfec 20 hysteresis 10
  cable upstream resiliency bonding-group 1
 upstream 0
 upstream 1
 attributes 88000000
  cable bundle 1
  cable ip-init ipv4
  cable managed fiber-node 1
  cable mtc-mode
  cable mrc -mode
end
```

cable profile rpd-event

To configure an event profile and apply it to RPD, use the **cable profile rpd-event** *profile_id* command in the global configuration mode.

cable profile rpd-event *profile_id priority* {*0x00x10x20x3*}

Syntax Description

rpd-event	Configures an event profile
profile-id	Profile ID for the event.
priority	The type of event. • emergency • alert • critical • error • warning • notice • informational • debug
{0x0|0x1|0x2|0x3}	Type of notifications. • 0x0—No log • 0x1— Save log in RPD local storage • 0x2—Report to Cisco cBR • 0x3—Save log in RPD local storage and report to Cisco cBR

Command Default

Not configured.

Command Modes

Privileged Configuration Mode (config)

Command History

Release	Modification
Cisco RPD IOS 1.1	The **cable profile rpd-event** *profile_id* command was introduced.

Usage Guidelines

RPD Event Profile

The **cable profile rpd-event** *profile_id* command is used to configure an RPD event profile. After you create an event profile, you can apply it to an RPD.

RPD Event Profile

```
Router(config)>enable
Router#configure terminal
Router(config)#cable profile rpd-event 6
Router(config rpd-event)#priority emergency 0x3
Router(config rpd-event)#priority alert 0x3
Router(config rpd-event)#priority critical 0x3
Router(config rpd-event)#priority error 0x3
Router(config rpd-event)#priority warning 0x3
Router(config rpd-event)#priority notice 0x3
Router(config rpd-event)#priority informational 0x3
Router(config rpd-event)#enable-notify
Router(config)#cable rpd node6
Router(config-rpd)#identifier badb.ad13.5e08
Router(config-rpd)#core-interface Te3/1/5
Router(config-rpd-core)#principal
Router(config-rpd-core)#rpd-ds 0 downstream-cable 3/0/17 profile 10
Router(config-rpd-core)#rpd-us 0 upstream-cable 3/0/34 profile 13
Router(config-rpd-core)#r-dti 16
Router(config-rpd-core)#rpd-event profile 6
```

cable proxy-arp

To activate cable proxy Address Resolution Protocol (ARP) on the cable interface or subinterface, use the **cable proxy-arp** command in cable interface or subinterface configuration mode. To disable this feature, use the **no** form of this command.

cable proxy-arp
no cable proxy-arp

Syntax Description

This command has no arguments or keywords.

Command Default

Proxy APR service is enabled.

Command Modes

Cable interface configuration (config-if)

Cable subinterface configuration (config-subif)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.1(3a)EC	The subinterface support was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables or disables direct host-to-host communications over the same cable subnet. Because the downstream and upstream are separate interfaces, CMs cannot directly perform address resolution with other CMs on the cable plant. This means that the CMs must send all traffic through the CMTS, even if the destination CM is on the same subnet.

The **cable proxy-arp** command enables the Cisco CMTS to act as a proxy for ARP requests generated by the CMs, which allows CMs on the same cable subnet to communicate directly which each other, without the traffic having to be routed first through the CMTS. The **no cable proxy-arp** command disables this feature, preventing CMs on the same subnet from communicating with each other without routing the traffic through the CMTS.



Note Using the **no cable arp** and **no cable proxy-arp**commands shifts all responsibility for the management of the IP addresses used by CMs and CPE devices to the DHCP server and provisioning system.

Examples

The following example shows how to activate proxy ARP for host-to-host communications:

```
Router(config-subif)# cable proxy-arp
```

The following example shows how to activate proxy ARP for host-to-host communications, on the cable subinterface:

```
Router(config)# interface cable 6/0.1
Router(config-subif)# cable proxy-arp
```

Related Commands

Command	Description
cable arp	Activates cable Address Resolution Protocol (ARP).

cable qos enforce-rule

To create an enforce-rule to enforce a particular quality of service (QoS) profile for subscriber traffic management, and to enter enforce-rule configuration mode, use the **cable qos enforce-rule** command in global configuration mode. To delete an enforce-rule and to remove it from the CMTS configuration, use the **no** form of this command.

cable qos enforce-rule *rule-name*
no cable qos enforce-rule *rule-name*

Syntax Description

rule-name	Name of the enforce-rule to be created and configured. This name can be any arbitrary and unique string from 1 to 15 characters in length.

Command Default

No enforce-rules are created.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(9a)BC	This command was integrated into Cisco IOS Release 12.3(9a)BC. This command replaces the **cable qos monitoring** command.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable qos enforce-rule** command creates an enforce-rule with the specified name and then enters enforce-rule configuration mode. After entering enforce-rule configuration mode, use the following commands to configure the enforce-rule for uBR Series Routers:

- **activate-rule at-byte-count**
- **enabled (enforce-rule)**
- **enforced qos-profile**
- **monitoring-duration**
- **penalty-period**
- **registered qos-profile**

At the very minimum, you must use the **activate-rule at-byte-count** and **registered qos-profile**commands to configure an enforce-rule, and the **enabled** command to activate it, before it takes effect.

Note Effective with Cisco IOS Release 12.3(9a)BC, the **activate-rule at-byte-count** command is not available in Cisco IOS software.

Maximum Number of Rules

The Cisco CMTS routers support a certain maximum number of enforce-rules depending on your Cisco IOS software release. If you have created the maximum number of enforce-rules and want to create another rule, you must first delete one of the existing rules.

- Cisco IOS Release 12.2(15)BC1 and later—Supports a maximum of 20 enforce-rules.
- Beginning in Cisco IOS Release 12.3(23)BC2—Supports a maximum of 40 enforce-rules.
- Cisco IOS Release IOS-XE 3.16.0S and later—Supports a maximum of 40 enforce-rules.



Note The maximum number of enforce-rules is counted as the total number of rules created on both the upstreams and downstreams combined.

Examples

The following example shows the creation of an enforce-rule named “residential.” The system then enters the enforce-rule configuration mode.

```
Router# configure terminal
Router(config)# cable qos enforce-rule residential
Router(enforce-rule)# ?
Configuration commands for QoS enforce rules:
  activate-rule        Activate rule parameters
  enabled              Enable the enforce-rule
  enforced             Enforced qos-profile
  exit                 Exit from QoS enforce rule editing mode
  monitoring-duration  Monitoring duration parameters
  no                   Negate a command or set its defaults
  penalty-period       Penalty-period
  registered           Registered qos-profile
Router(enforce-rule)# activate-rule at-byte-count 50000000 downstream enforced
Router(enforce-rule)# registered qos-profile 5
Router(enforce-rule)# enforced qos-profile 99
Router(enforce-rule)# monitoring-duration 120 sample-rate 20
Router(enforce-rule)# penalty-period 1440
Router(enforce-rule)# enabled
Router(enforce-rule)# exit
Router(config)# exit
```

The following example shows the deletion of an enforce-rule named “test”:

```
Router# configure terminal
Router(config)# no cable qos enforce-rule test
```

The following example shows the error message that is displayed if you try to create more than 20 enforce-rules in Cisco IOS Release 12.3(23)BC1 and earlier:

```
Router# configure terminal
Router(config)# cable qos enforce-rule residential
Can't create more enforce-rules. The maximum number is 20.
```

The following example shows the error message that is displayed when you try to name an enforce-rule with a name that is larger than 15 characters. An error message is displayed, and the name is truncated to the first 15 characters.

```
Router# configure terminal
```

```
Router(config)# cable qos enforce-rule reallyreallyreallylongname
Only the first 15 characters would be taken
```

The following example shows the creation of an enforce-rule named "test1" on Cisco cBR Series Converged Broadband Routers. The system then enters the enforce-rule configuration mode.

```
Router(config)#cable qos enforce-rule test1
Router(enforce-rule)# ?
Configuration commands for QoS enforce rules:
  Penalty-period     Penalty period in Minutes
  duration           Legacy monitoring parameters
  enabled            Enable the enforce-rule
  exit               Exit from QoS enforce rule editing mode
  monitoring-basics  Set the monitoring basics
  no                 Negate a command or set its defaults
  peak-time1         Peak-OffPeak parameters
  qos-profile        qos-profile for monitoring cable modems
  service-class      service-class for monitoring cable modems
  weekend            Setup different peak-time for weekends
```

Related Commands

Command	Description
activate-rule at-byte-count	Specifies the number of bytes that a subscriber can transmit during the monitoring period.
debug cable subscriber-monitoring	Displays enforce-rule debug messages for subscriber traffic management on the Cisco CMTS routers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers that violate their registered QoS profiles.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

cable qos permission

To specify permission for updating the quality of service (QoS) table, use the **cable qos permission** command in global configuration mode. To remove a previously enabled permission, use the **no** form of this command.

cable qos permission {**create** | **enforce** *index* | **modems** | **update**}
no cable qos permission

Syntax Description

create	Permits creation of QoS table entries by Simple Network Management Protocol (SNMP).
enforce *index*	The **enforce** keyword overrides the provisioned QoS profile of the CM and enforces a specific CMTS-local QoS profile. The index argument specifies the number of the QoS profile to be enforced on all CMs connecting to the CMTS. Valid values are from 1 to 255. **Note** Both the originally provisioned QoS profile and the enforced QoS profile must be created on the Cisco CMTS. This option does not support profiles that are created by the CM.
modems	Permits creation of QoS table entries by modem registration requests.
update	Permits dynamic update of QoS table entries by SNMP.

Command Default

Enable by modem and SNMP.

Command Modes

Global configuration (config)

Command History

Release	Modification
11.3 NA	This command was introduced.
11.3(9)NA	The **enforce** keyword was added.
12.1(4)CX	This command was deprecated for DOCSIS 1.1 use, because DOCSIS 1.1 replaces the QoS profile model with a service flow model.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If the QoS profile to be enforced does not exist at the CMTS during registration, the CMTS uses the QoS profile configured for the registering CM.

If you disable the use of CM-created profiles, using the **no cable qos permission** command, any CMs using such a profile go offline immediately and the CM-created profiles are removed.

This **no cable qos permission** command is similar to the docsIfCmtsQosProfilePermissions attribute in the DOCS-IF-MIB, as both prohibit CMs from creating their own QoS profiles in the future. However, the **no cable qos permission** command also immediately deletes QoS profiles that have been created by the cable modems and takes those modems offline. The docsIfCmtsQosProfilePermissions method does not affect QoS profiles that are currently in use, but only unused profiles and profiles that are created in the future.

Examples

The following example shows how to enable CMs to request arbitrary QoS parameters:

```
Router(config)# cable qos permission modems
```

The following example shows how a CM with a QoS profile 4 created by the CM is reset to use QoS profile 225 enforced by the cable router (management):

```
CMTS01# show cable modem
 Interface    SID   Online     Timing Receive QoS IP address      MAC address
                    State      Offset Power
 Cable6/0/U0  1     online     2848    0.00   4   19.2.20.139     0010.7b6b.7215
CMTS01# show cable qos profile 4
 Service Prio Max       Guarantee Max        Max tx TOS  TOS   Create  B
 class        upstream  upstream  downstream burst  mask value by      priv
              bandwidth bandwidth bandwidth                           enab
 4       7    128000    64000     2048000    255    0x0  0x0   cm      no
CMTS01(config)# cable qos profile 225 max-upstream 256
CMTS01(config)# cable qos permission enforce 225
CMTS01# clear cable modem all reset
CMTS01# show cable modem
 Interface    SID   Online     Timing Receive QoS IP address      MACaddress
                    State      Offset Power
 Cable6/0/U0  1     offline    2848    0.25   2   19.2.20.139     0010.7b6b.7215
CMTS01# debug cable reg
 ....
 00:15:59: Finished parsing REG Request
 00:15:59: Overriding Provisioned QoS Parameters In REG-REQ
 ....
CMTS01# show cable modem
 Interface    SID   Online     Timing Receive QoS IP address      MACaddress
                    State      Offset Power
 Cable6/0/U0  1     online     2852    0.00   225 19.2.20.139     0010.7b6b.7215
CMTS01# show cable qos profile 225
 Service Prio Max       Guarantee Max        Max tx TOS  TOS   Create     B
 class        upstream  upstream  downstream burst  mask value by         priv
              bandwidth bandwidth bandwidth                              enab
 225     0    256000    0         0          0      0x0  0x0   management no
```

Related Commands

Command	Description
cable qos profile	Configures a QoS profile.
show cable qos permission	Displays the status of permissions for changing QoS tables for a cable router.
show cable qos profile	Displays the QoS profiles that have been defined.

cable qos pre-registration

To ensure that cable modems get online when a large number of existing online cable modems are actively transmitting data, use the **cable qos pre-registration us-priority** command.

cable qos pre-registration us-priority *priority-value*

Syntax Description

us-priority	Specifies the upstream priority to be assigned to the pre-registration traffic.
priority-value	Priority value of the QoS profile-2. The valid range is from 0 to 7. **Note** When a cable modem begins initializing, its default upstream service flow is assigned a QoS profile-2 priority of zero. Zero is the lowest priority scheduled.

Command Default

The default QoS profile-2 priority of the initializing cable modem is zero.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD2	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable qos pre-registration** command allows the Cisco CMTS operators to enforce a profile on all cable modems that have not yet begun initialization. However, this command has no affect on cable modems that have already started initialization and may be having difficulties getting [w-]online.

Examples

The following example shows how to set the priority of the QoS profile-2.

```
Router# configure terminal
Router(config)# cable qos pre-registration us-priority 2
Router(config)#
```

Related Commands

Command	Description
show cable qos profile	Displays the QoS profiles for a Cisco CMTS.

cable qos pro max-ds-burst

To define ERBA on the downstream for DOCSIS 1.0 cable modems, use the **cable qos pro max-ds-burst** command in global configuration mode. To remove this ERBA setting from the QoS profile, use the **no** form of this command.

cable qos pro max-ds-burst *burst-size*
no cable qos pro max-ds-burst

Syntax Description

burst-size	The downstream burst size of QoS profile in bytes.

Command Default

This DOCSIS 1.0 configuration is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced for the Cisco uBR7100 Series and Cisco uB7246VXR router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To display ERBA settings as applied to DOCSIS 1.0 cable modems and QoS profiles on the Cisco CMTS, use the **show cable qos profile** command in Privileged EXEC mode.

The following example of the **cable qos profile** command in global configuration mode illustrates changes to the **cable qos profile** command. Fields relating to the ERBA feature are shown in bold for illustration:

```
Router(config)# cable qos pro 10 ?
  grant-interval       Grant interval
  grant-size           Grant size
  guaranteed-upstream  Guaranteed Upstream
  max-burst            Max Upstream Tx Burst
  max-ds-burst        Max Downstream Tx burst (cisco specific)
  max-downstream       Max Downstream
  max-upstream         Max Upstream
  name                 QoS Profile name string (cisco specific)

  priority             Priority
  privacy              Cable Baseline Privacy Enable
tos-overwrite        Overwrite TOS byte by setting mask bits to value
```

The following example of the **show cable qos profile** command illustrates that the maximum downstream burst has been defined, and is a management-created QoS profile:

```
Router# show cable qos pro
ID  Prio Max       Guarantee Max
        Max   TOS  TOS   Create  B     IP prec.
         upstream  upstream  downstream
 tx    mask value by      priv  rate
         bandwidth bandwidth bandwidth
  burst                    enab  enab
```

```
1   0    0         0         0
          0     0xFF 0x0   cmts(r) no    no
2   0    64000     0         1000000
    0     0xFF 0x0   cmts(r) no    no
3   7    31200     31200     0
          0     0xFF 0x0   cmts    yes   no
4   7    87200     87200     0
          0     0xFF 0x0   cmts    yes   no
6   1    90000     0         90000
      1522
  0xFF 0x0   mgmt
    yes   no
10  1    90000     0         90000
      1522
  0x1  0xA0  mgmt
    no    no
50  0    0         0         96000
      0     0xFF 0x0   mgmt    no    no
51  0    0         0         97000
      0     0xFF 0x0   mgmt    no    no
```

The following example illustrates the maximum downstream burst size in sample QoS profile 10 with the **show cable qos prof verbose** command in privileged EXEC mode:

```
Router# show cable qos pro 10 ver
Profile Index                           10
Name
Upstream Traffic Priority               1
Upstream Maximum Rate (bps)             90000
Upstream Guaranteed Rate (bps)          0
Unsolicited Grant Size (bytes)          0
Unsolicited Grant Interval (usecs)      0
Upstream Maximum Transmit Burst (bytes) 1522
Downstreamam Maximum Transmit Burst (bytes) 100000
IP Type of Service Overwrite Mask       0x1
IP Type of Service Overwrite Value      0xA0
Downstream Maximum Rate (bps)           90000
Created By                              mgmt
Baseline Privacy Enabled                no
```

If a cable modem registers with a QoS profile that matches one of the existing QoS profiles on the Cisco CMTS, then the maximum downstream burst size, as defined for that profile, is used instead of the default DOCSIS QoS profile of 1522.

For example, a DOCSIS 1.0 configuration that matches QoS profile 10 in the previous examples would be as follows:

```
03 (Net Access Control)         = 1
04 (Class of Service Encodings Block)
   S01 (Class ID)               = 1
   S02 (Maximum DS rate)        = 90000
   S03 (Maximum US rate)        = 90000
   S06 (US burst)               = 1522
   S04 (US Channel Priority)    = 1
   S07 (Privacy Enable)         = 0
```

The maximum downstream burst size (as well as the ToS overwrite values) are not explicitly defined in the QoS configuration file because they are not defined in DOCSIS. However, because all other parameters are a perfect match to profile 10 in this example, then any cable modem that registers with these QoS parameters has a maximum downstream burst of 100000 bytes applied to it.

For further illustration, consider a scenario in which packets are set in lengths of 1000 bytes at 100 packets per second (pps). Therefore, the total rate is a multiplied total of 1000, 100, and 8, or 800kbps.

To change these settings, two or more traffic profiles are defined, with differing downstream QoS settings as desired. The table below provides two examples of such QoS profiles for illustration:

Table 9: Sample QoS Profiles with Differing ERBA (Maximum Downstream) Settings

QoS Profile Setting	QoS Profile 101	QoS Profile 102
Maximum Downstream Transmit Burst (bytes)	max-burst 4000	max-burst 4000
Maximum Downstream Burst (bps)	max-ds-burst 20000	max-ds-burst 5000
Maximum Downstream Bandwidth	max-downstream 100	max-downstream 100

In this scenario, both QoS profiles are identical except for the max-ds-burst size, which is set to 5000 in QoS profile 101 and 5000 in QoS profile 102.

Optimal Settings for DOCSIS 1.0 Downstream Powerburst

DOCSIS allows the setting different token bucket parameters for each service flow, including the token bucket burst size. When burst sizes are closer to 0, QoS is enforced in a stricter manner, allowing a more predictable sharing of network resources, and as a result easier network planning.

When burst sizes are larger, individual flows can transmit information faster (lower latency), although the latency variance can be larger as well.

For individual flows, a larger burst size is likely to be better. As long as the system is not congested, a large burst size reduces the chances of two flows transmitting at the same time, because each burst is likely to take less time to transmit. However, as channel bandwidth consumption increases, it is probably that large burst traffic would exceed the thresholds of buffer depths, and latency is longer than with well shaped traffic.

For additional information about the **cable qos profile** command and configuring QoS profiles, see the *DOCSIS 1.1 for the Cisco CMTS* document on Cisco.com.

Related Commands

Command	Description
cable qos profile	Configures a QoS profile.
show cable qos permission	Displays the status of permissions for changing QoS tables for a cable router.
show cable qos profile	Displays the QoS profiles that have been defined.

cable queue-limit

To set the DOCSIS service flow queue limits to non-default values on the Cisco CMTS, use the **cable queue-limit** command in global configuration mode. To disable this function, use the **no** form of this command.

cable queue-limit *queue_limit_in_ms* **bandwidth-threshold** *threshold_value*
no cable queue-limit *queue_limit_in_ms* **bandwidth-threshold** *threshold_value*

Syntax Description

queue_limit_in_ms	Queue limit in milliseconds. The valid range is from 1 to 200 milliseconds.
threshold_value	Queue bandwidth threshold in Kbps. The valid range is from 0 to 1000000. **Note** The queue limit specification take effect only if the queue shape rate exceeds the queue-bandwidth threshold.

Command Default

This command is not enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
12.2(33)SCG1	Support was added for the Cisco uBR7200 Series router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable queue-limit bandwidth-threshold** command is used to configure the DOCSIS WFQ Scheduler on the Cisco CMTS Routers feature.

The queue size on the downstream interfaces can be adjusted to be different than the default settings; for example, when the application can benefit from a larger queue size on a high speed queue.

The queue size in packets is calculated as:

queue-size = bandwidth (Kbps) * queue-limit (ms) / 8 / 1518

(where 1518 B is the packet size, and bandwidth is the same as queue shape rate).

Examples

The following example shows how to set the queue limit to 25 ms at max-rate when bandwidth exceeds 100000 Kbps:

```
Router(config)# cable queue-limit 25 bandwidth-threshold 100000
```

Related Commands

Command	Description
(For uBR10K Series Routers) **show cable modem queue**	Displays the queue information on the Cisco uBR7200 router.
(For uBR10K Series Routers) **show pxf cpu queue**	Displays parallel express forwarding (PXF) queuing, link queue statistics, and the service flow queue information including the queue size on the Cisco uBR10012 router.
(For uBR10K Series Routers) **show pxf cable interface**	Displays information about a particular service ID (SID), including information about the status of queues used by the SID on the Cisco uBR10012 router

cable ranging cm packet

From cBR 16.12.1w and later, the rates of per-CM and per-US SNR have been improved, and supports the **cable ranging cm packet** command, which configures the number of ranging packets to get the CM-based SNR.

cable ranging cm packet

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.12.1w	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to configure the number of ranging packets to get the CM-based SNR using the **cable ranging cm packet** command:

```
Router(config)# cable ranging cm packet
<1-20>  number of ranging packet
```

cable ranging upstream packet

From cBR 16.12.1w and later, the rates of per-CM and per-US SNR have been improved, and supports the **cable ranging upstream packet** command, which configures the number of ranging packets to get the US channel-base SNR.

cable ranging upstream packet

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.12.1w	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following **cable ranging upstream packet** command example shows how to configure the number of ranging packets to get the US channel-base SNR:

```
Router(config)# cable ranging upstream packet
<10-80>  packet number for ranging to average
```

cable rate-limit-algorithm min-plus-excess

To enable a service flow to receive not only its configured minimum reserved traffic rate bandwidth but also its expected excess traffic rate bandwidth, use the **cable rate-limit-algorithm min-plus-excess** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable rate-limit-algorithm min-plus-excess
no cable rate-limit-algorithm min-plus-excess

Syntax Description

min-plus-excess	Specifies that the service flow requires a bandwidth of the specified minimum reserved traffic rate, plus excess traffic rate.

Command Default

When the **cable rate-limit-algorithm min-plus-excess** command is not configured, service flows with the minimum reserved traffic rate configured are guaranteed only their minimum reserved traffic rate. Excess traffic rate bandwidth may not be shared evenly among service flows with or without the minimum rate configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD5	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to specify the **min-plus-excess** keyword:

```
Router> enable
Router# configure terminal
Router(config)# cable rate-limit-algorithm argument min-plus-excess
Router(config)#
```

Related Commands

Command	Description
show interface cable mac-scheduler	Displays the current time-slot scheduling state, statistics, and weighted fair queuing (WFQ) parameters for the indicated cable interface.
show interface cable service-flow	Displays the attributes of the DOCSIS service flows on a cable interface.

cable rcc-template

To define a receive channel configuration (RCC) template, use the **cable rcc-template** command in global configuration mode.

cable rcc-template *index*

Syntax Description

index	Specifies an RCC template ID in the range 1 to 255.

Command Default

If an RCC template is not assigned to a cable interface, the CMTS will use the wideband cable interface generated RCC for a receive channel profile (RCP).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **cable rcc-templates frequency-based** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A valid RCC template consists of a configured RCP ID, a receive module (RM) entry, and a receive channel (RC) entry.

First, you define an RCC template for an RCP, and then assign the template to a cable interface to generate RCCs based on the actual DS channel configuration.

Note When assigning an RCC template to a cable interface, use this command in interface configuration mode.

Examples

The following example shows how to define an RCC template:

```
Router# configure terminal
Router(config)# cable rcc-template 1
```

Related Commands

Command	Description
rcp-id	Specifies an ID for the Receive Channel Profile.
receive-module	Specifies a receive module entry in the form of a numeric value.
receive-channel	Specifies a receive channel entry in the form of a numeric value.

cable rcc-templates frequency-based

To allow users to create RCC templates based on frequency-based RCC templates, use the **cable rcc-templates frequency-based** command in interface configuration mode. To remove an RCC template, use the **no** form of the command.

cable rcc-templates frequency-based *ID*
no cable rcc-templates frequency-based *ID*

Syntax Description

frequency-based	Specifies frequency-based RCC templates (1 - 8).
ID	RCC template ID. The range is from 1 to 64.

Command Default

Associates an RCC template with a particular MAC domain.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable rcc-template** command.

Usage Guidelines

This command is used to define multiple RCC templates.

The following example shows how to define an RCC template:

```
Router(config)# cable rcc-templates frequency-based 1
Router(config-rcc-freq-based)# rcp-id 00 10 18 80 61
(config-rcc-freq-based)# cm-attribute-mask 00ffffff
(config-rcc-freq-based)# rcc-template 1
(config-rcc-freq-based-tmplt)# module 1 channel 1-4 start-frequency 111000000
(config-rcc-freq-based-tmplt)# module 2 channel 5-8 start-frequency 135000000

(config)# interface cable 7/0/0
(config-if)# cable rcc-templates frequency-based 1
```

Related Commands

Command	Description
cable rcp-id	Specifies an ID for the Receive Channel Profile.

cable rcp-control

To enable the receive channel profile (RCP) reporting with verbose description, use the **cable rcp-control** command in interface configuration mode. To revert to the default simple RCP reporting, use the **no** form of this command.

cable rcp-control verbose
no cable rcp-control

Syntax Description

verbose	Enables RCP reporting with verbose description that contains complete subtype encodings defined in DOCSIS 3.0.

Command Default

If this command is not used, cable modems use the default RCP reporting method that contains only the RCP identifiers.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enable a CM to send detailed RCP data in the registration request. This detailed RCP data can be verified using the **debug cable registration** command. This verbose RCP data is useful while configuring a receive channel configuration (RCC) template.

Examples

The following example shows how to enable RCP reporting with verbose description on a cable interface on the Cisco uBR10012 router:

```
Router# configure terminal

Router(config)# interface cable 8/0/0
Router(config-if)# cable rcp-control verbose
```

The following example shows how to enable RCP reporting with verbose description on a cable interface on the Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal

Router(config)# interface cable 3/0/0
Router(config-if)# cable rcp-control verbose
```

Related Commands

Command	Description
debug cable registration	Displays debug messages for the CM registration process.

Command	Description
(For Cisco uBR Series Routers) **cable rcc-template**	Defines a Receive Channel Configuration (RCC) template.
(For Cisco cBR Series Routers) **cable rcc-template frequency-based**	Defines a frequency based Receive Channel Configuration (RCC) template.

cable rcp-id

To configure vendor specific Receive Channel Profile's (RCP), use the **cable rcp-id** command in global configuration mode.

cable rcp-id *rcp id*
no cable rcp-id *rcp id*

Syntax Description

rcp id	Specifies a unique RCP ID in hexadecimal.

Command Default

The Standard Receive Channel Profile's (RCP) defined in DOCSIS 3.0 MULPI Specification Annex E are pre-defined in the system by default. These RCP's are un-configurable and can be displayed using the **show cable rcps** command.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The RCP's define the physical layer components that permit CM to receive multiple downstream channels. All standard RCP's defined in DOCSIS 3.0 MULPI specification are already pre-loaded into the system. Users can configure vendor specific RCPs using this command.

The following example shows a typical display for the **cable rcp-id** *rcp id* command for all cable interfaces:

```
Router(config)#cable rcp-id 00 10 18 80 61
Router(config-rcp)#name TI
Router(config-rcp)#center-frequency-spacing 6
Router(config-rcp)#number-of-channels 8
Router(config-rcp)#primary-capable-channels 1
Router(config-rcp)#module 1 minimum-center-frequency 111000000 maximum-center-frequency
999000000(config-rcp)#module 1 number-of-adjacent-channels 10
Router(config-rcp)#module 1 connected-module 1
Router(config-rcp)#module 2 minimum-center-frequency 111000000 maximum-center-frequency
999000000
Router(config-rcp)#module 2 number-of-adjacent-channels 10
Router(config-rcp)#module 2 connected-module 2 #show cable rcp-id 00 10 18 80 61
RCP-ID  : 00 10 18 10 61
  Name     : TI
  Number of association        : 1
  Center Frequency Spacing     : 6
  Number of Channels           : 8
  Primary Capable Channels     : 1
  Number of Modules            : 2
    Module [1]:
        Number-of-adjacent-channels : 10
        Minimum-center-frequency    : 111000000
        Maximum-center-frequency    : 999000000
        Connected Module            :  1
   Module [2]:
        Number-of-adjacent-channels : 10
```

```
Minimum-center-frequency    : 111000000
Maximum-center-frequency    : 999000000
Connected Module            :  2
```

Related Commands

Command	Description
center-frequency-spacing	Specifies center frequency spacing between each channel in RCP.
number-of-channels	Specifies the number of receive channels.

cable reconciliation enable

If the cable modem does not respond to pings from the Cisco Converged Broadband Router, the modem DSBG, DSID, and the BPI index values on the Cisco Converged Broadband Router may be incorrect. To recover the unresponsive modem, run the **cable reconciliation enable command** to generate the correct DSBG, DSID, and the BPI index values.

cable reconciliation enable

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to recover unresponsive modems using the **cable reconciliation enable** command for all cable interfaces:

```
Router(config)#configure terminal
Router(config)# cable reconciliation enable
Router(config)# end
```

Related Commands

Command	Description
cable reconciliation *time*	Specifies the time when the cable reconciliation enable command should run.

cable reconciliation time

To set the time when the **cable reconciliation enable** command should run, use the **cable reconciliation time** *hours* command, where *hours* is the time in the 24 hour format.

cable reconciliation time

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to set the time when the **cable reconciliation enable** command should run:

```
Router(config)#configure terminal
Router(config)# cable reconciliation time 23
Router(config)# end
```

Related Commands

Command	Description
cable reconciliation enable	Recover unresponsive modems.

cable reduction-mode energy-management dynamic-channel-percent

To set the percentage of dynamic channel bandwidth, use the **cable reduction-mode energy-management dynamic-channel-percent** command in the global configuration mode. Use the **no** form of the command to restore the default value.

[no] cable reduction-mode energy-management dynamic-channel-percent *value*

Syntax Description

value	Percentage to channel bandwidth when creating dynamic bonding groups for energy management. Valid range is from 1-96.

Command Default

The default value is set to 5.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable reduction-mode energy-management dynamic-channel-percent** command sets the percentage of dynamic channel bandwidth.

```
Router# configure terminal
Router(config)#cable reduction-mode energy-management dynamic-channel-percent
 10
```

cable reduction-mode energy-management enable

To enable the energy management feature, use the **cable reduction-mode energy-management enable** command in the global configuration mode. To disable the energy management feature, use the **no** form of the command.

[no] cable reduction-mode energy-management enable

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Global configuration (config)

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable reduction-mode energy-management enable** command enables the energy management mode.

The following example shows how to enable or disable the energy management feature:

```
Router# configure terminal
Router(config)# cable reduction-mode energy-management enable
Router(config)#no cable reduction-mode energy-management enable
```

Related Commands

Command	Description
show cable modem	Shows if a modem is working in the energy management mode.
Show cable modem reduction-mode energy-management-mode	Shows the the original wideband and upstream channel information.

cable reduction-mode energy-management process-queue-size

To set the queue size of the energy management requests, use the **cable reduction-mode energy-management process-queue-size** command in the global configuration mode. Use the **no** form of the command to restore the default value.

[no] cable reduction-mode energy-management process-queue-size *value*

Syntax Description

value	Queue size.

Command Default

The default value is set to 150.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable reduction-mode energy-management process-queue-size** command sets the queue size of the energy management requests.

```
Router# configure terminal
Router(config)#cable reduction-mode energy-management process-queue-size 500
```

cable reduction-mode energy-management ranging-init-technique

To configure the technique in init-ranging, use the **cable reduction-mode energy-management ranging-init-technique** command in global configuration mode. Use the **no** form of the command to restore the default value.

[no] cable reduction-mode energy-management ranging-init-technique *value*

Syntax Description

value Value of US init-ranging technique:

- 1—Broadcast
- 2—Unicast
- 3—Broadcast or unicast
- 4—Direct use

Command Default

The default value is set to 1.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable reduction-mode energy-management ranging-init-technique** command sets the technique in init-ranging.

```
Router#configure terminal
Router(config)#cable reduction-mode energy-management ranging-init-technique
 3
```

cable reduction-mode mta-battery

To configure channel bonding downgrade for cable modems in battery backup mode, use the **cable reduction-mode mta-battery** command in global configuration and interface configuration mode. To remove the configuration, use the **no** form of this command.

Note For DOCSIS 3.1 battery mode, the inter-op testing with real CM is limited due to CM limitation. Most of the testing was run by simulation.

cable reduction-mode mta-battery { { **dampen-time** *seconds* } | { **dynamic-channel-percent** *percent* } | { **enable** } | { **process-queue-size** *size* } | { **ranging-init-technique** *us-raning-init-technique* } | { **scqam-primary** } }

Syntax Description

dampen-time *seconds*	Specifies the dampen time in seconds. Valid range is from 30 to 300.
dynamic-channel-percent *percent*	Specifies the maximum and first try percentage of dynamic channel bandwidth in battery backup mode. Valid range is from 1 to 96.
enable	Enables the channel bonding downgrade for cable modems in battery backup mode.
process-queue-size *size*	Specifies the maximum transaction that can be processed at the same time. Valid range is from 50 to 10000.
ranging-init-technique *us-raning-init-technique*	Specifies the init-ranging technique. The valid values are: • 1 - Broadcast. • 2 - Unicast. • 3 - Broadcast or Unicast. • 4 - Direct use.
scqam-primary	Use SCQAM primary channel in battery backup mode when the modem is with OFDM primary channel. This option is disabled by default.

Command Default

No default behavior or values.

Command Modes

Global configuration (config)

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	This **scqam-primary** option is introduced.
12.2(33)SCI2	This command was introduced.
IOS-XE 3.16.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable reduction-mode mta-battery** command to enable channel bonding downgrade for cable modems in battery backup mode. In addition, you can configure dampen time, init-range technique, maximum and first try percentage using this command.

Examples

The following example shows how to enable the channel bonding downgrade for cable modems in battery backup mode globally:

```
Router(config)# cable reduction-mode mta-battery enable
Router(config)#
```

The following example shows how to configure dampen time:

```
Router(config)# cable reduction-mode mta-battery dampen-time 30
Router(config)#
```

The following example shows how to configure the init-ranging technique:

```
Router(config)# cable reduction-mode mta-battery ranging-init-technique 3
Router(config)#
```

The following example shows how to configure the maximum and first try percentage of dynamic channel bandwidth in battery backup mode:

```
Router(config)# cable reduction-mode mta-battery dynamic-channel-percent 20
Router(config)#
```

The following example shows how to enable the channel bonding downgrade for cable modems in battery backup mode for each MAC domain:

```
Router(config-if)# cable reduction-mode mta-battery enable
Router(config-if)#
```

The following example shows how to enable support for DOCSIS 3.1 CM to single carrier (1 SCQAM DS + 1 SCQAM US) when it runs in Battery Reduction Mode:

:

```
Router(config-if)# cable reduction-mode mta-battery scqam-primary
Router(config-if)#
```

Related Commands

Command	Description
show cable modem reduction-mode mta-battery	Displays the channel bonding downgrade information for cable modems in battery backup mode.

cable redundancy hashfilter

To set the MAC address and DDC node mappings of the DDC redundancy scheme, use the **cable redundancy hashfilter** command in global configuration mode. This hash filter is to be shared by all DDC nodes (routers) in the redundancy scheme. To remove the hash filter from the Cisco CMTS router, use the **no** form of this command.

cable redundancy hashfilter *hash_id* {**type** *namestring* | **mac-mask** *mac-mask* | **mac-map** *mac-address* **node** *node_id* | **oui-map** *oui* **node** *node_id*}
no cable redundancy hashfilter

Syntax Description

hash_id	Unique ID for the shared hash filter. Multiple (differently named) hash filters are supported in the same Cisco DDC Redundancy scheme at the same time, though only one hash filter can be enabled at any one time. The valid range is from 1 to 3.
type *namestring*	Alphanumeric hash filter name. Only the namestring of **default** is supported at this time.
mac-mask *mac-mask*	Specifies the number of bits in the cable modem's MAC address to be used by the hashing algorithm.
mac-map *mac-address*	A manually configured MAC address for the DDC node (overrides any default MAC address configured on the router).
node *node_id*	This value overrides the node that all cable modems with the shared *mac-address* or *oui* value will use, and updates the MAC address mapping in the hash filter.
oui-map *oui*	This value overrides the node that all cable modems with the shared OUI value will use, and updates the OUI address mapping in the hash filter.

Command Default

- Cable redundancy hash filters are disabled (not configured) by default.
- Only the hash filter name of **default** is supported at this time.

Command Modes

Global configuration (config)

Command History

Release	Modification
Release 12.3(9a)BC	This command was introduced on the Cisco uBR7246 universal broadband router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used in the early stages of configuring DDC Redundancy on all DDC nodes (routers) in the scheme. For additional information in context, refer to the *Configuring Cisco DDC Redundancy on the Cisco uBR7246VXR Universal Broadband Router* feature documentation on Cisco.com.



Note This configuration must be present and identical on each CMTS router participating in the DDC redundancy scheme.

Examples

The following example implements the **cable redundancy hashfilter** command in four sequential steps, completing the entire mapping information required for one DDC node in a redundancy scheme of two routers:

```
Router# cable redundancy hashfilter 1 type default
Router# cable redundancy hashfilter 1 macmask FFFF.FF00.0000
Router# cable redundancy hashfilter 1 macmap 0007.0e03.68ad node 2
Router# cable redundancy hashfilter 1 ouimap 00070e node 1
```

Related Commands

Command	Description
cable redundancy myid	Sets the total number of Cisco DDC nodes (routers) in the DDC Redundancy scheme, and sets the ID of the current DDC node.
cable redundancy node	Configures the DDC node with active or standby state.
show cable redundancy	Displays the current DDC redundancy configurations and status.

cable redundancy myid

To set the total number of Cisco DDC nodes (routers) in the DDC Redundancy scheme, and to set the ID of the current DDC node, use the **cable redundancy myid** command in global configuration mode. To remove a DDC node ID from the router, use the **no** form of this command.

cable redundancy myid *node_id* **nodes** *nodes*
no cable redundancy myid *node_id*

Syntax Description

node_id	A unique identifier for the Cisco DDC node currently being configured. The value must be 1 or greater (not to exceed the value used for nodes). This value must be unique on each CMTS that participates in the scheme.
nodes	Total number of Cisco CMTS routers participating in the DDC redundancy scheme (range 1 to 3). This value must be identical on all DDC nodes (routers).

Command Default

DDC Redundancy is disabled and DDC nodes (routers) are not configured for DDC redundancy by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Release 12.3(9a)BC	This command was introduced on the Cisco uBR7246 universal broadband router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This configuration must be present (identical except *node_id*) on all DDC nodes (routers) participating in the scheme.

This command is used in the early stages of configuring DDC Redundancy on all DDC nodes (routers) in the scheme. For additional information in context, refer to the *Configuring Cisco DDC Redundancy on the Cisco uBR7246VXR Universal Broadband Router* feature documentation on Cisco.com.

Examples

The following example configures the DDC node (router) ID to be 2 in a scheme in which there are three DDC nodes total.

```
Router# cable redundancy myid 2 nodes 3
```

Related Commands

Command	Description
cable redundancy node	Configures the DDC node with active or standby state.
show cable redundancy	Displays the current DDC redundancy configurations and status.

cable redundancy node

To set the DDC node (router) with which a subinterface is associated, and to set the state for that interface, use the **cable redundancy node** command in subinterface configuration mode. To remove this configuration from the router, use the **no** form of this command.

cable redundancy node *node_id* {**active** | **standby**} [**force**]
no cable redundancy node *node_id* {**active** | **standby**}

Syntax Description

node_id	DDC node (router) with which the subinterface is associated. The range is the number of DDC nodes in the scheme.
force	Optional keyword forces the subinterface into the standby state regardless of the number of active voice or E911 calls.

Command Default

DDC switchover events are disabled by default and must be manually initiated on a case-by-case basis.

Command Modes

Subinterface configuration (config-subif)

Command History

Release	Modification
Release 12.3(9a)BC	This command was introduced on the Cisco uBR7246 universal broadband router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command can be used in the context of DDC configuration, testing or forced switchover events. Refer to earlier procedures in this document for additional information.



Note Use of this command is subject to additional constraints described in the *Active Voice Call Protection in Cisco DDC Redundancy* section of the *Configuring Cisco DDC Redundancy on the Cisco uBR7246VXR Universal Broadband Router* feature documentation on Cisco.com.

Examples

The following command sequence sets the DDC node states in a scheme with two DDC nodes (routers), then forces a switchover event on DDC node 1 that puts it into standby state.

```
Router(config-subif)# cable redundancy node 2 active
Router(config-subif)# cable redundancy node 1 standby
Router(config-subif)# cable redundancy node 1 standby force
```

Related Commands

Command	Description
cable redundancy myid	Sets the total number of Cisco DDC nodes (routers) in the DDC Redundancy scheme, and sets the ID of the current DDC node.

Command	Description
show cable redundancy	Displays the current DDC redundancy configurations and status.

cable redundancy node frequency

To set the downstream frequencies for each node participating in the scheme other than the current DDC node (router), use the **cable redundancy node frequency** command in interface configuration mode. This frequency is used to switch cable modems to the downstream frequency of the backup interface (on another DDC node) via DFO and DCC messages. To remove this setting from the router, use the **no** form of this command.

cable redundancy node *node_id* **frequency** *frequency*
no cable redundancy node *node_id* **frequency** *frequency*

Syntax Description

node_id	DDC target node ID for which the frequency is being set.
frequency	Downstream frequency of the target interface.

Command Default

Cable downstream frequency override is enabled by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Release 12.3(9a)BC	This command was introduced on the Cisco uBR7246 universal broadband router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command must be present on each cable interface participating in the scheme, regardless of its bundle status.

Examples

The following example configures the downstream frequency of DDC node 1 to be 435000000.

```
Router(config-if)# cable redundancy node 1 frequency 435000000
```

Related Commands

Command	Description
cable redundancy myid	Sets the total number of Cisco DDC nodes (routers) in the DDC Redundancy scheme, and sets the ID of the current DDC node.
cable redundancy node	Configures the DDC node with active or standby state.
cable redundancy target	Configures the DDC node by setting the target DDC node (router) to use in a DDC switchover event.
cable redundancy threshold	Configures the DDC node by setting the active voice call threshold on the current DDC node (router)
show cable redundancy	Displays the current DDC redundancy configurations and status.

cable redundancy target

To set the target DDC node (router) to use in a DDC switchover event, use the **cable redundancy target** command in interface configuration mode. To remove this configuration from the router, use the **no** form of this command.

cable redundancy target *node_id*
no cable redundancy target *node_id*

Syntax Description

node_id	Target node ID (in relation to the current DDC node)

Command Default

When this command is not present, the default target node is the next higher node in the scheme.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Release 12.3(9a)BC	This command was introduced on the Cisco uBR7246 universal broadband router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The downstream frequency that is used in a DDC switchover event is the frequency set on the respective target DDC node, as set with this command.

Note This command may be present on each participating cable interface, regardless of its bundle status.

When this command is not present, the default target node is the next higher node in the scheme (the next higher *node_id* value in the scheme). For example, if there are three participating nodes, the default target nodes are as follows (respectively):

- If the current node is 1, the target node is 2.
- If the current node is 2, the target node is 3.
- If the current node is 3, the target node is 1.

Examples

The following example configures the target node on the current router to be DDC node 1, often referred to as CMTS A in additional sections of this document.

```
Router(config-if)# cable redundancy target 1
```

Related Commands

Command	Description
cable redundancy myid	Sets the total number of Cisco DDC nodes (routers) in the DDC Redundancy scheme, and sets the ID of the current DDC node.
cable redundancy node	Configures the DDC node with active or standby state.

Command	Description
cable redundancy node frequency	Configures the DDC scheme by setting the DS frequencies for each node in the scheme other than the current DDC node (router).
cable redundancy threshold	Configures the DDC node by setting the active voice call threshold on the current DDC node (router).
show cable redundancy	Displays the current DDC redundancy configurations and status.

cable redundancy threshold

To set the active voice call threshold on the current DDC node (router), use the **cable redundancy threshold** command in interface configuration mode. To remove this configuration from the router, use the **no** form of this command.

cable redundancy threshold *max-calls*
no cable redundancy threshold

Syntax Description

max-calls	The threshold value for the number of active voice calls.

Command Default

The threshold for maximum calls is not set by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Release 12.3(9a)BC	This command was introduced on the Cisco uBR7246 universal broadband router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If the number of active voice calls exceeds this value, a DDC switchover does not take place unless it is forced by using the **cable redundancy node** *node_id* **standby force** subinterface configuration command.

If the command is configured on a bundle primary, the threshold is used to compare with the total number of voice calls in the bundle. This command is not accepted on interfaces configured as bundle subordinates.

If this threshold is not configured, this check does not occur and the DDC switchover proceeds regardless of how many voice calls are active. This is subject to additional constraints described in the *Call Priority in Cisco DDC Redundancy* section of the *Configuring Cisco DDC Redundancy on the Cisco uBR7246VXR Universal Broadband Router* feature documentation on Cisco.com.

Examples

The following example configures DDC redundancy not to take place if there are more than 20 active or E911 calls at the time a DDC switchover event is attempted or requested.

```
Router(config-if)# cable redundancy threshold 20
```

Related Commands

Command	Description
cable redundancy myid	Sets the total number of Cisco DDC nodes (routers) in the DDC Redundancy scheme, and sets the ID of the current DDC node.
cable redundancy node	Configures the DDC node with active or standby state.
cable redundancy node frequency	Configures the DDC scheme by setting the DS frequencies for each node in the scheme other than the current DDC node (router).

Command	Description
cable redundancy target	Configures the DDC node (node_id) by setting the target DDC node (router) to use in a DDC switchover event.
show cable redundancy	Displays the current DDC redundancy configurations and status.

cable registration-timeout

To set the value of the DOCSIS registration timeout timer (T9 timer) on a particular interface, use the **cable registration-timeout** command in cable interface configuration mode. To reset the timeout value to the default, use the **no** form of this command.

cable registration-timeout *minutes*
no cable registration-timeout

Syntax Description

minutes	Sets the value of the DOCSIS CM registration timeout timer (T9 timer). The range is from 2 to 60. The default is 3.

Command Default

3 minutes

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.0(7)XR2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS 1.1 specification states that the CMTS should enforce the T9 timer, which is a registration timeout timer that specifies the maximum time allowed between the CMTS sending a successful Ranging Response (RNG-RSP) message and the CM replying with a Registration Request (REG-REQ) message. If this timer expires, the CMTS must remove the CM from its list of active CMs, and the CM must restart the registration process.

The **cable registration-timeout**command can be used to customize the value of the T9 timer for each cable interface, to accommodate the CMs using that interface.

Examples

The following example shows the registration timeout value being increased from 3 minutes to 10 minutes:

```
Router# configure terminal
Router (config)# interface c6/0
Router(config-if)# cable registration-timeout 10
Router(config-if)# exit
Router(config)#
```

cable relay-agent-option

To enable the system to insert the CM MAC address into a Dynamic Host Configuration Protocol (DHCP) packet received from a CM or host and forward the packet to a DHCP server, use the **cable relay-agent-option** command in cable interface configuration mode. To disable MAC address insertion, use the **no** form of this command.

cable relay-agent-option
no cable relay-agent-option

Syntax Description

This command has no keywords or arguments.

Command Default

MAC address insertion is disabled (**no cable relay-agent-option**).

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0 mainline, 12.1(2)EC1, 12.0(10)SC	This command was made obsolete and was replaced by the **ip dhcp relay information option** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This functionality enables the use of DHCP Option 82 to allow a DHCP server to identify the CM sending the request and to initiate the appropriate action based on this information. On Cisco IOS Release 12.0 and later releases, use the **ip dhcp relay information option** command to enable Option 82 processing.

Examples

The following example shows how to enable the insertion of DHCP relay agent information into DHCP packets:

```
Router(config-if)# cable relay-agent-option
```

Related Commands

Command	Description
cable helper-address	Specifies a destination IP address for User Datagram Protocol (UDP) broadcast (DHCP) packets.
cable dhcp-giaddr	Modifies the GIADDR field of DHCPDISCOVER and DHCPREQUEST packets with a Relay IP address before they are forwarded to the DHCP server.
cable source-verify	Turns on CM upstream verification.
cable telco-return spd dhcp-authenticate	Enforces the telco-return CM to use a specific DHCP server.

Command	Description
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CM must access.
ip dhcp relay information option	Enables the system to insert the CM MAC address into a DHCP packet received from a CM or host and forward the packet to a DHCP server.
ip dhcp smart-relay	Monitors client retransmissions when address pool depletion occurs.

cable resiliency cm-max-rbg-moves

You can use the **cable resiliency cm-max-rbg-moves** command to configure the maximum number of times a CM can be moved to any RBG within the configured interval.

If a CM is currently at the configured limit, and it reports a new DS impairment, the CM moves to narrow band (primary DS only). CM-STATUS recovery events are still handled for CMs that are currently at the configured limit.

To disable this feature, use the **no** form of this command.

cable resiliency cm-max-rbg-moves *moves* **interval** *interval*

no cable resiliency cm-max-rbg-moves *moves* **interval** *interval*

Syntax Description

cm-max-rbg-moves *moves*	Number of times a CM can be moved to any RBG.The range is 1-10.
interval *interval*	Configurable interval in minutes. The range is 1-65535.

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1w	This command is introduced for the Cisco cBR Series Converged Broadband routers.

Usage Guidelines

Use this command to enter configuration mode.

Examples

The following example shows how to enter configuration mode:

```
router# configure terminal
router(config)#
```

The following example shows how to deny any CM from moving to RBG more than 5 times in one day

```
router(config)#cable resiliency cm-max-rbg-moves 5 interval 1440
router(config)#end
```

USe the following command to verify the configuration

```
router#show run | s cm-max-rbg-moves
cable resiliency cm-max-rbg-moves 5 interval 1440
```

Related Commands

Command	Description
show cable modem rbg-activity	View CM RBG usage statistics.

cable resiliency exclude

You can use the **cable resiliency exclude** command to exclude cable modems from Downstream Resiliency operations. This ensures that RBG and NB are not used and the resiliency activity reduces. The exclusion list is stored on the SUP.

The benefit of excluding cable modems is that you can manage the downstream resiliency feature better and improve CPU efficiency. The following scenarios are examples of when you can use this feature and exclude cable modems from Downstream Resiliency operations.

- If cable modems report an excessive amount of impairment or recovery events, then you can move cable modems to the exclusion list. You can use the **show cable resiliency counts** command to identify which downstream channels and cable modems have the most impairments.
- During planned maintenance windows, you can move cable modems to the exclusion list.

To disable this feature and remove the modem from the exclusion list, use the **no** form of this command.

cable resiliency exclude { **modem** *mac-address* | **oui** *id* }

no cable resiliency exclude { **modem** *mac-address* | **oui** *id* }

Syntax Description

modem *mac-address*	Excludes the cable modem with the specified MAC address from Downstream Resiliency operations.
oui *id*	Excludes the specified Organizational Unique Identifier (OUI) from Downstream Resiliency operations.

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1x	This command is introduced for the Cisco cBR Series Converged Broadband routers.

Usage Guidelines

Use this command to enter configuration mode.

Examples

```
router# configure terminal
router(config)#
```

The following example shows how to exclude a cable modem with a specified MAC address from Downstream Resiliency operations.

```
router(config)#cable resiliency exclude modem 34bd.fa0f.4784
router(config)#end
```

The following example shows how to exclude a cable modem with a specified OUI from Downstream Resiliency operations.

```
router(config)#cable resiliency exclude oui 34.bd.fa
router(config)#end
```

Use the following command to verify the configuration and view the list of excluded modems.

```
router# show cable resiliency exclude
Load for five secs: 14%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 21:59:51.293 EDT Sun Nov 30 2023

MAC Address         I/F       State          Primary WB
34bd.fa0f.4784      C8/0/1    w-online(pt)   Wi8/0/1:4
34bd.fa0f.3726      C8/0/1    w-online(pt)   Wi8/0/1:4
34bd.fa0f.5690      C8/0/0    w-online(pt)   Wi8/0/0:3
34bd.fa0f.8899      C8/0/0    w-online(pt)   Wi8/0/0:5
```

Related Commands

Command	Description
show cable resiliency exclude	Use this command to display a list of cable modems excluded from Downstream Resiliency operations.

cable resiliency ds-bonding

To enable the Downstream Resiliency Bonding Group feature and to create a resiliency bonding group (RBG) on the Cisco CMTS router, use the **cable resiliency ds-bonding** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable resiliency ds-bonding
no cable resiliency ds-bonding

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable ds-resiliency** command is used to configure the Downstream Resiliency Bonding Group feature.

Examples

The following example shows how to configure the Downstream Resiliency Bonding Group feature:

```
Router(config)# cable resiliency ds-bonding
```

Related Commands

Command	Description
cable ds-resiliency	Reserves a resiliency bonding group for a line card on the Cisco CMTS router.
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.
show cable resiliency	Displays all information about resiliency bonding groups on the Cisco CMTS router.

cable resiliency free-interval

To set the wait time before a created resiliency bonding group is freed/recycled, use the **cable resiliency free-interval** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable resiliency free-interval *seconds*
no cable resiliency free-interval

Syntax Description

seconds	Specifies the wait time in seconds before a created resiliency bonding group is freed/recycled. The recommended value is 360.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1y	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command applies to all non-primary RF channels on a Cisco CMTS router.

Examples

The following example shows how to specify the wait time in seconds before a created resiliency bonding group is freed/recycled:

```
Router# configure terminal
Router(config)# cable resiliency free-interval 360
```

Related Commands

Command	Description
cable rf-change-up-multiplier	Specifies the rf-channel up dampen time as an integer multiplier of the rf-channel down dampen time.

cable resiliency idle-interval

You can set the time in seconds for the **cable ds-resiliency idle-interval** *seconds* command to move an unused Resiliency Bonding Group's (RBG) state from `Assigned` to `In_Delete` in global configuration mode. To disable this feature, use the **no** form of this command.

cable resiliency idle-interval *seconds*
no cable resiliency idle-interval

Syntax Description

seconds	Specify the time in seconds for the **cable ds-resiliency** command to move an unused RBG's state from `Assigned` to `In_Delete`. The valid range is 1 to 3600. The default value is 300.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced for the Cisco cBR Series Converged Broadband Routers

Usage Guidelines

Use the **cable ds-resiliency idle-interval** *seconds* command to move an unused Resiliency Bonding Group's (RBG) state from `Assigned` to `In_Delete`. This command applies to all non-primary RF channels on a Cisco CMTS router.

Examples

The following example shows how to configure the **cable resiliency idle-interval** command:

```
Router# configure terminal
Router(config)# cable resiliency idle-interval 480
```

Related Commands

Command	Description
cable ds-resiliency	Reserves a resiliency bonding group for a line card on the Cisco CMTS router.

cable resiliency rbg-throttle

You can use the **cable resiliency rbg-throttle** command to reduce SUP CPU usage during CM Mass Registration Events. You can configure the SUP CPU threshold and CM online rate threshold.

To disable this feature, use the **no** form of this command.

cable resiliency rbg-throttle { **auto** { **cm-threshold** *cm-threshold* | **cpu-threshold** *cpu-threshold* | **nb-to-rbg-rate** *nb-to-rbg-rate* | **settle-time** *time* } | **rate** *rate* [**auto**] }

no cable resiliency rbg-throttle

Syntax Description

auto	Resiliency bonding group throttle auto mode.
rate	Resiliency bonding group throttle rate.
rate	The number of RBGs that are created per minute. The range is 0-100.
cm-threshold	Auto mode CM online threshold.
cm-threshold	Average CM online rate per minute. The range is 0-500.
cpu-threshold	Auto mode cpu threshold.
cpu-threshold	Average cpu usage per minute. The range is 0-100.
nb-to-rbg-rate	Rate of moving CMs from throttled-cm list to RBGs.
nb-to-rbg-rate	**Cisco IOS XE Dublin 17.12.1y Release and earlier**: Number of CMs moved every 30 seconds. The range is 1-10. **Cisco IOS XE Dublin 17.12.1z Release and later**: Number of CMs moved every 60 seconds. The range is 1-20.
settle-time	Auto mode settling state duration.
time	Settle state duration in minutes. The range is 0-65535.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	This rate and range for *nb-to-rbg-rate* values are updated.
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced for the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter configuration mode.

Examples

The following example shows how to enter configuration mode:

```
Router# configure terminal
Router(config)#
```

The following example shows how to configure RBG Throttle auto mode and set CM threshold, CPU threshold values, and settle time values.

```
Router(config)#cable resiliency rbg-throttle rate 10 auto
Router(config)#cable resiliency rbg-throttle auto cm-threshold 25
Router(config)#cable resiliency rbg-throttle auto cpu-threshold 95
Router(config)#cable resiliency rbg-throttle auto settle-time 2
Router(config)#cable resiliency rbg-throttle auto nb-to-rbg-rate 2
Router(config)#end
```

Use the following commands to verify the configuration.

- This is an example for **Cisco IOS XE Dublin 17.12.1z Release and later**:

```
Router# show cable resiliency throttled-cm stats
RBG Throttle:            Enabled
RBG Throttle Auto Mode:  Enabled

RBG Throttle Auto Mode State:  STEADY
RBG Throttle Auto Mode Settling State Duration:  3 (minutes)
RBG Throttle Auto Mode NB to RBG Rate:  10 (per minute)

Metric:             Configured Threshold:    Current Value:
RBG Creation Rate        100                        0
CPU Usage                090%                       19
CM Online Rate           500                        0

Throttled CM Statistics    Rate (per minute)    Total
CMs Added to List:         0000                 0
CMs Removed from List:     0000                 0
Attempts to Remove:        0005                 10
RBG Creation:              0000                 4
```

- This is an example for **Cisco IOS XE Dublin 17.12.1y Release and earlier**:

```
Router# show cable resiliency throttled-cm stats
RBG Throttle:            Enabled
RBG Throttle Auto Mode:  Enabled

RBG Throttle Auto Mode State:  STEADY
RBG Throttle Auto Mode Settling State Duration:  2 (minutes)
RBG Throttle Auto Mode NB to RBG Rate:  2 (per 30 seconds)

Metric:             Configured Threshold:    Current Value:
RBG Creation Rate        010                        0
CPU Usage                095%                       3
CM Online Rate           025                        0
```

```
Router# show cable resiliency throttled-cm list
Number of Throttled CMs: 3

MAC Address Timestamp
-------------- ---------
c8fb.26a3.cd54 Jul 28 23:25:58
```

```
c8fb.26a3.961a Jul 28 23:26:06
c8fb.26a3.aa82 Jul 28 23:26:11
```

Related Commands

Command	Description
cable ds-resiliency	Reserves a resiliency bonding group for a line card on the Cisco CMTS router.
show cable resiliency throttled-cm	Displays all information about resiliency bonding groups on the Cisco CMTS router.

cable resiliency traps-interval

To set the interval at which traps must be sent for Wideband Resiliency related events for each cable modem on the Cisco CMTS, use the **cable resiliency traps-interval** command in global configuration mode. To disable the interval, use the **no** form of this command.

cable resiliency traps-interval *count*
no cable resiliency traps-interval

Syntax Description

count	Time interval (in seconds) at which the traps must be sent for each cable modem. The range is from 0 to 86400. The default is 1.

Command Default

By default, the resiliency trap interval is enabled and set as 1 second.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable resiliency traps-interval** command is associated with the Wideband Modem Resiliency feature.

When the network has less number of cable modems with resiliency events occurring at a given time, use the default value of 1 second interval. But if the network has many cable modems with resiliency events occurring at a given time, set the interval to a higher value.

Examples

The following example shows how to set the time interval to 10 second for sending traps for each cable modem:

```
Router(config)# cable resiliency traps-interval 10
```

Related Commands

Command	Description
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.

cable rf-adapt timer

To configure timers for RF adaptation, use the **cable rf-adapt timer** command in global configuration mode. To disable the timers, use the **no**form of this command.

cable rf-adapt timer {**general** *time* | **candidate** *time* | **relocation** *time*}
no cable rf-adapt timer

Syntax Description

general	Period when the RF adaptation process examines the physical layer statistics of all modems on RF adaptation-enabled upstream channels. The valid range is from 1 to 300 seconds. The default value is 10 seconds.
candidate	Period when the RF adaptation process examines the physical layer statistics of modems flagged as downgrade and/or upgrade candidates. The valid range is from 1 to 300 seconds. The default value is 1 second.
relocation	Period when the RF adaptation process performs a single relocation of a candidate modem from its current upstream channel to the appropriate destination. The valid range is from 1 to 300 seconds. The default value is 1 second.
time	Time in seconds. The valid range is from 1 to 300.

Command Default

Default timer values are used.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set timers for cable modem upstream RF adaptation:

```
Router(config)# cable rf-adapt timer general 120
Router(config)# cable rf-adapt timer candidate 10
Router(config)# cable rf-adapt timer relocation 5
```

Related Commands

Command	Description
cable upstream rf-adapt	Enables RF adaptation on the physical upstream channel.
cable upstream rf-adapt (logical channel)	Configures the primary upstream logical channel and secondary upstream logical channel.

Command	Description
cable upstream threshold	Configures the upstream for the signal-to-noise ratio (SNR) and forward error correction (FEC) threshold values to be used in determining the allowable noise levels.
cable upstream threshold hysteresis	Configures the hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds.
cable upstream threshold rf-adapt	Configures the upstream RF adaptation threshold value, which prevents excessive relocation of modems from the primary upstream channel to the secondary upstream channel.
show cable modem rf-adapt	Displays the RF adaptation history.
show cable rf-adapt	Displays the downgrade and upgrade candidate lists.

cable rf-bandwidth-percent

To enable either static or dynamic bandwidth sharing for a modular cable (MC) or integrated cable (IC) interface, use the **cable rf-bandwidth-percent** command in interface configuration mode or MAC domain profile configuration mode. To remove bandwidth sharing for the MC or IC interface, use the **no** form of this command.

cable rf-bandwidth-percent *percent-value* [**remaining ratio** *excess-value*]
no cable rf-bandwidth-percent

Cisco cBR Series Converged Broadband Routers
cable rf-bandwidth-percent *percent-value*

Syntax Description

percent-value	Specifies static bandwidth allocation of a downstream RF channel. The range is 1–96. The default is 0.
remaining ratio	(Optional) Specifies the ratio of the remaining or excess bandwidth that can be allocated to the modular cable channel. (For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) **Note** This option is only available when dynamic bandwidth sharing is enabled.
excess-value	(For Cisco uBR10012 Router and Cisco uBR7200 Series Routers) Specifies the value of excess bandwidth that can be allocated to the modular cable channel. The valid range is from 1 to 100. The default is 1.

Command Default

The default static bandwidth percentage for a modular cable or integrated cable interface is 0.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.3(23)BC1	The **remaining ratio** option was added.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The total percentage of the RF channel bandwidth allocated to both the modular cable (MC) and wideband interfaces must not exceed 96 percent. The remaining 4 percent of the bandwidth is reserved for minislot allocation packet (MAP) and other MAC management messages (MMM) DOCSIS traffic using this RF channel as its primary channel.

When dynamic bandwidth sharing (DBS) is enabled on the MC or IC interface, the bandwidth percentage is converted to a committed information rate (CIR) value for the corresponding link queue. By re-interpreting the bandwidth percentage value as a CIR value for the interface, the interface receives, at minimum, the configured percent of bandwidth and more when the RF channel's bandwidth is not consumed by other interfaces sharing the same RF channel. The **remaining ratio** option (applicable only for Cisco uBR7K and uBR10K Series Routers) is only available when DBS is enabled using the **cable dynamic-bw-sharing** command.



Note For Cisco cBR Series Converged Broadband Routers, DBS is always enabled but the remaining ratio is not configurable.

(For Cisco uBR7K and uBR10K Series Routers) If the **cable rf-bandwidth-percent** command is not configured and DBS is enabled, no bandwidth is reserved for the MC interface and it is effectively in the protocol down state—the MC link queue is not created. Static bandwidth sharing (the default) or DBS can be configured on an MC interface, but you cannot have both on the same interface.

Examples

The following is an example of static bandwidth allocation configuration:

```
Router# configure terminal
Router(config)# interface modular-cable 1/0/0:0
Router(config-if)# cable rf-bandwidth-percent 70
```

The following is an example of dynamic bandwidth sharing configuration:

```
Router# configure terminal
Router(config)# interface modular-cable 1/0/0:0
Router(config-if)# shutdown
Router(config-if)# cable dynamic-bw-sharing
Router(config-if)# no shutdown
Router(config-if)# cable rf-bandwidth-percent 70 remaining ratio 25
```

The following is an example of static bandwidth allocation configuration in cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# interface Integrated-cable 3/0/0:0
Router(config-if)# cable rf-bandwidth-percent 70
```

Related Commands

Command	Description
cable dynamic-bw-sharing	Enables dynamic bandwidth sharing on a specific modular cable or wideband cable interface.
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel and allocates bandwidth.

Command	Description
show pxf cable controller	Displays information about the RF channel Versatile Traffic Management System (VTMS) links and link queues.
show pxf cpu queue	Displays parallel express forwarding (PXF) queueing and link queue statistics.

cable rf-change-dampen-time

To configure the amount of time a radio frequency (RF) channel must remain in its new state (either up or down), use the **cable rf-change-dampen-time** command in global configuration mode. To restore the default value, use the **no** form of this command.

cable rf-change-dampen-time *seconds*
no cable rf-change-dampen-time

Syntax Description

seconds	Specifies the amount of time in seconds for a non-primary RF channel to remain in its new state. The valid range is 1 to 65535. The default value is 60.

Command Default

If this command is not used, the default value of 30 seconds is restored.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE 17.3.1z	The default value was updated.

Usage Guidelines

This command applies to all non-primary RF channels on a CMTS.

Examples

The following example shows how to specify the amount of time for a non-primary RF channel to remain in its new state:

```
Router# configure terminal
Router(config)# cable rf-change-dampen-time 10
```

Related Commands

Command	Description
cable rf-change-trigger	Specifies the persistence thresholds for an event before the event triggers an action for the cable modem.

cable rf-change-trigger

To specify the amount of time an event must persist before it triggers an action for the reporting cable modem, use the **cable rf-change-trigger** command in global configuration mode. To restore the default value, use the **no** form of this command.

cable rf-change-trigger {**percent** *value* | **count** *number*} [**secondary**]
no cable rf-change-trigger {**percent** *value* | **count** *number*} [**secondary**]

Syntax Description

percent *value*	Indicates the percentage of cable modems that must report that a particular non-primary RF channel is down before that channel is suspended from the bonding group. The valid range is 1 to 100. The default is 50.
count *number*	Specifies the number of cable modems that must report that a particular non-primary downstream channel is down before that channel is suspended from the downstream bonding groups. The default is 0
secondary	(Optional) Configures the Cisco CMTS to move the unicast secondary service flows to the primary channel interface, when the number of cable modems reporting RF channel impairment is less than the configured (percent or count) threshold. By default, the **secondary** keyword is not configured. **Note** Only those unicast secondary service flows, which share the same wideband interface as the primary interface, are moved to the primary channel interface.

Command Default

If this command is not used, the default value 0 is used.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCE4	This command was modified. A new keyword **secondary** was added to move the unicast secondary SFs, which share the same interface as the primary SF, to the primary channel interface when the trigger threshold is not reached.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE 17.3.1z	The default value was updated.

Usage Guidelines

The **cable rf-change-trigger** command is used to configure the Wideband Modem Resiliency feature.

This command applies to all non-primary RF channels on a Cisco CMTS router. The default value of 0 prevents any bonding group modifications. In order to dampen the change of a logical state of an RF channel, the trigger for the channel can be set to one half of the number used for the logical state. For example, if you enter **cable rf-change-trigger percent 20**, when 20 percent of the cable modems report an RF channel is down,

the logical state of the RF channel is changed to down. And when 10 percent of the cable modems report that the affected RF channel is back, the logical state is changed to up.

In the case of a small number of wideband modems, you can specify an absolute value for triggering an event in addition to the percentage. Both values must be true in order to trigger the suspension of an RF channel. When both values are 0, the cable modem is reset if the cable modem reports an RF failure through a status message. Also, if you set thresholds to 0, then all cable modems with RF failures are reset and any RFs suspended from a bonding group are reactivated.

Examples

The following example shows how to specify the amount of time an event must persist before it triggers an action for the reporting cable modem:

```
Router# configure terminal
Router(config)# cable rf-change-trigger percent 50 count 1
The following example shows how to configure the Cisco CMTS to move secondary SFs to primary
 interface when the trigger threshold is not reached, in Cisco IOS Release 12.2(33)SCE4:
Router# configure terminal
Router(config)# cable rf-change-trigger percent 50 count 1 secondary
```

Related Commands

Command	Description
cable rf-change-dampen-time	Specifies the amount of time an RF channel must remain in its new state.

cable rf-change-up-multiplier

To set the rf-channel up dampen time as an integer multiplier of the rf-channel down dampen time, use the **cable rf-change-up-multiplier** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable rf-change-up-multiplier *value*
no cable rf-change-up-multiplier

Syntax Description

value	Specifies the multiplier of the rf-channel down dampen time. The valid range is 1 to 10. The default value is 1.

Command Default

1

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1y	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Gibraltar 16.12.1z2	This command was updated on the Cisco cBR Series Converged Broadband Routers. The default value was updated to 1.

Usage Guidelines

This command applies to all non-primary RF channels on a Cisco CMTS router.

Examples

The following example shows how to specify the multiplier of the rf-channel down dampen time:

```
Router# configure terminal
Router(config)# cable rf-change-up-multiplier 2
```

Related Commands

Command	Description
cable resiliency free-interval	Specifies the wait time before a created resiliency bonding group is freed/recycled.

cable rf-channel

To associate an RF channel on the Cisco Wideband SPA with a wideband interface and allocate bandwidth, use the **cable rf-channel** command in interface configuration mode. To remove an association of an RF channel to a wideband interface, use the **no** form of this command.

cable rf-channel {*rf-port* | **controller** *controller-num* **channel** *channel-num*} [**bandwidth-percent** *bw-percent*] [**remaining ratio** *excess-value*]
no cable rf-channel {*rf-port* | **controller** *controller-num* **channel** *channel-num*}

Syntax Description

rf-port	Specifies the RF channel physical port on the Wideband SPA field-programmable gate array (FPGA). **Note** Valid values for the RF *port* depend on the configuration set with the **annex modulation** command (see the "Usage Guidelines" section).
controller controller-num	Specifies the controller associated with the RF channel. The valid range is from 0 to 4. Effective with Cisco IOS Release 12.2(33)SCH for Bonding Across 3G60 Controllers Support feature, valid range is from 0 to 2.
channel channel-num	Specifies the channel from the controller. The valid range is from 0 to 3. Effective with Cisco IOS Release 12.2(33)SCH for Bonding Across 3G60 Controllers Support feature, valid range is from 0 to 23.
bandwidth-percent *bw-percent*	(Optional) Specifies the percent of bandwidth from this RF channel that will be used for the wideband interface. The range is 0 to 100. If **bandwidth-percent** is not used, the default bandwidth value is 100 percent.
remaining ratio *excess-value*	(Optional) Specifies the ratio of the excess bandwidth that can be allocated to the wideband interface. The default value is 1. The range is 1 to 100. **Note** This option is only available when dynamic bandwidth sharing (DBS) is enabled.

Command Default

No default RF channel association with a wideband interface is configured. If the **cable rf-channel** command is used without specifying **bandwidth-percent**, the default bandwidth value is 100 percent.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.3(23)BC	The **annex** and **modulation** keyword options were added.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.

Release	Modification
12.3(23)BC1	The **remaining ratio** option was added.
12.2(33)SCB	The **remaining ratio** option was integrated into Cisco IOS Release 12.2(33)SCB.
12.2(33)SCH	The **controller** option is supported for the Cisco uBR-MC3GX60V cable interface line card on the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable rf-channel** command associates an RF channel (port) on a Wideband SPA with a wideband interface. Optionally, you can specify the percent of bandwidth from this RF channel that will be used for the specified wideband interface.

The Cisco uBR10012 router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command. For annex A and 256 QAM modulation, each Wideband SPA supports up to 18 RF channels at full rate and up to 24 RF channels at less than full rate. For all other cases, the SPA supports 24 RF channels.

Note The command changes in Cisco IOS releases 12.3(23)BC and 12.3(23)BC1 are not supported in Cisco IOS release 12.2(33)SCA.

Note In Cisco IOS Releases 12.3(21)BC and 12.3(21a)BC3, the **cable rf-channel** command is not available on the Cisco IOS command line until annex and modulation have been set with **annex modulation** command. Effective with Cisco IOS Release 12.3(23)BC, the **annex modulation** command is obsolete and **annex** and **modulation** are included as keyword options in the **rf-channel frequency** command.

Each Wideband SPA supports up to 32 wideband channels. A wideband interface cannot consist of RF channels from two different Wideband SPAs. The number of RF channels that can be aggregated into a wideband interface is determined by the capability of the wideband cable modem.

- The Linksys WCM300-NA, WCM300-EURO, and WCM300 JP wideband cable modems can receive a wideband interface consisting of up to eight downstream RF channels at 6 MHz per channel, or up to six downstream RF channels at 8 MHz per channel. The modem requires that the channels be received in a 50-MHz capture window.
- The Scientific Atlanta DPC2505 and EPC2505 wideband cable modems support the receiving of one wideband interface. The wideband channel consists of three downstream RF channels at either 6 MHz per channel or 8 MHz per channel.

An RF channel can be associated with multiple wideband interfaces as long as the wideband interfaces belong to the same virtual bundle interface (cable bundle) and the RF channel's total allocated bandwidth does not exceed 100 percent. As an example, the table below shows that a single RF channel can be associated with multiple wideband interfaces as long as the total allocated bandwidth for the RF channel does not exceed 100 percent.

Table 10: RF Channel Bandwidth Allocation

RF Channel	Wideband Interface	Bandwidth Allocated
10	0	30 percent
10	1	30 percent
10	2	40 percent
Total Bandwidth Percent: 100 percent		

The table below shows that a single RF channel can be associated with a narrowband and multiple wideband interfaces as long as the total allocated bandwidth for the RF channel does not exceed 100 percent.

Table 11: Bandwidth Allocation Using a Primary-Capable RF Channel

	Modular Cable Interface	Wideband Channel 0	Wideband Channel 1	Wideband Channel 2	Total Bandwidth Percent
Bandwidth Allocated from RF Channel 10	54 percent (4 percent used internally for DOCSIS signaling)	10 percent	22 percent	14 percent	100 percent

Note Each RF channel on the CMTS can be mapped to a specific QAM port on an edge QAM device. Traffic from different Wideband SPAs cannot be mixed on the same QAM port.

When dynamic bandwidth sharing (DBS) is enabled, the bandwidth percentage is converted to a committed information rate (CIR) value that provides the level of guaranteed bandwidth for the wideband interface. The reserved bandwidth for the wideband interface is the sum of its link queue CIR values and is used for admission control of the service flows with minimal reserved rate. With DBS enabled and the **cable rf-channel** command configured, the corresponding link queue can have 100 percent of the CIR value. The *excess-value* is the percent of excess bandwidth that can be allocated to the wideband channel.

Static bandwidth sharing (the default) or DBS can be configured on a wideband interface, but you cannot have both on the same interface.

Examples

The following example shows how to associate RF channel 10 and RF channel 11 with wideband interface 0:

```
Router(config)# interface wideband-cable 1/0/0:0
Router(config-if)# cable rf-channel 10 bandwidth-percent 50

Router(config-if)# cable rf-channel 11
```

The following example shows how to associate a controller to the RF channel for a wideband interface:

```
Router(config)# interface wideband-Cable 7/1/0:0
Router(config-if)# cable rf-channel controller 0 channel 1
```

In the preceding example, because no **bandwidth-percent** is specified in the second **cable rf-channel** command, the default value (100 percent of bandwidth) applies; that is, 100 percent of RF channel 11 bandwidth is used for wideband interface 0.

The following example shows bandwidth allocation when DBS is enabled:

```
Router(config)# interface wideband-cable 1/0/0:0
Router(config-if)# shutdown
Router(config-if)# cable dynamic-bw-sharing
Router(config-if)# no shutdown
Router(config-if)# cable rf-channel 10 bandwidth-percent 50
 remaining ratio 5
```

In the preceding example, because DBS is enabled, the wideband interface is guaranteed 50 percent of the bandwidth and 5 as the value for allocating excess bandwidth.

The following example shows how the Bonding Groups Across 3G60 Controllers feature is configured:

```
Router(config-if)#interface wideband-cable 7/0/1:30
Router(config-if)#cable rf-channel controller 1 channel 21 bandwidth-percent 10
Router(config-if)#cable rf-channel controller 1 channel 22 bandwidth-percent 10
Router(config-if)#cable rf-channel controller 1 channel 23 bandwidth-percent 10
Router(config-if)#cable rf-channel controller 0 channel 21 bandwidth-percent 10
Router(config-if)#cable rf-channel controller 0 channel 22 bandwidth-percent 10
Router(config-if)#cable rf-channel controller 0 channel 23 bandwidth-percent 10
Router(config-if)#cable rf-channel 18 bandwidth-percent 10
Router(config-if)#cable rf-channel 19 bandwidth-percent 10
Router(config-if)#end
```

Related Commands

Command	Description
annex modulation	Sets the annex and modulation for the Wideband SPA.
cable bonding-group-id	Specifies a Bonding Group ID and indicates whether the bonding group is a primary or secondary bonded channel.
cable dynamic-bw-sharing	Enables dynamic bandwidth sharing on a specific modular cable or wideband cable interface.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
downstream cable	Assigns a primary downstream channel for a fiber node.
ip-address (controller)	Sets the IP address of the Wideband SPA FPGA.
modular-host subslot	Specifies the modular-host line card for Wideband protocol operations.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.
rf-channel description	Specifies the description for each RF channel.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.

Command	Description
rf-channel network delay	Specifies the CIN delay for each RF channel.
upstream cable connector	Specifies the upstream channel ports for a fiber node.

cable rf-channels

To associate RF channels on the router with a wideband interface and allocate bandwidth, use the **cable rf-channels** command in interface configuration mode. To remove the association of an RF channel with a wideband interface, use the **no** form of this command.

Note This command can be used in the wideband interface configuration to specify RF channels on different controllers or to specify different bandwidth percentages.

cable rf-channels [**controller** *controller number*] **channel-list** *group-list* [**bandwidth-percent** *bw-percent*]
no cable rf-channels [**controller** *controller number*] **channel-list** *group-list*

Syntax Description

channel-list *group-list*	Specifies the channels from the controller. The valid range is from 0 to 127.
controller *controller number*	(Optional) Specifies the controller associated with the RF channel. The range is from 0 to 7. If not specified, the controller is the same as wideband interface's controller.
bandwidth-percent *bandwidth-percent*	(Optional) Specifies the percent of bandwidth from this RF channel that is used for the wideband interface. The range is from 0 to 100.

Command Default

RF channel is not associated with a wideband interface.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

An RF channel can be associated with multiple wideband interfaces as long as the wideband interfaces belong to the same virtual bundle interface (cable bundle) and the RF channel's total allocated bandwidth does not exceed 100 percent.

An RF channel may be associated to a wideband interface on a different controller using the "controller" option, however the following restriction applies. Wideband interfaces on controllers 0 - 3 may only include RF channels on the same controllers. Likewise, wideband interfaces on controllers 4 - 7 may only include RF channels on those controllers.

The following example shows how to associate an RF channel with wideband interface and allocate bandwidth:

```
Router(config)# interface Wideband-Cable3/0/0:60
Router(config-if)# cable bundle 1
Router(config-if)# cable rf-channels channel-list 0-1 3-31 bandwidth-percent 1
```

```
Router(config)# interface Wideband-Cable3/0/0:45
Router(config-if)# cable bundle 1
Router(config-if)# cable rf-channels controller 2 channel-list 4-6 bandwidth-percent 2
```

cable rfswitch copy

To copy an image from the Cisco CMTS router to the Cisco NGRFSW-ADV or from Cisco NGRFSW-ADV to the Cisco CMTS, use the **cable rfswitch copy** command in privileged EXEC mode.

cable rfswitch copy *filename_cmts* {**to-rfsw** | **from-rfsw**} *filename_rfsw*

Syntax Description

filename_cmts	Filename of the image on or copied to the Cisco CMTS router.
to-rfsw	Copies an image from the Cisco CMTS router to the Cisco NGRFSW-ADV.
from-rfsw	Copies an image from the Cisco NGRFSW-ADV to the Cisco CMTS router.
filename_rfsw	Filename of the image on or copied to the Cisco NGRFSW-ADV.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable rfswitch copy** command when an existing image on the Cisco NGRFSW-ADV or Cisco CMTS router is corrupt or out-of-date and needs to be replaced with another image.

Examples

The following example shows how to download the gcv2.11 image from the Cisco CMTS router to the Cisco NGRFSW-ADV:

```
Router> enable
Router# cable rfswitch copy disk0:gcv2.11 to-rfsw gcv2.11
```

The following example shows how to upload the gcv2.11 image from the Cisco NGRFSW-ADV to the Cisco uBR10012 CMTS:

```
Router> enable
Router# cable rfswitch copy disk0:gcv2.11 from-rfsw gcv2.11
```

Related Commands

Command	Description
show hccp channel-switch state	Displays the current state of the Cisco NGRFSW-ADV.

cable rfswitch delete

To delete an image in the Cisco NGRFSW-ADV, use the **cable rfswitch delete** command in privileged EXEC mode.

cable rfswitch delete *filename_rfsw*

Syntax Description

filename_rfsw	Filename of the image on the Cisco NGRFSW-ADV that needs to be deleted.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable rfswitch delete** command is used to configure the Cisco uBR Advanced RF Switch (NGRFSW-ADV). For more information, see the Cisco uBR Advanced RF Switch Software Configuration Guide .

Use the **cable rfswitch delete** command when an existing image on the Cisco NGRFSW-ADV is corrupt, out-of-date, or needs to be replaced with another image. You cannot delete the active or the golden image on the Cisco NGRFSW-ADV.

Examples

The following example shows how to delete the gcv2.11 image on the Cisco NGRFSW-ADV:

```
Router> enable
Router# cable rfswitch delete gcv2.11
```

Related Commands

Command	Description
show hccp channel-switch image	Displays the image list on the Cisco NGRFSW-ADV.
show hccp channel-switch state	Displays the current state of the Cisco NGRFSW-ADV.

cable rfswitch reboot

To reboot the Cisco NGRFSW-ADV, use the **cable rfswitch reboot** command in privileged EXEC mode.

cable rfswitch reboot

Syntax Description

reboot	Reboots the Cisco NGRFSW-ADV.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable rfswitch reboot** command is used to configure the Cisco uBR Advanced RF Switch (NGRFSW-ADV). For more information, see the Cisco uBR Advanced RF Switch Software Configuration Guide .

Examples

The following example shows how to reboot the Cisco NGRFSW-ADV:

```
Router> enable
Router# cable rfswitch reboot
```

Related Commands

Command	Description
show hccp channel-switch image	Displays the image list on the Cisco NGRFSW-ADV.
show hccp channel-switch state	Displays the current state of the Cisco NGRFSW-ADV.

cable rfswitch set-active

To set an image as active on the Cisco NGRFSW-ADV, use the **cable rfswitch set-active** command in privileged EXEC mode.

cable rfswitch set-active *filename_rfsw*

Syntax Description

filename_rfsw	Filename of the image on the Cisco NGRFSW-ADV that needs to be set as active.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable rfswitch set-active** command is used to configure the Cisco uBR Advanced RF Switch (NGRFSW-ADV). For more information, see the Cisco uBR Advanced RF Switch Software Configuration Guide .

Examples

The following example shows how to set the gcv2.11 image as active on the Cisco NGRFSW-ADV:

```
Router> enable
Router# cable rfswitch set-active gcv2.11
Router# cable rfswitch reboot
```

Related Commands

Command	Description
show hccp channel-switch image	Displays the image list on the Cisco NGRFSW-ADV.
show hccp channel-switch state	Displays the current state of the Cisco NGRFSW-ADV.

cable rpd

To enter the RPD configuration mode, use the **cable rpd** command in global configuration mode. To void the RPD configuration, use the **no** form of this command.

cable rpd *name*

no cable rpd *name*

Syntax Description

name	Specifies the name of the RPD.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on theCisco cBR Series Converged Broadband Routers.
Cisco IOS XE Fuji 16.8.1	This command was updated to support Generic Control Protocol Principal (GCPP) on theCisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the RPD configuration mode.

Examples

The following example shows how to enter the RPD configuration mode:

```
Router# configure terminal
Router(config)# cable rpd
Router(config-rpd)#RphyNode-L01
```

Use this command to apply an Event Profile to RPD.

The following example shows how to apply an event profile to RPD.

```
Router(config)#cable rpd node6
Router(config-rpd)#identifier badb.ad13.5e08
Router(config-rpd)#core-interface Te3/1/5
Router(config-rpd)#principal
Router(config-rpd)#rpd-ds 0 downstream-cable 3/0/17 profile 10
Router(config-rpd)#rpd-us 0 upstream-cable 3/0/34 profile 13
Router(config-rpd)#r-dti 16
Router(config-rpd)#rpd-event profile 6
```

Use the following command to get events from RPD.

`cable rpd` {*RPD IPRPD MACall* }`event` {*locallogpending* }

To set the GCPP server as the core server, remove the **principal** keyword under RPD configuration.

```
cable rpd p1_0719
 identifier 0004.9f00.0719
 core-interface Te6/1/2
  principal             <<<<<<<<<<< remove it, gcpp is the principal core
  rpd-ds 0 downstream-cable 6/0/17 profile 7
  rpd-us 0 upstream-cable 6/0/17 profile 7
 core-interface Te6/1/1
  rpd-ds 0 downstream-cable 6/0/3 profile 17
r-dti 6
 rpd-event profile 0
```

Related Commands

Command	Description
core-interface	Configures the core-interface of the RPD.
rpd-event profile *profile_id*	Applies the event profile to RPD.
identifier	MAC address of RPD.
principal	The keyword to specify that this core is the principal core. Remove this option to set the GCPP server as the core server.
rpd-ds 0 downstream-cable downstream_controller profile downstream_controller_profile	Specifies the mapping relationship for RPD downstream channels and the Cisco cBR-8 routers downstream controller.
rpd-us 0 upstream-cable upstream_controller profile upstream_controller_profile	Specifies mapping relationship for RPD upstream port0 and Cisco cBR-8 routers upstream controller.
rpd-us 1 upstream-cable upstream_controller profile upstream_controller_profile	Specifies mapping relationship for RPD upstream port1 and Cisco cBR-8 upstream controller.

cable rpd period-fft (exec mode)

You can start or stop RPD periodical FFT polling using the **cable rpd {** *ip-address* **|***mac-address* **| all | slot } period-fft** *{ start | stop }* command in Privileged EXEC mode. To void the configuration, use the **no** form of this command.

cable rpd { *ip-address* | *mac-address* | **all** | **slot** } **period-fft** { **start** | **stop** }

no cable rpd { *ip-address* | *mac-address* | **all** | **slot** } **period-fft** { **start** | **stop** }

Syntax Description

ip-address	Specify the RPD IPv4 or IPv6 address.
mac-address	Specify the RPD MAC address.
all	Select all the RPDs.
slot	Specify RPDs by slot.
start	Start RPD periodical FFT polling.
stop	Stop RPD periodical FFT polling.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1x	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to start RPD periodical FFT polling for a specific RPD by mentioning the MAC address.

```
Router# cable rpd 0004.9f32.0019 period-fft start
Confirm to continue? [no]: yes
```

Examples

The following example shows how to stop RPD periodical FFT polling for all RPDs.

```
Router# cable rpd all period-fft stop
Confirm to continue? [no]: yes
```

Related Commands

Command	Description
show cable rpd core-ident	Displays active Cisco Remote PHY Devices (RPD).

cable rpd external-core

You can modify auxiliary cores to which the RPD is connected using the **cable rpd***name***external-core***ip-address* command. You can add or remove aux cores that exist outside the cBR-8 router without having to reboot the RPD. To void the RPD configuration, use the **no** form of this command.

cable rpd *name* **external-core** *ip-address*

no cable rpd *name* **external-core** *ip-address*

Syntax Description

name	Specifiy the name of the RPD.
ip-address	Specify the IPv4 or IPv6 address.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the RPD configuration mode.

Examples

The following example shows how to enter the RPD configuration mode:

```
Router# configure terminal
Router(config)# cable rpd node6
Router(config-rpd)# external-core 10.1.19.19
Router(config-rpd)# end
```

Related Commands

Command	Description
show cable rpd core-ident	Displays RPD CCAP Core Identification information.

cable rpd external-core (exec mode)

You can modify auxiliary cores to which the RPD is connected using the **cable rpd {** *ip-address* **|***mac-address* **| all | group | oui | slot } name external-core***core-ip-address* **{ add | delete }}** command. You can add or remove aux cores that exist outside the cBR-8 router without having to reboot the RPD. To void the RPD configuration, use the **no** form of this command.

cable rpd { *ip-address mac-address* | **all** | **group** | **oui** | **slot** } *name* **external-core** *core-ip-address* { **add** | **delete** } }

no cable rpd { *ip-address mac-address* | **all** | **group** | **oui** | **slot** } *name* **external-core** *core-ip-address* { **add** | **delete** } }

Syntax Description

ip-address	Specify the RPD IPv4 or IPv6 address.
mac-address	Specify the RPD Mac address.
all	Select all the RPDs.
group	Specify HA-Shelf group .
oui	Specify RPDs by OUI .
slot	Specify RPDs by slot.
core-ip-address	Specify the RPD IPv4 or IPv6 address of the core.
add	Add the core.
delete	Delete the core.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the RPD configuration mode.

Examples

The following example shows how to enter the RPD configuration mode:

```
Router# cable rpd 0004.9f00.0655 external-core 10.1.10.19 add
```

Related Commands

Command	Description
show cable rpd core-ident	Displays RPD CCAP Core Identification information.

cable rphy static-route

cBR8 transmits RPHY packets from the accurate DPIC interface in L3 ECMP scenario (CIN without VRF configured). You can use the **cable rphy static-route** command to dynamically add or remove the static route through code during the time when an RPD comes online or turns to offline, instead of configuring manually.

cable rphy static-route

no cable rphy static-route

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Fuji 16.8.1	This command was introduced on theCisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the RPD configuration mode.

Examples

After configuring the command, you can check if there are static routes that are dynamically added by code through **show [ipv6|ip] static route [vrf <id>]** command.

```
Router# show ipv6 static
IPv6 Static routes Table - default
Codes: * - installed in RIB, u/m - Unicast/Multicast only
       U - Per-user Static route
       N - ND Static route
       M - MIP Static route
       P - DHCP-PD Static route
       R - RHI Static route
*   2001:10:90:3::93/128 via 2001:192:106:1::93, distance 1
*   2001:10::/32 via 2001:80:3:1::1, distance 1
*   2001:20::/32 via 2001:80:3:1::1, distance 1
*   2001:80::/32 via 2001:80:3:1::1, distance 1
*U  2001:120:102:70:3:4E53:215E:4778/128 via FE80::2DE:FBFF:FE83:C7C2,
TenGigabitEthernet9/1/6, distance 1
*U  2001:120:102:70:3:5F42:9DA2:DA17/128 via FE80::2DE:FBFF:FE83:C7C2,
TenGigabitEthernet9/1/2, distance 1
*U  2001:120:102:70:3:7501:E3ED:3719/128 via FE80::2DE:FBFF:FE83:C7C2,
TenGigabitEthernet9/1/2, distance 1
*U  2001:120:102:70:7:B66B:F900:8352/128 via FE80::2DE:FBFF:FE83:C7C2,
TenGigabitEthernet9/1/6, distance 1
*U  2001:120:102:70:7:D14E:33F1:CF80/128 via FE80::2DE:FBFF:FE83:C7C2,
TenGigabitEthernet9/1/6, distance 1

       Infra_C05#show ip static route vrf s9
Load for five secs: 6%/1%; one minute: 7%; five minutes: 7%
No time source, *09:59:43.206 UTC Fri Sep 29 2017

Codes: M - Manual static, A - AAA download, N - IP NAT, D - DHCP,
       G - GPRS, V - Crypto VPN, C - CASA, P - Channel interface processor,
       B - BootP, S - Service selection gateway
```

```
       DN - Default Network, T - Tracking object
       L - TL1, E - OER, I - iEdge
       D1 - Dot1x Vlan Network, K - MWAM Route
       PP - PPP default route, MR - MRIPv6, SS - SSLVPN
       H - IPe Host, ID - IPe Domain Broadcast
       U - User GPRS, TE - MPLS Traffic-eng, LI - LIIN
       IR - ICMP Redirect
Codes in []: A - active, N - non-active, B - BFD-tracked, D - Not Tracked, P - permanent

Static local RIB for s9
M  120.102.70.117/32 [0/0] via TenGigabitEthernet0/1/7 192.168.9.2 [A]
```

cable rphy gcp

Use the options under **cable rphy gcp** to configure GCP-related information. To remove this configuration, use the **no** form of this command.

cable rphy gcp [**flowctrl-threshold** | **keepalive** *interval retries* | **max-idle-time** | **reconnect-timeout** | **recovery-act-delay** | **recovery-act-retry** | **recovery-action** *action*]

no cable rphy gcp [**flowctrl-threshold** | **keepalive** *interval retries* | **max-idle-time** | **reconnect-timeout** | **recovery-act-delay** | **recovery-act-retry** | **recovery-action** *action*]

Syntax Description

flowctrl-threshold	Set GCP sending flow control for low priority msg.
keepalive *interval retries*	GCP KA interval in seconds. The default value is 4 and the range is 0-100s. For more information, see cable rphy gcp keepalive timeout, on page 649.
max-idle-time	Configure the maximum GCP idle time in seconds. The range is 0-300s. The default value is 0. 0 means disable Max GCP Idle Time.
reconnect-timeout	Configure the GCP reconnect timeout in seconds. The range is 5-120s. The default value is 120s.
recovery-act-delay	Configure the GCP recovery action delay in seconds. The range is 0-600s. The default value is 30s.
recovery-act-retry	Configure the number of retries that the RPD attempts for the configured recovery action. The range is 0 - 255. The default value is 12. **Note** This attribute is not applicable to all of the defined recovery actions.
recovery-action *action*	Configure one of the following actions: • **1** - GcpWaitForAction • **2** - GcpReconnectToSameCore(default) • **3** - GcpHandoverToBackup • **4** - WaitAndReboot • **5** - GcpHandoverToBackupAfterReconnectFail

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1y	This command is introduced on theCisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the configuration mode.

The following is a sample configuration:

```
Router# configure terminal
Router(config)#cable rphy gcp keepalive timeout 20 30
Router(config)#cable rphy gcp max-idle-time 70
Router(config)#cable rphy gcp reconnect-timeout 100
Router(config)#cable rphy gcp recovery-act-delay 500
Router(config)#cable rphy gcp recovery-act-retry 200
Router(config)#cable rphy gcp recovery-action 2
Router(config)#exit
```

After configuring the command, you can verify your configuration using the following command:

```
Router# show cable rphy gcp config-info
              Keepaliveinterval      : 20
              Keepaliveretries       : 30
              MaxGcpIdleTime         : 70
              GcpRecoveryAction      : 2
              GcpRecoveryActionRetry : 200
              GcpRecoveryActionDelay : 500
              GcpReconnectTimeout    : 100
```

cable rphy gcp keepalive timeout

By default, the cBR-8 router sends a GCP KeepAlive message every 4 seconds to RPD. If no GCP message is received from RPD, the cBR-8 router continues to send GCP KeepAlive message to RPD. The max retry attempts are 6 by default. That means the GCP timeout value is 24(4x6)s by default. After that cBR-8 router marks the RPD offline due to GCP timeout.

GCP KeepAlive messages are used to verify GCP connectivity between a CCAP Core and an RPD. You can use the **cable rphy gcp keepalive timeout** *interval retries* command to configure the interval and retry attempts of the GCP keepAlive messages, that the cBR-8 router sends to RPD.

cable rphy gcp keepalive *timeout retries*

no cable rphy gcp keepalive *timeout retries*

Syntax Description

timeout	GCP KA interval in seconds. The default value is 4 and the range is 0 through 100. **Note** If you configure the GCP KA interval using the values as 1 through 3 or if the total timeout value is less than 24, then this may cause RPD flapping during SUPHA or LCHA in a large-scale environment. If you configure the GCP KA interval as 0, then the GCP keepalive function is disabled and the cBR-8 router cannot detect the GCP connection status using a keepalive message. Configure CP KA interval as 0 only for debugging. For standby core GCP connection, the GCP KA interval is 3 times the active core. After LCHA, the interval value is reset to the correct value for the corresponding role.
retries	Number of GCP keepalive retry attempts. The default value is 6 and the range is 3 through 1000.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1y	The range for *timeout* is updated from **0-1000** to **0-100**.
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on theCisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the configuration mode.

Examples

```
Router# configure terminal
Router(config)# cable rphy gcp keepalive timeout 20 6
Router# test platform software rphyman R0 gcp-keepalive logging enable
```

After configuring the command, you can verify your configuration using the following command:

```
Router# show cable rpd 0004.9f33.0091 Te9/1/5 gcp-transaction | i GDM
0004.9f33.0091   Te9/1/5    21375      GCP_MSG_ID_GDM           N/A            2022-01-04
16:46:09.294
0004.9f33.0091   Te9/1/5    21374      GCP_MSG_ID_GDM           N/A            2022-01-04
16:45:49.294
0004.9f33.0091   Te9/1/5    21373      GCP_MSG_ID_GDM           N/A            2022-01-04
16:45:29.294
0004.9f33.0091   Te9/1/5    21372      GCP_MSG_ID_GDM           N/A            2022-01-04
16:45:09.293
0004.9f33.0091   Te9/1/5    21371      GCP_MSG_ID_GDM           N/A            2022-01-04
16:44:49.294
0004.9f33.0091   Te9/1/5    21370      GCP_MSG_ID_GDM           N/A            2022-01-04
16:44:29.294
0004.9f33.0091   Te9/1/5    21369      GCP_MSG_ID_GDM_RSP       N/A            2022-01-04
16:44:09.299
0004.9f33.0091   Te9/1/5    21369      GCP_MSG_ID_GDM           N/A            2022-01-04
16:44:09.294
0004.9f33.0091   Te9/1/5    21368      GCP_MSG_ID_GDM_RSP       N/A            2022-01-04
16:43:49.298
0004.9f33.0091   Te9/1/5    21368      GCP_MSG_ID_GDM           N/A            2022-01-04
16:43:49.293
0004.9f33.0091   Te9/1/5    21367      GCP_MSG_ID_GDM_RSP       N/A            2022-01-04
16:43:29.300
0004.9f33.0091   Te9/1/5    21367      GCP_MSG_ID_GDM           N/A            2022-01-04
16:43:29.294
```

cable rphy rpd-capability reject-mismatch

Use the **cable rphy rpd-capability reject-mismatch** to control whether RPDs with OFDM capability mismatch are online or not. If the **cable rphy rpd-capability reject-mismatch** command is enabled, then RPDs with OFDM capability mismatch do not become online.

You can use the **no cable rphy rpd-capability reject-mismatch** command to disable this configuration and to accept the capabilities mismatch and let the RPDs come online.

RPDs may behave in a non-deterministic manner if there is a capability mismatch.

cable rphy rpd-capability reject-mismatch

no cable rphy rpd-capability reject-mismatch

Syntax Description

reject-mismatch	You can use this configuration to determine whether RPDs with OFDM capability mismatch are online or not.

Command Default

This command is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The following example shows you how to configure the **no cable rphy rpd-capability reject-mismatch** command, accept the capabilities mismatch and let the RPDs come online.

Examples

```
Router#show cable rpd 0004.9f31.0979 capability | s Downstream OFDM
Downstream OFDM Channels Per Port         : 2

Router#show cable rpd
MAC Address     IP Address       I/F       State        Role HA  Auth Name

0004.9f31.0979  ---              Te6/1/0   online       Pri  Act N/A  RPD1

Router(config)#cable rpd RPD1
Router(config-rpd)# identifier 0004.9f31.0979
Router(config-rpd)# core-interface Te6/1/0
Router(config-rpd-core)#  principal
Router(config-rpd-core)#rpd-ds 0 downstream-cable 6/0/3 profile 23

2023/01/16 12:27:14.953736374 {rphyman_R0-0}{255}: [errmsg] [1630]: UUID: 0, ra: 0 (ERR):
%RPHYMAN-3-RPD_CAPA_PARAM_MISMATCH_ERROR:
R0/0: rphyman: rpd_capa check, rpd_id: 0004.9f31.0979,  config_value 3 rpdCapa_value 2,
event: NumDsOfdmChannels mismatch, reject RPD online,
please configure OFDM channels equal to its capability..

Router#show cable rpd
MAC Address     IP Address       I/F       State        Role HA  Auth Name
0004.9f31.0979  ---              Te6/1/0   offline      Pri  Act N/A  RPD1
```

After configuring the **no cable rphy rpd-capability reject-mismatch** command, the RPD status displays as **online** as shown in the **show cable rpd** output below.

```
Router(config)#no cable rphy rpd-capability reject-mismatch

2023/01/16 12:32:13.480653142 {rphyman_R0-0}{255}: [errmsg] [1630]: UUID: 0, ra: 0 (warn):
 %RPHYMAN-4-RPD_CAPA_PARAM_MISMATCH_WARNING:
R0/0: rphyman: rpd_capa check, rpd_id: 0004.9f31.0979, config_value 3 rpdCapa_value 2,
event: NumDsOfdmChannels mismatch, accept RPD online,
but it may behave in a non-deterministic manner, suggest configure OFDM channels equal to
its capability.

Router#show cable rpd
MAC Address     IP Address       I/F       State        Role HA  Auth Name
0004.9f31.0979  ---              Te6/1/0   init(gcp)    Pri  Act N/A  RPD1

Router#show cable rpd
MAC Address     IP Address       I/F       State        Role HA  Auth Name
0004.9f31.0979  ---              Te6/1/0   online       Pri  Act N/A  RPD1
```

cable rphy statistics session update-freq

To configure the DEPI statistics synchronization interval, use the **cable rphy statistics session update-freq** command in global configuration mode. To void the configuration, use the **no** form of this command. This command is applied on all the CLC cards.

cable rphy statistics session update-freq *value*

no cable rphy statistics session update-freq *value*

Syntax Description

value	Specifies the DEPI statistics synchronization interval in unit of 5 seconds.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1z	This command was introduced on theCisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the DEPI statistics synchronization interval.

Examples

The following example shows how to configure the DEPI statistics synchronization interval:

```
Router# configure terminal
Router(config)# cable rphy statistics session update-freq 20
```

cable rphy supso suppress-rpd

SUP CPU utilization is high when SUPSO occurs, during new SUP rebuilding of RPDs, CMs, and so on. At this time, if RPDs fail to recover, then those rpds are suppressed and the speed it takes to become online again is based on the SUP IOS's CPU utilization. This can prevent the system from being further burdened by RPDs and CMs which come after them, by coming online and reducing the impact to other RPDs or CMs rebuilding.

You can use the **cable rphy supso suppress-rpd max-cpu** *max-cpu* **min-cpu** *min-cpu* **time** *time* command to configure this feature.

cable rphy supso suppress-rpd max-cpu *max-cpu* **min-cpu** *min-cpu* **time** *time*

no cable rphy supso suppress-rpd max-cpu *max-cpu* **max-cpu** *max-cpu* **time** *time*

Syntax Description

max-cpu	The maximum IOS CPU Utilization value that starts RPD suppress mode. The valid range is 1–100. The default is 95.
min-cpu	The minimum IOS CPU Utilization value that stops RPD suppress mode. Only if IOS CPU Utilization decreases under this *min-cpu* the RPD suppress mode stop. The valid range is 1–100. The default is 90.
time	The total suppress time(seconds) after SUPSO. The valid range is 1–3600. The default is 1800.

Note If a time out of the total suppress time occurs, then the RPD suppress mode stops even though the CPU load isn't dropped to *min-cpu* value.

Command Default

This command is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced on theCisco cBR Series Converged Broadband Routers.

Examples

The following example shown how to configure this feature:

```
router(config)# cable  rphy supso suppress-rpd max-cpu 90 min-cpu 80 time 1800
router(config)# end
```

Use this command to verify the configuration:

```
router# show run | in rphy
cable rphy gcp keepalive timeout 5 8
```

```
cable rphy supso suppress-rpd max-cpu 90 min-cpu 80 time 1800
cable wideband rphy-auto-reset
```

cable rsvp default-scn

To specify the default service class that enables the Resource ReSerVation Protocol (RSVP) created service flows to inherit characteristics , use the **cable rsvp default-scn** command in global configuration mode.

cable rsvp default-scn *service-class name*

Syntax Description

service-class name	The name of a downstream DOCSIS service-class .

Command Default

Service class is not configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable rsvp default-scn** command allows users to specify the default service class that enables the RSVP created service flows to inherit characteristics.

Examples

The following example configures a default RSVP service class.

```
Router# configure terminal
Router(config)# cable service class 220 name RSVPClass
Router(config)# cable service class 220 downstream
Router(config)# cable service class 220 max-latency 100000
Router(config)# cable service class 220 req-attr-mask ffff0000
Router(config)# cable rsvp default-scn RSVPClass
Router(config)# cable rsvp default-scn RSVPClass
```

Related Commands

Command	Description
show cable rsvp flow-db	Displays the contents of the RSVP to DOCSIS service-flow mapping database.



Cable Commands: cable s

- cable service attribute ds-bonded downstream-type bonding-enabled, on page 659
- cable service attribute non-ds-bonded downstream-type bonding-disabled, on page 661
- cable service attribute non-ds-bonded legacy-ranging downstream-type, on page 663
- cable service attribute voice-enabled, on page 665
- cable service attribute withhold-TLVs, on page 667
- cable service class, on page 668
- cable service flow activity-timeout, on page 675
- cable service-flow inactivity-timeout, on page 677
- cable service flow inactivity-threshold, on page 679
- cable service flow priority, on page 681
- cable service type, on page 682
- cable set mpls-experimental, on page 683
- cable sflog, on page 684
- cable shared-secondary-secret, on page 686
- cable shared-secret, on page 689
- cable sid-cluster-group, on page 692
- cable sid-cluster-switching, on page 694
- cable sip cir-scale, on page 696
- cable sip fpd-auto, on page 697
- cable sip ib-stats, on page 698
- cable snmp cache active , on page 699
- cable snmp cm-rcs, on page 700
- cable snmp iftype ds-phy, on page 701
- cable snmp trap detailed-alarm, on page 702
- cable source-route, on page 703
- cable source-verify, on page 704
- cable source-verify dhcp arp-probe, on page 709
- cable source-verify enable-sav-static, on page 710
- cable source-verify enable-sav-trust-last, on page 711
- cable source-verify group, on page 712
- cable source-verify leasequery-filter downstream, on page 714
- cable source-verify leasequery-filter upstream, on page 716
- cable source-verify sav-static-group-override, on page 718

- cable spectrum-group (global), on page 719
- cable spectrum-group (interface), on page 723
- cable spectrum-group hop period, on page 725
- cable spectrum-group hop threshold, on page 727
- cable spectrum-group shared, on page 730
- cable submgmt default, on page 732
- cable sync-interval, on page 738

cable service attribute ds-bonded downstream-type bonding-enabled

To force a downstream bonding-capable modem to initialize on a bonded primary-capable downstream channel, use the **cable service attribute ds-bonded downstream type bonding-enabled** command in global configuration mode. To restore default configuration, use the **no** form of the command.

cable service attribute ds-bonded downstream-type bonding-enabled [**enforce**]
no cable service attribute ds-bonded downstream-type bonding-enabled

Syntax Description

enforce	Enforces bonding-capable modems to register only on bonded RF channels.

Command Default

A bonding-capable modem is allowed to register on the primary channel selected by the modem for initiation even if the channel is not part of a bonding group.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the uBR10012 router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For bonding capable cable modems, the primary channel selection that is done by the CMTS depends on whether the modems can resolve its MAC Domain Downstream Service Group ID (MD-DS-SG). The CM must attempt to determine its MAC Domain Downstream Service Group ID (MD-DS-SG-ID) if an MDD is present on the downstream. If a modem has resolved its MD-DS-SG, the CMTS selects a bonded primary channel, the primary channel that is part of an operational wideband channel, from the RF channel set corresponding to the MD-DS-SG determined by the modem. The bonded primary channel selected by the CMTS needs to be hosted by an interface on the same uBR10-MC5X20 cable interface line card as the modem's initial primary channel. If there are multiple primary capable channels that meet the above criteria, the final primary channel will be randomly selected among the eligible channel set.

When the CMTS has an existing record of a CM (listed in the **show cable modem** command output) that should be moved to a bonded channel, a Dynamic Frequency Override (DFO) is triggered to be sent in the RNG-RSP from the CMTS to that CM.

If a CM is ranging for the first time (not listed in the **show cable modem** command output), no DFO is triggered at initial-ranging time. The CM proceeds to register and the CMTS gleans the bonding capabilities of the CM to determine if it should be moved to a bonded channel. If the CM is on a wrong primary DS channel, the DOCSIS specification does not allow a DFO at this time, so the CMTS rejects the registration of the CM forcing it to enter the reject(c) state. The CMTS then waits for the CM to start ranging again. If the CM engages with the same incorrect DS channel, the CMTS triggers a DFO to the CM during initial-ranging because it now has a record of that CM.

If a modem has not resolved its MD-DS-SG and the enforce option is configured, the CMTS selects a bonded primary channel based on MAP group associated with the modem's upstream channel. Typically, an upstream

channel is configured into a single fiber node and the CMTS infers the topology information based on the downstream channels associated with the upstream. If the enforce option is not configured or the CMTS cannot find a target primary channel, the modem will be allowed to register on the primary channel currently selected by the modem for initialization.

Note The CMTS will only try to move the modem with MD-DS-SG unresolved if the **enforce** option is configured.

By default, changing the primary channel to select a wideband channel is not enforced and modems are allowed to operate on a primary channel even if they are not included in any load balancing groups. At any time after the system is up, enabling the primary channel selection for bonding capable modems will not affect existing modems in the system. The operator has to manually reset the bonding capable modems using the **clear cable modem** command either globally or at per-MAC Domain level.

Note Enabling primary channel selection for wideband modems will not affect existing modems in the system.

Examples

```
Router# configure terminal

Router(config)# cable service attribute ds-bonded downstream-type bonding-enabled [enforce]
```

Related Commands

Command	Description
cable dfo-retry-count	Configures the Downstream Frequency Override (DFO) retry count.
cable service attribute non-ds-bonded downstream-type bonding-disabled	Forces the non-bonding-capable modems to register only on non-bonded RF channels on the CMTS.
cable service attribute voice-enabled	Restricts voice services to only to the uBR10-MC5x20 line cards for high availability.

cable service attribute non-ds-bonded downstream-type bonding-disabled

To force the non-bonding-capable modems to register only on non-bonded RF channels on the CMTS, use the **cable service attribute non-ds-bonded downstream-type bonding-disabled** command in global configuration mode. To restore default behavior, use the **no** form of the command.

cable service attribute non-ds-bonded downstream-type bonding-disabled

Syntax Description

This command has no keywords or arguments.

Command Default

The non-bonding-capable modem registers on its current primary channel.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A modem is identified as a non-bonding-capable modem if the modem reports a Multiple Receive Channel Support value of 1 for TLV 5.29 or an RCP ID unknown to the CMTS during the modem's registration request.

The non-bonding capable modem, identified at registration, will be moved to a non-bonded primary channel through downstream frequency override, if its current primary channel is part of a bonding group. The target non-bonded primary channel will be selected among primary capable channels that are associated to the modem's current upstream channel, however not included in any wideband channels associated to any host interfaces on the local line card. Once this option is enabled, the bonded primary channels will be taken out of load balancing group, to prevent non-bonding capable modems to be moved back to bonded primary channels for load balancing purpose.



Note Enabling primary channel selection for wideband modems will not affect existing modems in the system. The operator has to reset the existing non-bonding capable modems using the **clear cable modem** command.

Examples

```
Router# configure terminal

Router(config)# cable service attribute non-ds-bonded downstream-type bonding disabled
```

Related Commands

Command	Description
cable dfo-retry-count	Configures the Downstream Frequency Override (DFO) retry count.

Command	Description
cable service attribute ds-bonded downstream-type bonding-disabled	Forces a downstream bonding-capable modem to initialize on a bonded primary-capable downstream channel.
cable service attribute voice-enabled	Restricts voice services to only to the uBR10-MC5x20 line cards for high availability.
clear cable modem	Removes all modems or modems hosted by a uBR10-MC5x20 downstream interface under a specific category.

cable service attribute non-ds-bonded legacy-ranging downstream-type

To redirect potential non-bonding-capable modems that access the CMTS with INIT-RNG_REQ at initialization to a specified downstream channel frequency, use the **cable service attribute non-ds-bonded legacy-ranging downstream-type command** in global configuration mode. To restore default behavior, use the **no** form of the command.

cable service attribute non-ds-bonded legacy-ranging downstream-type frequency *freq*
no cable service attribute legacy-ranging downstream-type

Syntax Description

frequency *freq*	Specifies the downstream channel frequency to which modems that access the CMTS with legacy INIT-RNG-REQ are moved.

Command Default

The non-bonding-capable modem continues the ranging process on the primary channel currently selected by the modem for initialization.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the uBR10012 router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable service attribute non-ds-bonded** command provides the ability to prevent potential non-bonding-capable modems that access CMTS with legacy INIT-RNG-REQ at initialization to register on a CMTS that supports bonding-capable modem. These modems that use legacy initial ranging will be redirected to a specified downstream channel frequency.



Note If the frequency option is used and if the frequency is modified, then the new frequency setting will only impact new modems trying to initialize after the frequency is modified. To enforce the downstream channel selection policy on existing modems, each modem has to be manually reset either globally or at the individual primary channel level using the**clear cable modem** command.

Examples

```
Router# configure terminal

Router(config)# cable service attribute non-ds-bonded legacy-ranging downstream-type frequency
 55000000
```

Related Commands

Command	Description
cable service attribute voice-enabled	Restricts voice services only to the uBR10-MC5x20 line cards for high availability.
cable service attribute ds-bonded downstream-type bonding-enabled	Forces a downstream-bonding capable modem to initialize on a bonded primary-capable downstream channel.
cable service attribute non-ds-bonded downstream-type bonding-disabled	Forces the non-bonding-capable modems to register only on non-bonded RF channels on the CMTS.
clear cable modem	Removes all modems or modems hosted by a uBR10-MC5x20 line card downstream interface under a specific category.

cable service attribute voice-enabled

To restrict voice services only to the uBR10-MC5X20 downstream interfaces for high availability, use the **cable service attribute voice-enabled** command in global configuration mode. To remove the restriction of voice services to the uBR10-MC5X20 downstream interfaces, use the **no** form of the command.

cable service attribute voice-enabled downstream-type HA-capable
no cable service attribute voice-enabled downstream-type HA-capable

Syntax Description

downstream-type	Restricts voice services to a specific downstream type.
HA-capable	Restricts voice services to the uBR10-MC 5x20 line card.

Command Default

All primary-capable downstream channels on the uBR10-MC 5x20 line card and the SPA can support downstream voice service flows.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A voice-enabled cable modem is identified either at registration by decoding DHCP TLV 122 in the modem's DHCP-ACK, or at its first voice call if DHCP TLV 122 is not exchanged. If a voice-enabled modem is detected at registration on a SPA downstream channel, it will be moved to the uBR10-MC5x20 downstream channel in the CGD via downstream frequency override. If the voice-enabled modem is detected at its first voice call after registration, it will be moved after the call is over to the uBR10-MC5x20 channel in the CGD via DCC. If the voice enabled modem fails to come up on the target uBR10-MC5x20 channel, the CMTS will continue to move the modem until three retries (the maximum number of allowed retries) has been reached, when the modem will be allowed to stay on the SPA downsream channel until another set of retries is attempted by the CMTS every 24 hours. A voice enabled modem on the uBR10-MC5x20 channel will be excluded from being load balanced to a SPA downstream channel. If this option is configured at any time after the system if up, voice enabled modems that have been identified on the SPA dowsntream channel without active voice calls will be gradually moved to the uBR10-MC5x20 downstream channel in the CGD at the rate of one modem per five seconds.

Examples

```
Router# configure terminal

Router(config)# cable service attribute voice-enabled downstream-type HA-capable
```

Related Commands

cable service attribute non-ds-bonded	Forces a non-bonding-capable modem to register only on non-bonded RF channels.

cable service attribute ds-bonded	Forces a downstream-bonding capable modem to initialize on a bonded primary-capable DS channel.

cable service attribute withhold-TLVs

To block sending of DOCSIS 3.0 time, length, value (TLVs) to DOCSIS 1.x and DOCSIS 2.0 cable modems, use the **cable service attribute withhold-TLVs** command in global configuration mode. To unblock sending of the DOCSIS 3.0 TLVs to DOCSIS 1.x and DOCSIS2.0 cable modems, use the **no** form of this command.

cable service attribute withhold-TLVs peak-rate
no cable service attribute withhold-TLVs peak-rate

Syntax Description

peak-rate	Specifies the DOCSIS 3.0 peak traffic rate TLVs 24.27 and 25.27, which are blocked from being sent to the non-DOCSIS 3.0 cable modems.

Command Default

The DOCSIS 3.0 TLVs are sent to all cable modems.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB10	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Some DOCSIS 1.x and DOCSIS 2.0 cable modems may fail to come online when they receive DOCSIS 3.0 TLVs from the CMTS during registration. The **cable service attribute withhold-TLVs** command allows you to restrict sending of the configured DOCSIS 3.0 TLVs to DOCSIS 1.x and DOCSIS 2.0 cable modems. This command does not restrict sending of DOCSIS 3.0 TLVs to DOCSIS 3.0 cable modems.

Note In Cisco IOS Release 12.2(33)SCB10 only the **peak-rate** keyword is supported, which represents TLVs 24.27 and 25.27.

Examples

The following example shows how to configure the CMTS to restrict sending of DOCSIS 3.0 peak traffic rate TLVs 24.27 and 25.27 to non-DOCSIS 3.0 cable modems:

```
Router # configure terminal
Router(config)# cable service attribute withhold-TLVs peak-rate
```

The following warning message is displayed when the above example is configured.

```
Warning: This configuration may violate D3.0 MULPI specification per section 6.4.8.
```

Related Commands

Command	Description
cable service class	Defines and modifies a service class

cable service class

To set parameters for DOCSIS 1.1 cable service class, use the **cable service class** command in global configuration mode. To delete a service class or to remove a configuration, use the **no** form of the command.

cable service class *class-index* [*keyword-options*]
no cable service class *class-index* [*keyword-options*]

Syntax Description

class-index	Specifies the class ID for the class to be modified. Valid range is 1 to 1023.
activity-timeout	Specifies the activity timeout (0 to 65,535).
admission-timeout	Specifies the admitted timeout (0 to 65,535).
downstream	Specifies that the service class is for the downstream direction (from the CMTS to the CM). (The default direction is **upstream**.)
data-rate-unit *data-rate*	Configure Data Rate Unit Setting. The range is 0–3. 0=bps, 1=kbps, 2=Mbps, 3=Gbps.
grant-interval	Specifies the grant interval (0 to 4,294,967,295 microseconds).
grant-jitter	Specifies the grant jitter (0 to 4,294,967,295 microseconds).
grant-size	Specifies the grant size (0 to 65,535 bytes).
grants-per-interval	Specifies the grants per interval (0 to 127 grants).
max-burst	Specifies the maximum transmission burst (1522 to 4,294,967,295 bytes). **Note** The recommended value range is 1600 to 1800 bytes. Using a value of 0 or greater than 1800 bytes can cause latency issues for Voice-over-IP. A value of less than 1522 bytes can prevent the upstream transmission of large ethernet frames for any CM or CMTS not implementing fragmentation.
max-buff-size	Specifies the maximum buffer size of the upstream service-flow queue (or buffer) on the CM. The valid range is from 0 to 4294967295 bytes. The default value is 0.
max-concat-burst	Specifies the maximum concatenation burst (0 to 65,535 bytes).
max-latency	Specifies the maximum latency allowed (0 to 4,294,967,295 microseconds).
max-rate	Specifies the maximum rate (0 to 4,294,967,295 bps).
min-buff-size	Specifies the minimum buffer size of the upstream service-flow queue (or buffer) on the CM. The valid range is from 0 to 4294967295 bytes. The default value is 0.
min-packet-size	Specifies the minimum packet size for reserved rate (0 to 65,535 bytes).
min-rate	Specifies the minimum rate (0 to 4,294,967,295 bps).

name	Specifies the service class name string.
peak-rate	Specifies the peak rate (0 to 4,294,967,295 bps). Default value is zero, which represents the line rate. **Note** The **peak-rate** option is not supported on the DOCSIS 1.0 modems.
poll-interval	Specifies the poll interval (0 to 4,294,967,295 microseconds).
poll-jitter	Specifies the poll jitter (0 to 4,294,967,295 microseconds).
priority	Specifies the priority (0 to 7, where 7 is the highest priority).
req-trans-policy	Specifies the request transmission policy bit field (0 to FFFFFFF in hexadecimal).
sched-type	Specifies the service class schedule type: 2–Best-Effort Schedule Type 3–Non-Real-Time Polling Service Schedule Type (supported only in Cisco 12.2(4)BC and later releases) 4–Real-Time Polling Service Schedule Type 5–Unsolicited Grant Service with Activity Detection Schedule Type 6–Unsolicited Grant Service Schedule Type
tar-buff-size	Specifies the target or desired size of the upstream service-flow queue (or buffer) on the CM. The valid range is from 0 to 4294967295 bytes. The default value is 0.
tos-overwrite *and-mask or-mask*	Overwrites the ToS byte by first ANDing the TOS value with the *and-mask* value and then ORing the result of that operation with the *or-mask* value. Both parameters must be specified in hexadecimal. The *and-mask* value can range from 0x0 to 0xFF and the *or-mask* value can range from 0x0 to 0xFF.
upstream	Specifies that the service class is for the upstream direction (from the CM to the CMTS). This is the default direction.
downstream	Specifies that the service class is for the downstream direction (from the CMTS to the CM).
n	Specifies the bundle identifier.
req-attr-mask	Specifies the required attribute mask bit field (0 to FFFFFFF in hexadecimal).
forb-attr-mask	Specifies the forbidden attribute mask bit field (0 to FFFFFFF in hexadecimal).

Command Default

Values that are not specified are set to their DOCSIS 1.1 defaults, if applicable to the service-class schedule type. See Section C.2.2, *Service Flow Encodings* , in the DOCSIS 1.1 specification.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(4)CX	This command was introduced for DOCSIS 1.1 operation. This command replaced the **cable qos profile** command that was used in previous versions for DOCSIS 1.0 operation.
12.2(4)BC1	This command was integrated into Cisco IOS release 12.2(4)BC1. This command was also enhanced to support NRTPS scheduling.
12.2(11)BC2	The default value for the maximum transmission burst parameter (max-burst) was changed from 1522 bytes to 3044 bytes. The default value for the maximum concatenation burst parameter was also changed from 0 bytes (unlimited) to 1522 bytes. These changes are to accommodate the latest revision of the DOCSIS 1.1 specification (SP-RFI-v1.1-I09-020830).
12.3BC	This command was integrated into Cisco IOS release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA.
12.2(33)SCB	This command was modified with the addition of **req-attr-mask** and **forb-attr-mask** keywords.
12.2(33)SCB1	This command was modified with the addition of **peak-rate** to set value greater than the **max-rate**.
12.2(33)SCF2	This command was modified. Three new keywords **max-buff-size**, **min-buff-size**, and **tar-buff-size** were added as part of the Upstream Buffer Control feature.
12.2(33)SCI1	This command was modified with the addition of **downstream** keyword.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Dublin 17.12.1z	The **data-rate-unit** *data-rate* option is added.

Usage Guidelines

The **sched-type** option must always be specified for each upstream class. The option cannot be configured for downstream classes. When a certain scheduling type is selected, take care that the mandatory parameters for that scheduling type are explicitly entered, while non-applicable parameters must be explicitly removed.

The default direction is **upstream**. We recommend that you do not change the direction of a service class after you have created it, because some of the existing service class parameters might not be appropriate for the new direction. Instead, delete the current service class and create a new service class with the correct upstream or downstream direction.

If the service class is newly created, a service-class name must be defined before entering the parameters for the service class.

Note Section C.2.2.6.10, *IP Type of Service Overwrite* , of the DOCSIS 1.1 specification changed the operation of **tos-overwrite** option. In DOCSIS 1.1 networks, the new TOS value is calculated by the following formula: New IP TOS = ((Original TOS value AND *and-mask*) OR *or-mask*). (For a description of the previous method of calculating the TOS value, see the **cable qos profile** command.) The default is to leave the TOS value unchanged (no overwrite).

Examples

The following examples show configurations that use the **cable service class** command to create service classes. Based on the scheduling type specified, some command lines are mandatory, while others are optional.

Each example shown here is a complete configuration set for creating a service class.

Configuring a Service Class for Unsolicited Grant Scheduling Service

```
Router(config)# cable service class 1 name UP_UGS
Router(config)# cable service class 1 sched-type 6
Router(config)# cable service class 1 grant-size 100
Router(config)# cable service class 1 grant-interval 20000
Router(config)# cable service class 1 grant-jitter 4000
Router(config)# cable service class 1 grants-per-interval 1
Router(config)# cable service class 1 min-packet-size 100
Router(config)# cable service class 1 req-trans-policy 0x1FF
Router(config)# cable service class 1 tos-overwrite 0x1F 0xE0
Router(config)# cable service class 1 activity-timeout 30
Router(config)# cable service class 1 admission-timeout 30
```

Configuring a Service Class for Unsolicited Grant Scheduling with Activity Scheduling

```
Router(config)# cable service class 2 name UP_UGSAD
Router(config)# cable service class 2 sched-type 5
Router(config)# cable service class 2 grant-size 100
Router(config)# cable service class 2 grant-interval 20000
Router(config)# cable service class 2 grant-jitter 4000
Router(config)# cable service class 2 grants-per-interval 1
Router(config)# cable service class 2 poll-interval 10000
```

```
Router(config)# cable service class 2 poll-jitter 4000
Router(config)# cable service class 2 min-packet-size 100
Router(config)# cable service class 2 req-trans-policy 0x1FF
Router(config)# cable service class 2 tos-overwrite 0x1F 0xE0
Router(config)# cable service class 2 activity-timeout 30
Router(config)# cable service class 2 admission-timeout 30
```

Configuring a Service Class with Real-Time Polling Service

```
Router(config)# cable service class 3 name UP_RTPS
Router(config)# cable service class 3 sched-type 4
Router(config)# cable service class 3 poll-interval 10000
Router(config)# cable service class 3 poll-jitter 4000
Router(config)# cable service class 3 min-rate 64000
Router(config)# cable service class 3 max-rate 128000
Router(config)# cable service class 3 max-burst 2000
Router(config)# cable service class 3 max-concat-burst 1522
Router(config)# cable service class 3 req-trans-policy 0x1FF
Router(config)# cable service class 3 tos-overwrite 0x1F 0xE0
Router(config)# cable service class 3 activity-timeout 30
Router(config)# cable service class 3 admission-timeout 30
```

Configuring a Service Class for Best-Effort Upstream Service

```
Router(config)# cable service class 4 name UP_BE
Router(config)# cable service class 4 sched-type 2
Router(config)# cable service class 4 priority 5
Router(config)# cable service class 4 min-rate 0
Router(config)# cable service class 4 max-rate 128000
Router(config)# cable service class 4 max-burst 2000
Router(config)# cable service class 4 max-concat-burst 1522
Router(config)# cable service class 4 req-trans-policy 0x0
Router(config)# cable service class 4 tos-overwrite 0x1F 0xE0
```

```
Router(config)# cable service class 4 activity-timeout 30

Router(config)# cable service class 4 admission-timeout 30
```

Configuring a Service Class for Best-Effort Downstream Service

```
Router(config)# cable service class 5 name DOWN_BE

Router(config)# cable service class 5 priority 5

Router(config)# cable service class 5 min-rate 0

Router(config)# cable service class 5 max-rate 1000000

Router(config)# cable service class 5 max-burst 3000

Router(config)# cable service class 5 activity-timeout 30

Router(config)# cable service class 5 admission-timeout 30
```

Configuring a Service Class for Peak-Rate

```
Router(config)# cable service class
201 name hsd
Router(config)# cable service class
201 downstream
Router(config)# cable service class
201 max-rate 1024000
Router(config)# cable service class
201 min-rate 1024000
Router(config)# cable service class
201 peak-rate 2000000
```

Configuring a Service Class with Upstream Buffer Control Parameters

```
Router(config)# cable service class
10 name REG-US
Router(config)# cable service class
10 upstream
Router(config)# cable service class
10 max-buff-size 20000
Router(config)# cable service class
10 min-buff-size 10000
Router(config)# cable service class
10 tar-buff-size 15000
```

Associated Features

The **cable service class** command is used to configure the following features:

- Configuring Upstream Cable Interface Features on the Cisco CMTS Routers
- Upstream Scheduler Mode for the Cisco CMTS Routers

Related Commands

Command	Description
cable qos profile	Creates a DOCSIS 1.0 QoS profile.
show cable service-class	Displays the service classes that have been created.

cable service flow activity-timeout

To configure the activity timeout for dynamic cable service flows in DOCSIS 1.1 environments, where PacketCable is inactive, use the **cable service flow activity-timeout** command in global configuration mode. To remove the activity timer once configured, use the **no** form of this command.

cable service flow activity-timeout *n*
no cable service flow activity-timeout [<*n*>]

Syntax Description

n	The timeout length in seconds. Valid range is 0 - 65535 seconds. Setting this value to 0 configures the service flow to never timeout.

Command Default

0 seconds

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC2	This command was introduced to support DOCSIS 1.1 service flow operation in non-Packet-Cable environments.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When PacketCable is supported, PacketCable sets the inactivity timeout from the PacketCable gate, and the PacketCable activity overrides timeout values set with this command. This is the case even where the inactivity timeout is set to zero, which configures the service flow to never timeout.

Apart from PacketCable, this command enables the cable modem to control the setup of the dynamic service flows, and to remove inactive service flows. During the creation of service flows, all Upstream and Downstream flows in the request are checked to see if the configured activity timeout needs to be applied.



Note The **cable service flow activity-timeout** command affects new calls only; it does not clear any existing hung flows. To clear existing flows, use the **test cable dsd** *mac-add sid* command.

Examples

The following example in global configuration mode configures the cable modems connected to the Cisco CMTS to use activity timeout of zero, which means that related service flows do not timeout in a non-PacketCable environment:

```
Router(config)# cable service flow activity-timeout 0
```

The following example in global configuration mode configures the cable modems connected to the Cisco CMTS to use activity timeout of 300 seconds, which means that related service flows will timeout if no activities in 5 minutes:

```
Router(config)# cable service flow activity-timeout 300
```

Related Commands

Command	Description
cable qos profile	Creates a DOCSIS 1.0 QoS profile.
(Not for Cisco cBR Series Routers) **cable service flow inactivity-threshold**	Sets the amount of time a dynamic service-flow can be present in the system without any activity (DOCSIS 1.1 operation).
show cable service-class	Displays the service classes that have been created.

cable service-flow inactivity-timeout

To set the amount of time a dynamic service-flow can be present in the system without any activity, use the **cable service-flow inactivity-timeout** command in global configuration mode. To remove the specification, use the **no** form of this command.

cable service-flow inactivity-timeout *minutes*
no cable service-flow inactivity-timeout

Syntax Description

minutes	Specifies service-flow inactivity-timeout in minutes. Valid range is 1 to 120 minutes. Default value is 30 minutes.

Command Default

30 minutes

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(3a)EC	This command was introduced.
12.1(4)CX	This command was replaced by the **cable service flow inactivity-threshold** command for DOCSIS 1.1 operation.

Usage Guidelines

Resources such as service identifiers (SIDs) and bandwidth are dynamically allocated by a CM using Dynamic Service Addition (DSA) transaction. If the CM fails to release these resources by issuing a Dynamic Service Deletion (DSD), then the resources might be locked indefinitely. Use this command to release unused resources.

Examples

The following example shows how to set the inactivity timeout for dynamic service flows to 2 minutes. Once this setting is specified, any dynamic SID that does not show any activity in 2 minutes will be deleted.

```
Router(config)# cable service-flow inactivity-timeout 2
```

The following example shows how to set the inactivity timeout back to the default value of 30 minutes:

```
Router(config)# cable service-flow inactivity-timeout
```

Related Commands

Command	Description
cable service flow inactivity-threshold	Sets the amount of time a dynamic service-flow can be present in the system without any activity (DOCSIS 1.1 operation).
cable qos permission	Specifies permission for updating the cable router QoS table.
cable qos profile	Configures a QoS profile.

Command	Description
show controllers cable	Displays QoS profiles.

cable service flow inactivity-threshold

To set the inactivity threshold value for service flows using Unsolicited Grant Service with Activity Detection (UGS-AD), use the **cable service flow inactivity-threshold** command in global configuration mode. To disable the inactivity timer and reset the threshold limit timer to its default of 10 seconds, so that service flows revert to UGS activity only, use the **no** form of this command.

cable service flow inactivity-threshold *n*
no cable service flow inactivity-threshold *n*

Syntax Description

n	Specifies the threshold limit in seconds, with 10 seconds as the default. Configurable limits are 1 to 3600 seconds.

Command Default

The default is to enable the inactivity timer, with a default value of 10 seconds.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(4)CX	This command replaced the **cable service-flow inactivity-timeout** command for DOCSIS 1.1 operation.
12.2(4)BC1	Support for this command was added to the Release 12.2 BC train.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

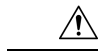
Usage Guidelines

DOCSIS 1.1 allows a CM to request Unsolicited Grant Service (UGS) for an upstream, allowing the CM to reserve a certain amount of Constant Bit Rate (CBR) bandwidth for real-time traffic, such as Voice-over-IP (VoIP) calls. The UGS-AD variation allows the CMTS to switch a service flow to Real Time Polling Service (RTPS) after a certain period of inactivity, so that bandwidth is not reserved when it is not needed. The CM can then request UGS service when the flow again becomes active.



Note This command replaced the **cable service-flow inactivity-timeout** command, which was used in DOCSIS 1.0 operation to enable or disable watchdog cleanup of dynamic service flows that are not sending any packets on the upstream.

The **cable service flow inactivity-threshold** command sets the inactivity timer for how long a service flow must be inactive before the CMTS can switch it from UGS-AD to RTPS. The **no cable service flow inactivity-threshold** command disables the timer and resets it to its default value of 10 seconds, so that the CMTS always provides UGS service to the service flow, even when the flow is idle.



Caution The **no cable service flow inactivity-threshold** command effectively disables the use of RTPS and USG-AD services and configures the CMTS to provide only UGS services. This will prevent a CM that registered for USG-AD services from being able to obtain upstream transmission opportunities, resulting in a significant loss of bandwidth when a large number of CMs are requesting UGS-AD service flows.

Examples

The following example shows the inactivity timer being set to 20 seconds:

```
Router(config)# cable service flow inactivity-threshold 20

Router(config)#
```

The following command disables the inactivity timer, so that the service flow remains UGS, even during periods of inactivity:

```
Router(config)# no cable service flow inactivity-threshold

Router(config)#
```

Related Commands

Command	Description
cable service class	Sets the DOCSIS 1.1 service class parameters.
cable service-flow inactivity-timeout	Sets the amount of time a dynamic service-flow can be present in the system without any activity (DOCSIS 1.0 operation).
show controllers cable	Displays information for the cable interface.

cable service flow priority

To enable the service flow priority in downstream extended header, use the **cable service flow priority** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable service flow priority
no cable service flow priority

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable service flow priority** command in global configuration mode to enable service flow priority in downstream extended header.

The following example in global configuration mode enables the service flow priority in downstream extended header:

```
Router(config)# cable service flow priority
```

Use the **show running-config | in service flow** command to check the enabled status of the feature:

```
Router(config)# show running-config | in service flow
cable service flow priority
```

Related Commands

Command	Description
show running-config | in service flow	Displays the service classes that have been created.

cable service type

To redirect CMs matching a service-type to downstream frequency, use the **cable service type** command in global configuration mode. To cancel the redirection of CMs, use the **no** form of this command.

cable service type *service-type-id* **ds-frequency** *frequency*
no cable service type *service-type-id* **ds-frequency** *frequency*

Syntax Description

service-type-id	Specifies the service type identifier to be redirected. The maximum length of *service-type-id* is 16.
ds-frequency *frequency*	Specifies the downstream frquency the CMs will be redirected to.

Command Default

Disabled

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command will redirect the CMs matching a particular service-type identifier to downstream frequency. Multiple service types can be redirected to one frequency. However, one service type cannot be redirected to multiple DS frequencies.

Examples

The following example shows how to redirect the CMs matching the service type to downstream frequency:

```
Router(config)# cable service type commercial ds-frequency 519000000
```

cable set mpls-experimental

To specify experimental bits for Multiprotocol Label Switching (MPLS) labels, use the **cable set mpls-experimental** command in Ethernet service configuration mode. To disable this configuration, use the **no** form of this command.

cable set mpls-experimental *value*
no cable set mpls-experimental *value*

Syntax Description

value	Experimental bit for MPLS labels. Valid values are from 0 to 7.

Command Default

If this command is not used, the experimental bits on the MPLS label are set to zero.

Command Modes

Ethernet service configuration (config-ethsrv)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The experimental bits are set for all inner and outer MPLS labels for the egress Layer 2 VPN traffic on the WAN interface.

Examples

The following example shows how to set an experimental bit for MPLS labels on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# cable l2vpn 0000.396e.6a68 customer1
Router(config-l2vpn)# service instance 2000 Ethernet
Router(config-ethsrv)# xconnect 101.1.0.2 221 encapsulation mpls pw-type 4
Router(config-ethsrv)# cable set mpls-experimental 7
```

Related Commands

Command	Description
cable l2vpn	Enables Ethernet L2VPN service and enters L2VPN configuration mode.
service instance	Configures an Ethernet service instance for a particular customer.
xconnect	Binds an attachment circuit to a pseudowire.

cable sflog

To enable service flow logging, to configure the number and duration of entries in the log, and to represent the time when the corresponding service flow is destroyed, use the **cable sflog** command in global configuration mode. To disable service flow logging, use the **no** form of the command.

cable sflog {**stop-record-time-overwrite** | **max-entry** *number* **entry-duration** *time* }
no cable sflog

Syntax Description

stop-record-time-overwrite	Specifies the time when the corresponding service flow is destroyed.
max-entry *number*	Specifies the maximum number of entries in the service flow log. When the log becomes full, the oldest entries are deleted to make room for new entries. The valid range is 0 to 59999, with a default of 0 (which disables service flow logging). **Note** The **max-entry** value applies to the entire chassis on the Cisco uBR7100 series and Cisco uBR7200 series routers, but applies to individual cable line cards on the Cisco uBR10012 router and Cisco cBR Series Converged Broadband Routers.
entry-duration *time*	Specifies how long, in seconds, entries can remain in the service flow log. The CMTS deletes entries in the log that are older than this value. The valid range is 1 to 86400 seconds, with a default value of 3600 seconds (1 hour).

Command Default

max-entry = 0 (service flow logging is disabled) and **entry-duration** = 3600 seconds

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
12.2(33)SCJ1	This command was modified with the addition of **stop-record-time-overwrite** keyword.

Usage Guidelines

A DOCSIS specification currently being developed requires the DOCSIS CMTS to maintain a log table that contains entries of deleted service flows. The **cable sflog** command enables the logging of deleted service flows in this table and also sets the maximum number of entries in the log. When the log becomes full, the oldest entries are deleted to make room for the newest ones.

This command also configures how long each entry can remain in the log. When an entry has been in the table for the specified time, the CMTS deletes it, even if the log is not currently full.

To display the service flow log, use SNMP commands to display the docsQosServiceFlowLogEntry entries in the docsQosServiceFlowLogTable table. These attributes are defined in the *Data Over Cable System Interface Specification Quality of Service Management Information Base (DOCSIS-QOS MIB)* internet draft.

Cisco IOS Release 12.2(15)BC1 supports version 4 of this DOCSIS-QOS MIB draft, which is available on the IETF Internet-Drafts web site.

Note At the time of this document's release, the DOCSIS-QOS MIB is still in draft form and is therefore subject to change in future releases of Cisco IOS software.

The **max-entry** value specified by this command applies to the entire chassis for the Cisco uBR7100 series and Cisco uBR7200 series routers, but to individual line cards on the Cisco uBR10012 and Cisco cBR Series Converged Broadband Routers. However, the Cisco uBR10012 and Cisco cBR Series Converged Broadband Routers still maintain only one log table for all deleted service flows.

For example, if the **max-entry** value is set to 10,000 on a Cisco uBR7200 series router, the service flow log table holds a maximum of 10,000 entries for all cable line cards in the chassis. If the **max-entry** value is set to 10,000 on a Cisco uBR100012 router that has four cable line cards installed, the service flow log table holds a maximum of 40,000 entries, with each cable line card having a maximum of 10,000 entries each.

Examples

The following example shows how to enable service flow logging with a maximum of 2,000 entries in the log, and with each entry remaining in the log for a maximum of 2 hours (7200 seconds):

```
Router(config)# cable sflog max-entry 2000 entry-duration 7200
```

The following example shows how to set the **max-entry** value to its default of 0 and disable service flow logging:

```
Router# configure terminal

Router(config)# no cable sflog

Router(config)# exit

Router#
```

Related Commands

Command	Description
cable service-flow inactivity-timeout	Sets the amount of time a dynamic service-flow can be present in the system without any activity (DOCSIS 1.0 operation).
cable service flow inactivity-threshold	Sets the amount of time a dynamic service-flow can be present in the system without any activity (DOCSIS 1.1 operation).

cable shared-secondary-secret

To configure one or more secondary shared-secret keys that CMs can use to successfully process the DOCSIS configuration file and register with the CMTS, use the **cable shared-secondary-secret** command in cable interface configuration mode. To remove the secondary shared secrets, use the **no** form of this command.

cable shared-secondary secret index *index-num* [**0** | **7**] *authentication-key*
no cable shared-secondary secret index *index-num*

Syntax Description

index *index-num*	Specifies the order in which the CMTS will use the secondary shared-secrets to verify the CM during the registration process. The valid range is 1 to 16.
0	(Optional) Specifies that an unencrypted message will follow.
7	(Optional) Specifies that an encrypted message will follow. **Note** As a general rule, the **7** option is not used by users at the command line because it requires a pre-encrypted password. Typically, the **7** option is useful only when cutting and pasting commands from another router's configuration file.
authentication-key	Text string specifying the shared secret string. When you also use the **service password-encryption** command, the key is stored in encrypted form. The text string can be any arbitrary string up to 80 characters in length.

Command Default

No secondary shared secret is used. If no encryption option is specified, the key is stored in the configuration file as encrypted text if the **service password-encryption** command has also been given.

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(8)BC2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable shared-secondary-secret** command can be used to supplement the **cable shared-secret** command so as to prevent unauthorized interception and alteration of the DOCSIS configuration file that is downloaded to the CM during the registration process. The DOCSIS specification allows for a CM and CMTS to use a shared secret (a secret encryption string) to calculate the MD5 Message Integrity Check (MIC) value for the DOCSIS configuration file that is downloaded to the CM.

The CM must use the proper shared secret encryption string to successfully decrypt and process the configuration file, and then register with the CMTS. If the CM does not have the proper encryption string, it will be unable to calculate the proper MIC value, and the **show cable modem** command will show **reject(m)** for the modem to indicate a MIC authentication failure.

The **cable shared-secondary-secret** command allows a cable operator to specify up to 16 alternate DOCSIS shared secrets. If a CM has a MIC authentication failure during registration, the CMTS then checks the MIC values using the alternate shared secrets. If a match is found, the CM is allowed online. If none of the alternate MIC values match the value returned by the CM, the CMTS refuses to allow the CM to come online and instead logs a MIC authentication failure.

The use of secondary shared secrets allow the MSO to gradually phase in changes to the shared secret key. If a shared secret has been compromised, or if the MSO decides to regularly change the shared secret, the MSO can use the **cable shared-secret** command to immediately change the primary shared secret. The previous key can then be made a secondary shared secret, using the **cable shared-secondary-secret** command, so that CMs can continue to register until the MSO can change all of the DOCSIS configuration files to use the new shared secret.

To use the secondary shared-secret feature, you must do the following:

- You must specify a shared secret with the **cable shared-secret** command. The **cable shared-secondary-secret** command has no effect if you have not specified a primary shared secret.



Note At any particular time, the majority of CMs should use the primary shared secret to avoid excessive registration times.

- Create DOCSIS configuration files that use the shared-secret encryption string to create the MD5 MIC value. This can be done using the Cisco DOCSIS Configurator tool by entering the shared-secret string in the **CMTS Authentication** field in the **Miscellaneous** parameters.



Tip The shared-secret string itself is not saved in the DOCSIS configuration file, so you must re-enter the string in the "CMTS Authentication" field whenever you create or edit a DOCSIS configuration file using the Cisco DOCSIS Configurator tool.

- Use the **cable shared-secondary-secret** command to configure the cable interfaces with one or more matching shared-secret strings. The string configured on an interface must match the string used to create the DOCSIS configuration files downloaded to the CMs on that interface, or the CMs will not be able to register. You can use different shared secrets for each interface, if you are also using a different set of configuration files for each interface.
- To encrypt the shared-secret strings in the CMTS configuration, you must include the **service password-encryption** global configuration command in the router's configuration.



Note You cannot use the shared secret feature with the files created by the internal DOCSIS configuration file editor (**cable config-file** command).

Examples

The following example shows how to specify multiple secondary shared-secret string using encrypted keys:

```
Router# configure terminal

Router(config)# service password-encryption
```

```
Router(config)# int c6/0

Router(config-if)# cable shared-secret n01jk_1a

Router(config-if)# cable shared-secondary-secret index 1 cabl3-x21b

Router(config-if)# cable shared-secondary-secret index 2 dasc9_ruld55ist5q3z

Router(config-if)# cable shared-secondary-secret index 3 j35u556_x_0

Router(config-if)# exit

Router(config)# exit

Router# show running-config | include shared

cable shared-secret 7 1407513181A0F13253920
cable shared-secondary-secret 7 14031A021F0D39263D3832263104080407
cable shared-secondary-secret 7 071B29455D000A0B18060615142B38373F3C2726111202431259545D6
cable shared-secondary-secret 7 0501555A34191B5F261D28420A555D
Router#
```

Note In this example, the shared-secret strings are initially entered as clear text, but because the **service password-encryption** command has been used, the strings are encrypted in the configuration file.

Related Commands

Command	Description
cable dynamic-secret	Enables the dynamic shared secret feature, so that DOCSIS configuration files are verified with a dynamically generated shared secret.
cable shared-secret	Configures an authentication shared-secret key that CMs must use to successfully process the DOCSIS configuration file and register with the CMTS.
cable tftp-enforce	Requires that all CMs on a cable interface attempt to download a DOCSIS configuration file using the Trivial File Transfer Protocol (TFTP) through the cable interface before being allowed to register and come online.

cable shared-secret

To configure an authentication shared-secret encryption key that CMs must use to successfully process the DOCSIS configuration file and register with the CMTS, use the **cable shared-secret** command in cable interface configuration mode or MAC domain profile configuration mode. To disable the use of a shared-secret key during the CM registration phase, use the **no** form of this command.

cable shared-secret [**0** | **7**] *authentication-key*
no cable shared-secret

Cisco cBR Series Converged Broadband Routers
cable shared-secret {**0** | **7**} *authentication-key*

Syntax Description

0	(Optional) Specifies that an unencrypted message (clear text) will follow.
7	(Optional) Specifies that an encrypted message will follow. **Note** As a general rule, the **7** option is not used by users at the command line because it requires a pre-encrypted password. Typically, the **7** option is useful only when cutting and pasting commands from another router's configuration file.
authentication-key	Text string specifying the shared secret string. When you also use the **service password-encryption** command, the key is stored in encrypted form. The text string can be any arbitrary string up to 80 characters in length.

Command Default

No shared-secret encryption key is used during registration, only the default DOCSIS MD5-encrypted checksum. When **cable shared-secret** is given without specifying an encryption option, the key is stored in the configuration file as an encrypted password if the **service password-encryption** command has also been given.

Command Modes

Interface configuration—cable interface only (config-if)

Wideband-interface profile configuration (config-profile-wb)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
11.3 XA	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable shared-secret** command can be used to prevent unauthorized interception and alteration of the DOCSIS configuration file that is downloaded to the CM during the registration process. The **cable shared-secret** command specifies a secret encryption string that the CMTS uses to calculate the MD5 Message

Integrity Check (MIC) value that is appended to every DOCSIS configuration file and that the CM and CMTS use to verify the file's integrity.

The CM must use the shared secret encryption string to successfully decrypt and process the configuration file, and then register with the CMTS. If the CM does not have the proper encryption string, it will be unable to calculate the proper MIC value, and the **show cable modem** command will show **reject(m)** for the modem to indicate a MIC authentication failure.

To use the shared-secret feature, you must do the following:

- Create DOCSIS configuration files that use the shared-secret encryption string to create the MD5 MIC value. This can be done using the Cisco DOCSIS Configurator tool by entering the shared-secret string in the "CMTS Authentication" field in the "Miscellaneous" parameters.



Note The shared-secret string itself is not saved in the DOCSIS configuration file, so you must re-enter the string in the "CMTS Authentication" field whenever you create or edit a DOCSIS configuration file using the Cisco DOCSIS Configurator tool.

- Use the **cable shared-secret** command to configure the cable interfaces with a matching shared-secret string. The string configured on an interface must match the string used to create the DOCSIS configuration files downloaded to the CMs on that interface, or the CMs will not be able to register. You can use different shared secrets for each interface, if you are also using a different set of configuration files for each interface.
- To encrypt the shared-secret string in the CMTS configuration, you must include the **service password-encryption** global configuration command in the router's configuration.



Note You cannot use the shared secret feature with the files created by the internal DOCSIS configuration file editor (**cable config-file** command).



Note In Cisco IOS Release 12.2(8)BC2 and later releases, you can also use the **cable shared-secondary-secret** command to specify multiple shared-secret strings, so that you can gradually phase in a new shared secret string.

Upgrading When Using Shared Secret Passwords

Cisco IOS Release 12.2 BC changed the encryption algorithm used for the **cable shared-secret** command. If you are upgrading from a Cisco IOS 12.1 EC or 12.0 SC release, you cannot cut and paste the **cable shared-secret** configuration lines that include an encrypted password. Instead, you must re-enter the original shared secret passwords at the CLI prompt, and then resave the configuration.

For example, if the actual shared secret password is "cm-sharedsecret-password", enter the **cable shared-secret cm-sharedsecret-password** command at the CLI prompt. If you have enabled password encryption, the configuration file will then show only the newly encrypted password.

Note This change affects only the encryption of the passwords that are stored in the configuration file. It does not affect the actual encryption that is used between the CMTS and CMs, so you do not need to change the shared secret in the DOCSIS configuration files for the CMs.

Examples

The following example shows how to specify a shared-secret string using an encrypted key:

```
Router# configure terminal

Router(config)# service password-encryption

Router(config)# int c6/0

Router(config-if)# cable shared-secret password
Router(config-if)# exit

Router(config)# exit

Router# show running-config | include shared

cable shared-secret 7 1407513181A0F13253920
Router#
```

Note In this example, the shared-secret string is initially entered as clear text, but because the **service password-encryption** command has been used, the string is encrypted in the configuration file.

The following example shows how to remove the use of a shared-secret encryption key on a cable interface. That particular interface then ignores any shared-secret that is used when calculating the MD5 checksum:

```
Router# configure terminal

Router(config)# int c6/0

Router(config-if)# no cable shared-secret
Router(config-if)# end

Router#
```

Related Commands

Command	Description
cable dynamic-secret	Enables the dynamic shared secret feature, so that DOCSIS configuration files are verified with a dynamically generated shared secret.
cable shared-secondary-secret	Configures one or more secondary shared-secret keys that CMs can use to successfully process the DOCSIS configuration file and register with the CMTS.
cable tftp-enforce	Requires that all CMs on a cable interface attempt to download a DOCSIS configuration file using the Trivial File Transfer Protocol (TFTP) through the cable interface before being allowed to register and come online.

cable sid-cluster-group

To configure a SID cluster group on a cable interface line card, use the **cable sid-cluster-group** command in cable interface configuration mode. To disable the configuration, use the **no** form of this command.

cable sid-cluster-group [**dynamic** [*max_rate_threshold*] | **req-multiplier** *value* | **num-of-cluster** *number*]
no cable sid-cluster-group [**dynamic** [*max_rate_threshold*] | **req-multiplier** *value* | **num-of-cluster** *number*]

Syntax Description

dynamic *max_rate_threshold*	If specified, the number of SID clusters is dynamically derived from the service flow maximum rate. Valid values are from 1 to 4,294,967,295 bps. If not specified, the legacy threshold of 28 Mbps is preserved.
req-multiplier *value*	Specifies the queue-depth request byte multiplier. Valid values are 1, 2, 4, 8, and 16. A cable modem uses queue-depth based requesting for all bandwidth requests, if the Multiple Transmit Channel mode is enabled.
num-of-cluster *number*	Specifies the number of SID clusters. Valid values are from 1 to 8. The default value is 1.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS XE Gibraltar 16.12.1z	This command was updated. *max_rate threshold* option was added.

Usage Guidelines

Configure the **cable sid-cluster-group num-of-cluster 2** command to achieve desired upstream bonded speeds. Alternatively, use a large upstream Max Traffic burst in the cable modem file (such as 30 kB). The Max Concat burst in the cable modem file does not need change because DOCSIS 3.0 uses continuous concatenations and fragmentation (CCF), and can therefore use the default value of 3044 in the Max Concat field.

If the **cable sid-cluster-group** command is not used, the router accepts the default SID cluster configuration. By default, only one SID cluster is configured.

Examples

The following example shows how to configure a SID cluster on a cable interface in slot 5, subslot 1, and port 0 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 5/1/0
Router(config-if)# cable sid-cluster-group
Router(config-if)# cable sid-cluster-group dynamic
Router(config-if)# cable sid-cluster-group req-multiplier 8
Router(config-if)# cable sid-cluster-group num-of-cluster 2
```

The following example shows how to configure 2 SID clusters on Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# interface cable 7/0/0
Router(config-if)# cable sid-cluster-group req-multiplier 12
Router(config-if)# cable sid-cluster-group num-of-cluster 2
```

The following example shows how to configure dynamic SID clusters on Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# interface cable 7/0/0
Router(config-if)# cable sid-cluster-group dynamic 3000000000
Router(config-if)# cable sid-cluster-group req-multiplier 12
```

Associated Features

The **cable sid-cluster-group** command is used to configure the Upstream Channel Bonding feature.

Related Commands

Command	Description
cable sid-cluster-switching	Specifies SID cluster switchover criteria on a cable interface line card.

cable sid-cluster-switching

To specify Service ID (SID) cluster switchover criteria on a cable interface line card, use the **cable sid-cluster-switching** command in cable interface configuration mode. To disable the configuration, use the **no** form of this command.

cable sid-cluster-switching [**max-outstanding-byte** *value* | **max-request** *value* | **max-time** *seconds* | **max-total-byte** *value*]
no cable sid-cluster-switching [**max-outstanding-byte** *value* | **max-request** *value* | **max-time** *seconds* | **max-total-byte** *value*]

Syntax Description

max-outstanding-byte *value*	(Optional) Specifies the total size, in bytes, for outstanding requests using the SID cluster. The valid values are from 0 to 4294967295.
max-request *value*	(Optional) Specifies the maximum number of requests that can be made using the SID cluster. The valid values are from 0 to 255. The default value is 1. **Note** Do not use 0 as a value for this configuration. The value 0 is used for Cisco Internal purposes only.
max-time *milliseconds*	(Optional) Specifies the total time, in milliseconds, that a service flow can continue to use the SID cluster for bandwidth requests. The valid values are from 0 to 65535.
max-total-byte *value*	(Optional) Specifies the total number of bytes that can be requested using the SID cluster. The valid values are from 0 to 4294967295.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If the service flow has only one SID cluster and the SID cluster switchover criterion limit is met, the cable modem stops sending bandwidth requests until the SID cluster is cleared.

The SID cluster configuration along with switchover criterion may impact overall system performance. So we recommend not to customizing switchover criterion unless justified. The default switchover criterion will meet most of the requirements. If the **cable sid-cluster-switching** command is not used, the router accepts the default SID cluster switchover criterion. That is only one request can be made using the SID cluster.

Examples

The following example shows how to specify SID cluster switchover criteria on a cable interface in slot 5, subslot 1, and port 0 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 5/1/0
Router(config-if)# cable sid-cluster-switching
Router(config-if)# cable sid-cluster-switching max-outstanding-byte 4444
Router(config-if)# cable sid-cluster-switching max-request 222
Router(config-if)# cable sid-cluster-switching max-time 444
Router(config-if)# cable sid-cluster-switching max-total-byte 67890
```

Related Commands

Command	Description
cable sid-cluster-group	Configures a SID cluster on a cable interface line card.

cable sip cir-scale

To configure the committed information rate (CIR) scaling ratio for scaling the admission control (AC) bandwidth for all Modular Cable and Wideband interfaces on a SIP, use the **cable sip cir-scale** command in global configuration mode. To disable the configuration, use the **no** form of the command.

cable sip *slot* **cir-scale** *percent*
no cable sip *slot* **cir-scale**

Syntax Description

slot	Slot number of the SIP on the Cisco uBR10012 router. The valid values are 1 and 3.
percent	Percentage for scaling the AC bandwidth on the SIP. The valid range is from 10 to 100.

Command Default

The AC bandwidth on the SIP is not scaled (that is, 100%).

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCI	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When CIR scaling is configured, the maximum reserved bandwidth is scaled based on the specified *percent*.

Note Do not change the CIR scaling value frequently as it can increase the system load.

The table below provides the recommended values for the CIR scaling:

Table 12: Recommended Values for the CIR Scaling

Shared Port Adapters	Recommended CIR Scaling
4 x Cisco 3 Gbps Wideband Shared Port Adapters	100%
4 x Cisco 6 Gbps Wideband Shared Port Adapters	50%
2 x Cisco 6 Gbps Wideband Shared Port Adapters	100%
1 x Cisco 6 Gbps Wideband Shared Port Adapter and 3 x Cisco 3 Gbps Wideband Shared Port Adapters	80%

The following examples shows how to set the CIR value to 50%:

```
Router# configure terminal
Router(config)# cable sip 1 cir-scale 50
```

cable sip fpd-auto

To configure the automatic upgrade and downgrade of field-programmable device (FPD) image based on the card configuration, use the **cable sip fpd-auto** command in global configuration mode. To disable the configuration, use the **no** form of the command.

cable sip *slot* **fpd-auto**

Syntax Description

slot	Slot number of the SIP on the Cisco uBR10012 router. The valid values are 1 and 3.

Command Default

Automatic upgrade and downgrade of FPD image is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCI1	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command can be used for automatic upgrade of Cisco 3 Gbps Wideband Shared Port Adapter and downgrade of Cisco 6 Gbps Wideband Shared Port Adapter FPD images.

The following example shows how to enable automatic upgrade and downgrade of FPD image:

```
Router# configure terminal
Router(config)# cable sip 1 fpd-auto
```

cable sip ib-stats

To configure the Ironbus throughput warning message threshold and print interval on a SIP, use the **cable sip ib-stats** command in global configuration mode. To disable the configuration, use the **no** form of the command.

cable sip *slot* **ib-stats bandwidth-usage** *percent* **message-throttle** *minutes*
no cable sip *slot* **ib-stats**

Syntax Description

slot	Slot number of the SIP on the Cisco uBR10012 router. The valid values are 1 and 3.
bandwidth-usage *percent*	Specifies the bandwidth usage, in percentage. The valid range is from 50 to 100. The default value is 90%.
message-throttle *minutes*	Specifies the warning message interval, in minutes. The valid range is from 0 to 60. The default value is 2 minutes.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Note If the warning message interval is set to 0, then the warning message is not displayed.

The following example shows how to set the bandwidth usage to 50% and the warning message interval to 10 minutes:

```
Router# configure terminal
Router(config)# cable sip 1 ib-stats bandwidth-usage 50 message-throttle 10
```

Related Commands

Command	Description
show ib statistics	Displays the Ironbus statistics information.

cable snmp cache active

To enable the SNMP cache status, use the **cable snmp cache active** command in global configuration mode. To disable the configuration, use the **no** form of this command.

cable snmp cache active
no cable snmp cache active

Syntax Description

This command has no keywords or arguments.

Command Default

SNMP cache is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable bgsync active** command.

Usage Guidelines

Important You must configure the **service internal** command in global configuration mode to enable or disable SNMP cache status.

The time interval for which the SNMP cache information is stored on the Supervisor is known as *age* and set to 5 seconds.

Example

The following example shows how to enable the SNMP cache status:

```
Router(config)# service internal
Router(config)# cable snmp cache active
```

Related Commands

Command	Description
show cable snmp cache-status	Displays the SNMP cache status.

cable snmp cm-rcs

To receive the service-group ID or the bonding-group ID as Receive Channel Set (RCS) ID that the CM is currently using.

cable snmp cm-rcs {**service-group** | **bonding-group**}

Syntax Description

service-group	Service-group ID is returned as RCS ID.
bonding-group	Bonding-group ID is returned as RCS ID.

Command Default

Service-group ID is returned as RCS ID.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **no** form of this command, that is, **no cable snmp cm-rcs** returns service-group ID as RCS ID.

Example

The following example shows how to configure the command to receive the service-group ID as RCS ID:

```
Router(config)# service internal
Router(config)# cable snmp cm-rcs serivce-group
```

cable snmp iftype ds-phy

Use the **cable snmp iftype ds-phy** command to change toggle the iftype for the downstream physical channels between the default Cisco defined mode and the IANA defined mode.

cable snmp iftype ds-phy *value*

Syntax Description

value	Denotes the iftype of DS_PHY. The following values may be used: • 1—Cisco-defined value for iftype of DS_PHY. • 257—IANA-defined value for iftype of DS_PHY.

Command Default

The default value is 1—Cisco defined iftype.

Command Modes

Global Configuration (config)

Command History

Release	Modification
12.2(33)SCH5	This command was introduced.
12.2(33)SCI1	This command is integrated from Cisco IOS Release 12.2(33)SCH5.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the **iftype** of the downstream physical channel from the default Cisco-defined value 1, to the IANA-defined value 257. The command is also used to revert to the default Cisco-defined value.

Example

This example shows how to change the iftype value of the downstream physical channel for IANA:

```
Router(config)#cable snmp iftype ds-phy 257
```

This example shows how to verify that the iftype value has changed:

```
Router#show running-config | include iftype
cable snmp iftype ds-phy 257
```

cable snmp trap detailed-alarm

The **cable snmp trap detailed-alarm** CLI is used to add an entity name into the alarm description text in alarm trap.

cable snmp trap detailed-alarm

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.10.1g	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable snmp trap detailed-alarm** CLI feature is disabled by default. When this CLI is enabled, the entity name is added into alarm trap description.

With the **cable snmp trap detailed-alarm** CLI, two new information will be added into the content of the **ceAlarmDescrText** component in alarm trap:

- A prefix character '#' .
- The entity name which has alarm.

There are no changes to the other existing components.

The following example shows an usage of the **cable snmp trap detailed-alarm** command:

```
Router(config)# configure terminal
Router(config)# cable snmp trap detailed-alarm
Router(config)# show running-config | i cable snmp
cable snmp trap detailed-alarm
```

cable source-route

To configure the virtual routing and forwarding instance (VRF) source route, use the **cable source-route** command in the cable modem's subinterface configuration mode. To disable the route, use the **no** form of this command.

cable source-route
no cable source-route

Syntax Description

This command has no arguments or keywords.

Command Default

The VRF source route is not configured.

Command Modes

Subinterface configuration (config-subif)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the VRF source route:

Note This command is supported on the Cisco uBR10012 broadband routers only.

```
Router(config-subif)# cable source-route
```

Related Commands

Command	Description
cable vrf-steering cable-modem	Steers or directs the cable modems to the specified VRF.
ip vrf	Defines a VRF instance and enters the interface configuration mode.
show ip arp vrf	Displays which VRF contains a specific cable modem in the ARP table.

cable source-verify

To enable verification of IP addresses for CMs and CPE devices on the upstream, use the **cable source-verify** command in bundle interface configuration mode. To disable verification, use the **no** form of this command.

cable source-verify [**dhcp** | **leasetimer** *value*]
no cable source-verify

Syntax Description

dhcp	(Optional) Specifies that queries will be sent to verify unknown source IP addresses in upstream data packets.
leasetimer *value*	(Optional) Specifies the time, in minutes, for how often the router should check its internal CPE database for IP addresses whose lease times have expired. The valid range for value is 1 to 240 minutes, with a default of 60 minutes.

Command Default

Disabled. When the **dhcp** option is specified, the **leasetimer** option defaults to 60 minutes.

Command Modes

Bundle Interface configuration (config-if)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.0(7)T	The **dhcp** keyword was added.
12.0(10)SC, 12.1(2)EC	Support was added for these trains.
12.1(3a)EC	Subinterface support was added.
12.1(13)EC, 12.2(11)BC1	The **leasetimer** keyword was added.
12.2(15)BC1	The verification of CPE devices was changed when using the **dhcp** keyword.
12.2(15)BC2	Support for verifying CMs and CPE devices that are on a different subnet than the cable interface was enhanced to use Reverse Path Forwarding (RFP).
12.3(9a)BC	Cisco IOS Release 12.3(9a)BC adds the option of using a per SID basis for deriving lease queries from CPE devices. This release also introduces a global rate limit for lease queries initiated by downstream traffic.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Configuring the **cable source-verify** command on the bundle interface of a bundle will configure it for all of the subordinate interfaces in the bundle as well.

The **cable source-verify** command helps to prevent the spoofing of IP addresses by CMs or their CPE devices by verifying that the upstream packets coming from each CM are known to be associated with the IP address in that packet. Packets with IP addresses that do not match those associated with the CM are dropped.

In order to protect the Cisco CMTS from denial of service attacks, Cisco IOS Release 12.3(9a)BC adds the option of using a per SID basis for deriving leasequeries from CPE devices. This release also introduces a global rate limit for leasequeries initiated by downstream traffic. These enhancements reduce the CPU utilization of Dynamic Host Configuration Protocol (DHCP) Receive and ISR processes when the Cisco CMTS is configured with the **cable source-verify dhcp** and **no cable arp** commands.

When **cable source-verify dhcp** and **no cable arp** commands are configured, DHCP leasequery is sent for downstream packets to verify unknown IP addresses within the IP address range configured on the bundle interface.

For DHCP leasequery to work in the downstream direction, the Cisco Network Registrar (CNR) should be made aware of the DHCP Option 82. This is required to make the CMTS map the CPE IP address to the correct CM. To do this, configure the **ip dhcp relay information option** command on the bundle interface to insert service class relay agent option into the DHCP DISCOVER messages. When the configuration is in place, during DHCP DISCOVER, the values of DHCP Option 82 is cached by the CNR and is returned to the CMTS on any subsequent DHCP leasequery for that IP address.

The Cisco CMTS maintains a database that links the MAC and IP addresses of known CPE devices with the CMs that are providing network access for those CPE devices. The CMTS typically populates this database with information obtained by examining the DHCP packets sent between the CPE devices and the DHCP server. Other IP traffic provides information about which CMs service which CPE devices.

After the **cable source-verify** command is issued, every IP upstream packet is examined. If the IP and MAC addresses of the CPE device are already associated with a known, online CM, it is allowed through. If not, the source IP address is examined to determine if it belongs to the cable network. If so, and if the **dhcp** option is not used, the packet is allowed through.

Using the dhcp Option

Note Do not enable the local DHCP server on the Cisco CMTS and configure local DHCP address pools using the **ip dhcp pool** command, when using **dhcp** option, because this prevents DHCP address validation.

If the **dhcp** option is used, all packets with unknown IP addresses within the cable network are dropped, but the Cisco CMTS sends a DHCP leasequery message to the DHCP server to verify the IP address. If a valid response is received from the DHCP server, the CMTS updates its database with the new CPE device and allows future traffic through. If the DHCP server does not return a successful response, all traffic from the CPE is dropped.

In Cisco IOS Release 12.2(15)BC1 and later releases, the **dhcp** option extends the verification to CPE devices that had been online using a valid IP address but then were reconfigured by the user with an unused static IP address. With Cisco IOS Release 12.2(15)BC1 and later, CPE devices are not allowed online when they are using static IP addresses that have not been allocated by the DHCP server. If you are using the **dhcp** option, the CPE device must use an IP address that has been assigned by the DHCP server.

Note You must enable the **ip dhcp relay information option** command to properly trigger the leasequery after configuring the **cable source-verify dhcp** command. If the **ip dhcp relay information option** command is not enabled, the leasequery does not recover the IP address of the CPE properly.

Note The **dhcp** option automatically blocks all statically-assigned IP addresses unless the DHCP server has been configured to recognize those addresses and respond with the appropriate leasequery response.

The **cable source-verify** command by itself prevents someone from stealing another customer's IP address. The **cable source-verify dhcp** command adds another level of security by refusing access to any CPE device with an IP address that has not been assigned by the DHCP server.

Note This **dhcp** option requires that the DHCP server support the leasequery message. The CNR supports leasequery in version 7.0 onwards. The leasequery message is defined in an IETF draft, and available at the URL: http://www.ietf.org/rfc/rfc4388.txt

Caution Do not enable the local DHCP server on the Cisco CMTS and configure local DHCP address pools, using the **ip dhcp pool** command, when you are also enabling the **cable source-verify dhcp** command, because the DHCP server on the Cisco CMTS can intercept the leasequery messages and prevent them from reaching the external DHCP server. This in turn prevents address validation from succeeding because the DHCP server on the Cisco CMTS does not support leasequery messages.

Note When the **cable source-verify dhcp** feature is enabled, and a statically-defined IP address has been added to the CMTS for a CM using the **cable trust** command to override the **cable source-verify dhcp** checks for this device, packets from this CM will continue to be dropped until an entry for this CM is added to the ARP database of the CMTS. To achieve this, disable the **cable source-verify dhcp** feature, ping the CMTS from the CM to add an entry to the ARP database, and re-enable the **cable source-verify dhcp** feature.

Using the leasetimer Option

Note The **leasetimer** option takes effect only when the **dhcp** option is also used on an interface. Also, this option is supported only on the primary interface and cannot be configured on subinterfaces. Configuring it for a primary interface automatically applies it to all subinterfaces.

The **leasetimer** option adds another level of verification by activating a timer that periodically examines the lease times for the IP addresses for known CPE devices. If the CMTS discovers that the DHCP lease for a CPE device has expired, it removes that IP address from its database, preventing the CPE device from communicating until it makes another DHCP request. This prevents users from treating DHCP-assigned addresses as static addresses, as well as from using IP addresses that were previously assigned to other devices.

Note The **leasetimer** option is active only if you have also specified the **cable source-verify dhcp** command for the bundle interface. If the **dhcp** option is not used, the leasetimer option has no effect. In addition, the **leasetimer** option can be configured only on an interface, not a subinterface. Applying it to a primary interface automatically applies it to all subinterfaces.

The **leasetimer** option allows you to configure how often the timer checks the lease times, so as to specify the maximum amount of time a CPE device can use an IP address that was previously assigned by the DHCP server but whose lease time has since expired. The time period can range from 1 minute to 240 minutes (4 hours), with a grace period of 2 minutes to allow a PC enough time to make a DHCP request to renew the IP address. To turn off the timer, so that the CMTS no longer checks the lease times, issue the **cable source-verify** command without the **dhcp** option, or turn off the feature entirely with the **no cable source-verify** command.

Using Multiple Subnets

In Cisco IOS Release 12.2(15)BC2 and later releases, the **cable source-verify** command can verify IP addresses that are on different subnets than what is being used on the bundle interface or subinterfaces only when Reverse Path Forwarding (RPF) is used in conjunction.



Note You must enable RPF before running the **cable source-verify command to verify IP addresses on subinterfaces.**

Examples

The following example shows how to enable RPF before running the **cable source-verify** command to verify IP addresses on subinterfaces:

```
Router# configure terminal
Router(config)# ip cef
 Router(config)# interface bundle 1
 Router(config-if)# ip verify unicast source reachable-via rx
```



Note Beginning with Cisco IOS Release 12.2(33)SCA,**ip verify unicast source reachable-via rx .** command must be used with the **allow-default** keyword

The following example shows how to turn on CM upstream verification and configures the Cisco CMTS router to send DHCP lease queries to verify unknown source IP addresses in upstream data packets:

```
Router# configure terminal
 Router#(config) interface bundle 1
 Router(config-if)# cable source-verify dhcp
Router(config-if)#
```

The following example shows how to enable the **leasetimer** feature so that every two hours, the CMTS checks the IP addresses in the CPE database for that particular interface for expired lease times:

```
Router# configure terminal
 Router#(config) interface bundle 1
 Router(config-if)# cable source-verify dhcp
Router(config-if)# cable source-verify leasetimer 120
```

The following example shows how to configure the bundle interface so that the CMTS can verify IP addresses that are on a different subnet than the one that the bundle interface is using:

```
Router# configure terminal
 Router(config)# ip cef
 Router#(config) interface bundle 1
 Router(config-if)# ip verify unicast source reachable-via rx
Router(config-if)# cable source-verify dhcp
```

Related Commands

Command	Description
cable arp	Enables or disables the use of the ARP protocol for CMs and their CPE devices.
cable helper-address	Specifies a destination IP address for User Datagram Protocol (UDP) broadcast (DHCP) packets.
cable dhcp-giaddr	Modifies the GIADDR field of DHCP DISCOVER and DHCPREQUEST packets with a Relay IP address before they are forwarded to the DHCP server.
cable logging badipsource	Logs error messages about bad IP source addresses on the cable interfaces.
cable relay-agent-option	Enables the system to insert the CM MAC address into a DHCP packet received from a CM or host and forward the packet to a DHCP server.
cable source-verify leasequery-filter downstream	Controls the number of DHCP leasequery request messages that are sent for unknown IP addresses on all cable downstream interfaces on the Cisco CMTS router.
cable source-verify leasequery-filter upstream	Controls the number of DHCP leasequery request messages that are sent for unknown IP addresses per each service ID (SID) on an upstream.
clear cable logging	Removes all error messages about bad IP source addresses on the cable interfaces from the error log buffer.
ip dhcp relay information option	Enables the system to insert the CM MAC address into a DHCP packet received from a CM or host and forward the packet to a DHCP server.
ip dhcp smart-relay	Monitors client retransmissions when address pool depletion occurs.
ip verify unicast reverse-path	Enables Unicast Reverse Path Forwarding (Unicast RPF), which checks each packet received on an interface to verify that the packet's source IP address appears in the routing tables as belonging to that interface, so as to prevent spoofed IP source addresses.

cable source-verify dhcp arp-probe

To send ARP to CPE after source verify is successful, use the **cable source-verify dhcp arp-probe** command to control the interval and retries. To disable the configuration, use the **no** form of this command.

cable source-verify dhcp arp-probe [**interval** *seconds* { **retries** *number-of-probes* }]

cable source-verify dhcp arp-probe [**interval** *seconds* [**retries** *number-of-probes*]]

Syntax Description

dhcp	DHCP LQ
arp-probe	ARP Probe
interval *seconds*	Interval between ARP probes
retries *number-of-probes*	Number of probes

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The following is a sample configuration of the command:

```
Router#configue terminal
Enter configuration commands, one per line.  End with CNTL/Z.

Router(config)#cable source-verify dhcp arp-probe interval 30 retries 3
```

Related Commands

Command	Description
cable arp	Enables or disables the use of the ARP protocol for CMs and their CPE devices.

cable source-verify enable-sav-static

To enable source address verification (SAV) on the Cisco CMTS, use the **cable source-verify enable-sav-static** command in global configuration mode. To disable the SAV, use the **no** form of this command.

cable source-verify enable-sav-static
no cable source-verify enable-sav-static

Syntax Description

This command has no arguments or keywords.

Command Default

SAV is disabled by default

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable source-verify enable-sav-static** command allows you to enable of SAV prefix processing on the Cisco CMTS. If the SAV feature is enabled, the SAV prefixes are matched during source verification. If the feature is disabled the SAV prefixes are not matched, and the configured SAV prefixes do not have any impact on the outcome of the source verification.

This feature is disabled by default.

Examples

The following example shows how to enable SAV prefix processing on the Cisco CMTS:

```
Router(config)# cable source-verify enable-sav-static
```

Related Commands

Command	Description
cable source-verify group	Configures SAV groups.
prefix	Configures IPv4 or IPv6 prefixes in a SAV group.

cable source-verify enable-sav-trust-last

To enable source address verification (SAV) for **trust-last**, use the **cable source-verify enable-sav-trust-last** command in global configuration mode. To disable the SAV for **trust-last**, use the **no** form of this command.

cable source-verify enable-sav-trust-last
no cable source-verify enable-sav-trust-last

Syntax Description

This command has no arguments or keywords.

Command Default

SAV is disabled by default

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE 17.15.1y	This command is introduced.

Usage Guidelines

SAV (source address verification) allows static CPE IPs within a prefix to bypass source-verify checks. It's similar to cable trust, which allows static IPs on specific MAC addresses(and only supports trust-first). The **cable source-verify enable-sav-trust-last** command allows SAV on trust-first as well.

When it's enabled, if a CM is configured with SAV, and a static CPE is configured with matching prefix, the MAC address matching flag is not set in its FIB entry in CPP. The CPE is allowed to change its MAC address while keeping the same IP address.

This feature is disabled by default.

Examples

The following example shows how to enable SAV for trust-last:

```
Router(config)# cable source-verify enable-sav-trust-last
```

Related Commands

Command	Description
cable source-verify enable-sav-static	Enable source address verification (SAV)

cable source-verify group

To configure the source address verification (SAV) prefix group, use the **cable source-verify group** command in global configuration mode. To disable the use of configured SAV prefix group, use the **no** form of this command.

cable source-verify group *groupname*
no cable source-verify group *groupname*

Syntax Description

groupname	Name of the SAV prefix group. The *groupname* can be any arbitrary string up to 15 characters in length.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable source-verify group** command is used to configure SAV groups. A SAV group is a group of IPv4 or IPv6 prefixes. The Cisco CMTS uses these prefixes to authenticate a cable modem (CM). A CM may be configured with an IPv4 or IPv6 prefix belonging to a particular SAV group. The time, length, value (TLV) 43.7.1 specifies the group name to which a given CM belongs. The Cisco CMTS considers a packet from a CM authorized if that packet is sourced with an IP address that belongs to the configured prefix in a SAV group.

A maximum of 255 SAV groups can be configured on a Cisco CMTS, with each SAV group containing up to four IPv4s, IPv6s, or a combination of both the prefixes (totalling up to four).

Examples

The following example shows how to configure a SAV group with one IPv6 prefixes and one IPv4 prefixes:

```
Router(config
)# cable source-verify group sav1
Router(config
)# prefix 10.16.0.0/12
Router(config
)# prefix 10::/12

Router(config
)# exit
```

Related Commands

Command	Description
cable source-verify enable-sav-static	Enables SAV prefix processing.
prefix	Configures IPv4 or IPv6 prefixes in a SAV group.

cable source-verify leasequery-filter downstream

To control the number of Dynamic Host Configuration Protocol (DHCP) LEASEQUERY request messages that are sent for unknown IP addresses on all cable downstream interfaces on the Cisco Cable Modem Termination System (CMTS) router, use the **cable source-verify leasequery-filter downstream** command in global configuration mode. To stop the filtering of DHCP lease queries, use the **no** form of this command.

cable source-verify leasequery-filter downstream *threshold interval*
no cable source-verify leasequery-filter downstream

Syntax Description

threshold	Maximum number of DHCP lease queries allowed for each interval period. The valid range is 0 to 255 lease queries.
interval	Time period, in seconds, over which lease queries should be monitored. The valid range is 1 to 10 seconds.

Command Default

Filtering of DHCP lease queries is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(15)BC1d, 12.2(15)BC2b	This command was introduced for the Cisco uBR7100 series, Cisco uBR7246VXR, and Cisco uBR10012 universal broadband routers.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When the **cable source-verify dhcp** and **no cable arp** commands are configured on a cable interface, the Cisco CMTS router sends a DHCP LEASEQUERY request to the DHCP server to verify unknown IP addresses that are found in packets to and from customer premises equipment (CPE) devices that are using the cable modems on the cable interface. The DHCP server returns a DHCP ACK message with the MAC address of the CPE device that has been assigned this IP address, if any. The router can then verify that this CPE device is authorized to use this IP address, which prevents users from assigning unauthorized IP addresses to their CPE devices.

Problems can occur, though, when viruses, denial of service (DoS) attacks, and theft-of-service attacks scan ranges of IP addresses, in an attempt to find unused addresses. This type of activity can generate a large volume of DHCP LEASEQUERY requests, which can result in high CPU utilization and a lack of available bandwidth for other customers.

To prevent such a large volume of LEASEQUERY requests on all downstreams in the Cisco CMTS router, use the **cable source-verify leasequery-filter downstream** command. After configuring this command, the Cisco CMTS allows only a certain number of DHCP LEASEQUERY requests in the downstream direction within each interval time period.

For example, the **cable source-verify leasequery-filter downstream 5 10** command configures the router so that it allows a maximum of 5 DHCP LEASEQUERY requests every 10 seconds for each SID on the downstream direction. This command applies to all downstream cable interfaces in the router.

Note The **cable source-verify leasequery-filter downstream** command enables DHCP lease query filtering on all downstreams, but the actual filtering does not begin until the **cable source-verify dhcp** command and the **no cable arp** command are configured on a particular downstream. You can configure these commands on either the downstream's main interface, or on a subinterface for the downstream. If these commands are configured on a subinterface, however, the lease query filtering occurs only for cable modems using that subinterface.

Tip Use the **cable source-verify leasequery-filter upstream** command to filter DHCP LEASEQUERY requests in the upstream direction.

Examples

The following example shows how to configure the Cisco CMTS router so that it allows a maximum of 10 DHCP lease query requests per SID over each five-second interval on all downstream cable interfaces. This example also shows the configuration of **cable source-verify dhcp** and **no cable arp** commands on a cable interface, which are required to use this feature.

```
Router# configure terminal

Router(config)# cable source-verify leasequery-filter downstream 10 5

Router(config)# interface cable 5/1/0
Router(config-if)# cable source-verify dhcp

Router(config-if)# no cable arp

Router(config-if)#
```

Related Commands

Command	Description
cable arp	Activates the cable Address Resolution Protocol (ARP).
cable arp filter	Controls the number of ARP requests and replies that can be forwarded over a cable interface.
cable source-verify	Enables verification of IP addresses for cable modems (CMs) and CPE devices on the upstream.
cable source-verify leasequery-filter upstream	Controls the number of DHCP lease query messages that are sent for unknown IP addresses per each service ID (SID) on an upstream.
show cable leasequery-filter	Displays the number of DHCP lease query messages that have been filtered for all cable modems or for a particular cable interface.

cable source-verify leasequery-filter upstream

To control the number of Dynamic Host Configuration Protocol (DHCP) LEASEQUERY request messages that are sent for unknown IP addresses per each service ID (SID) on an upstream, use the **cable source-verify leasequery-filter upstream** command in cable interface configuration mode. To disable the filtering of DHCP lease queries, use the **no** form of this command.

cable source-verify leasequery-filter upstream *threshold interval*
no cable source-verify leasequery-filter upstream

Syntax Description

threshold	Maximum number of DHCP lease queries allowed per SID for each *interval* period. The valid range is 0 to 20 lease queries.
interval	Time period, in seconds, over which lease queries should be monitored. The valid range is 1 to 5 seconds.

Command Default

Filtering of DHCP lease queries is disabled.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.2(15)BC1d, 12.2(15)BC2b	This command was introduced for the Cisco uBR7100 series, Cisco uBR7246VXR, and Cisco uBR10012 universal broadband routers.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When the **cable source-verify dhcp** and **no cable arp** commands are configured on a cable interface, the Cisco Cable Modem Termination System (CMTS) router sends a DHCP LEASEQUERY request to the DHCP server to verify unknown IP addresses that are found in packets to and from customer premises equipment (CPE) devices that are using the cable modems on the cable interface. The DHCP server returns a DHCP ACK message with the MAC address of the CPE device that has been assigned this IP address, if any. The router can then verify that this CPE device is authorized to use this IP address, which prevents users from assigning unauthorized IP addresses to their CPE devices.

Problems can occur, though, when viruses, denial of service (DoS) attacks, and theft-of-service attacks scan ranges of IP addresses, in an attempt to find unused addresses. This type of activity can generate a large volume of DHCP LEASEQUERY requests, which can result in high CPU utilization and a lack of available bandwidth for other customers.

To prevent such a large volume of LEASEQUERY requests on the upstreams on a cable interface, use the **cable source-verify leasequery-filter upstream** command. After configuring this command, the Cisco CMTS allows only a certain number of DHCP LEASEQUERY requests in the upstream direction within each interval time period.

For example, the **cable source-verify leasequery-filter upstream 5 5** command configures the router so that it allows a maximum of 5 DHCP LEASEQUERY requests every 5 seconds for each SID on the upstream direction. This command applies to all upstreams on the cable interface.

Note The **cable source-verify leasequery-filter upstream** command enables DHCP lease query filtering on all upstreams on a cable interface, but the actual filtering does not begin until the **cable source-verify dhcp** command and the **no cable arp** command are configured on the upstream's associated downstream interface. You can configure these commands on either the downstream's main interface, or on a subinterface for the downstream. If these commands are configured on a subinterface, however, the lease query filtering occurs only for cable modems using that subinterface.

Note If using cable interface bundling, configure the **cable source-verify leasequery-filter upstream** command on all primary and subordinate interfaces.

Tip Use the **cable source-verify leasequery-filter downstream** command to filter DHCP LEASEQUERY requests in the downstream direction.

Examples

The following example shows how to configure the Cisco CMTS router so that it allows a maximum of five DHCP lease query requests per SID over each two-second interval on all upstreams on a particular cable interface. This example also shows the configuration of **cable source-verify dhcp** and **no cable arp** commands on the cable interface, which are required to use this feature.

```
Router# configure terminal

Router(config)# interface cable 6/0
Router(config-if)# cable source-verify dhcp

Router(config-if)# cable source-verify leasequery-filter upstream 5 2

Router(config-if)# no cable arp

Router(config-if)#
```

Related Commands

Command	Description
cable arp	Activates the cable Address Resolution Protocol (ARP).
cable arp filter	Controls the number of ARP requests and replies that can be forwarded over a cable interface.
cable source-verify	Enables verification of IP addresses for cable modems (CMs) and CPE devices on the upstream.
cable source-verify leasequery-filter downstream	Controls the number of DHCP lease query messages that are sent for unknown IP addresses on all cable downstream interfaces on the Cisco CMTS router.
show cable leasequery-filter	Displays the number of DHCP lease query messages that have been filtered for all cable modems or for a particular cable interface.

cable source-verify sav-static-group-override

To override the global trust-last option, use the **cable source-verify enable-sav-trust-last** *group-name* **[trust-first|trust-last]** command in global configuration mode. To disable the override, use the **no** form of this command.

cable source-verify enable-sav-trust-last *group-name* **[trust-first|trust-last]**
no cable source-verify enable-sav-trust-last *group-name*

Syntax Description

group-name	Name of the SAV group.
trust-first	Denies MAC address change.
trust-last	Allows MAC address change.

Command Default

Disabled by default

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE 17.15.1y	This command is introduced.

Usage Guidelines

- If trust-last is disabled globally (by default), trust-last override on a group enables the trust-last feature on the group only.
- If trust-last is enabled globally by this command, then trust-first override on a group disables the trust-last feature on the group only.

This feature is disabled by default.

Examples

The following example shows how to configure the override:

```
Router(config)# cable source-verify enable-sav-static Group2 trust-last
```

Related Commands

Command	Description
cable source-verify enable-sav-trust-last	To enable source address verification (SAV) for **trust-last**.

cable spectrum-group (global)

To create and configure a spectrum group, use the **cable spectrum-group** command in global configuration mode. To disable this spectrum group, use the **no** form of this command.

cable spectrum-group *group-number* [**time** *day hh:mm:ss*] **frequency***up-freq-hz* [*pwr-lvl-dbmv*]
no cable spectrum-group *group-number*

Syntax Description

group-number	Specifies the spectrum group for which you are specifying a parameter value or specifies the number of the spectrum group you wish to remove from your router configuration. Valid range is from 1 to 32, or from 1 to 40, depending on the Cisco IOS software release.
time *day hh:mm:ss*	(Optional) For scheduled spectrum groups, enter the day of the week (**Sun**—**Sat**) and the time of day that the frequency and input power level should change.
frequency *up-freq-hz*	Specifies a center frequency for the upstream group. The valid range is 5,000,000 Hz to 42,000,000 Hz (DOCSIS), 55,000,000 Hz (Japan), or 65,000,000 (EuroDOCSIS). **Note** You can enter this command multiple times for the same spectrum group to create a group of individual frequencies to be used for frequency hopping.
band *up-freq1-hz up-freq2-hz*	Specifies a range of center frequencies the Cisco CMTS can scan to find an acceptable channel to which the spectrum group may hop. The valid range for *up-freq1-hz* is 5,000,000 Hz to 42,000,000 Hz (DOCSIS), 55,000,000 Hz (Japan), or 65,000,000 (EuroDOCSIS), but *up-freq2-hz* must be greater than *up-freq1-hz*. **Note** When creating spectrum groups for cable line cards that support Advanced Spectrum Management (Cisco uBR10-MC16S, uBR10-MC16U/X, uBR10-MC28U/X, and uBR10-MC5X20S/U), use the **band** option. The **frequency** option is not supported for these types of line cards.
pwr-lvl-dbmv	(Optional) Specifies the nominal input power level. The valid range is –10 to +25 dBmV, with a default of 0 dBmV. Some cable plants might want to change only the input power level, and not the frequency, on a daily time schedule.

Command Default

If not specified, the group is set for a nominal input power level of 0 dBmV and the group is not scheduled for automatic frequency or power changes.

Command Modes

Global configuration (config)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0(7)XR2	The **band** parameter for this command was added to enable frequency range scanning capabilities in the Cisco uBR-MC16S cable interface line card.

Release	Modification
12.0(13)SC, 12.1(4)EC, 12.2(4)BC1	The allowable frequency range was increased to 65 MHz to support the EuroDOCSIS frequency range of the Cisco uBR-MC16E cable interface line card.
12.2(15)BC2	The maximum number of spectrum groups was increased from 32 to 40 groups per router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Frequency agility is configured and activated using spectrum groups that are controlled by the spectrum manager. You can create from 1 to 32, or from 1 to 40, spectrum groups for each cable modem card upstream port, depending on the Cisco IOS software release.

To create spectrum groups, specify a list of upstream frequencies and nominal power levels that each spectrum group can use when an upstream frequency change is necessary. Each spectrum group should have its own list of upstream frequencies. At 1.6 MHz, the valid range is –10 dBmV to 25 dBmV. The power level value should be changed only if you want to change only the power level as part of spectrum management. The standard power level is 0 dBmV.

The **cable spectrum-group** command sets the center frequency for the upstream, but the total frequency bandwidth that is actually used depends on the channel width. Table below shows the possible center frequencies for each channel width, for both DOCSIS and EuroDOCSIS cable interfaces.

Table 13: Allowable Center Frequencies

Channel Width (MHz)	Center Frequency (MHz) DOCSIS (5 to 42 MHz)	Center Frequency (MHz) EuroDOCSIS (5 to 65 MHz)
200,000	5.1 to 41.9	5.1 to 64.9
400,000	5.2 to 41.8	5.2 to 64.8
800,000	5.4 to 41.6	5.4 to 64.6
1,600,000	5.8 to 41.2	5.8 to 64.2
3,200,000	6.6 to 40.4	6.6 to 63.4

The allowable range for the upstream channel frequency depends on the cable interface line card and Cisco IOS software release being used. See Table 2-11 for the currently supported values.

Table 14: Allowable Frequency Range for the cable upstream frequency Command

Frequency Range	Supported Cable Interfaces	Minimum Cisco IOS Releases
5 to 42 MHz	All supported cable interfaces	All releases supported for the Cisco CMTS
5 to 55 MHz	Cisco uBR-MC16U/X and Cisco uBR-MC28U/X, when operating with extended frequencies for Japanese mode	Cisco IOS Release 12.2(15)BC2

Frequency Range	Supported Cable Interfaces	Minimum Cisco IOS Releases
5 to 65 MHz	Cisco uBR-MC16E, Cisco uBR7111E and Cisco uBR7114E routers	Cisco IOS Release 12.0(13)SC, 12.1(4)EC, and 12.2(4)BC1



Note If both an Cisco uBR-MC16E cable interface line card and a Cisco uBR-MC16C or a Cisco uBR-MC16S cable interface line card are present in the chassis, a spectrum group in the 42-MHz to 65-MHz range should not be assigned.



Tip Cisco cable interface line cards always program the upstream's center frequency in 16 KHz increments, and this is the frequency displayed by the **show controller cable upstream** command. For example, if you use the **cable upstream frequency** command to specify a center frequency of 27 MHz (**cable upstream x frequency 27000000**), the actual center frequency will be 27.008 MHz, which is the next highest 16 KHz boundary.

You must repeat this command for each frequency or power level that you want to add to a spectrum group's list of valid values.

After you have created one or more spectrum groups for your cable network, you can add characteristics to them, providing you with more definitive control over frequency usage and frequency hopping.

The cable interface does not operate until you either create and configure a spectrum group or set a fixed upstream frequency. See the **cable upstream channel-width** command.

Examples

The following example shows how to configure spectrum group 1 with an upstream frequency of 6,500,000 Hz and a default power level of 0 dBmV:

```
Router(config)# cable spectrum-group 1 frequency 6500000
```

The following example shows how to add the upstream frequency 7,000,000 Hz to the list of valid frequencies with a default power level of 0 dBmV for spectrum group 1:

```
Router(config)# cable spectrum-group 1 frequency 7000000
```

The following example shows how to configure spectrum group 2 with an upstream frequency 7,500,000 Hz and change the power level to 5 dBmV:

```
Router(config)# cable spectrum-group 2 frequency 7500000 5
```

The following example shows how to configure spectrum group 3 with an upstream band of 12,000,000 to 18,000,000 Hz and default power level of 0 dBmV:

```
Router(config)# cable spectrum-group 3 band 12000000 18000000
```

The following example shows how to add the upstream band 20,000,000 to 24,000,000 Hz to the list of valid bands with a change in the power level of 13 dBmV for spectrum group 3:

```
Router(config)# cable spectrum-group 3 band 20000000 24000000 13
```

The following example shows how to configure a continuous band between 5,000,004 and 40,000,000 Hz for scheduled spectrum group 4 with a default power level of 0 dBmV. The spectrum group will be available to the spectrum group starting at 12:00 p.m. local time each Monday:

```
Router(config)# cable spectrum-group 4 time Monday 12:00:00 band 5000004 40000000
```

The following example shows how to add the upstream frequency 9,500,000 Hz to the list of valid frequencies and change the nominal power level to 5 dBmV. The spectrum manager adjusts frequencies and power levels on this group at 2:00 a.m. local time each day:

```
Router(config)# cable spectrum-group 3 time 02:00:00 frequency 9500000 5
```

The following example shows how to remove a specified spectrum group from your configuration:

```
Router(config)# no cable spectrum-group 3
Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Configures preset modulation profiles that you can apply to one or more upstream cable interfaces when you identify and configure spectrum groups.
cable spectrum-group hop period	Sets the minimum frequency-hop interval for a cable spectrum group.
cable spectrum-group hop threshold	Specifies a hop threshold for a cable spectrum group.
cable spectrum-group shared	Specifies the upstream ports in a spectrum group can share the same upstream frequency.
cable upstream frequency	Specifies that the upstream should either be set to a specific center frequency or be set dynamically.
cable upstream power-level	Specifies the upstream cable interface receive power level in dBmV.
cable upstream shutdown	Activates or shuts down a specified upstream cable interface.
cable upstream hopping blind	Disengages the advanced spectrum management features of the Cisco uBR-MC16S and Cisco uBR-MC5X20S cable interface line cards by enabling blind frequency hopping behavior.
show controllers cable	Displays information about the cable interface, including the upstream center frequency.

cable spectrum-group (interface)

To assign a default spectrum group to all of the upstreams on a cable interface, use the **cable spectrum-group** command in interface configuration mode. To remove the spectrum groups from the upstreams, use the **no** form of this command.

cable spectrum-group *group-number*
no cable spectrum-group *group-number*

Syntax Description

group-number	Specifies the spectrum group that should be used as the default group for the upstreams on this cable interface. The valid range is from 1 to 32, or from 1 to 40, depending on the Cisco IOS software release.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.2(15)BC2	The maximum number of spectrum groups was increased from 32 to 40 groups per router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command assigns a default spectrum group to all of the upstreams on the cable interface. All upstreams on the interface use this spectrum group unless you override this configuration, using one of the following commands:

- To assign a different spectrum group to a particular upstream, use the **cable upstream spectrum-group** command.
- To assign a new frequency to a particular upstream, use the **cable upstream frequency** command.

These two commands override the **cable spectrum-group** command for the particular upstreams to which they are applied. The remaining upstreams in the interface, however, continue to use the default configuration that is specified by the **cable spectrum-group** command.

Tip You must first create and configure the spectrum groups before you can assign them to an interface. To create and configure spectrum groups, use the set of **cable spectrum-group** commands that are available in global configuration mode.

Examples

The following example shows how to assign spectrum group 1 to all of the upstreams on the cable interface in slot 3/0:

```
Router(config)# interface cable 3/0
```

```
Router(config-if)# cable spectrum-group 1

Router(config-if)# exit

Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Configures preset modulation profiles that you can apply to one or more upstream cable interfaces when you identify and configure spectrum groups.
cable spectrum-group (global configuration)	Creates and configures a spectrum group.
cable spectrum-group hop period	Sets the minimum frequency-hop interval for a cable spectrum group.
cable spectrum-group hop threshold	Specifies a hop threshold for a cable spectrum group.
cable spectrum-group shared	Specifies the upstream ports in a spectrum group can share the same upstream frequency.
cable upstream hopping blind	Disengages the advanced spectrum management features of the Cisco uBR-MC16S and Cisco uBR-MC5X20S cable interface line cards by enabling blind frequency hopping behavior.
cable upstream spectrum-group	Assigns a spectrum group to an individual upstream on a cable interface line card.

cable spectrum-group hop period

To change the minimum time between frequency hops, use the **cable spectrum-group hop period** command in global configuration mode. To reset the frequency hop interval for this spectrum group to its default value, use the **no** form of this command.

cable spectrum-group *groupnum* **hop period** *seconds*
no cable spectrum-group *groupnum* **hop period**

Syntax Description

groupnum	Spectrum group number. Valid values are from 1 to 32, or from 1 to 40, depending on the Cisco IOS software release.
seconds	Specifies the frequency-hop time period in seconds. Valid values are from 1 to 3600 seconds (before Cisco IOS Release 12.2(8)BC1), or from 1 to 300 seconds (Cisco IOS Release 12.2(8)BC1 or later). For Cisco cBR Series Converged Broadband Routers, the valid values are from 5 to 300.

Command Default

Before Cisco IOS Release 12.2(15)BC1: 25 seconds

Cisco IOS Release 12.2(15)BC1 and later releases: 20 seconds when N+1 HCCP redundancy is not configured, and 15 seconds when N+1 HCCP redundancy is configured on the cable interface

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1 T	This command was introduced.
12.1(7)CX1	The default **hop period** was changed from 300 seconds to 25 seconds to accommodate the new spectrum management features for the Cisco uBR-MC16S spectrum management card.
12.2(8)BC1	The maximum frequency-hop time period was changed from 3600 to 300 seconds.
12.2(15)BC1	The default **hop period** was changed from 25 seconds to 20 seconds when N+1 HCCP redundancy is not configured on the cable interface, and changed to 15 seconds when N+1 HCCP redundancy is configured.
12.2(15)BC2	The maximum number of spectrum groups was increased from 32 to 40 groups per router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable spectrum-group hop period** command defines the minimum amount of time that must pass between upstream frequency hops. If ingress noise becomes excessive on a particular upstream, you can set this time period to a smaller value, so as to allow frequency hopping to continue more rapidly until a clear channel is found. Conversely, if the problem appears to be a transient condition, such as a defective CM generating a

large volume of errored packets, this time period can be increased to a larger value, so as to avoid excessive frequency hopping by allowing more time between frequency hops.

On the Cisco uBR-MC1xC cards, the maximum recommended hop period is 20 seconds. On the Cisco uBR-MC16S and Cisco uBR-MC5X20S/U cards, the minimum recommended hop period is 25 seconds and the maximum recommended hop period is 35 seconds.

In Cisco IOS Release 12.2(15)BC2, the Cisco CMTS adaptively increases the hop period from the user-defined value to the maximum value (300 seconds) whenever an upstream does not currently have any CMs ranging on it, so as to avoid unnecessary frequency hopping. The user-defined value is restored when a CM starts ranging on the upstream.



Note The hop period should be set to at least 25 seconds on the Cisco uBR-MC16S and Cisco uBR-MC5X20S/U cards so that transient network problems that are unrelated to ingress noise do not generate unnecessary frequency hops.

Examples

The following example shows how to change the minimum frequency-hop interval to 60 seconds. This means that frequency hops for this spectrum group cannot occur more quickly than once every 60 seconds, even if other characteristics, such as exceeding the CNR or FEC threshold values, would normally trigger the hop.

```
Router# configure terminal

Router(config)# cable spectrum-group 1 hop period 60
Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable spectrum-group hop threshold	Specifies a hop threshold for a cable spectrum group.
cable upstream channel-width	Configures an upstream for a range of allowable channel widths.
cable upstream modulation-profile	Configures an upstream for one modulation profile (static profile) or two modulation profiles (Dynamic Upstream Modulation).
show cable hop	Displays the current hop period and threshold for an upstream, along with other statistics.

cable spectrum-group hop threshold

To specify a frequency hop threshold for a spectrum group, use the **cable spectrum-group hop threshold** command in global configuration mode. To delete the hop threshold for this spectrum group, use the **no** form of this command.

cable spectrum-group *groupnum* **hop threshold** [*percent*]
no cable spectrum-group *groupnum* **hop threshold**

Syntax Description

groupnum	Spectrum group number. Valid values are from 1 to 32, or from 1 to 40, depending on the Cisco IOS software release.
percent	(Optional) Specifies the frequency hop threshold as a percentage of station maintenance messages that are lost. Valid range is from 1 to 100 percent.

Command Default

20 percent

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1 T	This command was introduced.
12.1(7)CX1	The default **hop threshold** was changed from 100 percent to 20 percent to accommodate the new spectrum management features for the Cisco uBR-MC16S spectrum management card.
12.2(4)BC1	Support for this command was added to the Release 12.2 BC train.
12.2(15)BC2	The maximum number of spectrum groups was increased from 32 to 40 groups per router.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS sends a station maintenance message to each CM at least once every 25 to 30 seconds. If a CM does not respond to a station maintenance message within that time period, the CMTS then resends station maintenance messages at a faster rate (typically one second apart) in an attempt to restore connectivity with the CM.

Station maintenance messages can be lost because CMs have lost connectivity with the CMTS, or because ingress noise and other factors are causing dropped and errored packets. Downstream noise can also affect the delivery of station maintenance messages. When a user-configurable percentage of station maintenance messages are lost, the CMTS hops to a new upstream frequency to improve connectivity and sends out an Upstream Channel Descriptor (UCD) update to the CMs to inform them of the change.

The optimal hop threshold value depends on several factors, including the quality of the upstream return path and the number of CMs on the upstream. In addition, the hop threshold works together with the hop period so that transient network problems do not generate an unnecessary number of frequency hops. Ideally, the

hop threshold should be set low enough so that the frequency hop can occur before a significant number of CMs go offline, but not so low that it generates frequency hops that are not needed.

For example, if the hop threshold is at its default of 20 percent and an upstream has 100 active CMs, a power outage that affected 20 CMs would usually cause a frequency hop since this is a 20 percent loss of CMs, which in turn would be responsible for at least 20 percent loss of station maintenance messages. But in this situation, the frequency hop would be unneeded because changing the upstream frequency could not correct the original problem (the power outage). If this were a common situation on this upstream, the network administrator might increase the hop threshold so that the repeated power outages would not generate unneeded frequency hops.

If, on the other hand, the power outage affected only 10 CMs, a frequency hop would not occur unless another factor, such as ingress noise, created a sufficient loss of station maintenance messages to reach the 20 percent threshold. In this situation, the default threshold of 20 percent might be sufficient.

Downstream problems can also generate frequency hops. For example, if 20 CMs were on a particularly noisy downstream, over time they could miss a sufficient number of station maintenance messages to generate a frequency hop. The network administrator could increase the hop threshold to limit the possibility of frequency hops due to downstream impairments.

Also, faulty CMs could generate a frequency hop under certain conditions. For example, if a number of faulty CMs generated a large number of uncorrectable forward error correction (FEC) errors or otherwise missed 50 to 60 percent of their station maintenance messages, without actually going offline, over time they could miss a sufficient number of station maintenance messages to cause a frequency hop or modulation change. The network administrator could increase the hop threshold to prevent the CMTS from generating a frequency hop or modulation change for problems such as these, which are unrelated to actual noise on the upstream.

Note If a previous frequency hop had already occurred within the user-configurable hop period, the CMTS will not immediately frequency hop. Instead, the CMTS would wait until the hop period expires, and if the percentage of station maintenance messages still exceeds the hop threshold, the CMTS would perform another frequency hop.

Tip When an upstream has 25 or fewer CMs (which is typical with lab and test environments), the CMTS increases the rate at which it sends station maintenance messages to the CMs. This higher polling rate, along with the small number of CMs, means that frequency hopping can occur more quickly than with a normally loaded upstream, especially when a small number of CMs are powered down or generate noisy traffic.

Note The DOCSIS specification states that when a CM misses 16 sequential station maintenance messages, the CMTS should consider the CM offline and should stop sending station maintenance messages to that CM. The CM must then reregister with the CMTS to resume connectivity.

Examples

The following example shows how to set the threshold that triggers frequency hop to 25 percent of station maintenance messages on the upstream that is assigned to spectrum-group 4:

```
Router# configure terminal
```

```
Router(config)# cable spectrum-group 4 hop threshold 25
Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable spectrum-group hop period	Sets the minimum frequency-hop interval for a cable spectrum group.
cable upstream channel-width	Configures an upstream for a range of allowable channel widths.
cable upstream modulation-profile	Configures an upstream for one modulation profile (static profile) or two modulation profiles (Dynamic Upstream Modulation).
show cable hop	Displays the current hop period and threshold for an upstream, along with other statistics.

cable spectrum-group shared

Note Effective with Cisco IOS Release 12.2(33)SCG, the **cable spectrum-group shared** command is not available in Cisco IOS software.

To specify that the upstream ports in a spectrum group share the same upstream frequency, use the **cable spectrum-group shared** command in global configuration mode. To delete this specification, use the **no** form of this command.

cable spectrum-group *groupnum* **shared**
no cable spectrum-group *groupnum* **shared**

Syntax Description

groupnum	Spectrum group number. Valid values are from 1 to 32, or from 1 to 40, depending on the Cisco IOS software release.

Command Default

Upstream port frequency is the same for all ports in the spectrum group.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1 T	This command was introduced.
12.2(11)BC3	Support was added for this command on the Cisco uBR-LCP2-MC16S card on the Cisco uBR10012 router.
12.2(15)BC2	The maximum number of spectrum groups was increased from 32 to 40 groups per router.
12.2(33)SCG	This command was removed.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Because this command forces upstream ports to use the same spectrum, you must ensure that you do not configure spectrum groups that have overlapping frequencies. To use shared spectrum groups, each group must be using a discrete set of frequencies.

Caution Depending on the frequencies being used, and how cable modems are distributed across those frequencies and among spectrum groups, switching from a group from shared to non-shared, or from non-shared to shared, could cause CMs in the spectrum group to go offline and begin reranging procedures. You should therefore use this command only during regularly schedule maintenance times, so that a minimum number of online customers are affected.



Note This command does not enable any sort of load balancing on the shared upstreams.

Examples

The following example shows how to specify that all the upstream ports for spectrum group 4 share the same upstream frequency, and that these upstream frequencies are not assigned to other upstream interfaces:

```
Router(config)# cable spectrum-group 4 shared

Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Configures preset modulation profiles that you can apply to one or more upstream cable interfaces when you identify and configure spectrum groups.
cable spectrum-group (global configuration)	Creates a spectrum group of one or more frequencies for an upstream.
cable spectrum-group hop period	Sets the minimum frequency-hop interval for a cable spectrum group.
cable spectrum-group hop threshold	Specifies a hop threshold for a cable spectrum group.
cable upstream hopping blind	Disengages the advanced spectrum management features of the Cisco uBR-MC16S and Cisco uBR-MC5X20S cable interface line cards by enabling blind frequency hopping behavior.
show controllers cable	Displays information about the cable interface, including the upstream center frequency.

cable submgmt default

To set the default values for attributes in the Subscriber Management MIB (DOCS-SUBMGT-MIB), and to enable Cisco Static CPE Override on the Cisco CMTS, use the **cable submgmt default** global configuration command. To restore the original defaults, use the **no** form of this command.

cable submgmt default [**active** | **learnable** | **max-cpe** *cpe-num* | **max-ipv6-cpe***cpe-num*]
no cable submgmt default [**active** | **learnable** | **max-cpe** *cpe-num* | **max-ipv6-cpe***cpe-num*]
cable submgmt default filter-group {**cm** | **cpe** | **mta** | **stb** | **ps**} {**downstream** | **upstream**} *group-id*
no cable submgmt default filter-group {**cm** | **cpe** | **mta** | **stb** | **ps**} {**downstream** | **upstream**} *group-id*

Cisco cBR Series Converged Broadband Routers
cable submgmt default [**active** | **filter-group** | {**cm** | **cpe** | **mta** | **stb** | **ps**} | {**downstream** | **upstream**} *group-id* | **learnable** | **max-cpe** *cpe-num* | **max-ipv6-cpe***cpe-num*]
no cable submgmt default [**active** | **filter-group** | {**cm** | **cpe** | **mta** | **stb** | **ps**} | {**downstream** | **upstream**} | **learnable** | **max-cpe** | **max-ipv6-cpe**]

Syntax Description

no	When used with the **active** and **learnable** options, the **no** form of the command sets the default attributes to false. When used with the **max-cpe**, **max-ipv6-cpe** and **filter-group** options, the **no** form of the command sets the attribute to 0.
active	(Optional) Sets the docsSubMgtCpeActiveDefault attribute, which controls whether the CMTS manages the CPE devices for a particular CM—when set to TRUE, the CMTS enforces the MAX-CPE value and the implemented filters. The **no cable submgmt default active** command sets the default value to FALSE (the original default), which turns off CPE management at the CMTS.
learnable	(Optional) Sets the docsSubMgtCpeLearnableDefault attribute, which controls whether the CMTS learns the CPE IP addresses for a particular CM—when set to TRUE (the original default), the CMTS learns IP addresses up to the MAX-CPE value. The **no cable submgmt default learnable** command sets the default value to FALSE, which means that the IP address for each allowable CPE device must be specified in the DOCSIS configuration file.
max-cpe *cpe-num*	(Optional) Sets the docsSubMgtCpeMaxIpDefault attribute, which specifies the default number of simultaneous IP addresses (CPE devices) permitted for the CM. The possible range is 0 to 1024, where 0 specifies that all CPE traffic from the CM is dropped. The default is 16.
filter-group	Specifies a filter group, which can be applied to either upstream or downstream traffic for either a CM or its CPE devices.
cm	Specifies that the filter group applies to traffic to or from a CM.
cpe	Specifies that the filter group applies to traffic to or from a CPE device.
mta	Specifies that the filter group applies to traffic to or from a multimedia terminal adaptor (mta.)
stb	Specifies that the filter group applies to traffic to or from a Set-Top Box (stb.)

ps	Specifies that the filter group applies to traffic to or from a portal server (ps.)
downstream	Specifies that the filter group applies to the downstream traffic that is going to the specified CM or CPE device.
upstream	Specifies that the filter group applies to the upstream traffic that is coming from the specified CM or CPE device.
group-id	Specifies the filter group ID (0 to 254) to be applied for the CM or CPE, downstream or upstream filter. This ID references the filter indexes that are used for rows in the docsSubMgtPktFilterTable. A value of 0 indicates that no filtering is used for this particular type of traffic.

Command Default

The Subscriber Management MIB defaults to the following default values:

- The **active** parameter defaults to FALSE (the CMTS does not actively manage CPE devices).
- The **learnable** parameter defaults to TRUE (the CMTS learns the IP addresses for CPE devices).
- The **max-cpe** parameter defaults to 16 IP addresses.
- The filter group ID for each type of filter group defaults to 0, which means that no filtering is done on that type of traffic.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.1(7)CX1	This command was introduced.
12.3(9a)BC	This command was integrated into Cisco IOS Release 12.3(9a)BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB	This command was updated to support MTA, STB, and portal server.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **max-ipv6-cpe** keyword was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables field technicians to add a temporary CPE device behind the subscriber's cable modem. The temporary CPE device shares the same SID settings as the original CPE device, even though the temporary CPE device has a different MAC address. The original CPE device automatically changes from **dhcp cpe** to **static cpe** in the CMTS host routing tables, and the CPE device continues to receive service with the same SID.

To disable Cisco CMTS Static CPE Override on the Cisco CMTS, use the **no** form of this command. This automatically updates the routing tables and enables the MAC address from the technician's laptop for a future field service connection at a different location.Prior to using this command, the first (existing) DHCP CPE device maintains its DHCP dynamic MAC address behind the cable modem. The SID is assigned to this IP address.

However, by enabling Static CPE override, you gain the following states and options on two CPE devices behind the cable modem.

- The SID definition on the first CPE device is assigned a different static IP address. This enables you to change the existing (dynamic) DHCP IP address to a static IP address without first clearing the DHCP CPE host entries from the Cisco CMTS. The CPE IP state changes from **dhcp** to **static cpe**.
- This static override allows a second CPE device with a second MAC address behind the same cable modem with SID1 to be assigned same IP address as the first CPE device.



Note The second CPE device changes from **dhcp cpe** to **static cpe** in the CMTS host tables.

The DOCSIS 1.1 Subscriber Management MIB (DOCS-SUBMGT-MIB) creates and maintains a number of tables that describe the state of subscriber management for the CMs and CPE devices being serviced by the Cisco CMTS. The CMTS creates rows in these tables for each CM and CPE device when the CM registers with the CMTS, and if the CM does not specify a value for an attribute in this table, the CMTS uses the defaults specified by the **cable submgmt default** command.



Timesaver The DOCS-SUBMGT-MIB MIB contains its own default values for these attributes, and those defaults can be overridden by giving the appropriate SNMP SET commands. The **cable submgmt default** command, however, allows the new defaults to be included in the Cisco IOS configuration file so that the defaults are automatically reconfigured whenever the CMTS reboots or reloads.



Note The **cable submgmt default** command sets only the default value for these attributes. These default values are used only if the CM does not specify other values when it registers with the CMTS. If the CM does specify different values at registration time, those values are used instead of these default values.

The attributes in DOCS-SUBMGT-MIB control how the CMTS manages the CPE devices behind a CM and the filters that are applied to the traffic to and from a particular CM and its CPE devices. The following sections describe the relationship between the different forms of the **cable submgmt default** commands and the attributes in DOCS-SUBMGT-MIB.

CPE Management

The first form of the **cable submgmt default** command controls the default values for the entries in the docsSubMgtCpeControlTable, which controls how the CMTS manages the CPE devices for each CM:

cable submgmt default active

Sets the docsSubMgtCpeActiveDefault attribute, which is the default value for the docsSubMgtCpeControlActive attribute in docsSubMgtCpeControlTable. This attribute controls whether the CMTS performs CPE management for a particular CM.

- The **cable submgmt default active** command sets the default to TRUE, which specifies that the CMTS is to manage CPE devices by enforcing the MAX-CPE number and the implemented filters.
- The **no cable submgmt default active** command sets the default to FALSE (the default value), which specifies that the CMTS is not to perform CPE management for the particular CM.

cable submgmt default learnable

Sets the docsSubMgtCpeLearnableDefault attribute, which is the default value for the docsSubMgtCpeControlLearnable attribute in docsSubMgtCpeControlTable. This attribute controls whether the CMTS learns the IP addresses for CPE devices behind a particular CM.

- The **cable submgmt default learnable** command sets the default to TRUE (the default value), which specifies that the CMTS is to learn the IP addresses for the CPE devices behind the CM, up to the value specified by the MAX-CPE parameter. The CMTS learns the IP addresses by monitoring the traffic sent by the CPE devices, and the first CPE devices to transmit traffic are the first CPE devices to be learned.
- The **no cable submgmt default learnable** command sets the default to FALSE, which specifies that the CMTS does not learn the IP addresses for the CPE devices behind a particular CM. Instead, the IP addresses for each CM that is to be allowed access must be specified in the DOCSIS configuration file.

cable submgmt default max-cpe *cpe-num*

Sets the docsSubMgtCpeMaxIpDefault attribute, which specifies the default value for the docsSubMgtCpeControlMaxCpeIp attribute in docsSubMgtCpeControlTable. This attribute specifies the maximum number of IP addresses that can transmit traffic through a particular CM. The possible range is 0 to 1024, and the original default is 16.



Note The MAX-CPE attribute is used only when the CMTS is actively managing CPE devices for the CM.

Filter Group Management

The second form of the **cable submgmt default** command controls the default values for the entries in the docsSubMgtCmFilterTable, which assigns the CM to one or more filter groups. A filter group specifies what filters are applied to the traffic going to or coming from each particular CM or CPE device. Filter groups can be numbered 0 to 1024, where 0 specifies that no filtering is done for that particular traffic type.



Note The actual filters specified in these commands must be created by setting the appropriate attributes in the DOCS-SUBMGT-MIB MIB using SNMP SET commands.

cable submgmt default filter-group cpe downstream *group-id*

Sets the ocsSubMgtSubFilterDownDefault attribute, which is the default value for the docsSubMgtSubFilterDownstream attribute in the docsSubMgtCmFilterTable. This attribute applies to downstream traffic that is sent to the CPE devices behind a particular CM.

cable submgmt default filter-group cpe upstream *group-id*

Sets the docsSubMgtSubFilterUpDefault attribute, which is the default value for the docsSubMgtSubFilterUpstream attribute in the docsSubMgtCmFilterTable. This attribute applies to upstream traffic that is sent by the CPE devices behind a particular CM.

cable submgmt default filter-group cm downstream *group-id*

Sets the docsSubMgtCmFilterDownDefault attribute, which is the default value for the docsSubMgtCmFilterDownstream attribute in the docsSubMgtCmFilterTable. This attribute applies to downstream traffic that is addressed to a particular CM.

cable submgmt default filter-group cm upstream *group-id*

Sets the docsSubMgtCmFilterUpDefault attribute, which is the default value for the docsSubMgtCmFilterUpstream attribute in the docsSubMgtCmFilterTable. This attribute applies to upstream traffic that is sent by a particular CM.



Note For more information about using static CPE override, see the Cisco CMTS Static CPE Override feature on Cisco.com.

Examples

The following commands specify that the CMTS defaults to actively managing the CPE devices for each CM that registers, allowing and learning up to four IP addresses for the CPE devices behind that CM. The **cable submgmt default max-cpe** command specifies the number of IPv6 addresses permitted behind a CM which includes all IPv6 addresses of all the CPE's.

```
Router# configure terminal

Router(config)# cable submgmt default active

Router(config)# cable submgmt default learnable

Router(config)# cable submgmt default max-cpe 4
```

The following commands specify that the CMTS defaults to actively managing the CPE devices for each CM that registers. Each CM, however, must specify its own MAX-CPE value; otherwise, that value defaults to 0 and all traffic to and from the CPE devices for that CM is blocked.

```
Router# configure terminal

Router(config)# cable submgmt default active

Router(config)# cable submgmt default max-cpe 0
```

The following commands specify that the CMTS defaults to not actively managing the CPE devices for each CM that registers. However, if the CM at registration time indicates that the CMTS is to actively manage the CPE devices, the CMTS defaults to allowing only one CPE device. Learning also is disabled, so that one CPE device, therefore, must be specified in the DOCSIS configuration file that the CM uses to register.

```
Router# configure terminal

Router(config)# no cable submgmt default active

Router(config)# no cable submgmt default learnable

Router(config)# cable submgmt default max-cpe 1
```

The following commands specify that the CMTS defaults to assigning three filter groups to each CM that registers. Unless the CM indicates otherwise at registration time, downstream and upstream traffic for the CPE devices behind the CM is filtered according to the rules for filter groups 20 and 21, respectively. Filter group 1 is applied to the downstream traffic addressed to the CM. Upstream traffic sent by the CM, however, is not filtered.

```
Router# configure terminal

Router(config)# cable submgmt default filter-group cpe downstream 20
```

```
Router(config)# cable submgmt default filter-group cpe upstream 21
Router(config)# cable submgmt default filter-group cm downstream 1
Router(config)# cable submgmt default filter-group cm upstream 0
```



Note The above example assumes that filter groups 1, 20, and 21 have already been created on the CMTS using the appropriate SNMP commands.

Related Commands

Command	Description
cable filter group	Creates a DOCSIS 1.1 filter group that filters packets on the basis of the TCP/IP and UDP/IP headers.

cable sync-interval

To specify the interval between successive sync message transmissions from the Cisco CMTS, use the **cable sync-interval** command in cable interface configuration mode. To return the sync message interval to its default value, use the **no** form of this command.

cable sync-interval *msec*
no cable sync-interval

Syntax Description

msec	Specifies the interval in milliseconds (ms) between successive sync message transmissions from the Cisco CMTS. Valid values are from 1 to 200 ms. Default value is 10 ms.

Command Default

10 ms

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
11.3 NA	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To verify whether or not a sync message interval has been configured, enter the **show running-config** command and look for the cable interface configuration information. If a sync message interval has been configured, it appears in this output. If the sync message interval has been deactivated or reset to its default value, no sync interval command line appears in the output.

Examples

The following example shows how to specify the interval for the sync message transmissions to 100 ms:

```
Router (config-if)# cable sync-interval 20
```



Cable Commands: cable t

- cable tag, on page 740
- cable telco-return enable, on page 743
- cable telco-return interval, on page 745
- cable telco-return registration-ip, on page 747
- cable telco-return spd dhcp-authenticate, on page 749
- cable telco-return spd dhcp-server, on page 751
- cable telco-return spd dial-timer, on page 753
- cable telco-return spd factory-default, on page 755
- cable telco-return spd manual-dial, on page 757
- cable telco-return spd password, on page 759
- cable telco-return spd phonenum, on page 761
- cable telco-return spd ppp-authenticate, on page 763
- cable telco-return spd radius-realm, on page 765
- cable telco-return spd service-provider, on page 767
- cable telco-return spd threshold, on page 769
- cable telco-return spd username, on page 771
- cable tftp-enforce, on page 773
- cable throttle-modem, on page 778
- cable throttle-ranging, on page 780
- cable time-server, on page 781
- cable toaster-shrink , on page 782
- cable toaster-voltage-adjust , on page 783
- cable trust, on page 784
- cable trust-last, on page 786
- cable tx-power-headroom, on page 787

cable tag

To configure a tag for a DOCSIS load balancing group on the CMTS, use the **cable tag** command in the global configuration mode. To delete the tag and remove it from the CMTS configuration, use the **no** form of this command.

cable tag *1-1000*
no cable tag *1-1000*

Syntax Description

1-1000	Specifies a cable tag number.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCH	This command was modified. The tag to exclude TLV type was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable tag** command creates a tag with the specified number and then enters the CMTS-tag configuration mode. Use the following commands in the CMTS-tag configuration mode to configure the tag:

- **docsis-version**
- **exclude**
- **exit**
- **name**
- **oui**
- **override**
- **service-class**
- **service-type-id**
- tlv

General tagging is used by Cisco CMTS as follows:

- The Cisco CMTS can classify some modems with user-defined modem classifiers using the STID, service class name, DOCSIS version and capability TLVs and MAC Organization Unique Identifier (OUI).
- Each modem classifier has a unique tag. The Cisco CMTS allows each modem to carry one tag. When multiple tags match one cable modem, the tag that has the least index gets applied on the CM.
- The Cisco CMTS classifies a CM and assigns a tag, and if a RLBG with that tag is configured, the CM gets assigned to that RLBG.
- The Cisco CMTS can match multiple tags to a RLBG and a DOCSIS policy.

Note

- Try to match tag with upstream service flow prior to downstream service flow.
- Only match service class name of the first upstream/downstream service flow.

Examples

The following example shows how to create a tag numbered as "1' following which the system enters the cmts-tag configuration mode:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(config-cmts-tag)# name CSCO
Router(config-cmts-tag)# service-type-id commercial
Router(config-cmts-tag)# service-class work
Router(config-cmts-tag)# docsis-version docsis20
Router(config-cmts-tag)# oui 00.1a.c3
Router(config-cmts-tag)# override
```

The following example shows how to configure the tag to exclude a DOCSIS version, a MAC address, a service class name, or a service type ID.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(config-cmts-tag)# exclude docsis-version docsis10
Router(config-cmts-tag)# exclude oui 00.1a.c3
Router(config-cmts-tag)# exclude service-class work
Router(config-cmts-tag)# exclude service-type-id commercial
```

In Cisco IOS Release 12.2(33)SCH, **TLV type** was introduced. The following example shows how to configure the tag to exclude the **TLV type**:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(config-cmts-tag)# exclude tlv mrcs 4
```

Related Commands

Command	Description
docsis-version	Configures the specified DOCSIS version of the cable modem (CM) for the tag.
exclude	Configures the tag to exclude a DOCSIS version, a MAC address, a service class name, or a service type ID.
name	Specifies the name of the tag.
oui	Configures the specified Organization Unique Identifier (OUI) of the CM for the tag.
override	Overrides type/length/value (TLV) or Simple Network Management Protocol (SNMP) settings when assigning the restricted load balancing group (RLBG) to CMs.
service-class	Configures the specified service class name for the tag.

Command	Description
service-type-id	Configures the specified service type ID for the tag.
tag	Associates the cable modem tag with a RLBG.
tlv	Configures a TLV type matching rule.

cable telco-return enable

To enable telco-return support, use the **cable telco-return enable** command in cable interface configuration mode. To disable this feature, use the **no** form of this command.

telco-return enable
no cable telco-return enable

Syntax Description

This command has no arguments or keywords.

Command Default

Telco-return support is disabled.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable telco-return:

```
Router(config-if)# cable telco-return enable
```

Note This command is available only in images that support telco-return. These images have a "t" as part of the image name.

Related Commands

Command	Description
cable telco-return interval	Defines the interval for sending Telephony Channel Descriptor (TCD) and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the service provider descriptor (SPD) that the telco-return CM uses during the initialization process.

Command	Description
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD message.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return interval

To set the interval for sending Telephony Channel Descriptor (TCD) and Termination System Information (TSI) messages, use the **cable telco-return interval**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return interval *seconds*
no cable telco-return interval

Syntax Description

seconds	Number of seconds between intervals for sending TCD and TSI messages. The valid range is from 2 to 60.

Command Default

2 seconds

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set the TCD and TSI message interval to 40 seconds:

```
Router(config-if)# cable telco-return interval 40
```

Note This command is available only in images that support telco-return. These images have a "t" as part of the image name.

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.

Command	Description
cable telco-return spd factory-default	Indicates the service provider descriptor (SPD) that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return registration-ip

To select a different IP address for the telco-return CM to send its registration requests, use the **cable telco-return registration-ip**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return registration-ip *ip-address*
no cable telco-return registration-ip

Syntax Description

ip-address	Registration IP address that is sent in Termination System Information (TSI) messages. Value is any of the cable interface's IP addresses.

Command Default

The downstream channel IP address of the Cisco CMTS is used.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.1(2)EC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Registration IP Address parameter in TSI messages. By default, the downstream channel IP address of the Cisco CMTS is also used for the registration IP address. When this **cable telco-return registration-ip** command is configured, telco-return CMs send their registration requests to this IP address instead of to the downstream channel IP address.

Note This command is available only in images that support telco-return. These images have a "t" as part of the image name.

Examples

The following example shows how to send the CM's registration requests to IP address 172.16.1.1:

```
Router(config-if)# cable telco-return registration-ip 172.16.1.1
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending Telephony Channel Descriptor (TCD) and TSI messages.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.

Command	Description
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the service provider descriptor (SPD) that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd dhcp-authenticate

To require the telco-return CM to use a specific Dynamic Host Configuration Protocol (DHCP) server, use the **cable telco-return spd dhcp-authenticate** command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **dhcp-authenticate**
no cable telco-return spd *spd-number* **dhcp-authenticate**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.

Command Default

The CM can use any available DHCP server.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the DHCP Authenticate parameter to TRUE (1) for the specified SPD in the Telephony Channel Descriptor (TCD) messages. It indicates that the CM must use the DHCP server that is specified with the **cable telco-return spd dhcp-server** command.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example indicates that for SPD 2, CMs must use the DHCP server identified by IP address 192.168.255.255:

```
Router(config-if)# cable telco-return spd 2 dhcp-authenticate
Router(config-if)# cable telco-return spd 2 dhcp-server 192.168.255.255
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.

Command	Description
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd dhcp-server

To identify the IP address of the Dynamic Host Configuration Protocol (DHCP) server that the telco-return CM must access, use the **cable telco-return spd dhcp-server**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **dhcp-server** *ip-address*
no cable telco-return spd *spd-number* **dhcp-server**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
ip-address	IP address of the DHCP server that CMs must use.

Command Default

The IP address is set to 0.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the DHCP Server parameter in the specified SPD in Telephony Channel Descriptor (TCD) messages. Telco-return CMs use the DHCP server that is identified by this IP address if the **cable telco-return spd dhcp-authenticate** command is configured. If the **cable telco-return spd dhcp-authenticate**command is not configured, the CMs use any available DHCP server.



Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example indicates that for SPD 2, CMs must use the DHCP server identified by IP address 192.168.255.255:

```
Router(config-if)# cable telco-return spd 2 dhcp-authenticate
Router(config-if)# cable telco-return spd 2 dhcp-server 192.168.255.255
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.

Command	Description
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd dial-timer

To set the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call, use the **cable telco-return spd dial-timer** command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **dial-timer** *seconds*
no cable telco-return spd *spd-number* **dial-timer**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
seconds	Number of seconds that a connection is idle before the CM disconnects the call. Valid range is 0 through 4,294,967,295. The default of 0 means that the dial-timer is not used.

Command Default

The dial-timer is set to 0, which means that inactive telephone connections are not disconnected.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Demand Dial Timer parameter for the specified SPD in Telephony Channel Descriptor (TCD) messages. This enables the CM to emulate true dial-on-demand functionality by monitoring inactive networking time and allowing it to disconnect any telephone connection that exceeds the timer.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows how to set the timer to 2 hours:

```
Router(config-if)# cable telco-return spd 2 dial-timer 7200
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.

Command	Description
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd factory-default

To indicate the service provider descriptor (SPD) that the telco-return CM uses during the initialization process, use the **cable telco-return spd factory-default**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **factory-default**
no cable telco-return spd *spd-number* **factory-default**

Syntax Description

spd-number	Service provider descriptor (SPD) that contains the set of telephony attributes used by the CM during initialization. Valid range is 1 through 5.

Command Default

The Factory Default Flag in the SPD is set to 0, which means that this SPD is not used for the initialization process.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Factory Default parameter in the specified SPD in Telephony Channel Descriptor (TCD) messages. This determines the set of telephony attributes, as defined by the SPD, that are used for the initialization process when the CM is powered on or is reset to its factory default.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows how to set the telco-return CM to use SPD 2 during the initialization procedure:

```
Router(config-if)# cable telco-return spd 2 factory-default
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.

Command	Description
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific Dynamic Host Configuration Protocol (DHCP) server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd manual-dial

To enable the telco-return CM to operate in manual-dial mode, use the **cable telco-return spd manual-dial**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **manual-dial**
no cable telco-return spd *spd-number* **manual-dial**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.

Command Default

Manual-dial mode is disabled.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Manual Dial vendor-specific parameter in the specified SPD in Telephony Channel Descriptor (TCD) messages.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows how to set manual-dial mode for SPD 1:

```
Router(config-if)# cable telco-return spd 1 manual-dial
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.

Command	Description
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd password

To set the password that the telco-return CM uses for authentication when establishing a PPP connection with the access server, use the **cable telco-return spd password**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **password** *password-string*
no cable telco-return spd *spd-number* **password**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
password-string	Login password that the CM uses for authentication during the initialization procedure.

Command Default

No password is used.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Login Password parameter for the specified SPD in Telephony Channel Descriptor (TCD) messages.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows how to set the password to 9JwoKd7 in service provider descriptor 2:

```
Router(config-if)# cable telco-return spd 2 password 9JwoKd7
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.

Command	Description
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd phonenum

To set the telephone numbers that the telco-return CM uses when connecting to the headend's network access server, use the **cable telco-return spd phonenum**command in cable interface configuration mode. To delete previously entered telephone numbers, use the **no** form of this command.

cable telco-return spd *spd-number* **phonenum** *dial-string*
no cable telco-return spd *spd-number* **phonenum** *dial-string*

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
dial-string	Telephone number that the CM uses to connect to the headend's network access server.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Phone Number parameters in the specified SPD in Telephony Channel Descriptor (TCD) messages. You can repeat this command, entering as many as three telephone numbers for the CM to use when attempting to establish a PPP connection with the network access server. The phone numbers are mapped to the parameters Phone Number1, Phone Number2, Phone Number3 in the order in which you enter them. The CM attempts to connect using Phone Number1 first. If it fails to connect, and its number of retries exceeds the limit set with the **cable telco-return spd threshold** command, the CM dials the next number in the list.



Note This command is available only in images that support telco-return. These images have a "t" as part of the image name.

Examples

The following example shows how to set the primary phone number to 9255551212. If the CM fails to connect using that number, it tries the next phone number, 9255551234:

```
Router(config-if)# cable telco-return spd 2 phonenum 9255551212
Router(config-if)# cable telco-return spd 2 phonenum 9255551234
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.

Command	Description
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd ppp-authenticate

To select the authentication method used when the telco-return CM is establishing a PPP connection, use the **cable telco-return spd ppp-authenticate**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **ppp-authenticate** [**both** | **chap** | **pap**]
no cable telco-return spd *spd-number* **ppp-authenticate**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
both	Challenge Handshake Authentication Protocol (CHAP) is used if the network access server supports CHAP. Password Authentication Protocol (PAP) is used only if the network access server does not support CHAP.
chap	CHAP authentication is used.
pap	PAP authentication is used.

Command Default

The default is **both**; either CHAP or PAP is used depending on the methods supported by the network access server.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the PPP Authentication parameter for the specified SPD in Telephony Channel Descriptor (TCD) messages.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example requires the CM to perform CHAP authentication:

```
Router(config-if)# cable telco-return spd 2 ppp-authenticate chap
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.

Command	Description
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd radius-realm

To select a RADIUS server domain to use for the login response string, use the **cable telco-return spd radius-realm**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **radius-realm** *string*
no cable telco-return spd *spd-number* **radius-realm**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
string	Alphanumeric string identifying a RADIUS server domain.

Command Default

The default value is the null string.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the RADIUS Realm parameter for the specified SPD in Telephony Channel Descriptor (TCD) messages. When this command is configured, telco-return CMs use this realm string to construct a domain name for the login username when responding to a PPP login query.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows a login response string of “sandy@sunol”:

```
Router(config-if)# cable telco-return spd 3 radius-realm sunol
Router(config-if)# cable telco-return spd 3 username sandy
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.

Command	Description
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd service-provider

To include the service provider name in the SPD, use the **cable telco-return service-provider**command in cable interface configuration mode. To remove the parameter from the SPD, use the **no** form of this command.

cable telco-return spd *spd-number* **service-provider** *spd-string*
no cable telco-return spd *spd-number* **service-provider**

Syntax Description

spd-number	Service provider descriptor number for which this parameter is set. Valid range is 1 through 5.
spd-string	Alphanumeric string that identifies the service provider.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Service Provider Name parameter for the specified SPD in the Telephony Channel Descriptor (TCD) messages.



Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows the service provider name being set to “san_jose” for SPD 2:

```
Router(config-if)# cable telco-return spd 2 service-provider san_jose
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.

Command	Description
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd threshold

To set the number of failed dial-up connections that can occur before the CM indicates a connection failure, use the **cable telco-return spd threshold**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **threshold** *threshold-number*
no cable telco-return spd *spd-number* **threshold**

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
threshold-number	Number of dial-up attempts that fail before the CM declares a connection failure. Valid range is 1 through 255.

Command Default

The default value is 1.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Connection Threshold parameter for the specified SPD in the Telephony Channel Descriptor (TCD) messages. A dial-up attempt is considered a connection failure if an answer connection is not made after ten rings. The CM continues to try to connect until the connection threshold is reached. If multiple phone numbers are configured using the **cable telco-return spd phonenum** command, the CM dials each phone number until it makes a connection or exceeds the configured threshold.



Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows the connection threshold being set to 20:

```
Router(config-if)# cable telco-return spd 2 threshold 20
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.

Command	Description
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd username	Sets the username that the telco-return CM uses for authentication when establishing a PPP connection.

cable telco-return spd username

To set the username that the telco-return CM uses for authentication when establishing a PPP connection with the access server, use the **cable telco-return spd username**command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable telco-return spd *spd-number* **username** *login-string*
no cable telco-return spd *spd-number* **username** *login-string*

Syntax Description

spd-number	Service provider descriptor (SPD) number for which this parameter is set. Valid range is 1 through 5.
login-string	Username that the CM uses for authentication during the initialization procedure.

Command Default

The default value is *guest*.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Login Username parameter for the specified SPD in the Telephony Channel Descriptor (TCD) messages.

Note This command is available only in images that support telco-return. These images have a “t” as part of the image name.

Examples

The following example shows the username being set to “sandy” for SPD 3:

```
Router(config-if)# cable telco-return spd 3 username sandy
```

Related Commands

Command	Description
cable telco-return enable	Enables telco-return functionality.
cable telco-return interval	Defines the interval for sending TCD and Termination System Information (TSI) messages.
cable telco-return registration-ip	Selects a different IP address for the telco-return CM to send its registration requests.
cable telco-return spd dhcp-authenticate	Indicates that telco-return CMs must use a specific DHCP server.

Command	Description
cable telco-return spd dhcp-server	Identifies the IP address of the DHCP server that the telco-return CMs must use.
cable telco-return spd dial-timer	Sets the number of seconds that a telephone connection is idle before the telco-return CM disconnects the call.
cable telco-return spd factory-default	Indicates the SPD that the telco-return CM uses during the initialization process.
cable telco-return spd manual-dial	Enables the telco-return CM to operate in manual-dial mode.
cable telco-return spd password	Sets the password that the telco-return CM uses for authentication when establishing a PPP connection.
cable telco-return spd phonenum	Sets the telephone numbers that the telco-return CM dials when connecting to the headend's network access server.
cable telco-return spd ppp-authenticate	Selects the authentication procedure to use when the telco-return CM is establishing a PPP connection.
cable telco-return spd radius-realm	Selects a RADIUS server domain to use for the login response string.
cable telco-return spd service-provider	Includes the service provider name in the SPD.
cable telco-return spd threshold	Sets the number of failed dial-up connections that can occur before the CM indicates a connection failure.

cable tftp-enforce

To require that all CMs on a cable interface attempt to download a DOCSIS configuration file using the Trivial File Transfer Protocol (TFTP) through the cable interface before being allowed to register and come online, use the **cable tftp-enforce** command in cable interface configuration mode. To disable this feature, use the **no** form of this command.

cable tftp-enforce [**mark-only**]
no cable tftp-enforce [**mark-only**]

Syntax Description

mark-only	(Optional) Allow CMs to come online without attempting to download a DOCSIS configuration file through the Cisco CMTS cable interface, but prints a warning message and marks those CMs with a pound sign (#) in the **show cable modem** command.

Command Default

TFTP downloads through the Cisco CMTS are not required (**no cable tftp-enforce**).

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.1(11b)EC1	This command was introduced for the Cisco uBR7100 series and Cisco uBR7200 series universal broadband routers.
12.1(19)EC	CMs that fail the TFTP checked are now marked with a reject(c) error in the **show cable modem** command, instead of the original reject(m) error, so as to be consistent with the behavior in the Release 12.2 BC train.
12.2(8)BC2	Support for this command was added to the 12.2 BC release train for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 universal broadband routers.
12.2(15)BC1	The command was enhanced on the Cisco uBR10012 router to prevent the router from rejecting cable modems that did properly download a DOCSIS configuration file.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable tftp-enforce** cable interface configuration command requires all cable modems on a cable interface to attempt a TFTP request for the DOCSIS configuration file through the cable interface with the Cisco CMTS router before being allowed to register and come online. This can help prevent the following situations from occurring:

- Users who attempt theft-of-service by reconfiguring their local networks to allow the downloading of an unauthorized DOCSIS configuration file from a local TFTP server. Typically, some users do this to obtain services that they have not paid for, such as higher guaranteed bandwidths or a higher priority Quality of Service (QoS) profile.
- Some brands or models of cable modems might be running older software releases that cache the DOCSIS configuration file and use the cached version instead of downloading the actual file from a TFTP server during the registration process. Although this can marginally speed up the registration process, it also

violates the DOCSIS requirements and could create a situation in which the cable modem is not using the proper DOCSIS configuration file. A user might then be mistakenly accused of theft-of-service, when in reality the problem is the non-DOCSIS-compliant cable modem.

The **cable tftp-enforce** command identifies these situations and can block these cable modems from registering and coming online. This command also has a **mark-only** option that allows these cable modems to come online, but it also identifies the cable modems so that the network administrators can investigate the situation further before taking any action.

When the command is used without the **mark-only** option, cable modems that do not download a TFTP file through the cable interface are blocked from registering and coming online. The following message is displayed on the console when such a cable modem attempts to register:

```
06:53:57: %UBR7200-4-REGISTRATION_BEFORE_TFTP: Registration request unexpected:
Cable Modem did not attempt TFTP. Registration Rejected. CM Mac Addr <00ff.ff66.12fb>
```

The **mark-only** option allows cable modems that do not download the TFTP file to come online, but it also prints a warning message on the console and marks the cable modem in the **show cable modem** command with a pound sign (#). The following message is displayed on the console when such a cable modem registers with the Cisco CMTS.

```
06:53:57: %UBR7200-4-REGISTRATION_BEFORE_TFTP: Registration request unexpected:
Cable Modem did not attempt TFTP. Modem marked with #. CM Mac Addr <00ff.ff66.12fb>
```

Tip Cisco recommends that you initially configure cable interfaces with the **mark-only** option, so that potential problems are identified without immediately interfering with users' ability to come online. After you identify and resolve these initial problems, reconfigure the cable interfaces without the **mark-only** option to block problem cable modems that attempt to come online without downloading a valid DOCSIS configuration file.

The default behavior is not to require the TFTP download through the cable interface with the Cisco CMTS router. Each cable interface must be configured with this command to require the TFTP download.

Note The **cable tftp-enforce** command cannot be used on subinterfaces or on non-cable interfaces.

Operation on the Cisco uBR10012 Router

In Cisco IOS Release 12.2(15)BC1 and later releases, the Cisco uBR10012 router can occasionally allow a cable modem to temporarily come online before the system has received confirmation that the cable modem has downloaded the proper DOCSIS configuration file. This situation can occur when the cable interface line card receives a registration request (REG-REQ) message from a cable modem before the PRE1 module has notified the line card whether the modem did download the proper file from the TFTP server.

In previous Cisco IOS releases, these cable modems were not allowed to come online (or marked as TFTP violators) even if they had successfully downloaded the appropriate DOCSIS configuration file. In Cisco IOS Release 12.2(15)BC1 and later releases, however, the Cisco uBR10012 router allows these cable modems to temporarily come online until the PRE1 module has finished determining the modem's TFTP status. If the system determines that the modem did not download the appropriate DOCSIS configuration file, it is then taken offline (or marked as a TFTP violator).

Note In the above situation, cable modems that do not download a DOCSIS configuration file are marked as "offline" instead of "reject(c)" by the **show cable modem** command. The console still displays the %UBR10000-4-REGISTRATION_BEFORE_TFTP error message, however, to allow you to identify these cable modems as TFTP violators.

Examples

The following example shows how to enforce TFTP downloads for all of the cable modems on cable interface 3/0. These cable modems must attempt a TFTP download of the DOCSIS configuration file through the cable interface with the Cisco CMTS. If they do not, they are not allowed to register or come online, and they are marked as having either a registration error—reject(c)—in the **show cable modem** command.

Note The initial version of this feature marked CMs that failed the TFTP check as having a Message Integrity Check (MIC) failure—reject(m). The command was changed to show reject(c) in Cisco IOS Release 12.2(8)BC2 and Release 12.1(19)EC.

```
Router# configure terminal

Router(config)# interface cable 3/0

Router(config-if)# cable tftp-enforce
Router(config-if)# exit

Router(config)#
Router# show cable modems

Interface   Prim  Online     Timing Rec    QoS CPE IP address      MAC address
            Sid   State      Offset Power
Cable3/0/U1 1     online(pt)  2734    0.50  5   0   10.1.1.38       00ff.fffa.0a35
Cable3/0/U0 2     online(pt)  2729    0.25  5   0   10.1.1.50       00ff.ff07.382f
Cable3/0/U0 3     init(i)     2732    0.25  2   0   10.1.1.48       00ff.ff03.307d
Cable3/0/U1 4     online(pt)  2737    0.75  5   0   10.1.1.34       00ff.ff59.4477
Cable3/0/U1 5     reject(m)   2215    0.25  2   0   10.1.1.47       00ff.ff66.12fb
Router#
```

Note DOCSIS-compliant cable modems that are rejected with a MIC failure go into the offline state for a short period of time and then retry the registration process.

The **debug cable registration** command can be used to display additional information:

```
Router# debug cable interface c3/0 verbose

Router# debug cable registration CMTS registration debugging is on
Jun  6 23:27:15.859: Registration request from 00ff.ff66.12fb, SID 7 on Cable3/0/U1
Jun  6 23:27:15.859: Found a network access control parameter: Ok
Jun  6 23:27:15.859: Found a class of service block: Ok
Jun  6 23:27:15.859: Found Baseline Privacy config: Ok
Jun  6 23:27:15.859: Found Max CPE: Ok
Jun  6 23:27:15.859: Found CM MIC: Ok
```

```
Jun  6 23:27:15.859: Found CMTS MIC: Ok
Jun  6 23:27:15.859: Found modem ip: Ok
Jun  6 23:27:15.859: Found modem capabilities: Ok
Jun  6 23:27:15.859: Finished parsing REG Request
Jun  6 23:27:15.859: Cable Modem sent Registration Request without attempting required TFTP
22:33:21 %UBR7200-4-REGISTRATION_BEFORE_TFTP: Registration request unexpected:
Cable Modem did not attempt TFTP. Registration Rejected. CM Mac Addr <00ff.ff66.12fb>
Registration failed for Cable Modem 00ff.ff66.12fb on interface Cable3/0/U0:
              CoS/Sflow/Cfr/PHS failed in REG-REQ
Jun  6 23:27:15.859: REG-RSP Status : failure (2)
Jun  6 23:27:15.859: Registration Response:
Jun  6 23:27:15.859: 0x0000: C2 00 00 1B 00 00 00 50 73 4E B4 19 00 05 00 E0
Jun  6 23:27:15.859: 0x0010: 56 AC 00 09 00 00 03 01 07 00 00 02 02
Jun  6 23:27:15.859: Registration Response Transmitted
```

The following example of the **mark-only** option shows how that cable modems that do not attempt a TFTP download through the Cisco CMTS are allowed to register and come online, but they are marked with a pound sign (#) when using the **show cable modem** command.

```
Router# configure terminal

Router(config)# interface cable 3/0

Router(config-if)# cable tftp-enforce mark-only
Router(config-if)# exit

Router(config)#
Router# show cable modems

Interface   Prim  Online     Timing Rec    QoS CPE IP address      MAC address
            Sid   State      Offset Power
Cable3/0/U1 1     online(pt)  2734    0.50  5   0   10.1.1.38       00ff.fffa.0a35
Cable3/0/U0 2     online(pt)  2729    0.25  5   0   10.1.1.50       00ff.ff07.382f
Cable3/0/U0 3     init(i)     2732    0.25  2   0   10.1.1.48       00ff.ff03.307d
Cable3/0/U1 4     online(pt)  2737    0.75  5   0   10.1.1.34       00ff.ff59.4477
Cable3/0/U1 5    #online      2213    0.25  6   0   10.1.1.47       00ff.ff66.12fb
Router#
```

The**debug cable registration** command can be used to display additional information:

```
Jun  6 23:27:15.859: Registration request from 00ff.ff66.12fb, SID 7 on Cable3/0/U1
Jun  6 23:27:15.859: Found a network access control parameter: Ok
Jun  6 23:27:15.859: Found a class of service block: Ok
Jun  6 23:27:15.859: Found Baseline Privacy config: Ok
Jun  6 23:27:15.859: Found Max CPE: Ok
Jun  6 23:27:15.859: Found CM MIC: Ok
Jun  6 23:27:15.859: Found CMTS MIC: Ok
Jun  6 23:27:15.859: Found modem ip: Ok
Jun  6 23:27:15.859: Found modem capabilities: Ok
Jun  6 23:27:15.859: Finished parsing REG Request
Jun  6 23:27:15.859: Cable Modem sent Registration Request without attempting required TFTP
23:27:15: %UBR7200-4-REGISTRATION_BEFORE_TFTP: Registration request unexpected:
Cable Modem did not attempt TFTP. Modem marked with #. CM Mac Addr <00ff.ff66.12fb>
Jun  6 23:27:15.859: Sec sids obtained for all requested classes of service
Jun  6 23:27:15.859: Performing connection admission control (CAC) for each Sid
Jun  6 23:27:15.859: CAC Status for ClassID:1 is CAC_SUCCESS
Jun  6 23:27:15.859: Registration Status: ok (0)
Jun  6 23:27:15.859: Registration Response Transmitted
```



Tip You can also use the **show interface cable sid** and **show cable qos profile**commands to examine the SID and service classes in use, to determine whether a CM has registered using unauthorized QoS parameters.

Related Commands

Command	Description
cable dynamic-secret	Enables the dynamic shared secret feature, so that DOCSIS configuration files are verified with a dynamically generated shared secret.
cable shared-secondary-secret	Configures one or more secondary shared-secret keys that CMs can use to successfully process the DOCSIS configuration file and register with the CMTS.
cable shared-secret	Configures an authentication shared-secret key that CMs must use to successfully process the DOCSIS configuration file and register with the CMTS.
debug cable registration	Displays debug messages for the CM registration process.
show cable modem	Displays information for the registered and unregistered CMs.

cable throttle-modem

To enable the Cable Modem Registration Throttling feature, which improves the cable modem online speed at initial ranging stage by reducing CPU usage, use the **cable throttle-modem** command in global configuration mode. To disable this feature, use the **no** form of this command.

cable throttle-modem init-rate *value* **holdoff-time** *value* **flush-rate** *value*
no cable throttle-modem

Syntax Description

init-rate *value*	Specifies the maximum number of modems allowed to pass the initialization step per second. The valid range is from 1 to 1000. The default value is 32.
holdoff-time *value*	Specifies the maximum number of seconds a cable modem is allowed to wait in the throttling queue. The valid range is from 5 to 100. The default value is 45.
flush-rate *value*	Specifies the maximum number of modems flushed per second from the throttling queue after the holdoff time expires. The valid range is from 100 to 1000. The default value is 300.

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF3	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable throttle-modem** command enables dynamic adjustment of number of cable modems in the registration queue thus reducing CPU usage.

You must manually disable the **cable throttle-ranging** command (applicable only for Cisco uBR10K Series Routers) configuration to enable the **cable throttle-modem** command configuration.

Examples

The following example shows how to enable the Cable Modem Registration Throttling feature on a Cisco CMTS:

```
Router# configure terminal
Router(config)# cable throttle-modem init-rate 1 holdoff-time 5 flush-rate 100
```

Related Commands

Command	Description
(For Cisco uBR10K Series Routers) **cable throttle-ranging**	Enables faster cable modem registration times.

Command	Description
show cable throttle-modem	Displays cable throttle configuration information.

cable throttle-ranging

To enable faster cable modem registration times, use the **cable throttle-ranging** command in global configuration mode. To disable faster cable modem registration times, use the **no** form of this command.

cable throttle-ranging
no cable throttle-ranging

Syntax Description

This command has no arguments or keywords

Command Default

This command is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable throttle-ranging** command enables faster cable modem registration times on the CMTS.

Reload the Cisco CMTS with a Cisco IOS Release 12.3(21)BC image and configure the **cable throttle-ranging** command on the CMTS. Once the **cable throttle-ranging** has been configured, save the new configuration and reload the Cisco CMTS again. Faster cable modem registration times will now be enabled on the Cisco CMTS.



Note The **cable throttle-ranging** command is only available on an ubr10k CMTS.

Examples

The following example shows how to enable Fast CM registration feature on a Cisco CMTS:

```
Router(config)# cable throttle-ranging
```

cable time-server

To enable the integrated time-of-day (ToD) server on the Cisco CMTS series, enter the **cable time-server** command in global configuration mode. To disable the time-of-day server function, use the **no** form of this command.

cable time-server
no cable time-server

Syntax Description

This command has no keywords or arguments.

Command Default

The integrated time-of-day (ToD) server is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Per the DOCSIS specifications, the ToD server uses the UDP protocol, so UDP minor servers must also be enabled using the **service udp-small-servers max-servers no-limit** command.

Examples

The following example shows how to enable the time-of-day server:

```
Router# configure terminal

Router(config)# service udp-small-servers max-servers no-limit
Router(config)# cable time-server
Router(config)#
```

cable toaster-shrink

To enable turbo mode, which uses six or seven pipelines in Parallel eXpress Forwarding, use the **cable toaster-shrink** command in global configuration mode. To reset to default settings, which use eight pipelines in Parallel eXpress Forwarding, use the **no** form of this command.

cable toaster-shrink *row-count*
no cable toaster-shrink [*row-count*]

Syntax Description

row-count	Specifies the shutdown row count in toaster. The values are: • 1—Shutdown one pipeline and uses seven pipelines. • 2—Shutdown two pipelines and uses six pipelines.

Command Default

Disabled

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCJ1	This command was introduced in Cisco uBR10012 router.

Examples

The following example shows how to enable turbo mode which shutdown one pipeline and uses seven pipelines:

```
Router# configure terminal
Router(config)# cable toaster-shrink 1
```

cable toaster-voltage-adjust

To change PRE5 toaster voltage from 1.2 V to 1.3 V for T0 to T3, and to enable high voltage margin for T4, use the **cable toaster-voltage-adjust** command in global configuration mode. To reset to default settings, use the **no** form of this command.

cable toaster-voltage-adjust {**groupA** | **groupB**}
no cable toaster-voltage-adjust {**groupA** | **groupB**}

Syntax Description

groupA	Enables the PRE5 toaster voltage from 1.2 V to 1.3 V for T0 to T3.
groupB	Enables the high voltage margin for T4.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCJ1	This command was introduced in Cisco uBR10012 router.

Examples

The following example shows how to change PRE5 toaster voltage from 1.2 V to 1.3 V for T0 to T3:

```
Router# configure terminal
Router(config)# cable toaster-voltage-adjust groupA
```

cable trust

To enable packets from trusted source MAC addresses in DHCP, use the **cable trust** command in global configuration mode. To remove a trusted MAC address from the MAC exclusion list, use the **no** form of this command. Removing a MAC address from the exclusion list subjects all packets from that source to standard DHCP source verification.

cable trust *mac-address*
no cable trust *mac-address*

Syntax Description

mac-address	The MAC address of a trusted DHCP source, and from which packets will not be subject to standard DHCP source verification.

Command Default

Disabled

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Per the DOCSIS specifications, the ToD server uses the UDP protocol, so UDP minor servers must also be enabled using the **service udp-small-servers max-servers no-limit** command.

This command and capability are only supported in circumstances in which the Cable Source Verify feature is first enabled on the Cisco CMTS.

When this feature is enabled in addition to cable source verify, a packet's source must belong to the MAC Exclude list on the Cisco CMTS. If the packet succeeds this exclusionary check, then the source IP address is verified against Address Resolution Protocol (ARP) tables as per normal and previously supported source verification checks. The service ID (SID) and the source IP address of the packet must match those in the ARP host database on the Cisco CMTS. If the packet check succeeds, the packet is allowed to pass. Rejected packets are discarded in either of these two checks.

Any trusted source MAC address in the optional exclusion list may be removed at any time. Removal of a MAC address returns previously trusted packets to non-trusted status, and subjects all packets to standard source verification checks on the Cisco CMTS.

Note When the **cable source-verify dhcp** feature is enabled, and a statically-defined IP address has been added to the CMTS for a CM using the **cable trust** command to override the **cable source-verify dhcp** checks for this device, packets from this CM will continue to be dropped until an entry for this CM is added to the ARP database of the CMTS. To achieve this, disable the **cable source-verify dhcp** feature, ping the CMTS from the CM to add an entry to the ARP database, and re-enable the **cable source-verify dhcp** feature.

Examples

The following example shows how to configure this command:

```
Router# configure terminal
Router(config)# cable trust 0007.0e03.69f9
Router#
```

cable trust-last

To allow packets with source MAC addresses that match a configured trust-last MAC addresses, bypass source-verification, use the **cable trust-last** command in global configuration mode. To remove a MAC address from the trust-last list, use the **no** form of this command.

cable trust-last *mac-address*
no cable trust-last *mac-address*

Syntax Description

mac-address	The MAC address of a trust-last host.

Command Default

Disabled

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE 17.15.1y	This command is introduced.

Examples

The following example shows how to configure this command

```
Router# configure terminal
Router(config)# cable trust-last 0034.0f04.69f9
Router#
```

cable tx-power-headroom

To configure cable modems with the extended transmit power capability based on the Organizational Unique Identifier (OUI), use the **cable tx-power-headroom** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable tx-power-headroom *OUI dB-value*
no cable tx-power-headroom *OUI dB-value*

Syntax Description

OUI	First 24 bits of a MAC address that is unique to the cable modem vendor.
dB-value	Decibel value for the upstream channel transmit power. The valid range is from 1 to 6.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS Release 12.2(33)SCE3	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can use the **cable tx-power-headroom** command for each unique OUI. You can specify either the MAC address or the OUI value with this command. If you specify the MAC address, only its OUI value is saved.

Examples

The following example shows how to configure extended transmit power on the Cisco CMTS router in Cisco IOS Release 12.2(33)SCE3:

```
Router# configure terminal
Router(config)# cable tx-power-headroom 0025.2ed0.8cba 3
```

Related Commands

Command	Description
cable upstream max-channel-power-off	Specifies the power budget offset value on the Cisco CMTS router for the reduced channel set assignment.
show cable modem	Displays transmit power values for each assigned upstream channel along with cable modem details.



Cable Commands: cable u through cable w

- Configuring Upstream Cable Interface Features on the Cisco CMTS Routerscable udc-capability, on page 792
- cable upgrade dsphy-fw auto, on page 793
- cable upstream active-codes, on page 794
- cable upstream adjust-frequency, on page 795
- cable upstream admission-control, on page 796
- cable upstream admission-control max-reserved-bandwidth, on page 800
- cable upstream attribute-mask, on page 802
- cable upstream balance-scheduling, on page 803
- cable upstream bcast-init-ranging tcc-enc excl-timing, on page 805
- cable upstream bonding-group, on page 806
- cable upstream chan-class-id, on page 808
- cable upstream channel-width, on page 810
- cable upstream codes-per-minislot, on page 815
- cable upstream concatenation, on page 816
- cable upstream connector, on page 817
- cable upstream controller-profile, on page 821
- cable upstream data-backoff, on page 822
- cable upstream description, on page 824
- cable upstream differential-encoding, on page 825
- cable upstream docsis-mode, on page 826
- cable upstream dpon, on page 831
- cable upstream dps, on page 833
- cable upstream equalization-coefficient, on page 834
- cable upstream equalization-error-recovery, on page 837
- cable upstream ext-power, on page 839
- cable upstream fec, on page 840
- cable upstream fec-strength, on page 841
- cable upstream fragmentation, on page 842
- cable upstream fragment-force, on page 844
- cable upstream freq-adj averaging, on page 847
- cable upstream frequency, on page 848
- cable upstream hopping blind, on page 851

- cable upstream hop-priority, on page 853
- cable upstream ingress-noise-cancellation, on page 855
- cable upstream jumbo-grants, on page 858
- cable upstream load-balance group, on page 859
- cable upstream maintain-psd, on page 861
- cable upstream max-channel-power-offset, on page 863
- cable upstream max-codes-per-subframe, on page 864
- cable upstream max-interleave-step, on page 865
- cable upstream max-logical-chans, on page 867
- cable upstream max-ports, on page 871
- cable upstream min-bwreq-ops, on page 873
- cable upstream minimal-voice-jitter, on page 874
- cable upstream minislot-size, on page 875
- cable upstream modulation-profile, on page 878
- cable upstream ofdma-prof-mgmt active-scs-threshold-pct, on page 884
- cable upstream ofdma-prof-mgmt downgrade, on page 885
- cable upstream ofdma-prof-mgmt exempt-mslot-pct, on page 887
- cable upstream ofdma-prof-mgmt mer-margin-qdb, on page 888
- cable upstream ofdma-prof-mgmt prof-upgrade-auto, on page 889
- cable upstream ofdma-prof-mgmt rxmer-poll-interval, on page 890
- cable upstream power-adjust, on page 891
- cable upstream power-level, on page 895
- cable upstream priority, on page 898
- cable upstream qos wfq, on page 899
- cable upstream range-backoff, on page 901
- cable upstream ranging-init-technique, on page 903
- cable upstream ranging-poll, on page 904
- cable upstream rate-adapt (global), on page 906
- cable upstream rate-adapt (interface), on page 907
- cable upstream rate-limit, on page 909
- cable upstream rate-limit-bwreq exempted-priority, on page 911
- cable upstream rate-limit-ccf, on page 912
- Upstream Channel Bondingcable upstream resiliency, on page 914
- cable upstream resiliency recover, on page 917
- cable upstream rf-adapt (logical channel), on page 918
- cable upstream rf-adapt, on page 920
- cable upstream rng-holdoff, on page 922
- cable upstream scheduling type, on page 924
- cable upstream scrambler, on page 926
- cable upstream-sharing, on page 928
- cable upstream shutdown, on page 929
- cable upstream spectrum-group, on page 931
- cable upstream spreading-interval, on page 933
- cable upstream threshold, on page 934
- cable upstream threshold hysteresis, on page 939
- cable upstream threshold rf-adapt, on page 941

- cable upstream timing-adjust, on page 943
- cable upstream unfrag-slot-jitter, on page 945
- cable util-interval, on page 946
- cable vc-map, on page 948
- cable video, on page 950
- cable video source-switch, on page 951
- cable vrf-steering cable-modem, on page 952
- cable wideband auto-reset, on page 953

Configuring Upstream Cable Interface Features on the Cisco CMTS Routerscable udc-capability

To enable the Upstream Drop Classifier (UDC) feature on cable modems, use the **cable udc-capability** command in interface configuration mode. To disable the UDC feature, use the **no** form of this command.

cable udc-capability
no cable udc-capability

Syntax Description

This command has no arguments or keywords

Command Default

Disabled.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCG5	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used in the MAC domain. When this command is used on a particular interface, the UDC feature for all the cable modems on that interface is enabled.

Examples

The following example shows how to configure the **cable udc-capability** command:

```
Router# configure terminal
Router(config)# interface cable 7/0/0
Router(config-if)# cable udc-capability
```

The following example shows how to configure the **cable udc-capability** command on Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# interface cable 3/0/0
Router(config-if)# cable udc-capability
```

The **cable udc-capability** command is used to configure the Upstream Drop Classifier (UDC) feature on Cisco CMTS. For more information on the UDC feature, refer to the Configuring Upstream Cable Interface Features on the Cisco CMTS Routers *guide.*

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered cable modems.

cable upgrade dsphy-fw auto

To enable automatic upgrade of the Downstream PHY firmware on the Cisco cBR-8 router, use the **cable upgrade dsphy-fw auto** command in global configuration mode. To disable the automatic upgrade, use the **no** form of this command.

cable upgrade dsphy-fw auto
no cable upgrade dsphy-fw auto

Syntax Description

This command has no arguments or keywords

Command Default

Downstream PHY firmware auto upgrade is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to automatically upgrade the Downstream PHY firmware on the Cisco cBR-8 router.

Examples

The following example shows how to enable automatic upgrade of the Downstream PHY firmware on the Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# cable upgrade dsphy-fw auto
```

The following example shows how to disable automatic upgrade of the Downstream PHY firmware on the Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# no cable upgrade dsphy-fw auto
```

Related Commands

Command	Description
Need info	Need info

cable upstream active-codes

To specify the number of active codes that can be configured on an upstream channel, use the **cable upstream active-codes** command in cable interface configuration mode. To set the default value of active codes to 112 when ingress noise cancellation is enabled and to 128 when it is disabled, use the **no** form of this command.

cable upstream *n* **active-codes** *active-code*
no cable upstream *n* **active-codes**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
active-code	Specifies the number of active codes. Valid values are from 64 to 128, with a default value of 112, when ingress noise cancellation is enabled; and *a* default value of 128, when ingress noise cancellation is disabled.

Command Default

The active-code setting cannot be applied if the Synchronous Code Division Multiple Access (S-CDMA) is not configured.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is applicable only for S-CDMA channels. You should configure S-CDMA to apply the active-code setting.

Examples

The following example sets the active code to 128 on upstream port 0:

```
Router(config)# interface cable 7/0/4
Router(config-if)# cable upstream 0 active-codes 128
Router(config-if)#
```

Related Commands

Command	Description
cable upstream codes-per-minislot	Specifies the number of codes per minislot allowed on an upstream channel.
cable upstream spreading-interval	Specifies the spreading interval for S-CDMA channels on an upstream channel.

cable upstream adjust-frequency

To enable frequency adjustment, use the **cable upstream adjust-frequency** command in cable interface configuration mode. To turn off frequency adjustment, use the **no** form of this command.

no
cable *n* **upstream** **adjust-frequency**

Syntax Description

adjust-frequency	Enables frequency adjustment
n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For cBR Series Converged Broadband Routers, the valid range is from 0 to 15.

Command Default

Frequency adjustment is enabled by default.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Example

The following sample shows and example of the **cable upstream adjust-frequency** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # cable upstream 0 adjust-frequency
Router(config-profile-md)#end
```

The following sample shows and example of the **no cable upstream adjust-frequency** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # no cable upstream 0 adjust-frequency
Router(config-profile-md)#end
```

cable upstream admission-control

To specify the percentage overbooking rate that is allowed on an upstream channel, use the **cable upstream admission-control** command in cable interface configuration mode. To set overbooking rate to its default of 100 percent, use the **no** form of this command.

cable upstream *n* **admission-control** *percentage*
no cable upstream *n* **admission-control**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
percentage	Specifies the percentage overbooking rate to limit overbooking. Valid values are from 10 to 1000 percent, with a default of 100 percent.

Command Default

100 percent

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
11.3(6) NA	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command limits the maximum number of CMs for a given upstream port by looking at the minimum guaranteed upstream bandwidth allocated to each CM. Cable modems providing residential services and commercial services can be given different weights according to their traffic needs. This command affects only whether CMs can register with the CMTS—it does not affect CMs that have already come online.

The CMTS uses the minimum guaranteed upstream bandwidth field from the CM's DOCSIS configuration file to calculate whether the CM can come online or not. If the CM's minimum guaranteed upstream bandwidth would exceed the total upstream bandwidth multiplied by the overbooking percentage specified by this command, the CM cannot come online on that upstream. The CM will attempt to find another upstream, and if it cannot register on any upstreams, it will attempt to lock on to a new downstream.



Note A CM with a guaranteed upstream bandwidth does not consume that bandwidth unless it has active traffic. By guaranteeing a CM a minimum upstream bandwidth, individual customers are assured of never being totally shut out from network access in a very high-traffic situation.

The following table shows the approximate bandwidth for each upstream channel, depending on channel width, symbol rate, and modulation type, when admission control is used at 100 percent. When setting admission control to other values, scale the bandwidth values in the following table accordingly, so as to plan for the maximum number of CMs effectively allowed per upstream port.

Table 15: Admission Control Bandwidth Table

Channel Width (KHz)	Symbol Rate (Ksym/sec)	QPSK Virtual Channel Bandwidth—100% limit (bits/sec)	16 QAM Virtual Channel Bandwidth—100% limit (bits/sec)
200	160	320,000	640,000
400	320	640,000	1,280,000
800	640	1,280,000	2,560,000
1600	1280	2,560,000	5,120,000
3200	2560	5,120,000	10,240,000

For example, with a 3.2 MHz channel width and QPSK modulation, the total bandwidth is approximately 5 Mbps. This is the maximum allowable bandwidth that can be allocated to CMs at the default admission rate of 100%. If each CM is allocated a minimum upstream bandwidth of 128 kbps, this means a maximum of 40 CMs will be allowed to come online.

To verify whether or not upstream admission control is configured and activated, use the **show interface** command for a cable upstream to display its configuration information. If upstream admission control is configured and enabled, the output contains an entry stating "CIR admission control enforced." If upstream admission control is disabled, no admission control entry is displayed in the output.

Note Setting the admission control limit to below the current total reserved bandwidth for the channel does not immediately force any CMs offline, but may prevent CMs from reconnecting if they drop offline at a later time. Increasing the admission control limit allows more CMs to connect.

When an upstream becomes overbooked, use the **test cable ucc** command to move a cable modem that is currently online from one upstream port to another. For example, the following example shows that the cable modem with the IP address of 10.128.1.128 is being moved from port C3/0/U0 to C3/0/U1:

```
Router# show cable modem 10.128.1.128

Interface   Prim Online     Timing Rec    QoS CPE IP address      MAC address
            Sid  State      Offset Power
Cable3/0/U0 101  online     1919    5.25  7   0   10.128.1.128    0030.1976.7067
Router# test cable ucc c3/0 101 1
Router# show cable modem 10.128.1.128

Interface   Prim Online     Timing Rec    QoS CPE IP address      MAC address
            Sid  State      Offset Power
Cable3/0/U1 101  online     1920    5.25  7   0   10.128.1.128    0030.1976.7067
```

Examples

The following example shows overbooking on upstream port 4 being limited to 125 percent:

```
Router(config)# interface cable 3/0
Router(config-if)# cable upstream 4 admission-control 125
Router(config-if)#
```

Use the **show interface cable upstream** command to display the current status of admission control on an interface. For example, the following command output shows that this upstream has allocated a total bandwidth of 2.5 Mbit/sec to those online CMs that were assigned a guaranteed upstream bandwidth in their DOCSIS configuration files.

This displays also shows that the admission control is being enforced at a subscription level of 125 percent. The Virtual channel BW field is computed by multiplying channel bandwidth by the admission control limit. The Admissions requests rejected counter shows the number of cable modems that attempted to register but were refused because of the admission control policy.

```
Router# show interface c3/0 u4

Cable3/0: Upstream 4 is up
      Received 11585 broadcasts, 11854 multicasts, 3222651 unicasts
      0 discards, 829 errors, 0 unknown protocol
      3246090 packets input, 5 uncorrectable
      557 noise, 0 microreflections
      Total Modems On This Upstream Channel : 69 (68 active)
      Default MAC scheduler
      Queue[Rng Polls]  0/64, fifo queueing, 0 drops
      Queue[Cont Mslots]  0/52, fifo queueing, 0 drops
      Queue[CIR Grants]  0/64, fair queueing, 0 drops
      Queue[BE Grants]  0/64, fair queueing, 0 drops
      Queue[Grant Shpr]   0/64, calendar queueing, 0 drops
      Reserved slot table currently has 0 CBR entries
      Req IEs 205196036, Req/Data IEs 0
      Init Mtn IEs 7604617, Stn Mtn IEs 422496
      Long Grant IEs 4848, Short Grant IEs 1646196
      Avg upstream channel utilization : 1%
      Avg percent contention slots : 94%
      Avg percent initial ranging slots : 1%
      Avg percent minislots lost on late MAPs : 0%
      Total channel bw reserved 2500000 bps
      CIR admission control enforced
      Subscribtion level 125%
      Virtual channel bw 6400000 bps
      Admission requests rejected 32
      Current minislot count   : 5200298    Flag: 0
      Scheduled minislot count : 5200420    Flag: 0
Router#
```

If a CM is denied access due to the admission control policy, its entry in the **show cable modem** command output shows “reject(c)”:

```
Router# show cable modem

Interface   Prim Online     Timing Rec    QoS CPE IP address      MAC address
            Sid  State      Offset Power
Cable2/0/U0 1    online     2288    0.50  4   0   10.16.30.66     0010.7bb3.fb45
Cable2/0/U0 2    online     2288    0.50  4   0   10.16.30.68     0010.7bb3.fb7b
Cable2/0/U0 3    init(i)    2280    0.00  2   0   10.16.30.69     0010.9500.05e
 . . .
Cable3/0/U1 113  online     3921    0.00  5   0   10.128.1.108    0030.9433.c38b
Cable3/0/U1 114  online     3920    0.25  6   0   10.128.1.87     0030.1976.6ebf
Cable3/0/U0 115  reject(c)  3922    0.25  2   0   10.128.1.75     0030.1976.703b
Cable3/0/U0 116  online     3919    0.75  5   0   10.128.1.57     0030.1976.6fa1
```

Related Commands

Command	Description
debug cable mac-scheduler	Displays information for the MAC layer's scheduler and admission control activities.
debug cable us-adm-ctrl	Displays debug messages for upstream admission control activity.
show cable modem	Displays statistics for a CM, including its upstream port and primary SID.
show interface cable upstream	Displays the interface configuration, which for an upstream includes the current admission control policy, if any.

cable upstream admission-control max-reserved-bandwidth

To define the maximum reserved bandwidth per bonding group for all service flows that are allowed by the Cisco CMTS, use the **cable upstream admission-control max-reserved-bandwidth** command in the interface configuration mode. To reset or disable the maximum reserved bandwidth value, use the **no** form of this command.

cable upstream*n***admission-control max-reserved-bandwidth** *bw-in-kbps*
no cable upstream*n***admission-control max-reserved-bandwidth**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
bw-in-kbps	Maximum admission control reserved bandwidth. The value is in kbps and is based on the RF bandwidth percent defined for the bonding group. Valid range is from 0 to 30720.

Command Default

The max-reserved-bandwidth value is 80 percent of the aggregate bandwidth of the RF channels configured in the US or DS bonding group.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to define the maximum reserved bandwidth per bonding group. The default maximum reserved bandwidth value is 80 percent. However the user can choose to configure a higher (up to 96 percent) or lower reserved bandwidth so that there is bandwidth allocated for zero committed information rate (CIR) best effort traffic.

Examples

The following example shows a sample definition of the maximum reserved bandwidth value.

```
Router> enable
Router# configure terminal
Router(config)# interface c5/0/1
Router(config-if)# cable upstream 0 admission-control max-reserved-bandwidth 6344
```

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for the Cisco CMTS router and supporting broadband processing engines (BPEs).
cable admission-control event	Configures and enables admission control event types on the Cisco CMTS router.
cable admission-control ds-bandwidth	Configures admission control downstream bandwidth thresholds on the Cisco CMTS router.

Command	Description
cable admission-control us-bandwidth	Configures admission control upstream bandwidth thresholds on the Cisco CMTS router.
debug cable admission-control	Enables automatic admission control troubleshooting processes on the Cisco CMTS router.
show cable admission-control	Displays the current admission control configuration and status on the Cisco CMTS router or on a specified interface.

cable upstream attribute-mask

To specify an upstream attribute mask in hexadecimal format, use the **cable upstream attribute-mask** command in cable interface configuration mode or MAC domain profile configuration mode. Use the **no** form of this command to set default value to upstream channel attribute mask.

cable upstream *upstream***attribute-mask** *attribute-mask*
no cable upstream *upstream* **attribute-mask** *attribute-mask*

Syntax Description

upstream	Specifies the upstream port.
attribute-mask *attribute-mask*	Specifies the attribute mask bitmap in hexadecimal format. Example: 0-FFFFFFFF

Command Default

If the router is not high availability (HA) supported and the upstream is not bonded, the default value for cable upstream attribute mask is 0x00.

If the router is HA supported, the default value is 0x20000000.

If the upstream channel is part of a bonding group, the default value is 0x80000000.

If the router is HA supported and the upstream channel is part of a bonding group, the default value is 0xA0000000.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the attribute mask of upstream channel.

Examples

The following example shows how to set upstream attribute mask in hexadecimal format:

```
Router(config-if)# cable upstream 0 attribute-mask ffff
```

Related Commands

Command	Description
clear cable modem attribute-masks	This command clears the cable modem attribute masks.

cable upstream balance-scheduling

To enable the USCB balancing scheduler, use the **cable upstream balance-scheduling** command in cable interface configuration mode or MAC domain profile configuration mode. To disable, use the **no** form of this command.

cable upstream balance-scheduling
no cable upstream balance-scheduling

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Interface configuration (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCH2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to balances service flows across upstream channels in a MAC domain. This command is used only for UB-online cable modems.

The following example shows the configuration of the **cable upstream balance-scheduling** command:

```
Router# configure terminal
Router(config)# interface cable 8/1/2
Router(config-if)# cable upstream balance-scheduling
```

The following example shows the output of the **show cable interface** command that displays the enabled status of the balancing scheduler:

```
Router# show interface cable 8/1/2 mac-scheduler 0
  Load for five secs: 1%/0%; one minute: 2%; five minutes: 2%
  Time source is hardware calendar, *07:29:34.137 CST Wed Feb 5 2014

       DOCSIS 1.1 MAC scheduler for Cable8/1/2/U0: rate 7680000
       wfq:None balance-scheduling: on
       Queue[Rng Polls] 0/128, 0/0 drops, flows 0 max 0/0/0
       Queue[CIR Grants] 0/256, 0/0 drops, flows 0 max 0/0/0
       Queue[BE(7) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
       Queue[BE(6) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
       Queue[BE(5) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
       Queue[BE(4) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
       Queue[BE(3) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
       Queue[BE(2) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
```

```
Queue[BE(1) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
Queue[BE(0) Grants] 0/96, 0/0 drops, flows 0 max 0/0/0
BG pending grant list entries: 0
BG delay list entries: 0
Req Slots 0, Req/Data Slots 0
Init Mtn Slots 0, Stn Mtn Slots 0
Short Grant Slots 0, Long Grant Slots 0
Adv Phy Short Grant Slots 0, Adv Phy Long Grant Slots 0
Adv Phy UGS Grant Slots 0
Awacs Slots 0
Fragmentation count 0
Fragmentation test disabled
Avg upstream channel utilization : 0%
Avg percent contention slots : 0%
Avg percent initial ranging slots : 0%
Avg percent minislots lost on late MAPs : 0%
Sched Table Rsv-state: Grants 0, Reqpolls 0
Sched Table Adm-State: Grants 0, Reqpolls 0, Util 0%
UGS    : 0 SIDs, Reservation-level in bps 0
UGS-AD : 0 SIDs, Reservation-level in bps 0
RTPS   : 0 SIDs, Reservation-level in bps 0
NRTPS  : 0 SIDs, Reservation-level in bps 0
BE     : 0 SIDs, Reservation-level in bps 0

MAP TSS: lch_state 1, init_retries 0
         late_initial_maps 0, late_ucd_maps 0
         mac-phy tss errors 0, missed ccc 0
```

Related Commands

Command	Description
cable upstream scheduling type	Enables various scheduler modes
show interface cable	Displays the current configuration and status of a cable interface

cable upstream bcast-init-ranging tcc-enc excl-timing

To enable feature of ECN MULPIv3.0-N-14.1145-1 on the CMTS router, use the **cable upstream bcast-init-ranging tcc-enc excl-timing** command in global configuration mode. To disable feature of ECN MULPIv3.0-N-14.1145-1, use the no form of this command - **no cable upstream bcast-init-ranging tcc-enc excl-timing**.

cable upstream bcast-init-rangingtcc-encexcl-timing
no cable upstream bcast-init-rangingtcc-encexcl-timing

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS XE Fuji 16.9.1a	This command was introduced.

Usage Guidelines

To verify whether or not ECN MULPIv3.0-N-14.1145-1 feature is activated, enter the **show running-config command** and look for the **cable upstream bcast-init-ranging tcc-enc excl-timing** information. By default, it is disabled.

The following example shows the configuration of the **cable upstream balance-scheduling** command:

```
Router# configure terminal
Router(config)# cable upstream bcast-init-ranging tcc-enc excl-timing
```

Related Commands

There are no related commands.

cable upstream bonding-group

To create a static upstream bonding group on a cable interface, use the **cable upstream bonding-group** command in cable interface configuration mode. To disable this configuration, use the **no** form of this command.

cable upstream bonding-group *id*
no cable upstream bonding-group *id*

Syntax Description

id	Bonding group ID on the cable interface. Valid values are from 1 to 65535.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0S	The valid range of upstream channels for each MAC Domain was increased to 0-15.

Usage Guidelines

You can configure up to 32 static upstream bonding groups for each Media Access Control (MAC) domain. However, you can configure only 16 upstream channels for each MAC domain. If you delete an upstream bonding group using the **no** form of the command, the Cisco CMTS router enforces the bonded upstream service flows associated with the deleted upstream bonding group to readmit.

Under the upstream bonding configuration submode, you can specify the following for an upstream bonding group:

- Upstream channels
- Bandwidth reservation
- Provisioned attribute masks

Note While adding upstream channels under the upstream bonding group, ensure that the upstream channel is pre-configure using the following command:

downstream integrated-cable *slot/subslot/port* **rf-channel** *rf-channels* [**upstream** *grouplist*]

Upstream channels that are not pre-configured are not accepted and an error message is displayed as follows:

```
Router(config-if)#cable upstream bonding-group 106
Router(config-upstream-bonding)#upstream 0
Router(config-upstream-bonding)#upstream 6
Upstream 6 is not yet defined in MD Cable9/0/0.
```

Note The changes made to the configuration, using the attributes command in the upstream bonding configuration submode, on the working line card are synchronized with the configuration on the protect line card only after exiting the configuration mode. Use the end command to exit to Privileged EXEC mode, before using the show running configuration command.

Starting from Cisco IOS-XE 3.18.0S release, maximum of 16 upstream channels can be configured for each MAC Domain, which are divided into two groups:

- Group 1: upstream channel 0-7
- Group 2: upstream channel 8-15

An **upstream bonding-group** should include all the upstream channels either from Group 1 or Group 2 only. For example, consider the following configuration:

```
Router(config-if)#cable upstream bonding-group 106
Router(config-upstream-bonding)#upstream 0
Router(config-upstream-bonding)#upstream 6
Router(config-upstream-bonding)#upstream 7
.
.
.
Router(config-if)#cable upstream bonding-group 110
Router(config-upstream-bonding)#upstream 12
Router(config-upstream-bonding)#upstream 13
Router(config-upstream-bonding)#upstream 14
```

If you try to add **upstream 11** into **upstream bonding-group 106** or **upstream 4** into **upstream bonding-group 110**, it will be rejected.

Examples

The following example shows how to configure an upstream bonding group on a cable interface in slot 7, subslot 1, and port 0 on a Cisco CMTS router:

```
Router# configure terminal
Router(config)# interface cable 7/1/0
Router(config-if)# cable upstream bonding-group 235
```

Related Commands

Command	Description
upstream cable connector	Specifies the upstream channel ports for a fiber node.
cable fiber-node	Creates a fiber node and enters cable fiber-node configuration mode.

cable upstream chan-class-id

To configure a channel class ID for a logical upstream channel on the CMTS router, use the **cable upstream chan-class-id** command in cable interface configuration mode. To disable the channel class ID configuration, use the **no** form of this command.

cable upstream *port-number* **chan-class-id** *id*
no cable upstream *port-number* **chan-class-id** *id*

Syntax Description

port-number	Cable upstream port number. The valid range depends on the number of upstream channels configured in a MAC domain. For example, if the total number of upstream channels configured is 4, then the valid range for the upstream port number is from 0 to 3.
id	Channel class ID for the logical upstream channel in the hexadecimal format. The valid range is from 0 to ffffffff. The default value is 0.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream chan-class-id** command is associated with the CM Steering on the Cisco CMTS Routers feature.

An upstream channel descriptor (UCD) message includes type, length, value (TLV) 18 and 19 for an upstream logical channel based on the channel class ID and ranging hold-off priority configuration. If a channel class ID is not configured, the UCD does not include TLV18 and 19 irrespective of the ranging hold-off priority configuration.

Examples

The following example shows how to configure a channel class ID for a logical upstream channel on a cable interface line card on the cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 5/0/0
Router(config-if)# cable upstream 0 chan-class-id ff
```

Related Commands

Command	Description
cable load-balance exclude	Excludes a cable modem or a group of cable modems from DOCSIS load balance.

Command	Description
cable upstream rng-holdoff	Configures an upstream ranging hold-off priority value for an upstream logical channel on the CMTS router.
show cable modem verbose	Displays information about the registered and unregistered cable modems connected to the CMTS router.

cable upstream channel-width

To specify an upstream channel width for an upstream port, use the **cable upstream channel-width** command in cable interface configuration mode. To set the channel width back to the default setting of 1,600,000 Hz, use the **no** form of this command.

cable upstream *n* **channel-width** *first-choice-width* [*last-choice-width*]
no cable upstream *n* **channel-width**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
first-choice-width	Specifies the upstream channel width in hertz (Hz).
last-choice-width	The upstream channel width in hertz. The valid values are the same as those for the *first-choice-width* parameter, but for proper operation, the *last-choice-width* should be equal to or less than the *first-choice-width* value. Use this parameter with supported cards to enable symbol rate management algorithms.

Command Default

The first-choice-width value and the *last-choice-width* value default to 1,600,000 Hz. When an upstream channel is configured to operate in DOCSIS 2.0 A-TDMA or DOCSIS 3.0 S-CDMA-mode, only three channel width options (1.6 Mhz, 3.2 Mhz, and 6.4 Mhz) are available.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.3(5)NA	This command was introduced.
12.0(4)XI	The *last-choice-width* argument was added.
12.2(11)CY, 12.2(11)BC3	Support was added for the Cisco uBR10-MC5X20S cable interface line card on the Cisco uBR10012 router.
12.2(15)CX	Support was added for the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line card, including DOCSIS 2.0 A-TDMA and mixed modulation profiles using 6.4 MHz channel widths.
12.2(15)BC2	Support was added for DOCSIS 2.0 A-TDMA and mixed modulation profiles using 6.4 MHz channel widths on the Cisco uBR-MC5X20S/U cable interface line cards.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	Support was added for Cisco UBR10-MC20X20V cable interface line card.
12.2(33)SCG2	Support was added for Copy and Paste Support for TDMA to A-TDMA Upgrade feature.

Release	Modification
IOS-XE 3.15.OS	This command was removed. This command is replaced by **us-channel channel-width** command.

Usage Guidelines

The *last-choice-width* parameter is supported only by the Cisco uBR-MC16S, Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR-MC5X20S/U cable interface line cards. When one of these particular cards is installed, the system attempts to increase the channel width from the smallest channel width value to the largest channel width value.

When you specify both channel width values, the smaller value is taken as the *last-choice-width* parameter and the larger value is taken as the *first-choice-width* parameter. In the event of noise in the channel, the symbol rate automatically steps down to a value that is lower than the *first-choice-width* and greater or equal to the *last-choice-width* to maintain a stable channel.

Table 16: Supported Channel Widths and DOCSIS Modes for Cable Interfaces

Cable Interface	Channel Width	DOCSIS 1.X (TDMA)	Mixed DOCSIS 1.X/2.0	DOCSIS 2.0 (A-TDMA)	DOCSIS 2.0 (S-CDMA)	DOCSIS 3.0 (S-CDMA)
Cisco uBR-MC16U/X [4], Cisco uBR-MC28U/X	6.4 MHz 3.2 MHz 1.6 MHz 800 kHz 400 kHz 200 kHz	41 to 50 (default is 41)	141 to 150 (default is 141)	241 to 250 (default is 241)	N/A	N/A
Cisco uBR-MC5X20S/U/H	6.4 MHz 3.2 MHz 1.6 MHz 800 kHz 400 kHz 200 kHz	21 to 30 (default is 21)	121 to 130 (default is 121)	221 to 230 (default is 221)	N/A	N/A
Cisco uBR-MC20X20[5]	6.4 MHz 3.2 MHz 1.6 MHz 800 kHz 400 kHz 200 kHz	21 to 30 (default is 21)	121 to 130 (default is 121)	221 to 230 (default is 221)	321 to 330 (default is 321)	1 to 400 (default is 381)
Cisco uBR-MC88U	6.4 MHz 3.2 MHz 1.6 MHz 800 kHz 400 kHz 200 kHz	21 to 30 (default is 21)	121 to 130 (default is 121)	221 to 230 (default is 221)	321 to 330 (default is 321)	1 to 400 (default is 381)
Cisco uBR-MC3GX60V	6.4 MHz 3.2 MHz 1.6 MHz 800 kHz 400 kHz 200 kHz	21 to 30 (default is 21)	121 to 130 (default is 121)	221 to 230 (default is 221)	321 to 330 (default is 321)	1 to 400 (default is 381)

[4] Supports 6,400,000 Hz (5,120,000) symbols/sec) while operating in the DOCSIS 2.0 (A-TDMA-only) mode.
[5] The DOCSIS 3.0 S-CDMA modulation profiles do not support 200 kHz, 400 kHz, and 800 kHz channel widths.This applies to Cisco uBR-MC88U and Cisco uBR-MC3GX60V.

Note The UBR-MC20X20V cable interface line card has three variants, UBR-MC20X20V-0D, UBR-MC20X20V-5D, and UBR-MC20X20V-20D. The UBR-MC20X20V-0D line card supports 20 upstreams and zero (no) downstreams. The UBR-MC20X20V-5D line card supports 20 upstreams and five downstreams, and the UBR-MC20X20V-20D line card supports 20 upstreams and 20 downstreams.

Note In Cisco IOS Release 12.2(15)BC1 and later releases, changing the channel width could force a frequency hop, if the current frequency does not fit within the new channel width parameters, or if the system needs to reset the fixed frequency or shared frequency group parameters to match the new channel width.

Caution In DOCSIS 1.X networks, do not change the channel width more than one step at a time on an interface that has cable modems that are currently online. The DOCSIS 1.X specifications require that cable modems remain online when the channel width is changed in single step increments (such as 800,000 to 1,600,000 Hz), but cable modems can go offline when you change the channel width in larger amounts (such as changing it from 800,000 to 3,200,000 Hz). To check if the DOCSIS 2.0 cable modems support changing the channel width by two steps, test each brand of modem before attempting it on a live network. Also, after changing the channel width, do not change the channel width again until all cable modems have performed their ranging adjustments for the new width (which could take up to a minute, depending on the number of cable modems).

Note To specify only one channel width for the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, or Cisco uBR-MC5X20S/U/H card, specify the same value for both the *first-choice-width* and *last-choice-width* parameters. For example:**cable upstream 0 channel-width 800000 800000**

When using this command to change channel-widths for an upstream interface on the Cisco uBR-MC5X20S cable interface line card, some DOCSIS 1.1 CMs can go offline if you do not change the minislot size to the corresponding value. See the following examples for the correct channel-width and minislot pairings:

```
Router(config-if)# cable upstream 0 channel-width 3200000
Router(config-if)# cable upstream 0 minislot 4
Router(config-if)# cable upstream 0 channel-width 1600000
Router(config-if)# cable upstream 0 minislot 8
Router(config-if)# cable upstream 0 channel-width 800000
Router(config-if)# cable upstream 0 minislot 16
Router(config-if)# cable upstream 0 channel-width 400000
Router(config-if)# cable upstream 0 minislot 32
Router(config-if)# cable upstream 0 channel-width 200000
Router(config-if)# cable upstream 0 minislot 64
```

Note This limitation does not affect DOCSIS 1.1-compliant CMs. Also, in Cisco IOS Release 12.2(15)CX, Cisco IOS Release 12.2(15)BC2, and later releases, there is no need to manually change the minislot size on the Cisco uBR-MC16U/X, Cisco uBR-MC28C, and Cisco uBR-MC28U/X cards. These cards automatically change the minislot size when the channel width is changed, to produce 32 symbols per minislot.

Note Starting with Cisco IOS 12.2(33)SCG2, when the channel-width value in the **cable upstream channel-width** command is specified as 6.4 MHz in the TDMA or mixed TDMA/A-TDMA mode, the DOCSIS mode automatically changes to A-TDMA-only (DOCSIS 2.0) mode.

PacketCable Limitations

The 200,000 Hz channel width cannot be used on:

- Upstreams that support PacketCable voice calls
- Upstreams that use Unsolicited Grant Service (UGS) or UGS with Activity Detection (UGS-AD) service flows.

Using this small channel width with voice and other UGS/UGS-AD service flows results in rejected calls because of "DSA MULTIPLE ERRORS".

Examples

The following example shows the upstream port 2 on a Cisco uBR-MCXXC card being configured with a channel width of 200,000 Hz (which is equivalent to a symbol rate of 160 kilosymbols/second):

```
Router(config-if)# cable upstream 2 channel-width 200000
Router(config-if)#
```

The following example shows the upstream port 2 on a Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, or Cisco uBR-MC5X20S card being configured with a channel width of 200,000 Hz (which is equivalent to a symbol rate of 160 kilosymbols/second):

```
Router(config-if)# cable upstream 2 channel-width 200000 200000
Router(config-if)#
```

The following example shows the upstream port 3 being configured to step from a channel width of 1,600,000 Hz to a channel width of 3,200,000 Hz in increments of 200,000 Hz:

```
Router(config-if)# cable upstream 3 channel-width 1600000 3200000
Router(config-if)#
```

The following example shows an upstream port on a Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, Cisco uBR-MC5X20S, Cisco uBR-MC20X20V, Cisco uBR-MC88U or Cisco uBR-MC3GX60V card being configured with a channel width of 6.4 MHz, which is supported only in DOCSIS 2.0 A-TDMA-only mode:

```
Router(config-if)# cable upstream 0 channel-width 6400000
Router(config-if)#
```

The following example shows an upstream port on Cisco uBR-MC5X20H, Cisco uBR-MC20X20V, Cisco uBR-MC88U, Cisco uBR-MC3GX60V line cards being configured with a channel width of 6.4 MHz in DOCSIS 3.0 S-CDMA mode:

```
Router(config-if)# cable upstream 0 channel-width 6400000
Router(config-if)#
```

Related Commands

Command	Description
cable upstream hopping blind	Disables optimum frequency hopping on the Cisco uBR-MC16S and Cisco uBR-MC5X20S cable interface line cards.
cable upstream minislot-size	Specifies the minislot size for a specific upstream interface.
cable upstream modulation-profile	Overrides modulation types specified in the modulation profile for the specified upstream channel.

Command	Description
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.

cable upstream codes-per-minislot

To specify the number of codes-per-minislot allowed on an upstream channel, use the **cable upstream codes-per-minislot** command in cable interface configuration mode. To set the default values to the codes-per-minislot, which depend on the setting of the **cable upstream spreading-interval** command, use the **no** form of this command.

cable upstream *n* **codes-per-minislot** *code*
no cable upstream *n* **codes-per-minislot**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
code	Specifies the number of codes-per-minislot. Valid values range from 2 to 32.

Command Default

The codes-per-minislot setting cannot be applied if the Synchronous Code Division Multiple Access (S-CDMA) is not configured. The default value of codes-per-minislot depends on the setting of the **cable upstream spreading-interval** command.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command limits the maximum number of codes-per-minislot for a given upstream port. You should configure S-CDMA to apply the active-code setting.

Examples

The following example sets the codes-per-minislot to 8 on the upstream port 0:

```
Router(config)# interface cable 7/1/0
Router(config-if)# cable upstream 0 codes-per-minislot 8
Router(config-if)#
```

Related Commands

Command	Description
cable upstream active-codes	Specifies the number of active codes that can be configured on an upstream channel.
cable upstream spreading-interval	Specifies the spreading interval for SCDMA on an upstream channel.

cable upstream concatenation

To enable DOCSIS concatenation at the CMTS, use the **cable upstream concatenation** command in cable interface configuration mode. To turn off concatenation, use the **no** form of this command.

cable upstream *n* **concatenation**
no cable upstream *n* **concatenation**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For cBR Series Converged Broadband Routers, the valid range is from 0 to 15.

Command Default

Concatenation is enabled.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.0(7)XR2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Concatenation is part of DOCSIS 1.0 extension support. Concatenation provides for improved bandwidth efficiency but must be supported at both the headend CMTS and the CM.

DOCSIS concatenation combines multiple upstream packets into one packet to reduce packet overhead and overall latency and increase transmission efficiency. Using concatenation, a DOCSIS CM needs to make only one bandwidth request for a concatenated packet, compared to making bandwidth requests for each individual packet. This technique is especially effective for bursty real-time traffic such as voice calls.

Concatenation support improves upstream per CM data throughput. The Cisco CMTS radio frequency (RF) line card driver can receive only one MAC frame in a data burst. Thus the CM must make explicit bandwidth requests for every packet it sends upstream. This limits the maximum upstream data throughput received by the CM due to the inherent request-to-grant round-trip latency of the hybrid fiber-coaxial (HFC) cable system incurred by every packet. To increase this per-CM upstream throughput, the Cisco CMTS driver has been enhanced to receive a concatenated burst of multiple MAC frames from the same CM.



Note Concatenation is not supported on the Cisco uBR-MC11 FPGA and Cisco uBR-MC16B cable interface line cards.

Examples

The following example shows how to enable concatenation for CMs on upstream port 2 on the cable interface in slot 3/0:

```
Router(config)# interface c3/0
Router(config-if)# cable upstream 2 concatenation
```

cable upstream connector

To map a MAC domain upstream port to a physical port on the Cisco cable interface line cards (Cisco uBR-MC5X20U/H, Cisco uBR-MC20X20V, Cisco uBR-MC88V, Cisco uBR-MC28U, or Cisco uBR-MC3GX60V), use the **cable upstream connector** command in cable interface configuration mode. To remove the mapping, use the **no** form of this command.

cable upstream *port* **connector** *physical-port* **shared**
no cable upstream *port* **connector** *physical-port* **shared**

Syntax Description

port	Index of the MAC domain upstream. The index range is configured with the **cable upstream max-ports** *n* command, and the valid range is 0 to *n* -1.
physical-port	Index of the actual physical port to be mapped. The valid range for Cisco uBR-MC520U/H, Cisco uBR-MC20X20V, and Cisco uBR-MC3GX60V cable line cards is from 0 to 19. The valid range for Cisco uBR-MC28U and Cisco uBR-MC88V cable line cards is from 0 to 7.
shared	Indicates that the connector is shared by multiple upstream ports. **Note** This option is not valid for Cisco uBR-MC3GX60V cable interface lin ecard on Cisco IOS Release 12.2(33)SCE and later releases. A connector becomes shared automatically when multiple upstream ports are mapped to it.

Command Default

By default, each MAC domain has four upstream ports allocated. For all the currently supported cable line cards—Cisco uBR-MC5X20U/H, Cisco uBR-MC20X20V, Cisco uBR-MC88V, Cisco uBR-MC28U, and Cisco uBR-MC3GX60V the default mapping is four upstream for each MAC domain.

For the Cisco uBR-MC5X20U/H and Cisco uBR-MC28U cable line cards, each MAC domain has one downstream and four upstreams. For the other cards, each MAC domain can have multiple downstreams.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(15)BC1	This command was introduced to support the Cisco uBR-MC5X20S cable interface line card.
12.2(15)BC2	Support was added for the Cisco uBR-MC5X20U card. Also, the entAliasMappingTable in the ENTITY-MIB was updated to show the mapping between the physical upstream connectors and the logical upstream connectors.
12.2(33)SCE	Support for the **shared** keyword was removed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream connector** command maps a MAC domain upstream port to a particular physical RF port on the cable line card front panel. For all cable line cards except the Cisco uBR-MC3GX60V, the default

mapping assigns one upstream port to one physical port. The default mapping of Cisco uBR-MC3GX60V cable line card assigns four upstream ports to one physical port. The physical ports are mapped sequentially in the order in which they appear on the front panel.

The **no** version of this command removes the upstream port mapping and shuts down the upstream port. The port must be remapped to another physical port before it can come online again.



Tip Use the **cable upstream max-ports** command to set the maximum number of upstream ports per MAC domain before using the **cable upstream connector** command.

Table 17: Default Upstream Port Assignments for the Cisco uBR-MC5X20U/H Cable Interface Line Card

	Physical Ports (upstream, as labeled on the card)																			
Physical Upstream Ports	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MAC Domain 0 Upstream	0	1	2	3																
MAC Domain 1 Upstream					0	1	2	3												
MAC Domain 2 Upstream									0	1	2	3								
MAC Domain 3 Upstream													0	1	2	3				
MAC Domain 4 Upstream																	0	1	2	3

Table 18: Default Upstream Port Assignments for the Cisco uBR-MC3GX60V Cable Interface Line Card

	Physical Ports (upstream, as labeled on the card)																			
Physical Upstream Ports	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MAC Domain 0 Upstream	0-3																			

	Physical Ports (upstream, as labeled on the card)																			
MAC Domain 1 Upstream		0-3																		
MAC Domain 2 Upstream			0-3																	
MAC Domain 3 Upstream					0-3															
MAC Domain 4 Upstream						0-3														
MAC Domain 5 Upstream							0-3													
MAC Domain 6 Upstream									0-3											
MAC Domain 7 Upstream										0-3										
MAC Domain 8 Upstream											0-3									
MAC Domain 9 Upstream													0-3							
MAC Domain 10 Upstream														0-3						
MAC Domain 11 Upstream															0-3					
MAC Domain 12 Upstream																	0-3			
MAC Domain 13 Upstream																		0-3		

	Physical Ports (upstream, as labeled on the card)																		
MAC Domain 14 Upstream																		0-3	

Each MAC domain can have up to 8 upstream ports. Each upstream port can be mapped to a physical port.

Examples

The following example shows how to configure a MAC domain with 8 upstream ports:

```
Router# configure terminal
Router(config)# interface cable 8/1/0
Router(config-if)# cable upstream max-ports 8
Router(config-if)# cable upstream 0 connector 16
Router(config-if)# cable upstream 1 connector 17
Router(config-if)# cable upstream 2 connector 18
Router(config-if)# cable upstream 3 connector 12
Router(config-if)# cable upstream 4 connector 13
Router(config-if)# cable upstream 5 connector 14
Router(config-if)# cable upstream 6 connector 15
Router(config-if)# cable upstream 7 connector 11
Router(config-if)# exit
Router(config)# exit
Router#
```

Note The "WARNING: This upstream will be removed from all the upstream channel bonding groups in the MAC Domain." warning message is displayed when you configure **no cable upstream connector** command.

When an upstream is mapped to a physical upstream port (connector), it is also mapped to an internal upstream PHY receiver. In Cisco uBR-MC5X20U/H, Cisco uBR-MC20X20V, and Cisco uBR-MC88V cable line cards, each upstream PHY chip has two connectors and two receivers, and can support two upstreams. The two upstreams can be mapped in four ways:

- Straight mapping: upstream1 =>connector1 =>receiver1; upstream2 =>connector2 =>receiver2;
- Share A mapping: upstream1 =>connector1 =>receiver1; upstream2 =>connector1 =>receiver2;
- Share B mapping: upstream1 =>connector2 =>receiver1; upstream2 =>connector2 =>receiver2;
- Crossed mapping: upstream1 =>connector2 =>receiver1; upstream2 =>connector1 =>receiver2;

The card hardware only supports the first three mappings, and does not support crossed mapping. During normal configuration, certain configuration sequence can cause crossed mapping. When that happens, the connector command will fail, and the CNNR-NOXC error message is displayed. To fix the cross mapping, remove all existing upstream connector configurations in these two connectors, and re-provision them.

Related Commands

Command	Description
cable upstream max-ports	Configures the maximum number of upstreams on a downstream (MAC domain) on a Cisco uBR-MC5X20S cable interface line card.

cable upstream controller-profile

To configure the upstream controller profile, use the **cable upstream controller-profile** command in global configuration mode. To void the upstream controller profile configuration, use the **no** form of this command.

cable upstream controller-profile *id* [**RPHY** | **I-CMTS**]

no cable upstream controller-profile *id*

Syntax Description

Syntax Description

id	Specifies the upstream controller profile ID.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Fuji 16.7.1	This command was modified on the Cisco cBR Series Converged Broadband Routers. Keywords **RPHY** and **I-CMTS** were added.

Usage Guidelines

Use this command to configure the upstream controller profile.

When configuring a new i-CMTS controller profile, keyword **I-CMTS** is needed. If user input **RPHY** or do not input any keyword, the system will consider it as a RPHY controller profile.

Examples

The following example shows how to enter the upstream controller profile configuration mode:

```
Router# configure terminal
Router(config)# cable upstream controller-profile 1 I-CMTS
Router(config-controller-profile)#
```

cable upstream data-backoff

To specify automatic or fixed start and stop values for data backoff, use the **cable upstream data-backoff** command in cable interface configuration mode. To use the default data backoff values, use the **no** form of this command.

cable upstream *n* **data-backoff** {**automatic** | *start* *end*}
no cable upstream n data-backoff

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
automatic	Specifies automatic data backoff start and stop values. It enables dynamic variation in the *start* and *end* values.
start	Binary exponential algorithm. Sets the start value for data backoff. Valid values are from 0 to 15. The default value is 3.
end	Binary exponential algorithm. Sets the end value for data backoff. Valid values are from 0 to 15. The default value is 5.

Command Default

The default cable upstream data-backoff values are 3 5.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.1 T	This command was introduced.
12.1(5)EC1	Support was added for the Cisco uBR7100 series router.
12.2(4)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS-specified method of contention resolution for CMs used to send data or requests on the upstream channel is a truncated binary exponential backoff with the initial backoff window and the maximum backoff window controlled by the CMTS. The Cisco CMTS router specifies backoff window values for both data and initial ranging, and sends these values downstream as part of the Bandwidth Allocation Map (MAP) MAC message.

The values specified in this command are exponential power-of-two values. For example, a value of 4 indicates a window between 0 and 15; a value of 10 indicates a window between 0 and 1023.

To manually specify the data-backoff values, use the following formula as a guideline for the *start* and *end* binary exponents:

```
0.33 = (2**stop- 2**start)/n
```

where *n* is the number of CMs on the upstream. Choose *start* and *stop* values that come closest to the value of 0.33 (which is the optimal probability to transmit on a contention-based system).

Related Commands

Command	Description
cable insertion-interval	Configures the interval between consecutive initial ranging slots on an upstream.
cable upstream range-backoff	Specifies automatic or configured initial ranging backoff calculation.
show controllers cable	Displays the backoff window setting for the configured upstream port.

cable upstream description

To assign a label to an upstream, use the **cable upstream description** command in cable interface configuration mode. To remove the label from the upstream, use the **no** form of this command.

cable upstream *n* **description** *label*
no cable upstream *n* **description**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
label	An arbitrary string, up to 80 characters long, that describes this upstream for management and tracking purposes. If the string contains any spaces, enclose the string within quotes.

Command Default

No description is assigned to upstreams.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
11.3 NA	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **us-channel description** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **cable upstream description** command to assign arbitrary labels to the upstreams on the cable interfaces. These labels can contain any information that identifies the upstream and that could aid in network management or troubleshooting.



Tip Use the **show interface cable upstream** command to display the labels that are assigned to a particular upstream.

Examples

The following example shows how to assign descriptions to the first two upstreams on the cable interface in slot 3:

```
Router# configure terminal
Router(config)# interface cable 3/0
Router(config-if)# cable upstream 0 description "SJ-Node1-Upstream 0"
Router(config-if)# cable upstream 1 description "SJ-Node1-Upstream 1 (Unused)"
Router(config-if)#
```

Related Commands

Command	Description
show interface cable	Displays the current configuration and status of a cable interface.

cable upstream differential-encoding

To enable differential encoding on upstream traffic to a specified cable interface, use the **cable upstream differential-encoding** command in cable interface configuration mode. To disable this function, use the **no** form of this command.

cable upstream *n* **differential-encoding**
no cable upstream *n* **differential-encoding**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.

Command Default

Enabled

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.1	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To verify whether or not upstream differential encoding is activated, enter the **show running-config** command and look for the cable interface configuration information. If upstream differential encoding is enabled, a differential encoding entry is displayed in the output of the **show running-config** command. If upstream differential encoding is disabled, no differential encoding entry is displayed in the output.

If you are having trouble, make sure that the cable connections are not loose or disconnected; the cable interface line card is firmly seated in its chassis slot; the captive installation screws are tight; you have entered the correct slot and port numbers; and you selected a valid frequency for your router.

Examples

The following example shows how to enable differential encoding for upstream port 2:

```
Router(config-if)# cable upstream 2 differential-encoding
Router(config-if)#
```

cable upstream docsis-mode

To configure an upstream to use DOCSIS 1.x, DOCSIS 2.0 or DOCSIS 3.0 modulation profiles, use the **cable upstream docsis-mode** command in cable interface configuration mode. To reset the upstream to its default configuration, use the **no** form of this command.

cable upstream *n* **docsis-mode** {**atdma** | **scdma** | **scdma-d3** | **tdma** | **tdma-atdma**}
no cable upstream *n* **docsis-mode** {**atdma** | **scdma** | **scdma-d3** | **tdma** | **tdma-atdma**}

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
atdma	Configures the upstream only for DOCSIS 2.0 Advanced Time Division Multiple Access (A-TDMA) modulation profiles.
scdma	Configures the upstream for DOCSIS 2.0 Synchronous Code Division Multiple Access (S-CDMA) modulation profiles only.
scdma-d3	Configures the upstream for DOCSIS 3.0 S-CDMA modulation profiles. The **scdma-d3** option uses channel type 4SR mode.
tdma	Configures the upstream only for DOCSIS 1.0/DOCSIS 1.1 Time Division Multiple Access (TDMA) modulation profiles (default).
tdma-atdma	Configures the upstream for both A-TDMA and TDMA operations (mixed mode). If you are using abbreviations at the command line, you must specify at least the **tdma** to select the mixed mode. If you choose a shorter abbreviation, you select TDMA-only mode.

Command Default

All upstreams are configured ATDMA-only mode.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(15)CX	This command was introduced to support DOCSIS 2.0 A-TDMA and mixed modulation profiles on the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line card on the Cisco uBR7246VXR router.
12.2(15)BC2	Support was added for the Cisco uBR-MC5X20S/U cable interface line cards on the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	This command was modified with the addition of **scdma** and **scdma-d3** keyword options and support was added for the Cisco UBR-MC20X20V cable interface line card on the Cisco uBR10012 router.
12.2(33)SCG	The command default was changed from TDMA to ATDMA.

Release	Modification
12.2(33)SCG2	Support was added for the Copy and Paste Support for TDMA to A-TDMA upgrade feature.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is replaced by **us-channel docsis-mode** command.

Usage Guidelines

The DOCSIS 2.0 specification builds on the existing TDMA to support advanced modulation profiles that increase potential upstream bandwidth. The A-TDMA profiles support higher QAM rates of up to 64-QAM and wider channel widths of up to 6.4 MHz (5.12 Msymbols).

Note The advanced hardware-based spectrum management features for the Cisco uBR-MC16S/U/X, Cisco uBR-MC28U/X, and Cisco uBR-MC5X20S/U cards are supported only in the DOCSIS 1.0/1.1 TDMA-only mode. They cannot be used in the mixed or A-TDMA-only modes.

Note Starting with Cisco IOS Release 12.2(33)SCG and later, the default upstream DOCSIS mode is ATDMA only.

The DOCSIS 2.0 specification allows an upstream to be configured in one of the following three modes:

- A-TDMA only mode—Upstreams only support cable modems that register using A-TDMA modulation profiles. The CMTS does not allow DOCSIS 1.0 and DOCSIS 1.1 cable modems to register and come online on these upstreams. The Cisco uBR-MC5X20S /U , Cisco uBR-MC16U/X, and Cisco uBR-MC28U/X cards also support 6,400,000 Hz (5,120,000 symbols/sec) when operating in DOCSIS 2.0 (A-TDMA-only) mode.

Changing the DOCSIS mode to A-TDMA only mode automatically changes the symbol rate to 5.12 megasymbols per second and the channel width to 6.4 MHz. It also automatically disables the dynamic upstream modulation.

Note Starting with Cisco IOS 12.2(33)SCG2, when the channel-width value in the **cable upstream channel-width** command is specified as 6.4 MHz in the TDMA or mixed TDMA/A-TDMA mode, the DOCSIS mode automatically changes to A-TDMA-only (DOCSIS 2.0) mode. Changing DOCSIS mode to A-TDMA only mode will not automatically change the symbol rate to 5.12 megasymbols per second and the channel width to 6.4 MHz. The symbol rate and channel width before the DOCSIS mode change are maintained after the change.

In addition, the following are required to support the DOCSIS 2.0 A-TDMA features:

- • Cable modems must be DOCSIS 2.0 compliant.
  - The DOCSIS configuration file for the cable modem must either omit the DOCSIS 2.0 Enable field (TLV 39), or it must set TLV 39 to 1 (enable). If you set TLV 39 to 0 (disable), a DOCSIS 2.0 CM uses the TDMA mode.
  - The upstream must be configured for either A-TDMA-only or mixed TDMA/A-TDMA mode.

- TDMA-only mode—Upstreams only support cable modems that register using TDMA modulation profiles. DOCSIS 2.0 cable modems can register on these upstreams only by using a DOCSIS 1.0/DOCSIS 1.1 modulation profile (which typically would happen only when a DOCSIS 2.0 cable modem cannot find an A-TDMA channel in its DOCSIS domain).

Changing the DOCSIS mode to TDMA-only mode automatically changes the symbol rate to 1.28 megasymbols per second and the channel width to 3.2 MHz. It also automatically disables the dynamic upstream modulation.

- Mixed mode—Upstreams support both DOCSIS 1.0/DOCSIS 1.1 cable modems using TDMA modulation profiles and DOCSIS 2.0 cable modems using A-TDMA modulation profiles. (The maximum channel width in mixed mode is 3.2 MHz.)

Changing the DOCSIS mode to mixed mode also automatically changes the symbol rate to 1.28 megasymbols per second and the channel width to 3.2 MHz. Dynamic upstream modulation is also automatically disabled.

Note Mixed mode upstreams do not support the 6.4 MHz channel width.

The DOCSIS 3.0 specification allows an upstream to be configured in one of the following modes:

- SCDMA-d3 mode—Upstreams only support cable modems that register using DOCSIS 3.0 S-CDMA modulation profiles.
- SCDMA mode—Upstreams only support cable modems that register using DOCSIS 2.0 S-CDMA modulation profiles.

Note The DOCSIS 3.0 option **scdma-d3** (4SR) is available only when the CMTS is configured to operate in the global modulation profile format and is not available in the default mode. This option is available only for the Cisco UBR-MC20X20V cable interface line card, and not for other legacy line cards.

Refer to the **cable upstream channel-width** command for valid values of supported channel widths and DOCSIS modes for cable interfaces.

Note Changing the DOCSIS Mode for an Upstream Port Forces the Cable Modems on That Upstream to Go Offline and Reregister

When you switch the DOCSIS mode of an upstream between the TDMA-only and mixed TDMA/A-TDMA modes, cable modems that are currently online on that upstream are taken offline and are forced to reregister. This helps the CMTS to determine the capabilities of the cable modems on the new channels.

If you change an upstream port to A-TDMA only mode, DOCSIS 1.x cable modems will not be able to come online on that upstream. If you change an upstream to TDMA only mode, DOCSIS 2.0-compliant cable modems are expected to attempt to come online on another upstream that is configured for A-TDMA or mixed mode. If no such upstreams are configured, or if the cable modem is configured to use only that particular upstream, it comes online in the DOCSIS 1.x mode.

Note DOCSIS 2.0-compliant cable modems that are already online on a TDMA-only upstream do not automatically reregister on another upstream that has been configured for mixed-mode operations. The cable modem must either be reset or the CMTS must send an Upstream Channel Change (UCC) message to instruct the cable modem to move to the new channel.

If you change an upstream port to the mixed TDMA/A-TDMA mode, and some cable modems remain offline, or appear to come online but cannot pass traffic, upgrade the modem software to a DOCSIS-compliant software version.

Note The cable physical plant must support the higher upstream bandwidths and symbol rates to be able to use the A-TDMA or mixed mode modulation profiles.

Examples

The following example configures the first four upstreams for the first downstream on the Cisco uBR-MC28U/X cable interface line card in slot 5/0. The first two upstreams are configured for A-TDMA mode and the last two upstreams are configured for mixed TDMA/A-TDMA mode.

```
Router# configure terminal
Router(config)# interface cable 5/0/0
Router(config-if)# cable upstream 0 docsis-mode atdma

%%Docsis mode set to ATDMA only, 1.x CMs will go offline.
%%The following defaults will be set:
%%Channel Width 6.4MHz
%%Minislot Size 1 tick
%%Modulation Profile 241
Router(config-if)# cable upstream 1 docsis-mode atdma

%%Docsis mode set to ATDMA only, 1.x CMs will go offline.
%%The following defaults will be set:
%%Channel Width 6.4MHz
%%Minislot Size 1 tick
%%Modulation Profile 241
Router(config-if)# cable upstream 2 docsis-mode tdma-atdma

%%Docsis mode set to DOCSIS2.0 Mixed Mode.
Router(config-if)# cable upstream 3 docsis-mode tdma-atdma

%%Docsis mode set to DOCSIS2.0 Mixed Mode.
Router(config-if)# exit

Router(config)# exit

Router#
```

The following example shows the abbreviations needed to configure TDMA-only and mixed TDMA/A-TDMA modes.

```
Router# configure terminal
Router(config)# interface cable 4/0
Router(config-if)# cable upstream 0 docsis-mode tdm
%%Docsis mode set to DOCSIS1.0 TDMA Mode.
Router(config-if)# cable upstream 1 docsis-mode tdma-
```

```
%%Docsis mode set to DOCSIS2.0 Mixed Mode.
Router(config-if)#
```

The following examples configures the SCDMA and SCDMA-d3 modes.

```
Router# configure terminal
Router(config-if)# cable upstream 0 docsis-mode scdma

%interface Cable7/1/0 U0 Docsis mode set to DOCSIS2.0 SCDMA
%modulation profile set to 321
Router(config-if)#
Router# configure terminal
Router(config-if)# cable upstream 0 docsis-mode scdma
-d3
%interface Cable7/1/0 U0 Docsis mode set to DOCSIS3.0 SCDMA (1.x and 2.0 CMs wi)
%modulation profile set to 381
Router(config-if)#
SLOT 7/1: Jul 10 22:04:24.356: %UBR10000-6-PREAMLENADJUST: initial burst's prea.
SLOT 7/1: Jul 10 22:04:24.356: %UBR10000-6-PREAMLENADJUST: station burst's prea.
Router(config-if)# end
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for use on the router.
cable modulation-profile global-scheme	Defines a global modulation profile for use on the router.
cable upstream channel-width	Specifies an upstream channel width for an upstream port.
cable upstream equalization-coefficient	Enables the use of a DOCSIS 1.1 pre-equalization coefficient on an upstream.
cable upstream maintain-psd	Requires DOCSIS 2.0 CMs on an A-TDMA-only upstream to maintain a constant power spectral density after a modulation rate change.
cable upstream modulation-profile	Assigns one or two modulation profiles to an upstream port.
show cable modulation-profile	Displays the modulation profile information for a Cisco CMTS.
show interface cable mac-scheduler	Displays the current time-slot scheduling state and statistics.

cable upstream dpon

To enable the DOCSIS Passive Optical Network (DPON) for a MAC domain on the Cisco CMTS router, use the**cable upstream dpon** command in interface configuration mode. To disable one or more DPONs for the MAC domains, use the **no** form of this command.

cable upstream dpon
no cable upstream dpon

Syntax Description

This command has no arguments or keywords.

Command Default

D-PON is not enabled.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.OS	This command is implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Configuring D-PON for a MAC domain enables D-PON for all MAC domains on that line card. However, only a single MAC domain can be used within a D-PON fiber node. This is to ensure proper scheduling of the upstream and to prevent multiple Optical Network Terminals (ONTs) from transmitting upstream data at the same time.



Note On cBR Series Converged Broadband Routers, when the **cable upstream dpon** command is configured for a specific MAC domain or interface, it is localized to that MAC domain or interface alone.

You should configure the **cable upstream ranging-init-technique 2** command to prevent the use of additional broadcast initial ranging opportunities for the non-DPON reference upstream channels.

When you shutdown an upstream channel, the D-PON associated with that MAC domain will stop working. To enable D-PON again, you must manually shut down and enable the MAC domain using the **shutdown** and **no shutdown** command.

Examples

The following example shows how to enable D-PON on a Cisco CMTS router:

```
Router# configure terminal
Router(config)# interface cable 7/0/1
Router(config-if)# cable upstream dpon
```

```
Router(config-if)# shutdown
Router(config-if)# no shutdown
```

Related Commands

Command	Description
cable upstream ranging-init-technique	Configures the initial ranging technique for the modem in the MTC-mode.
interface cable	Specifies a cable interface.
show interface cable mac-scheduler	Displays the current time-slot scheduling state and statistics.

cable upstream dps

To enable DOCSIS Predictive Scheduler (DPS) on a MAC domain, use the **cable upstream dps** command in cable interface configuration mode.

cable upstream dps { **scqam-only** | **ofdma-only** | **all** }

no cable upstream dps { **scqam-only** | **ofdma-only** | **all** }

Keyword	Description
scqam-only	Enables DPS for scqam only.
ofdma-only	Enables DPS for ofdma only.
all	Enable sDPS for scqam and ofdma.

Command Default

DPS is in disabled state by default.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	You can configure the **cable upstream dps ofdma-only** command without configuring the **service internal** command in global configuration mode.
IOS XE Amsterdam 17.3.1w	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure DPS on a MAC domain:

```
Router> enable
Router# configure terminal
Router(config)# interface Cable 7/0/1
Router(config-if)# cable upstream dps scqam-only
```

cable upstream equalization-coefficient

To enable the use of a DOCSIS 1.1 or 2.0 pre-equalization coefficient on an upstream port, use the **cable upstream equalization-coefficient** command in cable interface configuration mode. To disable the use of the pre-equalization coefficient, use the **no** form of this command.

cable upstream *n* **equalization-coefficient**
no cable upstream *n* **equalization-coefficient**

Syntax Description

n	Specifies the upstream port number. Valid range is from 0 to 7 for upstream ports in the cable interface line card.

Command Default

Pre-equalization coefficient is disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(4)BC1	This command was introduced.
12.2(15)CX	Support was added for the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line card, including DOCSIS 2.0 A-TDMA and mixed modulation profiles.
12.2(15)BC2	Support was added for DOCSIS 2.0 A-TDMA and mixed modulation profiles on the Cisco uBR-MC5X20S/U cable interface line cards.
12.3(23)BC6	Support was added for updated default modulation profiles for use with pre-equalization on the Cisco uBR-MC5X20S/U/H cable interface line cards.
12.2(33)SCB	Support was added for updated default modulation profiles for use with pre-equalization on the Cisco uBR-MC5X20S/U/H cable interface line cards.
IOS-XE 3.15.OS	This command was replaced by the **us-channel equalization-coefficient** command.

Usage Guidelines

The DOCSIS 1.1 and 2.0 specifications allow a CMTS to specify a pre-equalization coefficient in the DOCSIS ranging response (RNG-RSP) MAC management messages it forwards to the cable modems (CM)s. When this is enabled, a CM can engage in transmit-side equalization (pre-equalization) to mitigate the effects of certain impairments in the cable plant, such as in-channel tilt, and group delay.

These impairments are more significant with higher order modulation formats such as 64-QAM or 16-QAM, and near the first octave break-point of the diplex filters (34 MHz to 38 MHz). This break-point exists predominantly as a time-domain group delay issue, and becomes severe for longer amplifier cascades.

Each amplifier causes the DOCSIS upstream signal to traverse two diplex filters. All diplex filter frequency splits (5-42 MHz, 5-65 MHz, or 5-88 MHz) share this characteristic, which is not visible in a frequency response measurement or sweep test.

For more information about the use of pre-equalization, see the DOCSIS 2.0 RFI specification section 6.2.15, Transmit Pre-Equalizer, and section 8.3.6 Ranging Response (RNG-RSP) MAC Management Messages.

DOCSIS 1.1 specifies the Type 4 type length value (TLV), and an 8-tap equalizer. DOCSIS 2.0 adds the Type 9 TLV, and increases the equalizer to support 24 taps to compensate for more complex impairments.

The **cable upstream equalization-coefficient** command configures the CMTS to send Type 4 TLV or Type 9 TLVs in the DOCSIS RNG-RSP MAC management messages to the CMs.

The **no** form of the command disables the CMTS from sending Type 4 TLV or Type 9 TLVs in the DOCSIS RNG-RSP MAC management messages to the CMs.

After the CMTS stops sending pre-equalization TLVs to the CM, the CM must retain these values until the modem's cable interface resets, or a modification is made to the upstream channel descriptor (UCD), which would make the stored equalization coefficients invalid.

You can reset the cable modem's interface by:

- Power cycling the cable modem
- Resetting the cable modem from the CMTS using the **clear cable modem** command

```
Router# clear cable modem aaaa.bbbb.cccc reset
```

You can reset the equalizer coefficient of all CMs on an upstream by:

- Changing the upstream center frequency. A 16-kHz or 32-kHz change is sufficient and unlikely to take many CMs offline.
- Briefly changing the periodic ranging messages in the modulation profile between 16-QAM and Quadrature Phase Shift Keying (QPSK), or 64-QAM and 16-QAM.

A CMTS operating in a pure DOCSIS 2.0 upstream mode sends equalizer data supporting 24 taps to all modems during initial ranging.

The **cable up 0 docsis-mode atdma** command configures a DOCSIS 2.0-only upstream mode on the CMTS.

A CMTS operating in a DOCSIS 1.1 or mixed TDMA-ATDMA upstream mode sends equalizer data supporting 8 taps to all modems during initial ranging. The CMTS cannot send data supporting 24 taps until it is notified by the CM, that it is DOCSIS 2.0 compliant in the Registration Request (REG-REQ) message, immediately preceding the online state.

This can be configured on the CMTS using the **cable up 0 docsis-mode tdma-atdma** command.

When a CM receives a Type 4 TLV in the RNG-RSP MAC management message from the CMTS, it must combine the previously stored values with the new values from the CMTS. Under certain HFC plant conditions, a dynamic impairment occurs that require the CM to adjust its main equalizer tap. The DOCSIS standard specifies a convolution function that is sometimes unable to adjust for dynamic impairments. The result, is a CM whose signal-to-noise ratio (SNR) value as received by the CMTS, is quite low compared to other CMs on the same upstream.

In a mixed modulation profile, where station maintenance is of a lower order modulation format than the data grants, it is possible for the modem to enter a steady state where the SNR estimate is:

- Below the required estimate for data grants to be processed by the CMTS
- Above the requirement for station maintenance

This results in a modem that responds to DOCSIS Layer 2 pings, but not to Layer 3 traffic. The following commands can be used to check status:

- **ping docsis** {*cm-mac address* | *cm ip address*}—succeeds
- **ping ip** {*cm IP address* | *CPE IP address*}**—fails**

A cable modem whose SNR estimate is in this condition may enter the expired(pt) state when baseline privacy interface plus (BPI+) is enabled. A modulation profile where station maintenance and data grants are of the same order modulation, prevents this condition.

The CMTS may be configured to enable cable upstream pre-equalization on a per upstream port basis, and may be configured to disable the sending of upstream equalization-coefficients on a per modem MAC address or Organizational Unique Identifier (OUI) basis, using the related global exclude commands.

Some DOCSIS 2.0 compliant CMs / embedded media terminal adapters (EMTA)s have been known to report as DOCSIS 1.1 compliant to the CMTS, unless connected to a DOCSIS 2.0 format upstream. These CMs are treated by the CMTS as DOCSIS 1.1, and only send 8-tap equalizer coefficients. A firmware or SNMP set may be used on these cable modems to enable the proper reporting of DOCSIS 2.0 compliance under a DOCSIS 1.1-style upstream (for example, 3.2 MHz, 16-QAM, TDMA format).

Some older DOCSIS cable modem firmware versions will incorrectly process the transition from 8 to 24 taps when in a mixed TDMA-ATDMA mode, and will experience degrading or low SNR MER as displayed with **show cable modem phy command**. Upgrade the CM firmware, and temporarily move these modems to a pure DOCSIS 1.1 or 2.0 channel or disable pre-equalization for these devices with the exclude command.

Examples

The example shows how to enable the use of the pre-equalization coefficient on upstream port 0 in the cable interface line card in slot 5/1 on the Cisco uBR10012 router, while excluding the equalization coefficient messaging to a modem with MAC address aaaa.bbbb.cccc, and all modems with the OUI of 00aa.bb:

```
Router# configure terminal
Router# cable pre-equalization exclude aaaa.bbbb.cccc
Router# cable pre-equalization exclude 00aa.bb
Router(config)# interface cable 5/1/0
Router(config-if)# cable upstream 0 equalization-coefficient
Router(config-if)#
```

Related Commands

Command	Description
show cable modem phy	Displays the physical layer RF parameters of the cable modem, including USSNR estimate (MER).
show cable modem docsis version	Displays the DOCSIS version of a cable modem, and the upstream DOCSIS mode— TDMA or ATDMA.
show cable modem [**verbose**]	Displays detailed information about the cable modem. Lines with the string Equalizer describe modem specific equalizer data.
debug cable range	Debugging commands to display the equalizer coefficients being sent by the CMTS to the cable modem in the DOCSIS RNG-RSP MAC management messages.
debug cable interface {*interface*} {*cm-mac-address*}[**verbose**]	Debugging commands to display the equalizer coefficients being sent by the CMTS to the cable modem in the DOCSIS RNG-RSP MAC management messages. **Caution** Certain debug settings can produce a very large amount of data on a production router, and should be used with caution. Specifying the CM mac-address will dramatically reduce the amount of data produced.

cable upstream equalization-error-recovery

To enable the pre-equalizer direct load mechanism on an upstream port, use the **cable upstream equalization-error-recovery** command in cable interface configuration mode.

cable upstream *port number* **equalization-error-recovery**
no cable upstream *port number* **equalization-error-recovery**

Syntax Description

port number	Specifies an upstream port number on a cable interface. Valid range is from 0 to 7.

Command Default

This command is enabled by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.3(23)BC7	This command was introduced.
12.2(33)SCB4	This command was integrated into Cisco IOS Release 12.2(33)SCB4.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The pre-equalizer direct load mechanism is enabled by default. However, to use this direct load mechanism, you must enable the pre-equalization coefficient on an upstream port using the **cable upstream equalization-coefficient** command.

The **cable upstream equalization-error-recovery** command enables the CMTS to send Type-Length-Value (TLV) Type 9 in the DOCSIS RNG-RSP MAC management messages. This mechanism helps CMs come online when TLV Type 4 convolved method causes CMs to go offline.

Note The TLV Type 9, called pre-equalizer direct load, supports only the DOCSIS 2.0 or 3.0-certified modems. When a CM receives TLV Type 9, the CM replaces its data with the new data provided in the DOCSIS RNG-RSP MAC management messages.

Examples

The example shows how to enable the pre-equalizer direct load mechanism on a cable interface line card in slot 8/0 on the Cisco uBR10012 router.

```
Router# configure terminal
Router(config)# interface cable 8/0/0
Router(config-if)# cable upstream 0 equalization-error-recovery
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.

Command	Description
cable upstream equalization-coefficient	Enables the use of a DOCSIS 1.1 or 2.0 pre-equalization coefficient on an upstream port.
show cable modem calls	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.

cable upstream ext-power

To enable the DOCSIS extended transmit power support on the Cisco CMTS, use the **cable upstream ext-power** command in interface configuration mode. To disable DOCSIS extended transmit power support, use the **no** form of this command.

cable upstream ext-power
no cable upstream ext-power

Syntax Description

This command has no arguments or keywords.

Command Default

DOCSIS extended transmit power support is enabled.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCF2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream ext-power** command is used to configure the following feature:

- Upstream Channel Bonding

Examples

The following example shows how to enable DOCSIS extended transmit power support on the Cisco CMTS:

```
Router# configure terminal
Router(config)# interface cable 7/0/0
Router(config-if)# cable upstream ext-power
Router(config-if)# end
```

Related Commands

Command	Description
show cable modem extended-power	Displays the list of cable modems that are transmitting at an extended power level.

cable upstream fec

To enable upstream forward error correction (FEC), use the **cable upstream fec** command in cable interface configuration mode. To disable FEC, use the **no** form of this command.

cable upstream *n* **fec**
no cable upstream *n* **fec**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.

Command Default

Enabled

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
11.3 XA	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS uses FEC to attempt to correct any upstream data that might have been corrupted. To use this feature, you need to activate FEC on the upstream RF carrier. When FEC is activated, the Cisco CMTS commands all CMs on the network to activate FEC.

Examples

The following example shows how to activate upstream forward error correction:

```
Router (config-if)# cable upstream 0 fec
```

Related Commands

Command	Description
cable upstream frequency	Enters a fixed frequency of the upstream RF carrier for an upstream port.
cable upstream power-level	Sets the input power level for the upstream RF carrier in decibels per millivolt (dBmV).
cable upstream scrambler	Enables the cable upstream scrambler.
cable upstream shutdown	Disables the upstream port.

cable upstream fec-strength

To override the forward error correction (FEC) setting specified in the modulation profile for this upstream channel, use the **cable upstream fec-strength** command in cable interface configuration mode. To restore the default value, use the **no** form of this command.

cable upstream *n* **fec-strength** *t-bytes*
no cable upstream *n* **fec-strength**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
t-bytes	Overrides the FEC strength specified in the modulation profile for this upstream channel. Valid values are from 0 to 10, where: • 0 disables FEC. • 1 is the lowest FEC strength. • 10 is the highest FEC strength.

Command Default

No default behavior or values

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
12.1T	This command was deprecated and removed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the **cable upstream fec-strength** command:

```
Router(config-if)# cable upstream 2 fec-strength 3
```

Related Commands

Command	Description
cable upstream channel-width	Specifies an upstream channel width for a headend cable router.
cable upstream fec	Enables the upstream FEC.
cable upstream hopping blind	Disables optimum frequency hopping on the Cisco uBR-MC16S and Cisco uBR-MC5X20S/U cable interface line cards.
cable upstream modulation-profile	Overrides modulation types specified in the modulation profile for the specified upstream channel.

cable upstream fragmentation

To enable fragmentation of DOCSIS frames on a particular upstream, use the **cable upstream fragmentation** command in cable interface configuration mode. To disable fragmentation, use the **no** form of this command.

cable upstream *n* **fragmentation**
no cable upstream *n* **fragmentation**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 15.

Command Default

By default, fragmentation is enabled for all upstream ports on ASIC line cards (Cisco uBR-MC11C, Cisco uBR-MC12C, Cisco uBR-MC14C, Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C) and disabled for all upstream ports on old FPGA line cards.

Note Cisco IOS Release 12.1 CX supports the Multiple Grant Mode of DOCSIS 1.1 fragmentation.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.1(4)CX	This command was introduced.
12.2(4)BC1	Support for this command was added to the Release 12.2 BC train.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables and disables DOCSIS layer 2 fragmentation, which reduces run-time jitter experienced by constant bit rate (CBR) slots on the corresponding upstream. Disabling fragmentation increases the run-time jitter, but also reduces the fragmentation reassembly overhead for fragmented MAC frames. For ports running CBR traffic, fragmentation should be enabled (the default).

Note Do not confuse DOCSIS Layer 2 fragmentation with IP Layer 3 fragmentation.

Examples

The following command shows DOCSIS fragmentation being enabled on upstream 0 on the cable interface in slot 2/0:

```
Router# configure terminal
Router(config)# interface c2/0
Router(config-if)# cable upstream 0 fragmentation
Router(config-if)#
```

Related Commands

Command	Description
cable default-phy-burst	Specifies a value for the upstream Maximum Traffic Burst parameter for CMs that do not specify their own value.
cable upstream fragment-force	Specifies that a cable interface line card should fragment DOCSIS frames on an upstream when the frame exceeds a particular size.

cable upstream fragment-force

To specify that a cable interface line card should fragment DOCSIS frames on an upstream when the frame exceeds a particular size, use the **cable upstream fragment-force** command in cable interface configuration mode. To set the fragment size to its default value, use the **no** form of this command.

cable upstream *n* **fragment-force** [*fragment-threshold* [*number-of-fragments*]]
no cable upstream *n* **fragment-force**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 15.
fragment-threshold	(Optional) Number of bytes for the threshold at which DOCSIS frames are fragmented. The valid value ranges from 1,500 to 3,500 bytes, with the default value of 2,000 bytes. For Cisco uBR10-MC5X20S cable interface line card running Cisco IOS Release 12.3(23)BC1, the valid value ranges from 0 to 1,987 bytes, with the default value of 1,600 bytes.
number-of-fragments	(Optional) Number of fragments that the cable interface line card should create when fragmenting DOCSIS frames. The card attempts to create this many equal-sized fragments when fragmenting. The valid value ranges from 1 to 10 fragments, with the default value of 3 fragments. The *number-of-fragments* option has been deprecated. See Usage Guidelines section for more details.

Command Default

- Default value for *fragment-threshold* is 2,000 bytes.
- For Cisco uBR10-MC5X20S cable interface line card running Cisco IOS Release 12.3(23)BC1, default value for *fragment-threshold* is 1,600 bytes.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(15)BC2	This command was introduced.
12.3(21a)BC	This command was modified and the *number-of-fragments* option has been deprecated.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

DOCSIS 1.1 allows the CMTS to fragment DOCSIS frames to improve performance, especially in networks that combine real-time traffic, such as voice, with data traffic. The **cable upstream fragment-force** command

allows you to specify the size of frames that should be fragmented, as well as the number of fragments that should be created when fragmenting.



Tip This command takes effect only when fragmentation has been enabled on the upstream using the **cable upstream fragmentation** command (which is the default configuration). Whether fragment is enabled or not, is decided by the **cable upstream fragmentation** command.

In the default configuration, the Cisco CMTS fragments DOCSIS frames that are 2,000 bytes or larger in size, and it fragments these frames into equally-sized fragments. Starting from Cisco IOS Release 12.2(21a)BC, 12.2(33)SCB, and later releases, the larger frames are fragmented by the threshold. Instead of dividing frames into equal number of fragments as before, the concatenated frames are cut into many fragments, as defined in the threshold size, with the last one being the shortest. For example, the previous form of the **cable upstream fragment-force** command fragments a concatenated frame of 9000 into 5 frames of 1800. The new form of the **cable upstream fragment-force** command fragments a concatenated frame of 9000 into frames of 2000, 2000, 2000, 2000, and 1000.

Do not use a fragment size greater than 1,600 bytes on the Cisco uBR10-MC5X20S cable interface line card running Cisco IOS Release 12.3(23)BC1. Do not use a fragment size greater than 2,000 bytes on the Cisco uBR10-MC5X20U cable interface line card, and do not use a fragment size greater than 3,500 bytes on all other cable interface line cards, unless otherwise instructed by a Cisco TAC engineer.

When using DOCSIS concatenation, you might need to change the **cable default-phy-burst** command from its default size, so that multiple frames can be concatenated into a maximum-sized burst. If you set the **cable default-phy-burst** command to zero, the max burst then becomes the lowest of 255 mini-slots, the maximum concatenated burst setting in the DOCSIS configuration file, or the value of the long data grant burst that is specified in the upstream's profile.

When you set the **cable default-phy-burst** command to zero, the CMTS fragments large requests into big chunks and the cable modems will not be able to register on specific groupings of upstream interfaces due to the large fragment size. We recommend the use of a fragment size of 2,000 bytes, if you want to set the **cable default-phy-burst** command to zero to provide upstream speed of above 5 Mbps.



Caution Ensure that the *number-of-fragments* parameter is large enough to keep the size of each fragment of a maximum-sized burst less than the 1,600 bytes or 2,000 bytes or 3,500 bytes specified above. If fragments are too large, the cable modem might not be able to come online or pass traffic.



Note The *number-of-fragments* option has been deprecated from Cisco IOS Release 12.2(21a)BC, 12.2(33)SCB, and later releases.



Note Do not confuse DOCSIS Layer 2 fragmentation with IP Layer 3 fragmentation.

Examples

The following example shows how to enable DOCSIS fragmentation on frames that are 1,500 bytes or larger, using four fragments per frame:

```
Router# configure terminal
Router(config)# interface c2/0
Router(config-if)# cable upstream 0 fragment-force 1500 4
Router(config-if)#
```

The following example shows how to disable the forced fragmentation of DOCSIS frames on an upstream. This also resets the *fragment-threshold* parameter to default value.

```
Router# configure terminal
Router(config)# interface c5/1/0
Router(config-if)# no cable upstream 0 fragment-force
Router(config-if)#
```

Cisco IOS Release 12.2(21a)BC, 12.2(33)SCB and Later

The following example shows how to enable DOCSIS fragmentation on frames that are 2,000 bytes or larger:

```
Router# configure terminal
Router(config)# interface c2/0
Router(config-if)# cable upstream 0 fragment-force 2000
Router(config-if)#
```

Related Commands

Command	Description
cable default-phy-burst	Specifies a value for the upstream Maximum Traffic Burst parameter for CMs that do not specify their own value.
cable upstream fragmentation	Enables fragmentation of DOCSIS frames on a particular upstream.

cable upstream freq-adj averaging

To specify the percentage of frequency adjustment packets that is required to change the adjustment method from the regular power-adjustment method to the noise power-adjustment method, use the **cable upstream freq-adj averaging** command in cable interface configuration mode. To disable power adjustments, use the **no** form of this command.

cable upstream *n* **freq-adj averaging** *% of frequency adjustment*
no cable upstream *n* **freq-adj averaging**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 15.
% of frequency adjustment	Specifies the percentage of frequency-adjustment packets required to switch from the regular power-adjustment method to the noise power-adjustment method. Valid range is from 10 to 100 percent.

Command Default

No default behavior or values

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.0(7)T	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to change the power-adjustment method when the frequency-adjustment packet count reaches 50 percent:

```
Router(config-if)# cable upstream 0 freq-adj averaging 50
```

Related Commands

Command	Description
cable upstream power-adjust	Controls power-adjustment methods on the Cisco CMTS.
show cable flap-list	Displays a list of CMs that have exceeded the threshold number of power adjustments.
show cable modem	Displays CM configuration settings.

cable upstream frequency

To enter a fixed frequency of the upstream radio frequency (RF) carrier for an upstream port, use the **cable upstream frequency** command in cable interface configuration mode. To restore the default value for this command, use the **no** form of this command.

cable upstream *n* **frequency** *up-freq-hz*
no cable upstream *n* **frequency** *up-freq-hz*

Syntax Description

n	Specifies the upstream port number on the cable interface line card for which you want to assign an upstream frequency. Valid values start with 0 for the first upstream port on the cable interface line card.
up-freq-hz	The upstream center frequency is configured to a fixed Hertz (Hz) value. The valid upstream frequency range is 5 MHz (5000000 Hz) to 42 MHz (42000000 Hz), 55 MHz (55000000 Hz), or 65 MHz (65000000 Hz), depending on the cable interface line card being used. If you wish to have the Cisco CMTS dynamically specify a center frequency for the given upstream interface, do not enter any frequency value.

For D30 CMs, the upstream path selection will look at CM Capability TLV 5.20 to determine the upstream frequency range supported by the CM. The frequency range can either be Standard (5MHz to 42MHz), or Extended (5MHz to 85MHz). This new configuration is intended to be used by customers who are configuring US spectrum above 42MHz. The configuration ensures that only the D30 CMs supporting Standard US frequency range are excluded from US channels above 42Mhz.

cable *us-freq-use-cm-cap*
no cable *us-freq-use-cm-cap*

The default value of the config is **no cable us-freq-use-cm-cap**. Therefore, by default there is no change in behavior.

Command Default

Dynamic (not fixed frequency)

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.0(13)SC	Support for the higher EuroDOCSIS upstream range (5 to 65 MHz) was introduced for the Cisco uBR-MC16E cable interface line card.
12.1(4)EC, 12.2(4)BC1	Support for the higher EuroDOCSIS upstream range (5 to 65 MHz) was introduced for the Cisco uBR7111E and Cisco uBR7114E routers.
12.2(15)BC2	The allowable range of frequencies that you can select with this command is determined by the configuration of the **upstream freq-range** command.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is replaced by **us-channel frequency** command.

Usage Guidelines

The upstream channel frequency of your RF output must be set to comply with the expected input frequency of your cable interface line card. To configure an upstream channel frequency, you may:

- Configure a fixed frequency between the allowable ranges and enable the upstream port, or
- Create a global spectrum group, assign the interface to it, and enable the upstream port.

The allowable range for the upstream channel frequency depends on the cable interface line card and Cisco IOS software release being used. The following table provides the currently supported values.

Table 19: Allowable Frequency Range for the cable upstream frequency Command

Frequency Range	Supported Cable Interfaces	Minimum Cisco IOS Releases
5 to 42 MHz	All supported cable interfaces	All releases supported for the Cisco CMTS
5 to 55 MHz	Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, Cisco uBR-MC5X20U	Cisco IOS Release 12.2(15)BC2
5 to 65 MHz	Cisco uBR-MC16E, Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, Cisco uBR-MC5X20U, Cisco uBR7111E and Cisco uBR7114E routers	Cisco IOS Release 12.0(13)SC, 12.1(4)EC, and 12.2(4)BC1

Note In Cisco IOS Release 12.2(15)BC2 and later releases, the allowable range of frequencies that you can select with the **cable upstream frequency** command is determined by the configuration of the **upstream freq-range** command.

Tip If both a Cisco uBR-MC16E cable interface line card and a Cisco uBR-MC16C and/or a Cisco uBR-MC16S cable interface line card are present in the chassis, a spectrum group in the 42 MHz to 65 MHz range should not be assigned.

To configure the default upstream frequency (which is no fixed frequency), enter the **cable upstream** *n*> **frequency** command without specifying a center frequency.

Examples

The following example shows how to configure the upstream center frequency for port 0, located in slot 6, to 5,700,000 Hz:

```
Router(config-if)# cable upstream 0 frequency 5700000
Router(config-if)# exit
Router(config)# exit
Router# show running-config | include frequency
cable upstream 0 frequency 5696000

Router#
```

Note Cisco cable interface line cards always program the upstream's center frequency in 16 KHz increments, and this is the frequency displayed by the lines added to the router's configuration and by the **show controllers cable upstream** command. For example, if you use the **cable upstream frequency** command to specify a center frequency of 27 MHz (**cable upstream x frequency 27000000**), the actual center frequency will be 27.008 MHz, which is the next highest 16 KHz boundary. The configuration file will therefore show the line **cable upstream 0 frequency 27008000**.

The following example shows how to configure the upstream center frequency to a frequency (54,700,000 Hz) within the extended Japanese frequency range:

```
Router# configure terminal
Router(config)# upstream freq-range japanese
Router(config)# interface cable 3/0
Router(config-if)# cable upstream 0 frequency 54000000
Router(config-if)# exit
Router(config)# exit
Router#
```

The following example shows how to allow the Cisco CMTS to dynamically specify a center frequency for the upstream port 0:

```
Router(config-if)# no cable upstream 0 frequency
```

The following command example from Cisco IOS Release 12.3 BC illustrates the allowable upstream frequency range in Hz:

```
Router(config-if)# cable upstream 3 frequency ?

<5000000-55000000> Upstream Frequency in Hz
```

Related Commands

Command	Description
cable spectrum-group (global configuration)	Creates spectrum groups, which contain one or more upstream frequencies.
show controllers cable	Displays information about the cable interface, including the upstream center frequency.
upstream freq-range	Configures the Cisco CMTS router for the range of frequencies that are acceptable on upstreams.

cable upstream hopping blind

To override hop decisions, use the **cable upstream hopping blind** command in cable interface configuration mode. To stop blind hopping, enter the **no**form of this command.

cable upstream *n* **hopping blind**
no cable upstream *n* **hopping blind**

Syntax Description

n	Specifies the upstream port for which blind frequency hopping will be activated. Valid values start with 0 for the first upstream port on the cable interface line card.

Command Default

Disabled (hopping is optimized)

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.0(7)XR2	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Enter this command to override the hardware spectrum manager's decision to optimize hopping.

Note Do not use this command unless you have a specific reason to disable optimum hopping configurations. For example, if you are experimenting with a Cisco uBR-MC16S or Cisco uBR-MC5X20S/U card, you can use this command to enforce blind hopping on individual upstream channels.

Examples

The following example shows how to specify hopping blind on the upstream port 0:

```
Router(config-if)# cable upstream 0 hopping blind
```

Related Commands

Command	Description
cable monitor	Configures preset modulation profiles that you can apply to one or more upstream cable interfaces when you identify and configure spectrum groups.
cable spectrum-group (global configuration)	Configures spectrum management characteristics for the given spectrum group.
cable upstream channel-width	Specifies the channel width of the given upstream cable interface.
cable upstream frequency	Specifies the center frequency for a given upstream cable interface.

Command	Description
cable upstream power-level	Specifies the upstream cable interface receive power level in dBmV.
cable upstream shutdown	Activates or shuts down a specified upstream cable interface.

cable upstream hop-priority

To configure the priority of the corrective actions to be taken when a frequency hop is necessary due to ingress noise on the upstream, use the appropriate **cable upstream hop-priority** command in cable interface configuration mode.

cable upstream *n* **hop-priority frequency modulation channel-width**
cable upstream *n* **hop-priority modulation frequency channel-width**
cable upstream *n* **hop-priority frequency channel-width modulation**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
frequency, modulation, channel-width	Specifies the priority of corrective actions to be taken when ingress noise occurs on a downstream. **Note** The **channel-width** option must come after the **frequency** option, either immediately or after the **modulation** option, as shown in the above examples.

Command Default

The default priority is **frequency**, **modulation**, and **channel-width**.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(7)CX1	This command was introduced for Cisco uBR7200 series routers using the Cisco uBR-MC16S cable interface line card.
12.2(8)BC2	Support was added for the Cisco uBR10012 router and the Cisco uBR-LCP2-MC16S cable interface line card.
12.2(11)CY, 12.2(11)BC3	Support was added for the Cisco uBR10-MC5X20S cable interface line card on the Cisco uBR10012 router.
12.2(15)BC2	Support was added for the Cisco uBR10-MC5X20U cable interface line card on the Cisco uBR10012 router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is replaced by **us-channel hop-priority** command.

Usage Guidelines

This command specifies the priority of the corrective actions that should be taken when a frequency hop is necessary to correct excessive ingress noise on an upstream. For example, if the upstream on a Cisco uBR-MC16S card is set for the default settings (**frequency**, **modulation**, and **channel-width**), the following occurs when the upstream noise exceeds the CNR threshold value for the current modulation profile:

1. The Cisco uBR-MC16S changes to a new frequency, if a clean frequency is available in its spectrum group.

2. If no clean frequency is available, the Cisco uBR-MC16S uses the Dynamic Upstream Modulation feature to switch the upstream to the secondary modulation profile.
3. If the noise levels still exceed the CNR threshold value for the secondary modulation profile, and if the upstream has been configured for a range of channel widths, the Cisco uBR-MC16S narrows the channel width of the upstream by half. If the noise levels are still excessive, the channel width is again cut in half, and this process continues until a clean upstream is found or the bandwidth is reduced to the minimum channel width that has been configured using the **cable upstream channel-width** command.

Allowable DOCSIS channel widths are 3.2 MHz, 1.6 MHz, 800 KHz, 400 KHz, and 200 KHz. If the channel width drops to 200 KHz, but the noise still exceeds the SNR threshold, the CMs go offline.

Note The default specifies only a single channel width of 1.6 MHz. If this is not changed to specify a range of allowable channel widths (using the **cable upstream channel-width** command), the Cisco uBR-MC16S does not attempt to change the channel width.

To use the Dynamic Upstream Modulation feature, you must first create two modulation profiles (using the **cable modulation-profile** command) and assign them to the upstream (using the **cable upstream modulation-profile** command).

Examples

The following example shows that when ingress noise on the upstream exceeds the threshold allowed for the primary modulation profile, the Cisco uBR-MC16S line card should first switch to the secondary modulation profile, then try frequency hopping, and if that fails to correct problem, to finally try narrowing the channel width:

```
Router(config)#interface cable 3/0
Router(config-if)#cable upstream 0 hop-priority modulation frequency channel-width
Router(config-if)#exit
Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable upstream channel-width	Configures an upstream for a range of allowable channel widths.
cable upstream modulation-profile	Configures an upstream for one modulation profile (static profile) or two modulation profiles (Dynamic Upstream Modulation).
show cable hop	Displays the current hop period and threshold for an upstream, along with other statistics.
show cable modulation-profile	Displays the cable modulation profiles that have been created.

cable upstream ingress-noise-cancellation

To configure how often a cable interface line card should train its noise-cancellation circuitry so as to adjust to noise levels on the upstream, use the **cable upstream ingress-noise-cancellation** command in cable interface configuration mode. To disable the ingress noise cancellation feature, use the **no** form of this command.

cable upstream *n* **ingress-noise-cancellation** *interval*
no cable upstream *n* **ingress-noise-cancellation**

Syntax Description

n	Upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
interval	Triggering interval, in milliseconds. The valid range is 10 to 3000 milliseconds, with a default value of 100 milliseconds.

Command Default

The default interval is 100 milliseconds.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(15)CX	This command was introduced for the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line cards on the Cisco uBR7246VXR router.
12.3(17b)BC4	Support was added for the Cisco uBR10-MC5X20H broadband processing engine on the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(23)BC10 and later 12.2(33)SCB11 and later 12.2(33)SCC6 and later 12.2(33)SCD6 and later 12.2(33)SCE and later 12.2(33)SCF and later	The default interval was changed to 100 milliseconds.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is replaced by **us-channel ingress-noise-cancellation** command.

Usage Guidelines



Note This command is available only on the Cisco uBR10-MC5X20H BPE, Cisco uBR-MC16U/X, and Cisco uBR-MC28U/X cable interface line cards. It cannot be used on other cable interface line cards.

Cable interface line cards, such as the Cisco uBR-MC28U/X cards, contain advanced hardware-based noise cancellation circuitry that digitally removes in-channel impairments such as ingress, common path distortion, and certain types of impulse noise. To configure how often these line cards should train their noise cancellation circuity, so as to adapt to changes in the noise types and levels, use the **cable upstream ingress-noise-cancellation** command.

When you enable ingress noise cancellation on an upstream, the Cisco CMTS periodically schedules a 256-symbol idle slot on the upstream channel. The *interval* option specified in the **cable upstream ingress-noise-cancellation** command determines how often this idle slot is generated.

The default for BPE cards is for the card to train its circuitry every 100 milliseconds. The smaller the triggering interval, the faster the card can adjust to changes in ingress noise, which makes the upstream more robust to noise problems, but at the cost of decreasing bandwidth on the upstream channel. To determine the bandwidth cost, in percentage of raw bandwidth, use the following formula:

```
(256/interval)/channel-symbol-rate
```

where interval is the time period in milliseconds specified by the **cable upstream ingress-noise-cancellation** command, and *channel-symbol-rate* is the symbol rate in kilohertz. For example, if the upstream is using a 2.56 MHz channel rate and a noise cancellation interval of 10 milliseconds, the bandwidth cost is 1% of the total raw bandwidth:

```
(256/10)/2560 = 0.01 (1% of bandwidth)
```

Broadband Processing Engine Support

The **cable upstream ingress-noise-cancellation** command is required on the Cisco uBR10-MC5X20H broadband processing engine (BPE) to enable ingress noise cancellation.

The Cisco uBR10-MCX520S/U BPEs have ingress noise cancellation capability enabled by default, so no configuration of ingress noise cancellation is available in the Cisco IOS software for these cards.

However, for configuration compatibility in support of high availability among Cisco uBR10-MC5X20S/U/H cards, the Cisco IOS software will accept configuration of the **cable upstream ingress-noise-cancellation** command for these BPEs without generating any warning or error when synchronizing the configuration.

Examples

The following example shows how to configure the first upstream on a Cisco uBR-MC16U/X or Cisco uBR-MC28U/X card to perform ingress noise cancellation every 300 milliseconds:

```
interface cable 5/0
 cable upstream 0 ingress-noise-cancellation 300
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for use on the router.
cable upstream channel-width	Specifies an upstream channel width for an upstream port.

Command	Description
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.
cable upstream frequency	Enters a fixed frequency of the upstream RF carrier for an upstream port.
cable upstream minislot-size	Specifies the minislot size (in ticks) for a specific upstream interface.
cable upstream modulation-profile	Assigns one or two modulation profiles to an upstream port.
cable upstream power-level	Sets the input power level for the upstream RF carrier in decibels per millivolt (dBmV).
show cable hop	Displays CM configuration settings.
show cable modulation-profile	Displays the modulation profile information for a Cisco CMTS.
show interface cable mac-schedule	Displays the current time-slot scheduling state and statistics.
show interface cable sid	Displays cable interface information.

cable upstream jumbo-grants

To allow jumbo grants, use the **cable upstream jumbo-grants** command. To disable jumbo grants, use the no form of this command.

no
cable upstream *n* **jumbo-grants**

Syntax Description

jumbo-grants	Allows jumbo grants
n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For cBR Series Converged Broadband Routers, the valid range is from 0 to 15.

Command Default

Jumbo grants are disabled by default.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Example

The following sample shows and example of the **cable upstream jumbo-grants** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # cable upstream 0 jumbo-grants
Router(config-profile-md)#end
```

The following sample shows and example of the **no cable upstream jumbo-grants** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # no cable upstream 0 jumbo-grants
Router(config-profile-md)#end
```

cable upstream load-balance group

To assign an upstream to a load-balance group, use the **cable upstream load-balance group** command in interface configuration mode. To remove an upstream from a load-balance group, use the **no** form of this command.

cable upstream *uport* **load-balance group** *n*
no cable upstream *uport* **load-balance group** *n*

Syntax Description

uport	Specifies the upstream port that should be assigned to the load-balance group. Upstream port values start with 0 and end with a value that depends on the number of upstream ports on the cable interface line card.
n	Specifies the number of the load-balance group to which the upstream should be assigned. In Cisco IOS Release 12.2(33)SCE3 and earlier, the valid range is from 1 to 80. In Cisco IOS Release 12.2(33)SCE4 and later, the valid range is from 1 to 256.

Command Default

An upstream is not assigned to any load-balance groups. If you use the **cable load-balance group (interface configuration)** command to assign a downstream interface to a load-balance group, all its upstreams are automatically assigned to the same group until you use the **cable upstream load-balance group** command to reassign an upstream to a different group.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCE4	The valid range for the load balance group was changed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream load-balance group** command is used to configure the following feature:

Load Balancing and Dynamic Channel Change on the Cisco CMTS Routers

After you have used the **cable load-balance group (global configuration)** command to initially create and configure a load-balance group, use the **cable upstream load-balance group** command to assign this load-balance group to an upstream. This enables the cable interface to begin participating in load-balancing operations.

Tip Use the **cable load-balance group (interface configuration)** command to assign this load-balance group to a downstream.

The following rules apply when creating and assigning load-balance groups:

- A downstream or upstream can belong to only one load-balance group.

- All downstreams and upstreams in a load-balance group must share physical radio frequency (RF) connectivity to the same group of cable modems. Downstreams can be in a separate load-balance group than upstreams, but all downstreams or all upstreams that have the same RF physical connectivity must be members of the same load-balance group. You cannot distribute downstreams or upstreams that share physical connectivity across multiple load-balance groups.
- Load balancing is done only on a per-chassis basis—all interfaces in a load-balance group must be in the same chassis.

Examples

The following example shows how to assign the first four upstreams for cable interface 5/1 to load balance group 14:

```
Router# config terminal
Router(config)# interface cable 5/1/0
Router(config-if)# cable upstream 0 load-balance group 14
Router(config-if)# cable upstream 1 load-balance group 14
Router(config-if)# cable upstream 2 load-balance group 14
Router(config-if)# cable upstream 3 load-balance group 14
Router(config-if)#
```

Related Commands

Command	Description
cable load-balance exclude	Excludes a particular cable modem, or all cable modems from a particular vendor, from one or more types of load-balancing operations.
cable load-balance group (global configuration)	Creates and configures a load-balance group.
cable load-balance group (interface configuration)	Assigns a downstream to a load-balance group.
cable load-balance group interval	Configures the frequency of the load-balancing policy updates.
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable load-balance group threshold	Configures the threshold values that a load-balance group should use for load-balancing operations.
clear cable load-balance	Clears the counters or state machine used to track load-balancing operations.
show cable load-balance	Displays real-time statistical and operational information for load-balancing operations.

cable upstream maintain-psd

To require DOCSIS 2.0 CMs on an A-TDMA-only upstream to maintain a constant power spectral density (PSD) after a modulation rate change, use the **cable upstream maintain-psd** command in cable interface configuration mode. To return to the default behavior, so that CMs do not need to maintain their power spectral density, use the **no** form of this command.

cable upstream *uport* **maintain-psd**
no cable upstream *uport* **maintain-psd**

Syntax Description

uport	Specifies the upstream port to be configured. Upstream port values start with 0 and end with a value that depends on the number of upstream ports on the cable interface line card.

Command Default

Cable modems are not required to maintain their power spectral density after a modulation rate change (**no cable upstream maintain-psd**)

Note In Cisco IOS Release 12.2(15)BC2 and later releases, this command is automatically removed from the configuration when you configure an upstream for a TDMA-only or mixed TDMA/A-TDMA configuration.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.2(15)CX	This command was introduced to support DOCSIS 2.0 operations on the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line card.
12.2(15)BC2	Support was added for DOCSIS 2.0 operations on the Cisco uBR-MC5X20S/U cable interface line cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is replaced by **us-channel maintain-psd** command.

Usage Guidelines

Use this command to specify whether DOCSIS 2.0 CMs should maintain their power spectral density when the Cisco CMTS changes their upstream modulation rate in an upstream channel descriptor (UCD) message. When you configure an upstream with the **cable upstream maintain-psd** command, the Cisco CMTS sets TLV 15 (Maintain Power Spectral Density) to ON in the UCD messages it sends to the CMs on that upstream.

When TLV 15 is on, and when the new UCD specifies a new upstream modulation rate for the CM, the CM must change its transmit power level to keep its power spectral density as close as possible to what it was before the modulation rate change. The CM must maintain this power spectral density until the CMTS sends a power adjustment command in a Ranging-Response (RNG-RSP) message.

The default configuration (**no cable upstream maintain-psd**) configures TLV 15 to OFF, and CMs are not required to maintain their power spectral density after a modulation rate change. However, per the DOCSIS specifications, the CMs continue to maintain constant total input power on the upstream.



Note This command affects only DOCSIS 2.0 CMs that are online an upstream that is configured for the DOCSIS 2.0 A-TDMA-only mode. This command has no effect on DOCSIS 1.0 and DOCSIS 1.1 CMs, which will continue to maintain constant total input power on the upstream, per the DOCSIS 1.x specifications.

Examples

The following example shows how to configure four upstreams on a cable interface line card to require cable modems to maintain a constant power spectral density after a modulation rate change.

```
Router# configure terminal
Router(config)# interface cable c6/1/0
Router(config-if)# cable upstream 0 maintain-psd
Router(config-if)# cable upstream 1 maintain-psd
Router(config-if)# cable upstream 2 maintain-psd
Router(config-if)# cable upstream 3 maintain-psd
Router(config-if)# exit
Router(config)# exit
Router#
```

The following example shows how to configure an upstream for the default behavior, which is that CMs are not required to maintain a constant power spectral density after a modulation rate change, but do continue to maintain constant total input power levels on the upstream.

```
Router# configure terminal
Router(config)# interface cable c5/1/0
Router(config-if)# no cable upstream 0 maintain-psd
Router(config-if)# exit
Router(config)# exit
Router#
```

Related Commands

Command	Description
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.

cable upstream max-channel-power-offset

To set the power budget offset value on the Cisco CMTS router for the reduced upstream channel set assignment, use the **cable upstream max-channel-power-offset** command in cable interface configuration mode. To disable this configuration, use the **no** form of this command.

cable upstream max-channel-power-offset *dB-value*
no cable upstream max-channel-power-offset *dB-value*

Syntax Description

dB-value	Decibel value for the upstream channel transmit power. The valid range is from 1 to 6. The default is 3. **Note** Effective with Cisco IOS Release 12.2(33)SCH1 and Cisco IOS Release 12.2(33)SCG5, the valid range is from 0 to 6.

Command Default

The power budget offset is configured with the default value of 3 dB.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
Cisco IOS Release 12.2(33)SCE3	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The threshold value specified for the power budget offset (max-channel-power-offset) must be less than the power threshold value (power-adjust continue) that determines the value of the Ranging Status field in the Ranging Response (RNG-RSP) messages that the Cisco CMTS router sends to the cable modem. You can specify the power threshold value using the **cable upstream power-adjust** command.

Examples

The following example shows how to enable the Cisco CMTS router to reduce the channel set assignment based on the total power budget of the cable modem in Cisco IOS Release 12.2(33)SCE3:

```
Router# configure terminal
Router(config)# interface cable 7/0/0
Router (config-if)# cable upstream max-channel-power-offset 5
```

Related Commands

Command	Description
cable tx-power-headroom	Specifies the extended transmit power on the Cisco CMTS router.
show cable modem	Displays transmit power values for each assigned upstream channel along with cable modem details.

cable upstream max-codes-per-subframe

To specify the upper limit to override the maximum value of codes-per-subframe defined in the individual modulation profile setting for an upstream channel, use the **cable upstream max-codes-per-subframe** command in cable interface configuration mode. To specify the default value of 2 to maximum codes-per-subframe, use the **no** form of this command.

cable upstream *n* **max-codes-per-subframe** *code*
no cable upstream *n* **max-codes-per-subframe**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
code	Specifies the number of codes-per-subframe. Valid values range from 1 to 128, with a default value of 2.

Command Default

The maximum codes per subframe setting cannot be applied if the Synchronous Code Division Multiple Access (S-CDMA) is not configured.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is applicable only for S-CDMA channels. You should configure S-CDMA to apply the the maximum codes-per-subframe setting. The number of codes-per-subframe should not exceed the number of active codes.

Examples

The following example sets the number of codes-per-subframe to 128 on the upstream port 0:

```
Router(config)# interface cable 7/0/4
Router(config-if)# cable upstream 0 max-codes-per-subframe 128
Router(config-if)#
```

Related Commands

Command	Description
cable upstream active-codes	Specifies the number of active codes allowed on an upstream channel.
cable upstream codes-per-minislot	Specifies the number of codes-per-minislot allowed on an upstream channel.
cable upstream spreading-interval	Specifies the spreading interval for S-CDMA on an upstream channel.

cable upstream max-interleave-step

To specify the upper limit to override the maximum interleave step for each burst defined in the modulation profile for the upstream channel, use the **cable upstream max-interleave-step** command in cable interface configuration mode. To specify the default interleave step size of 1, use the **no** form of this command.

cable upstream *n* **max-interleave-step** *max-interleave-step*
no cable upstream *n* **max-interleave-step**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
max-interleave-step	Specifies the maximum number of interleave steps. Valid values range from 1 to 31, with a default value of 1.

Command Default

The maximum interleave step setting cannot be applied if the Synchronous Code Division Multiple Access (S-CDMA) feature is not configured.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is applicable only for S-CDMA channels and the command limits the maximum number of interleave steps for a given upstream port. The *max-interleave-step* value should be less than the *spreading-interval* value specified using the **cable upstream spreading-interval** command.

Examples

The following example sets the number of interleave steps to 31 on the upstream port 0:

```
Router(config)# interface cable 7/0/4
Router(config-if)# cable upstream 0 max-interleave-steps 31
Router(config-if)#
```

Related Commands

Command	Description
cable upstream active-codes	Specifies the number of active codes that can be configured on an upstream channel.
cable upstream codes-perminislot	Specifies the number of codes-per-minislot allowed on an upstream channel.
cable upstream max-codes-per-subframe	Specifies the upper limit and the maximum value of codes-per-subframe defined in the individual modulation profile setting for an upstream channel.

Command	Description
cable upstream spreading-interval	Specifies the spreading interval for SCDMA on an upstream channel.

cable upstream max-logical-chans

To specify the number of logical channels on a physical port, use the **cable upstream max-logical-chans** command in cable interface configuration mode. To disable the use of multiple logical channels, use the **no** form of this command.

cable upstream *n* **max-logical-chans** *code*
no cable upstream *n* **max-logical-chans**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
code	Specifies the number of logical channels per port. Valid values are 1 and 2.

Command Default

The maximum logical channels setting cannot be applied if the Synchronous Code Division Multiple Access (S-CDMA) is not configured.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream max-logical-chans** command limits the number of logical channels per port on an upstream channel. The default value is 1.

When two logical channels are configured through **cable upstream max-logical-chans** command, both logical channels are mapped to the same physical port specified and the physical upstream bandwidth is shared between the two logical channels. However, from the cable modem perspective, each logical channel appears as an independent upstream channel.

When multiple logical channels are configured, the upstream related commands are categorized into two groups: physical port level and logical channel level.

Physical Port Level

Physical port level commands use the format of **cable upstream** *n, where n* denotes the physical port number.

Logical Channel Level

Logical channel level commands use the format of **cable upstream** *n m, where n* denotes the physical port number, and *m* denotes the logical channel index number of 0 or 1.



Note Multiple logical channels and Spectrum groups cannot be configured on the same upstream port.

The following commands are supported at the logical channel level:

- **cable upstream active-codes**
- **cable upstream attribute-mask**
- **cable upstream codes-per-minislot**
- **cable upstream concatenation**
- **cable upstream data-backoff**
- **cable upstream description**
- **cable upstream differential-encoding**
- **cable upstream docsis-mode**
- **cable upstream equalization-coefficient**
- **cable upstream fec**
- **cable upstream fragment-force**
- **cable upstream fragmentation**
- **cable upstream freq-adjust**
- **cable upstream max-codes-per-subframe**
- **cable upstream max-interleave-step**
- **cable upstream modulation-profile**
- **cable upstream power-adjust**
- **cable upstream range-backoff**
- **cable upstream rate-adapt**
- **cable upstream rate-limit**
- **cable upstream scheduling type**
- **cable upstream scrambler**
- **cable upstream shutdown**
- **cable upstream spreading-interval**
- **cable upstream threshold**
- **cable upstream unfrag-slot-jitter**



Note The above logical channel level commands are not available at the physical port level, when logical channels are configured. However, the **cable upstream shutdown** and **cable upstream threshold command**s operate both at the physical and at the logical channel level.

The physical upstream port level commands such as **cable upstream frequency** and **cable upstream** channel-width affects all logical channels configured under a physical port.

Examples

The following example sets two logical channels on the upstream port 0:

```
Router(config)# interface cable 7/0/4
Router(config-if)# cable upstream 0 max-logical-chans 2
Router(config-if)#
```

Related Commands

Command	Description
cable upstream attribute-mask	Specifies the upstream attribute mask in hexadecimal format.

Command	Description
cable upstream codes-per-minislot	Specifies the number of codes-per-minislot allowed on an upstream channel.
cable upstream concatenation	Enables DOCSIS concatenation at the CMTS.
cable upstream data-backoff	Specifies automatic or fixed start and stop values for data backoff.
cable upstream description	Assigns arbitrary labels to the upstreams on the cable interfaces.
cable upstream differential-encoding	Enables differential encoding on upstream traffic to a specified cable interface.
cable upstream docsis-mode	Configures an upstream to use DOCSIS 1.x or DOCSIS 2.0 or DOCSIS 3.0 modulation profiles.
cable upstream equalization-coefficient	Enables the use of a DOCSIS 1.x or DOCSIS 2.0 or DOCSIS 3.0 pre-equalization coefficient on an upstream port.
cable upstream fec	Enables upstream forward error correction.
cable upstream fragment-force	Specifies that a cable interface line card should fragment DOCSIS frames on an upstream when the frame exceeds a particular size.
cable upstream fragmentation	Enables fragmentation of DOCSIS frames on a particular upstream.
cable upstream freq-adjust	Specifies the percentage of frequency adjustment packets that is required to change the adjustment method from the regular power-adjustment method to the noise power-adjustment method.
cable upstream max-codes-per-subframe	Specifies the upper limit to override the maximum value of codes-per-subframe defined in the individual modulation profile setting of an upstream channel.
cable upstream max-interleave-step	Specifies the upper limit to override the maximum interleave step for each burst defined in the modulation profile for the upstream channel.
cable upstream modulation-profile	Assigns up to three modulation profiles to an upstream port.
cable upstream power-adjust	Controls power-adjustment methods on the Cisco CMTS.
cable upstream range-backoff	Specifies automatic or configured initial ranging backoff calculation.
cable upstream rate-adapt	Enables and configures upstream utilization optimization.
cable upstream rate-limit	Specifies DOCSIS rate limiting for an upstream port on a cable interface line card.
cable upstream scheduling type	Enables various scheduler modes.
cable upstream scrambler	Enables the cable upstream scrambler.

Command	Description
cable upstream shutdown	Disables the upstream port.
cable upstream spreading-interval	Specifies the spreading interval for S-CDMA on an upstream channel.
cable upstream threshold	Configures the upstream for the CNR or SNR and FEC threshold values to be used in determining the allowable noise levels.
cable upstream unfrag-slot-jitter	Specifies how much jitter can be tolerated on the corresponding upstream due to unfragmentable slots.

cable upstream max-ports

To configure the maximum number of upstreams on a MAC domain on a cable interface line card, use the **cable upstream max-ports** command in cable interface configuration mode. To reset the card to its default value of 4 upstreams per MAC domain, use the **no** form of this command.

cable upstream max-ports *n*
no cable upstream max-ports

Syntax Description

n	The valid range is 0 to 8, with a default of 4.

Command Default

4

Command Modes

Interface configuration (cable interface only)

Command Modes

Release	Modification
12.2(15)BC1	This command was introduced to support the Cisco uBR-MC5X20S cable interface line card.
12.2(15)BC2	Support was added for the Cisco uBR-MC5X20U cable interface line card.
12.2(33)SCE	The minimum number of max-ports supported was changed from 1 to 0.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify how many upstreams a MAC domain will support on the cable interface line card, before using the **cable upstream connector** command to assign upstreams to physical ports on the card. The MAC domains on a card can be configured for different maximum upstream values.

After using this command, the valid range for upstreams on that cable interface will be from 0 to one less than the maximum port value. For example, if you use the **cable upstream max-ports 6** command to specify a maximum of 6 upstreams for the MAC domain, the valid range for upstreams will be 0 to 5.

The total of max-ports on each interface should not be greater than the total number of upstream channels in the line card. For example, the Cisco uBR-MC3GX60V line card that has a total of 60 upstream channels can have a maximum of 60 max-ports and the Cisco UBR-MC20X20V line card that has a total of 20 upstream channels can have a maximum of 20 max-ports.

If the max-port exceeds the number of upstream channels on a line card, the total number of ports that can be unshut is limited to the actual number of channels available on the line card and the remaining ports remain as shutdown.

The **cable upstream connector** command fails when all the upstream channels are mapped. For example, with Cisco uBR-MC3GX60V line card, if 60 upstream ports are mapped to connectors, adding more upstream ports to connectors fail. When you configure a total of 120 ports and unshut the first 60 ports but map the last 60 ports to connectors, none of the ports work because the port is either shutdown or has no connector mapped to it.

Examples

The following example shows how to configure all MAC domains on a Cisco uBR-MC5X20S card for a maximum number of 6 upstreams.

```
Router# configure terminal

Router(config)# interface cable c6/1/0
Router(config-if)# cable upstream max-ports 1
Router(config-if)# interface cable c6/1/1
Router(config-if)# cable upstream max-ports 2
Router(config-if)# interface cable c6/1/2
Router(config-if)# cable upstream max-ports 3
Router(config-if)# interface cable c6/1/3
Router(config-if)# cable upstream max-ports 6
Router(config-if)# interface cable c6/1/4
Router(config-if)# cable upstream max-ports 8
Router(config-if)# exit
Router(config)# exit
Router#
```

Related Commands

Command	Description
cable upstream connector	Maps an upstream port to a physical port on the cable interface line card for use with a particular downstream.

cable upstream min-bwreq-ops

To configure the number of reserved minislots for contention, use the **cable upstream min-bwreq-ops** command in cable interface configuration mode.

cable upstream min-bwreq-ops {scqam | ofdma} *percent tenths_of_a_percent*

Syntax Description

scqam	Specifies the percent of bandwidth request opportunities in SCQAM maps.
ofdma	Specifies the percent of bandwidth request opportunities in OFDMA maps.
percent	Specifies the minimum bandwidth request opportunities in 0% to 20%.
tenths_of_a_percent	Specifies the minimum bandwidth request opportunities in 0 to 9 tenths of a percent.

Command Default

No default behavior or values

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
IOS XE Amsterdam 17.3.1w	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the number of reserved minislots for contention:

```
Router> enable
Router# configure terminal
Router(config)# interface Cable 7/0/1
Router(config-if)# cable upstream min-bwreq-ops ofdma 5 0
```

cable upstream minimal-voice-jitter

To configure the shortest jitter allowed, use the **cable upstream minimal-voice-jitter** command. To reset the jitter value to default, use the no form of the command.

no
cable upstream *n* **minimal-voice-jitter** *jitter*

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For cBR Series Converged Broadband Routers, the valid range is from 0 to 15.
jitter	Specifies the shortest jitter allowed.

Command Default

The default jitter value is 2000 ms.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Example

The following sample shows and example of the **cable upstream minimal-voice-jitter** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # cable upstream 0 minimal-voice-jitter 2500
Router(config-profile-md)#end
```

The following sample shows and example of the **no cable upstream minimal-voice-jitter** command.

```
Router# conf t
Router(config)# cable profile mac-domain MD1
Router(config-profile-md) # no cable upstream 0 minimal-voice-jitter 2500
Router(config-profile-md)#end
```

cable upstream minislot-size

To specify the minislot size (in ticks) for a specific upstream interface, use the **cable upstream minislot-size** command in cable interface configuration mode. To reset the minislot size to the default for the current channel width setting, use the **no** form of this command.

cable upstream *n* **minislot-size** *size*
no cable upstream *n* **minislot-size**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
size	Specifies the minislot size in time ticks. Valid minislot sizes are: • **1**—(32 symbols at 6.4MHz channel width) Supported by the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X and Cisco uBR-MC5X20S /U cable interface line cards when operating in Advanced TDMA (A-TDMA) DOCSIS 2.0 only mode. • **2** (32 symbols at at 3.2 MHz channel width) • **4** (64 symbols at 3.2 MHz channel width) • **8** (128 symbols at 3.2 MHz channel width) • **16** (256 symbols at 3.2 MHz channel width) • **32** (512 symbols at 3.2 MHz channel width) • **64** (1024 symbols at 3.2 MHz channel width) • **128** (2048 symbols at 3.2 MHz channel width)

Command Default

The default settings vary, depending on the upstream's channel width. The default values were changed in Cisco IOS Release 12.2(15)BC1 and later releases to better optimize data and voice traffic on the upstream.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
11.3(6) NA	This command was introduced.
12.2(15)CX	Support was added for the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line cards, including support for minislot size of 1 to support DOCSIS 2.0 A-TDMA and mixed modulation profiles.
12.2(15)BC1	The default minislot size was reduced to optimize the upstream for data and Voice-over-IP (VoIP) traffic. The previous defaults produced 16 bytes per minislot when using QPSK modulation and a 1.6 MHz channel width, and the new defaults produce 8 bytes per minislot with the same configuration.
12.2(15)BC2	Support was added for the minislot size of 1 to support DOCSIS 2.0 A-TDMA and mixed modulation profiles on the Cisco uBR-MC5X20S/U cable interface line cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is **us-channel minslot-size** command.

Usage Guidelines

The minislot size determines the minimum amount of information that can be transmitted on the upstream. How much a particular minislot size can contain depends on the modulation profile and channel width being used, with higher-bandwidth settings allowing larger amounts of data.

Because DOCSIS specifications require that the minislot size contain at least 32 symbols, you might need to change the minislot size whenever you change the channel width or modulation of an upstream, to meet the DOCSIS requirements.



Note In Cisco IOS Release 12.2(15)CX, Cisco IOS Release 12.2(15)BC2, and later releases, manually changing the minislot size is not needed on the Cisco uBR-MC16U/X, Cisco uBR-MC28C, and Cisco uBR-MC28U/X cards, because these cards automatically change the minislot size when the channel width is changed, to produce 32 symbols per minislot, as required by the DOCSIS specifications.

The table below lists the default minislot sizes for each channel width for Cisco IOS releases before and after Cisco IOS Release 12.2(15)BC1.

Table 20: Default Minislot Sizes

Releases Earlier than Cisco IOS Release 12.2(15)BC1 (creates 64 symbols and 16 bytes per minislot)		**Cisco IOS Release 12.2(15)BC1 and Later Releases (creates 32 symbols and 8 bytes per minislot)**	
Channel Width	Default Minislot Size (in Ticks)	Channel Width	Default Minislot Size (in Ticks)
0.2 MHz	64	0.2 MHz	32
0.4 MHz	32	0.4 MHz	16
0.8 MHz	16	0.8 MHz	8
1.6 MHz	8	1.6 MHz	4
3.2 MHz	4	3.2 MHz	2
		6.4 MHz (DOCSIS 2.0 only)	1[6]

[6] You must be using a 6.4 MHz channel width if using a minislot size of 1 tick. Otherwise, you will violate the DOCSIS requirements that each minislot should contain 32 symbols.

Increasing the Minislot Size for High Bandwidth Users

The DOCSIS specifications allow a maximum burst limit of 255 minislots, which could require increasing the minislot size from the default values if you are offering service level agreements (SLAs) that offer guaranteed upstream speeds of 2 Mbps or greater, or if you are allowing maximum concatenation bursts greater than 2000 bytes. This is because the default minislot sizes might not accommodate the largest bursts that are possible with these configurations.

The default minislot sizes provide for 8 or 16 bytes per minislot, depending on Cisco IOS release. If the default setting provides 8 bytes per minislot, then the maximum possible burst is 8 bytes * 255 minislots, or 2040 total bytes, which might not be sufficient for certain users with high guaranteed upstream speeds. You should increase the minislot size to accommodate the expected maximum burst transmissions, adding in approximately 10 percent for overhead.

Caution Using values of 64 or 128 for higher symbol rates such as 1280 kilosymbols/second or 2560 kilosymbols/second can cause performance problems. Depending on your current setting's symbol rate, you should select the minislot size (in ticks) that yields a minislot size of 32 or 64 symbols.

Examples

The following example shows how to set the minislot size on upstream port 4 to 16:

```
Router# configure terminal
Router(config)# interface cable 3/0
Router(config-if)# cable upstream 4 minislot-size 16
Router(config-if)# exit
Router(config)# exit
Router#
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for use on the router.
cable upstream channel-width	Specifies an upstream channel width for an upstream port.
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.
cable upstream equalization-coefficient	Enables the use of a DOCSIS 1.1 pre-equalization coefficient on an upstream.
cable upstream modulation-profile	Assigns one or two modulation profiles to an upstream port.
show cable hop	Displays CM configuration settings.
show cable modulation-profile	Displays the modulation profile information for a Cisco CMTS.
show interface cable mac-schedule	Displays the current time-slot scheduling state and statistics.
show interface cable sid	Displays cable interface information.

cable upstream modulation-profile

To assign up to three modulation profiles to an upstream port, use the **cable upstream modulation-profile** command in cable interface configuration mode. To set the upstream modulation profile to the single default profile based on the DOCSIS-mode setting of the upstream, use the no form of this command.

cable upstream *n* **modulation-profile** *primary-profile-number* [*secondary-profile-number*] [*tertiary-profile-number*]
no cable upstream *n* **modulation-profile** *primary-profile-number* [*secondary-profile-number*] [*tertiary-profile-number*]

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
primary-profile number	Specifies the number identifying the primary modulation profile for the upstream port. The primary modulation profile is used when the upstream is operating with nominal noise conditions. The valid values depend on the cable interface being used and the mode of operation.
secondary-profile-number	(Optional) Specifies the secondary modulation profile for the upstream port, which is used when noise on the upstream increases to the point that the primary modulation profile can no longer be used. The valid values are the same ranges as the primary modulation profile. The secondary modulation profile should specify a more robust performance profile (in terms of coping with noise) than the primary profile. The secondary profile is used for both basic and advanced dynamic modulation.
tertiary-profile-number	(Optional) Specifies the tertiary modulation profile for the upstream port, which is used when noise on the upstream increases to the point that the secondary modulation profile can no longer be used. The tertiary modulation profile is only available for the basic dynamic modulation. You cannot use the tertiary modulation profile when a spectrum group is defined for the upstream.

Command Default

Default modulation profiles are created, using profile numbers 1, 21, 41, 101, 121, 201, 221, 241, 321, and 381 depending on the DOCSIS mode and the cable interface line cards being used. See the table for a list of the valid ranges for the individual cable interface cards.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.3 NA	This command was first introduced.
12.0(7)XR2 and 12.1(1a)T1	This command was introduced into the Cisco IOS Release 12.0 and Release 12.1 trains, replacing the previous version of the **cable upstream modulation-profile** command.

Release	Modification
12.1(3a)EC1	This command was modified to add the optional *secondary-profile-number* parameter to enable the Dynamic Upstream Modulation feature.
12.1(5)EC	This command was introduced for the Cisco uBR7100 series universal broadband routers.
12.1(7)CX1	This command was enhanced for the Cisco uBR-MC16S line card.
12.2(4)BC1	Support for this command was added for the Cisco IOS Release 12.2 BC train.
12.2(8)BC2	Support for this command was added for the Cisco uBR-MC16S and Cisco uBR-LCP2-MC16S line cards.
12.2(11)CY, 12.2(11)BC3	Support was added for the Cisco uBR10-MC5X20S cable interface line card on the Cisco uBR10012 router.
12.2(15)CX	Support was added for the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X cable interface line card, including DOCSIS 2.0 ATDMA and mixed modulation profiles.
12.2(15)BC2	Support was added for DOCSIS 2.0 ATDMA and mixed modulation profiles on the Cisco uBR-MC5X20S/U/H cable interface line cards.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.3(23)BC7	This command was modified to add the optional *tertiary-profile-number* parameter to enable Three Step Dynamic Upstream Modulation feature.
12.2(33)SCC	Support was added for DOCSIS 2.0 S-CDMA and DOCSIS 3.0 S-CDMA modulation profiles using 1.6 MHz, 3.2 MHz, and 6.4 MHz channel widths on the Cisco UBR-MC20X20V cable interface line card.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is replaced by **us-channel modulation-profile** command.

Usage Guidelines

The **cable upstream modulation-profile** command assigns up to three modulation profiles to an upstream port, depending on the type of cable interface and Cisco IOS software release being used. The third modulation profile is only available for the basic dynamic modulation and is unavailable when a spectrum group is defined for the upstream.

Static Modulation Profile (single profile)

The **cable upstream modulation-profile** command assigns a single modulation profile to an upstream port on the Cisco uBR7100 series routers and on all cable interface line cards that are available for the Cisco CMTS routers. This modulation profile affects all CMs and set-top boxes that are using that upstream port.

Dynamic Upstream Modulation (up to three profiles)

The **cable upstream modulation-profile** command assigns up to three modulation profiles to an upstream port to use the Dynamic Upstream Modulation feature. You must assign at least two profiles to activate the Dynamic Upstream Modulation feature. This feature operates differently, depending on the Cisco IOS software release and the cable interface line card that is providing the upstream port:

- The upstream port is on a Cisco uBR7100 series router or on a Cisco uBR-MC28U/X, or Cisco uBR-MC16U/X line card that is used on Cisco CMTS router running Cisco IOS Release 12.3(23)BC7 or later release.

When using the Dynamic Upstream Modulation feature, the primary modulation profile is the default profile. The line card monitors the signal-to-noise ratio (SNR) value and forward error correction (FEC) counters for the upstream, to track the upstream signal quality. For a dual modulation profile, the line card monitors the SNR value, carrier-to-noise ratio (CNR) value, and FEC counters to track the upstream signal quality.

When the noise on the upstream exceeds the threshold(s) for the primary profile, the upstream switches to the secondary profile in a dual modulation profile. Whereas, in a three modulation profile setup, the upstream can switch from primary profile to the secondary profile or directly to the tertiary profile based on the SNR, and FEC counter thresholds. Two separate thresholds are used for switching between the primary profile and the secondary profile and from secondary profile to the tertiary profile.

When the noise conditions improve (defined as a SNR value that is 3 dB greater than the threshold value and FEC counters that are below the threshold values), the upstream automatically switches back to the primary modulation profile. For a Three Step Dynamic Upstream Modulation, the user can configure the threshold values and FEC counters for the upgrade. However, there is no direct upgrade from tertiary profile to the primary profile. The upgrade follows a sequential order, from tertiary profile to secondary profile and then to the primary profile.

For example, in a dual modulation profile, the primary modulation profile could be configured for 16-QAM (or mixed 16-QAM and QPSK) operation and the secondary profile for QPSK operation. If noise conditions on the upstream threaten to force CMs offline, the upstream switches to the secondary profile to implement QPSK operation. When the noise ingress conditions are solved, the upstream switches back to 16-QAM operation.

In a Three Step Dynamic Upstream Modulation, the primary modulation profile could be configured for 64-QAM operation, the secondary modulation profile for 16-QAM operation (or mixed 64-QAM and 16-QAM), and the tertiary modulation profile for QPSK. If the noise conditions increase, the upstream switches to the secondary profile to implement 16-QAM (or mixed profile) operation and then to the tertiary modulation profile to implement QPSK operation. When the noise ingress conditions are improved, the upstream switches back to 16-QAM operation (or mixed 64-QAM and 16-QAM), and then to the 64-QAM operation, on further improvement of noise conditions.

Note For more information on this form of the Dynamic Upstream Modulation feature, see the chapter, Spectrum Management for the Cisco Cable Modem Termination System .

When Dynamic Upstream Modulation is enabled and spectrum groups are configured on the same interface, the line cards respond to excessive noise by first switching to the secondary modulation profile. If the noise conditions worsen, the line card changes the modulation or frequency hopping in an attempt to find a new upstream channel, and if that fails, the line card reduces the channel width.

Note The default priority of switching modulation profile is frequency (F), modulation (M), and channel-width (C). However, it is user configurable and can be changed to MFC or FCM.

- The upstream port is on a Cisco uBR-MC16U/X line card that is used on Cisco CMTS routers using Cisco IOS Release 12.1(7)CX1 or later release, or on a Cisco uBR-MC5X20S/U/H line card.

The Dynamic Upstream Modulation feature on the Cisco uBR-MC16U/X line card is identical to other line cards except that the spectrum management hardware onboard the Cisco uBR-MC16U/X or Cisco uBR-MC5X20S/U/H line card uses the CNR value (you can use only the CNR value for a dual profile configuration) in conjunction with the SNR value. The CNR value is a more accurate description of noise conditions on the upstream. Because of this, these line cards switch back to the primary modulation profile when noise conditions improve to a CNR value that is only 3 dB greater than the threshold value (assuming FEC counters are also below the threshold values).



Note If the Cisco CMTS router is running Cisco IOS Release 12.1(3a)EC1 or a later Cisco IOS release, the Dynamic Upstream Modulation feature on the Cisco uBR-MC16U/X line card operates the same as it does on the other line cards.

When Dynamic Upstream Modulation is enabled and spectrum groups are configured on the same interface, the line cards take corrective action in response to excessive noise, as determined by the **cable upstream hop-priority** command (either frequency hopping or changing to the secondary modulation profile). If the noise conditions worsen, the line card takes the second corrective action that has been defined, and if that fails, the line card takes the last corrective action.



Note The Dynamic Upstream Modulation feature uses the SNR, CNR, and FEC thresholds for 64-QAM, 16-QAM, and QPSK operation to determine when to switch modulation profiles. We recommend the use of 64-QAM, 16-QAM, and QPSK for primary, secondary, and tertiary profiles in a Three Step Dynamic Upstream Modulation. For dual profile configuration, we recommend the use of 16-QAM or mixed 16-QAM and QPSK modulation for primary profile and QPSK modulation for the secondary profile. However, this is optional. Both modulation profiles can be either QPSK or QAM. It is not mandatory that one is QAM and the other QPSK, but modulation profile switchover is tied to the QAM and QPSK thresholds.



Tip Modulation profiles must be first created using the **cable modulation-profile** command before they can be assigned using the **cable upstream modulation-profile** command.

Modulation Profile Ranges

The valid range for modulation profiles depends on the cable interface used and the type of modulation profile created.

The table below lists the valid ranges according to cable interface and modulation type.

Table 21: Supported Channel Widths and DOCSIS Modes for Cable Interfaces

Cable Interface	DOCSIS 1.X (TDMA)	Mixed DOCSIS 1.X/2.0	DOCSIS 2.0 (A-TDMA)	DOCSIS 3.0 (S-CDMA)
Cisco uBR-MC16U/X [7], Cisco uBR-MC28U/X	41 to 50 (default is 41)	141 to 150 (default is 141)	241 to 250 (default is 241)	N/A
Cisco uBR10-MC5X20S/U/H	21 to 30 (default is 21)	121 to 130 (default is 121)	221 to 230 (default is 221)	N/A

Cable Interface	DOCSIS 1.X (TDMA)	Mixed DOCSIS 1.X/2.0	DOCSIS 2.0 (A-TDMA)	DOCSIS 3.0 (S-CDMA)
Cisco UBR-MC20X20V[8]	21 to 30 (default is 21)	121 to 130 (default is 121)	221 to 230 (default is 221)	1 to 400 (default is 381)

[7] Supports 6,400,000 Hz (5,120,000) symbols/sec) while operating in DOCSIS 2.0 (A-TDMA-only) mode .
[8] The UBR-MC20X20V cable interface line card has three variants, UBR-MC20X20V-0D, UBR-MC20X20V-5D, and UBR-MC20X20V-20D. The UBR-MC20X20V-0D line card supports 20 upstreams and zero (no) downstreams. The UBR-MC20X20V-5D line card supports 20 upstreams and five downstreams, and the UBR-MC20X20V-20D line card supports 20 upstreams and 20 downstreams.

In addition to the legacy modulation profile number schemes, the new global modulation profile scheme introduced in Cisco IOS Release 12.2(33)SCC, allows you to assign any modulation profile number to any DOCSIS-mode up to 400, without any restrictions.

The global modulation profile mode allows you to create and configure DOCSIS 3.0 channel type 4SR (scdma-d3). When an upstream's DOCSIS mode is changed into scdma-d3 , it is initially assigned to the system created default modulation profile as shown in the table.



Note Though you can assign any number between 1 to 400 to any modulation profile, the default modulation profile number assigned to an upstream channel for a given channel type will remain the same. That is, modulation profile numbers 21, 121, 221, 321, and 381 will be applicable for TDMA, mixed, A-TDMA, S-CDMA, and DOCSIS 3.0 S-CDMA channel types.

All the existing and previously defined modulation profiles are converted to the new format. However, all the newly created modulation profiles, which are outside of the legacy number space range, will be lost when you revert to the legacy modulation profile.

For more details on the new global modulation profile scheme, refer to the **cable modulation-profile global-scheme** command.

Examples

The following example assigns the primary modulation profile 2, the secondary modulation profile 1, and the tertiary modulation profile 4 to the upstream port 0 on the cable interface line card in slot 3. This automatically enables the Dynamic Upstream Modulation feature for all CMs using that upstream.

```
Router(config)#interface cable 3/0
Router(config-if)#cable upstream 0 modulation-profile 2 1 4
Router(config-if)#
```

The following example assigns the primary modulation profile 2 and the secondary modulation profile 1, to the upstream port 0 on the cable interface line card in slot 3. This automatically enables the Dynamic Upstream Modulation feature for all CMs using that upstream.

```
Router(config)#interface cable 3/0
Router(config-if)#cable upstream 0 modulation-profile 2 1
Router(config-if)#
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable modulation-profile global-scheme	Defines a global modulation profile for use on the router.
cable upstream hop-priority	Determines the order of the corrective actions to be taken when ingress noise exceeds the allowable value for an upstream. This command is related to the **cable upstream modulation-profile** command only when using advanced dynamic modulation configuration, that is, when spectrum group is defined for the upstream channel.
show cable modulation-profile	Displays the cable modulation profiles that have been created.

cable upstream ofdma-prof-mgmt active-scs-threshold-pct

To specify the active subcarrier percent below RxMER threshold, use the **cable upstream ofdma-prof-mgmt active-scs-threshold-pct** command in cable interface configuration mode.

cable upstream ofdma-prof-mgmt active-scs-threshold-pct *percent*

Syntax Description

percent	Specifiy the active subcarrier percent below RxMER threshold. The valid range is from 0 to 100 percent.

Command Default

None

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the active subcarrier percent below RxMER threshold.

```
Router(config)# cable upstream ofdma-prof-mgmt active-scs-threshold-pct 30
```

Related Commands

Command	Description
cable upstream ofdma-prof-mgmt prof-upgrade-auto	Disable the automatic profile downgrade.
cable upstream ofdma-prof-mgmt mer-margin-qdb	Configure the offset.
cable upstream ofdma-prof-mgmt exempt-mslot-pct	Configure the percentage of minislot average RxMER that can be ignored in the recommended profile calculation.
show cable ofdma-prof-mgmtrxmer-poll-interval	Configure the RxMER poll interval.

cable upstream ofdma-prof-mgmt downgrade

To configure the OFDMA profile downgrade, use the **cable upstream ofdma-prof-mgmt downgrade** command in configuration mode.

cable upstream ofdma-prof-mgmt downgrade { **enable** | **hold-down** *minutes* | **interval** *seconds* | **min-cws** *value* | **partial-hold-down** *value* | **partial-threshold** *value* | **rxmer-enable** | **rxmer-exempt-mslot-pct** *value* | **rxmer-invalid-enable** | **synchronized** | **threshold** *value* }

Syntax Description

downgrade	Configuration options to enable profile management downgrade and specify the downgrade interval, threshold value, hold-down time, and min codewords needed for evaluation.
enable	Enable codeword error downgrade. To disable this feature, use no form of this command.
hold-down *minutes*	Specifies the time after a profile downgrade to defer modem from consideration by upgrade algorithms.
interval *seconds*	Specifies the downgrade assessment interval.
min-cws *value*	Specifies the minimum number of codewords that are required within downgrade interval to consider modem for profile downgrade.
partial-hold-down	Time in minutes that upgrade is disabled after a downgrade to partial-mode
partial-threshold *value*	Specifies the codeword error threshold above which to trigger profile downgrade to partial mode in hundredths of a percentage.
rxmer-enable	Enables RxMER downgrade.
rxmer-exempt-mslot-pct *value*	Specifies the number of minislots that can be below minimum IUC and not trigger downgrade.
rxmer-invalid-enable	Enable downgrade to partial based on invalid RxMER data.
synchronized	Synchronize the downgrade processing with reception of new statistics. Configuring this command enables the downgrade processing to be done as soon as the statistics are available. When using this feature, the **ofdma-prof-mgmt downgrade interval** must be a factor of 10 seconds.
threshold *value*	Specifies the codeword error threshold above which to trigger profile downgrade in hundredths of a percentage.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE 17.15.1w	The **synchronized** option is added.

Release	Modification
Cisco IOS XE Cupertino 17.9.1y	The **rxmer-invalid-enable** option is added.
Cisco IOS XE Amsterdam 17.3.1w	The **rxmer-enable** and **rxmer-exempt-mslot-pct** options are added.
Cisco IOS XE Gibraltar 16.12.1y	The **partial-threshold** and **partial-hold-down** options are added.
Cisco IOS XE Gibraltar 16.12.1x	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable the codeword error threshold feature.

```
Router(config)# cable upstream ofdma-prof-mgmt downgrade enable
```

cable upstream ofdma-prof-mgmt exempt-mslot-pct

To specify the percentage of minislot average RxMER that can be ignored in the recommended profile calculation, use the **cable upstream ofdma-prof-mgmt exempt-mslot-pct** command in cable interface configuration mode.

cable upstream ofdma-prof-mgmt exempt-mslot-pct *percent*

Syntax Description

percent	Specifiy the minislot average RxMER that can be ignored in the recommended profile calculation in percentage. The valid range is from 0 to 100 percent.

Command Default

None

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the percentage of minislot average RxMER.

```
Router(config)# cable upstream ofdma-prof-mgmt exempt-mslot-pct 30
```

Related Commands

Command	Description
cable upstream ofdma-prof-mgmt prof-upgrade-auto	Disable the automatic profile downgrade.
cable upstream ofdma-prof-mgmt mer-margin-qdb	Configure the offset.
show cable ofdma-prof-mgmtrxmer-poll-interval	Configure the RxMER poll interval.

cable upstream ofdma-prof-mgmt mer-margin-qdb

To configure the offset in quarter-decibel (DB), when RxMER is mapped to the ideal bit loading, use the **cable upstream ofdma-prof-mgmt mer-margin-qdb** command in global configuration mode.

cable upstream ofdma-prof-mgmt mer-margin-qdb*quarter-decibel*

Syntax Description

quarter-decibel	Quarter-decibel to configure the offset. The valid value is from 0 to 40 quarter-DB.

Command Default

0 quarter-DB

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This configured value (quarter-DB) is added to the RxMER values collected by CMTS before using the above mapping table, thus giving a user more control in selecting the recommended profiles.

Examples

The following example shows how to configure the offset:

```
Router(config)# cable upstream ofdm-prof-mgmt mer-margin-qdb 20
```

Related Commands

Command	Description
cable upstream ofdma-prof-mgmt exempt-mslot-pct	Specifiy the minislot average RxMER in percentage.
cable upstream ofdma-prof-mgmt prof-upgrade-auto	Disable the automatic profile downgrade.
show cable ofdma-prof-mgmtrxmer-poll-interval	Configure the RxMER poll interval.

cable upstream ofdma-prof-mgmt prof-upgrade-auto

To disable the auto profile management for OFDMA upstream channels, use the **no cable upstream ofdma-prof-mgmt prof-upgrade-auto** command in global configuration mode. If disabled, profile changes will not be implemented automatically by the system.

no cable upstream ofdma-prof-mgmt prof-upgrade-auto

Command Default

The automatic profile management is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to disable automatic profile namagement.

```
Router(config)# no cable upstream ofdma-prof-mgmt prof-upgrade-auto
```

Related Commands

Command	Description
cable upstream ofdma-prof-mgmt exempt-mslot-pct	Specifiy the minislot average RxMER in percentage.
cable upstream ofdma-prof-mgmt mer-margin-qdb	Configure the offset.
show cable ofdma-prof-mgmtrxmer-poll-interval	Configure the RxMER poll interval.

cable upstream ofdma-prof-mgmt rxmer-poll-interval

To configure the interval at which to send periodic Receive Modulation Error Ratio (RxMER) probes and periodic equalization probes, use the **cable upstream ofdma-prof-mgmt rxmer-poll-interval** command in global configuration mode.

cable upstream ofdma-prof-mgmt rxmer-poll-interval*interval*

no cable upstream ofdma-prof-mgmt rxmer-poll-interval

Syntax Description

interval	RxMER poll interval in minutes. The valid range is from 5 to 1440 minutes. A value of 1440 disables periodic probing.

Command Default

60 minutes

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The CMTS uses upstream probing to collect RxMER data per CM. This occurs during registration and periodically thereafter. The collected RxMER data is averaged per minislot and used to compute the recommended IUCs for each CM.

The **no cable upstream ofdma-prof-mgmt rxmer-poll-interval** command sets the rxmer-poll-interval to 1440, which is the value to disable the feature. The rxmer data is also not displayed after disabling the feature.

Examples

The following example shows how to configure the offset:

```
Router(config)# cable upstream ofdm-prof-mgmt rxmer-poll-interval 20
```

Related Commands

Command	Description
cable upstream ofdma-prof-mgmt exempt-mslot-pct	Specifiy the minislot average RxMER in percentage.
cable upstream ofdma-prof-mgmt prof-upgrade-auto	Disable the automatic profile downgrade.
cable upstream ofdma-prof-mgmt mer-margin-qdb	Configure the offset.

cable upstream power-adjust

To control power-adjustment methods on the Cisco CMTS, use the **cable upstream power-adjust**command in cable interface configuration mode or MAC domain profile configuration mode. To return to the default values, use the **no** form of this command.

cable upstream *n* **power-adjust** {**continue** *pwr-level* | **noise** *perc-pwr-adj* | **threshold** *value*}
no cable upstream *n* **power-adjust** {**continue** | **noise** | **threshold**}

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
continue *pwr-level*	Specifies the power threshold value that determines the value of the Ranging Status field in the Ranging Response (RNG-RSP) messages that the CMTS sends to the CM. The valid range is from 2 to 15 dB, with a default of 4 dB.
threshold *value*	Specifies the power adjustment threshold. The threshold range is from 0 to 10 dB, with a default of 1 dB.
noise *perc-pwr-adj*	Specifies the percentage of power adjustment packets that is required to change the adjustment method from the regular power-adjustment method to the noise power-adjustment method, which uses an averaging algorithm to smooth out wide jumps in the power level. The valid range is 10 to 100 percent, with a default of 30 percent.

Command Default

The **continue** option defaults to 4 dB, the **noise** option defaults to 30 percent, and the **threshold** option defaults to 1 dB.

Command Modes

Interface configuration (cable interface only)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.0(7)T	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Fuji 16.7.1	This command was modified to support MAC domain profile configuration on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When a CM comes online, it sets itself for the optimal power level, as determined by the CMTS. As the CMTS periodically polls each CM, the CMTS examines the CM's power level and orders the CM to adjust its power level to adapt to current total attenuation between it and the CMTS. These power adjustments can be required because of temperature variations, upstream frequency hopping, or increased attenuation that has been added either intentionally or unintentionally. The **cable upstream power-adjust**command controls how the CMTS makes these power adjustments.

Note To set the upstream power level on the CMTS, see the **cable upstream power-level** command.

Setting the threshold Option

The **threshold** option specifies the allowable range between the target upstream power for a CM and the actual receive power that the CMTS is measuring for that CM. If the CM receive power level is above or below the target power level by a value that is greater than the **threshold** option, the CMTS will command the CM to change its power level. When the CMTS receive power level for a CM falls within the **threshold** range of the target power level, the CMTS stops commanding the CM to change its power level.

For example, the default **threshold** value of 1 dB means that the CM must be 1 dB above or below its target power range before the CMTS will command it to change its power level. If the CM is within 1 dB of its target power level, the CMTS does not adjust the CM's power level.

Note The **threshold** parameter can be set from 0 dB to 10 dB with a default of 1 dB. However, do not set the **threshold** to 0 dB because this means that the CMTS will command all CMs to continually change their power levels until the CMTS measures the power levels at exactly 0 dBmV. Cisco recommends that you set the **threshold** parameter to a minimum of its default value of 1 dB so that the CMs do not change their power levels continually for minuscule RF plant variations.

Setting the continue Option

The **continue** option specifies the maximum allowable range for the CM's power level, in relation to its target power level. The CM can operate even at its maximum transmit power level, as long as it is within the **continue** range. The **continue** parameter can be set from 2 dB to 15 dB, with a default of 4 dB. For example, with the value of 2 dB, the CM can operate within 2 dB of its target power level, even if it is transmitting at its maximum power level.

The **continue** option works together with the **threshold**option to control the CM's operation. If the CM is within the **threshold**range, the CMTS sets the Ranging Status field of its RNG-RSP messages to SUCCESS. If the CM is outside the **threshold**range, but within the **continue**range, the CMTS sets the Ranging Status field to CONTINUE.

Note Cisco recommends designing the network so that CMs are at least 6 dB from the CM's maximum transmit power level. This will accommodate new services, changing modulation schemes, different channel widths, customer-installed passives, temperature variations, and other non-linearities. DOCSIS specifies a minimal power range of +8 dBmV to +55 dBmV for 16-QAM operation and +8 dBmV to +58 dBmV maximum power level for QPSK operation. Cisco CMs typically have a maximum power level of +60 dBmV, which exceeds the DOCSIS standards.

Tip If a number of CMs are transmitting close to their maximum transmit power, try increasing the **continue** range to allow the CMTS to continue adjusting the CM's power levels. This situation can happen when systems use high value taps, such as 29 dB taps, in the design of the plant.

Note When the CM requires 16 successive power adjustments that are greater than the value of the **continue** option, the CMTS re-initializes the CM and starts to rescan downstream carriers, as per the DOCSIS specification.

Determining if the CM has Reached Its Maximum Power Level

Per the DOCSIS specification, the CMTS does not adjust the CM power level by commanding the CM to set itself to an absolute power level. Instead, the CMTS changes the CM power levels by commanding the CM to make relative power adjustments, using increments of +/–0.25 dB (or multiples thereof).

If the CMTS commands a CM to adjust its power level by a particular amount, but the measured power level afterwards shows that the CM has made a smaller adjustment than requested, the **show cableflap-list** and **show cable modem** commands show an exclamation point (!) for that particular CM. This typically indicates that the CM has reached its maximum power level.

If the CM has not reached its maximum power level, but the **show cable flap-list** and **show cable modem** commands still show an exclamation point (!) for that CM, the problem could be a fault in the upstream path of the cable network. This fault is typically found as amplifier misalignment, where one upstream amplifier is adjusted with too much input attenuation, and the next has too little. The amplifier with too little attenuation enters non-linear operation and begins serious intermodulation.

Another possible cause is a faulty CM or a faulty connection between the CM and cable network. For example, a faulty coaxial cable or bad F-connector could also create noise problems.

Note A CM that shows an exclamation point (!) in the **show cable flap-list** and **show cable modem** displays is typically more prone to packet loss than other CMs.

Setting the noise Option

The **noise** option specifies that when the number of power adjustments beyond the threshold amount exceeds a certain percentage of the total Ranging Requests for a CM, the CMTS switches into its noise power-adjustment method. The noise power-adjustment method uses an averaging algorithm to make power adjustments for a particular CM, so that if a modem is experiencing wide swings in its power levels (known as “bouncing’), the CMTS averages the power levels before sending a power adjustment to the CM. The CMTS returns to the normal power adjust method after receiving ten Ranging Request messages with power adjustments below the threshold value.

For example, the **cable upstream power-adjust noise 30** command instructs the CMTS that when 30 percent (3 out of the last 10) of the Ranging Responses for a particular CM resulted in a power adjustment beyond the threshold level, the CMTS begins using power averaging for that CM to adjust its power level.

Tip The **cable upstream power-adjust noise** command is typically not needed during normal operations, but it can help in certain situations where the cable plant is experiencing ingress noise and other interference that is forcing many CMs to frequently re-range. If the **show cable flap-list** and **show cable modem** commands show a large number of CMs with asterisks (*), experiment with the **noise** option, so that the CMTS will average its CM power readings before sending any power adjustments to the CMs.



Note When a CM is in power averaging mode, the **show cable flap-list** and **show cable modem** commands shows an asterisk (*) for that particular CM.

Examples

The following example shows the commands needed so that the CMTS will begin using the power averaging adjustment method when 50 percent of Ranging Requests result in a power adjustment beyond the threshold level of 2 dB:

```
Router(config)# interface c6/0
Router(config-if)# cable upstream 0 power-adjust threshold 2
Router(config-if)# cable upstream 0 power-adjust noise 50
Router(config-if)#
```

Related Commands

Command	Description
cable upstream frequency	Configures a fixed frequency of the upstream RF carrier for an upstream port.
cable upstream power-level	Sets the input power level for the upstream radio frequency (RF) carrier.
show cable flap-list	Displays a list of CMs that have exceeded the threshold number of power adjustments.
show cable modem	Displays CM configuration settings.

cable upstream power-level

To set the input power level for the upstream radio frequency (RF) carrier in decibels per millivolt (dBmV), use the **cable upstream power-level** command in cable interface configuration mode. To restore the default value for this command, use the **no** form of this command.

cable upstream *n* **power-level** *dbmv*
no cable upstream *n* **power-level** *dbmv*

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
dbmv	Decibels per millivolt designating the upstream signal input power level. Valid range is –16 dBmV to +26 dBmV, depending on the cable interface and the upstream's symbol rate (channel width).

Command Default

0 dBmV

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.2(15)BC1	The allowable range of power levels was changed so that it depends on the upstream's channel width.
IOS-XE 3.15.0S	This command was replaced by the **us-channel power-level** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS controls the output power levels of the CMs to meet the desired upstream input power level. The nominal input power level for the upstream RF carrier is specified in decibels per millivolt (dBmV). The default setting of 0 dBmV is the optimal setting for the upstream power level.

The valid range for the input power level depends on the data rate, as expressed as the symbol rate and channel width. The table below shows the valid power levels for each allowable rate, as given in the DOCSIS specification. Higher (more positive) values cause the CMs to increase their transmit power, achieving a greater carrier-to-noise ratio (CNR).

Table 22: Allowable DOCSIS Power Levels

Symbol Rate (Symbols per second)	Channel Width (Hz)	Allowable Power Range (dBmV)
160,000	200,000	–16 to +14
320,000	400,000	–13 to +17
640,000	800,000	–10 to +20
1,280,000	1,600,000	–7 to +23

Symbol Rate (Symbols per second)	Channel Width (Hz)	Allowable Power Range (dBmV)
2,560,000	3,200,000	–4 to +26
5,120,000[9]	6,400,000	–1 to +29 (max. valid value for DOCSIS is +26)

[9] The 5.12 MSymbols/sec symbol rate and 6.4 MHz channel width are supported only on upstreams that are configured for DOCSIS 2.0 A-TDMA-only operation.



Note Some cable interfaces might allow smaller ranges of either –10 to +10 or –10 to +25 dBmV.



Tip You can use inline attenuators to force CMs to transmit at higher power levels and to achieve a higher CNR value on the network.



Caution If you increase the input power level or add inline attenuators before the CMTS, the CMs on your HFC network increase their transmit power level. Be careful if you adjust this parameter. You might violate the upstream return laser design parameters or exceed the CM's maximum transmit power level.



Note Do not adjust your input power level by more than 5 dB in a 30-second interval. If you increase the power level by more than 5 dB within 30 seconds, you will disrupt CM service on your network. If you decrease the power level by more than 5 dB within 30 seconds, the CMs on your network will be forced to re-range.



Tip When setting upstream power levels, Cisco recommends that the adjacent channels of equal bandwidth not have a large variation. The recommended maximum input power variance is 5 to 6 dB.

Examples

The following example shows how to set the input power level for upstream port 0 to -5 dBmV:

```
Router(config)# interface cable 5/1/0
Router(config-if)# cable upstream 0 power-level -5
Router(config-if)#
```

Related Commands

Command	Description
cable upstream fec	Enables the upstream FEC.
cable upstream frequency	Enters a fixed frequency of the upstream RF carrier for an upstream port.
cable upstream power-adjust	Controls how the CMTS adjusts the CM power level so that the CMs reach the target transmit power setting.

Command	Description
cable upstream shutdown	Disables the upstream port.

To set the input power level for the upstream channel in decibels per millivolt (dBmV), use the **cable upstream power-level** command in cable interface configuration mode. The value in dBmV reflects the upstream RF set point's (the entry point the RF signal enter CMTS) power level. It is recommended to use the default value, zero (0) dBmV. To restore the default value for this command, use the **no** form of this command.



Note If an upstream controller contains both OFDMA and SC-QAM channels, the upstream channel's power level setting difference between OFDMA and SC-QAM should be within the following ranges, to avoid unexpected behavior:

- For 6.4 MHz, the difference should not be larger than 10 dB.
- For 3.2 MHz, the difference should not be larger than 7 dB.
- For 1.6 MHz, the difference should not be larger than 4 dB.

The above power setting guideline applies to iCMTS, Node RPD, 6x12 shelf RPD, and HA-Shelf RPD.

cable upstream priority

To specify the relative priority of an upstream channel, use the **cable upstream priority** command in cable interface configuration mode. To set the default value, use the **no** form of this command.

cable upstream *n* **priority** *value*
no cable upstream *n* **priority**

Syntax Description

n	Specifies the upstream channel. Valid values start with 0 for the first upstream channel on the cable interface line card.
value	Specifies the priority. Valid values are from lowest priority 0 to highest priority 7, with a default value of 0.

Command Default

0.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1w	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example sets the priority to 1 on upstream channel 0:

```
Router(config)# interface cable 3/0/1
Router(config-if)# cable upstream 0 priority 1
Router(config-if)#
```

cable upstream qos wfq

To configure weighted fair queuing (WFQ) parameters for optimum bandwidth utilization for upstream service flows on a cable interface, use the **cable upstream qos wfq** command in cable interface configuration mode. To disable this configuration, use the **no** form of this command.

cable upstream qos wfq {**class** | **activity** | **weights** *priority0-priority7*}
no cable upstream qos wfq {**class** | **activity** | **weights** *priority0-priority7*}

Syntax Description

class	Enables class-based weighted fair queuing.
activity	Enables activity-based weighted fair queuing.
weights *priority0-priority7*	Specifies custom weight values for all the eight service flow priorities in a service class. By default, the weight of a priority is equal to "priority+1." For example, priority 0 has a weight of 1 and priority 1 has a weight of 2. You must specify custom weight values for all the eight service flow priorities (0 to 7) when you modify the default weights of priorities. The valid range is from 1 to 255.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCD2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure WFQ parameters on a cable interface in slot 7, subslot 1, and port 0 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 7/1/0
Router(config-if)# cable upstream qos wfq class
Router(config-if)# cable upstream qos wfq activity
Router(config-if)# cable upstream qos wfq weights 10 20 30 40 50 60 70 80
```

The following example shows how to configure WFQ parameters on a cable interface in slot 3, subslot 0, and port 0 on a Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# interface cable 3/0/0
Router(config-if)# cable upstream qos wfq class
Router(config-if)# cable upstream qos wfq activity
Router(config-if)# cable upstream qos wfq weights 10 20 30 40 50 60 70 80
```

Related Commands

Command	Description
show interface cable mac-scheduler	Displays the current scheduling state, statistics, and WFQ parameters configured on a cable interface.

cable upstream range-backoff

To specify automatic or configured initial ranging backoff calculation, use the **cable upstream range-backoff** command in cable interface configuration mode. To set default values, use the **no** form of this command.

cable upstream *n* **range-backoff** {**automatic** | *start* *end*}
no cable upstream *n* **range-backoff**

Cisco cBR Series Converged Broadband Routers
cable upstream *n* **range-backoff** *start* *end*
no cable upstream *n* **range-backoff**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
automatic	Specifies the fixed data backoff start and end values. **Note** The **automatic** setting is not supported on Cisco uBR-MC5X20S/U cable interface line cards, which should use manually configured ranging backoff instead.
start	Binary exponential algorithm. Sets the start value for initial ranging backoff. Valid values are from 0 to 15.
end	Binary exponential algorithm. Sets the end value for initial ranging backoff. Valid values are from 0 to 15.

Command Default

Ranging backoff is enabled with the**automatic** setting

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.1 T	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers. The **automatic** keyword was removed.

Usage Guidelines

The DOCSIS-specified method of contention resolution for CMs used to send data or requests on the upstream channel is a truncated binary exponential back-off with the initial backoff window and the maximum backoff window controlled by the CMTS. The Cisco CMTS router specifies backoff window values for both data and initial ranging and sends these values downstream as part of the Bandwidth Allocation Map (MAP) MAC message. The values are power-of-two values. For example, a value of 4 indicates a window between 0 and 15; a value of 10 indicates a window between 0 and 1023.

The **automatic** setting is optimized for a maximum of 250 CMs per upstream port. Set manual values for data backoff windows only when operating with more than 250 CMs per upstream port. (The **automatic** setting

is not supported on Cisco uBR-MC5X20S/U cable interface line cards, which should use manually configured ranging backoff instead.)



Tip Use the **show controllers cable upstream** command to display the current Ranging Backoff settings.

Examples

The following example shows how to set the range backoff to **automatic** for upstream port 2 on a Cisco uBR10012 router:

```
Router(config)# interface cable 4/0
Router(config-if)# cable upstream 2 range-backoff automatic
Router(config-if)#
```

The following example shows how to set the range backoff for upstream port 2 on a Cisco cBR-8 router:

```
Router(config)# interface cable 3/0/1
Router(config-if)# cable upstream 2 range-backoff 0 10
Router(config-if)#
```

Related Commands

Command	Description
cable insertion-interval	Configures the interval between consecutive initial ranging slots on an upstream.
cable upstream data-backoff	Specifies automatic or fixed start and stop values for data backoff.

cable upstream ranging-init-technique

To configure the initial ranging technique for the modem in the Multiple Transmit Channel (MTC) mode, use the **cable upstream ranging-init-technique** command in interface configuration mode. To disable the ranging initialization technique, use the **no** form of this command.

cable upstream ranging-init-technique *1-4*
no cable upstream ranging-init-technique

Syntax Description

1-4	Type of ranging. • 1—broadcast • 2—unicast • 3—broadcast or unicast • 4—direct use

Command Default

The default option is 1—broadcast

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The ranging initialization technique is used when the modem transitions from a single channel to the multiple transit channel mode (MTC-mode), for the initial ranging on the newly added channels during registration.

Use the default value of 1 for initial ranging.

Examples

The following example shows how to configure the initial ranging for the modem in the MTC-mode:

```
Router# configure terminal
Router(config)# interface cable 7/0/1
Router(config-if)# cable upstream ranging-init-technique 1
```

Related Commands

Command	Description
cable mtc-mode	Enables the MTC-mode for a MAC interface.
interface cable	Specifies a cable interface.

cable upstream ranging-poll

To change the default ranging poll interval (20 seconds) on upstream channels, use the **cable upstream ranging-poll** command in cable interface configuration mode. To disable this configuration, use the **no** form of this command.

cable upstream ranging-poll [**interval** *value* | **t4-multiplier** *timeout-value*]
no cable upstream ranging-poll [**interval** *value* | **t4-multiplier** *timeout-value*]

Syntax Description

interval *value*	(Optional) Specifies the ranging poll interval in milliseconds. Valid values are from 20000 to 30000. The default value is 20000.
t4-multiplier *timeout-value*	(Optional) Specifies T4 timeout multiplier value for the cable modems that are in the MTC mode. The valid range is from 1 to 10.

Command Default

None

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

T4 multiplier is the T4 timeout multiplier value for cable modems that are in the MTC mode. The default value is derived from the number of channels in the modem transmit channel set. You can change the default T4 multiplier value using the **cable upstream ranging-poll** command in cable interface configuration mode. For example, DOCSIS 2.0 defines T4 timeout for the modem at 30 seconds. If the T4 multiplier value is equal to one, the cable modem will T4 time out in every 30 seconds. If you change the T4 multiplier to four, then the new T4 timeout value will be 120 seconds (4 x 30 = 120).

In the MTC mode, you can increase the T4 timeout value in order to reduce the router overhead associated with processing of ranging request (RNG-REQ) slots and ranging response (RNG-RSP) messages. If an RNG-RSP message does not contain a T4 timeout multiplier value, then the cable modem uses the default T4 timeout value.



Note We recommend that you do not modify the default ranging poll interval unless required. With the default configuration, a DOCSIS 2.0 cable modem in non-MTC mode performs ranging on one upstream channel every 20 seconds.

Examples

The following example shows how to change the default ranging poll interval and the T4 timeout multiplier value on a cable interface line card:

```
Router# configure terminal
Router(config)# interface cable 7/1/0
Router(config-if)# cable upstream ranging-poll interval 24000 t4-multiplier 4
```

Related Commands

Command	Description
cable mtc-mode	Enables the Multiple Transmit Channel mode (MTC) for a MAC interface.

cable upstream rate-adapt (global)

To globally enable upstream utilization optimization on all cable modem upstream flows, use the **cable upstream rate-adapt** command in global configuration mode. To disable global upstream utilization optimization, use the **no** form of this command.

cable upstream rate-adapt [**local** | **priority** *value* | **rate** *number*]
no cable upstream rate-adapt [**local** | **priority** *value* | **rate** *number*]

Syntax Description

local	(Optional) Specifies upstream utilization optimization is enabled on a specific upstream.
priority *value*	(Optional) Specifies upstream utilization optimization is enabled if an upstream flow meets or exceeds a defined priority. The valid range is 0–7.
rate *number*	(Optional) Specifies upstream utilization optimization is enabled if an upstream flow meets or exceeds the set minimum max-rate of the flow. The valid range is 0–30000000.

Command Default

Upstream utilization optimization is globally disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If upstream utilization optimization is globally enabled, activated service flows are configured for upstream utilization optimization. The command also turns on local upstream utilization optimization so specific local upstreams can be configured to be rate-adapt enabled. Using the **priority** or **rate** option allows you to restrict upstream utilization optimization to service flows that meet or exceed specified levels for priority or rate.

Examples

The following example enables upstream utilization optimization globally on all upstream flows.

```
Router(config)# cable upstream rate-adapt
```

Related Commands

Command	Description
cable upstream rate-adapt (interface)	Enables and configures upstream utilization optimization locally.
show cable rate-adapt	Displays the global and local upstream utilization optimization configuration parameters.

cable upstream rate-adapt (interface)

To enable and configure upstream utilization optimization locally, use the **cable upstream rate-adapt** command in cable interface configuration mode. To disable upstream utilization optimization on the specified upstream flow, use the **no** form of this command.

cable upstream *port* **rate-adapt** [**bcs** *slots* | **duration** *millisecs* | **fcms-off** | **priority** *value* | **rate** *number*]
no cable upstream *port* **rate-adapt** [**bcs** *slots* | **duration** *millisecs* | **fcms-off** | **priority** *value* | **rate** *number*]

Syntax Description

port	Identifies the specific upstream flow to be optimized and configured.
bcs *slots*	(Optional) Specifies the number of broadcast contention minislots (BCS). MAPs that have gaps are filled with BCS. You can override the default of 10 with a larger or smaller number using the **bcs** option. The valid range is 0–80. The default is 10 BCS.
duration *millisecs*	(Optional) Specifies the length of time, in milliseconds, that a flow rate-adapts. This keyword overrides the default duration. The default is 1. The valid range is 0–2000.
fcms-off	(Optional) Disables the forced broadcast contention minislot at the end of a filled MAP.
priority *value*	(Optional) Specifies the minimum priority required to enable rate-adapt on a flow. This keyword overrides any globally configured rate-adapt priority. The valid range is 0–7.
rate *number*	(Optional) Specifies the minimum max-rate required to enable rate-adapt on a flow. This keyword overrides any globally configured rate-adapt rate. The valid range is 0–30000000.

Command Default

Upstream utilization optimization is not enabled on a local upstream.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If eligible, local upstream flows can utilize upstream utilization optimization.

Examples

The following example enables and configures rate-adapt on upstream 0 with a priority of 6 and a rate of 200.

```
Router(config-if)# cable upstream 0 rate-adapt priority 6 rate 200
```

Related Commands

Command	Description
cable upstream rate-adapt (global)	Enables upstream utilization optimization globally on all cable modem upstream flows.
show cable rate-adapt	Displays the global and local upstream utilization optimization configuration parameters.

cable upstream rate-limit

To set DOCSIS rate limiting for an upstream port on a cable interface line card, use the **cable upstream rate-limit** command in cable interface configuration mode. To disable DOCSIS rate limiting for the upstream port, use the **no** form of this command.

cable upstream *n* **rate-limit** [**token-bucket** [**shaping**]]
no cable upstream *n* **rate-limit**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
token-bucket shaping	(Optional) Enables rate limiting for the specified upstream cable interface using the token-bucket policing algorithm. The **shaping** option enables token-bucket shaping. **Note** For Cisco cBR Series Converged Broadband Routers, rate limiting is always enabled.

Command Default

Token-bucket algorithm with traffic shaping

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
11.3(6)NA	This command was introduced for the Cisco uBR7246VXR universal broadband routers.
11.3(9)NA	The **shaping** keyword was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Upstream rate limiting allows upstream bandwidth requests from rate-exceeding CMs to be buffered without incurring TCP-related timeouts and retransmits. This enables the Cisco CMTS to enforce the peak upstream rate for each CM without degrading overall TCP performance for the subscriber CPE devices. Upstream grant shaping is per cable modem (SID).

When the **token-bucket** algorithm is configured, the Cisco CMTS automatically drops packets in violation of allowable upstream bandwidth.

Use of the default value (the upstream port's rate limit) enforces strict DOCSIS-compliant rate limiting. Cisco highly recommends to using the default setting of **token-bucket** with the **shaping** option.

This command is specific to the uBR7225VXR routers only.

Examples

The following example shows how to configure the token bucket filter algorithm with traffic shaping on upstream port 4:

```
Router(config-if)# cable upstream 4 rate-limit token-bucket shaping
```

Related Commands

Command	Description
cable downstream rate-limit	Enables DOCSIS rate limiting on downstream traffic.

cable upstream rate-limit-bwreq exempted-priority

To configure the service flow priority of the bandwidth requests that should be exempted from being throttled by the upstream (US) bandwidth request rate limiting (BRRL) feature, use the **cable upstream rate-limit-bwreq exempted-priority** command in global configuration mode. To reset the exempted priority to the default value, use the **no** form of this command.

cable upstream rate-limit-bwreq exempted-priority *priority*
no cable upstream rate-limit-bwreq

Syntax Description

priority	Service flow priority. Bandwidth requests with this service flow priority value (and above) are exempted from being throttled by the BRRL feature. For example, if the priority value is set to 3, then bandwidth requests with priority 3, 4, 5, 6, and 7 are exempted. The valid range is from 0 to 7.

Command Default

All bandwidth requests are throttled by the BRRL feature.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The upstream BRRL feature throttles incoming bandwidth requests in order to control CPU consumption by the US scheduler.

The **cable upstream rate-limit-bwreq exempted-priority** command enables you to configure an exempted priority. Any best effort(BE) service flow bandwidth requests received with this configured priority or above, is exempted from BRRL and is therefore not dropped even if high CPU consumption by the US scheduler is observed. For example, if the configured exempted priority is 4, any bandwidth request with priority 4, 5, 6, or 7 is not dropped even if high CPU consumption is observed.

Exempted service flow priority is a platform level configuration and is applicable to all line cards. If the exempted priority is set to value zero, all the BE bandwidth requests are exempted from being throttled by the BRRL feature.

Examples

The following example shows how to configure a BRRL exempted service flow priority to value 5:

```
Router# configure terminal
Router(config)# cable upstream rate-limit-bwreq exempted-priority 5
```

cable upstream rate-limit-ccf

To configure rate limiting parameters for upstream bonded service flows on a Cisco uBR10-MC5X20H cable interface line card, use the **cable upstream rate-limit-ccf** command in global configuration mode. To disable this configuration, use the **no** form of this command.

cable upstream rate-limit-ccf [**aggregated-burst** *value* | **aggregated-throughput** *value* | **cpu-burst** *value* | **cpu-threshold** *value*]
no cable upstream rate-limit-ccf [**aggregated-burst** *value* | **aggregated-throughput** *value* | **cpu-burst** *value* | **cpu-threshold** *value*]

Syntax Description

aggregated-burst *value*	(Optional) Specifies the burst rate for aggregated throughput-based rate limiting in bits. The valid range is from 0 to 250000000. The default value is 8000000.
aggregated-throughput *value*	(Optional) Specifies the throughput value for throughput-based rate limiting in bits per second (bps). The valid range is from 0 to 540000000. The default value is 115000000.
cpu-burst *value*	(Optional) Specifies the CPU burst for Continuous Concatenation and Fragmentation (CCF) in percentage. The valid range is from 0 to 100. The default value is 10.
cpu-threshold *value*	(Optional) Specifies the CPU threshold for CCF in percentage. The valid range is from 0 to 100. The default value is 50.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure rate limiting parameters for upstream bonded service flows on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# cable upstream rate-limit-ccf
Router(config)# cable upstream rate-limit-ccf aggregated-burst 25000
Router(config)# cable upstream rate-limit-ccf aggregated-throughput 540000
Router(config)# cable upstream rate-limit-ccf cpu-burst 30
Router(config)# cable upstream rate-limit-ccf cpu-threshold 60
```

Related Commands

Command	Description
show cable rate-limit-ccf	Displays information about rate limiting criteria configured on a Cisco uBR10-MC5X20H cable interface line card.

Upstream Channel Bondingcable upstream resiliency

To configure cable upstream resiliency on a cable interface line card, use the **cable upstream resiliency** command in cable interface configuration mode. To disable the configuration, use the **no** form of this command.

cable upstream resiliency {**channel-down-detect** *number* | **data-burst snr** *number* **ufec** *number* **cfec** *number* **hysteresis** *number* | **modem-offline-detect** *number* | **on-failure** {**disable-channel** | **extended-ranging** | **reset-modem**} | **sf-move** {**NRTPS** | **RTPS** | **UGS** | **UGS-AD**}}
no cable upstream resiliency {**channel-down-detect** *number* | **data-burst snr** *number* **ufec** *number* **cfec** *number* **hysteresis** *number* | **modem-offline-detect** *number* | **on-failure** {**disable-channel** | **extended-ranging** | **reset-modem**} | **sf-move** {**NRTPS** | **RTPS** | **UGS** | **UGS-AD**}}

To configure data-burst resiliency polling interval, use the **cable upstream resiliency data-burst polling-interval** command in global configuration mode. To disable the configuration, use the **no** form of this command.

cable upstream resiliency data-burst polling-interval *number*
no cable upstream resiliency data-burst polling-interval *number*

Syntax Description

channel-down-detect *number*	Specifies the threshold (number of consecutive ranging misses) to determine if a channel is down. The valid values are from 8 to 64. Starting from Cisco IOS-XE 3.15.0S, the valid values are 32-128.
data-burst snr *number* **ufec** *number* **cfec** *number* **hysteresis** *number*	Specifies the upstream channel data burst resiliency. • **snr** *number*—Sets the threshold value for SNR. The valid values are from 10 to 40. • **ufec** *number*—Sets the threshold value for uncorrectable forward error correction (uFEC) error. The valid values are from 0 to 100. • **cfec** *number*—Sets the threshold value for correctable forward error correction (cFEC) error. The valid values are from 0 to 100. • **hysteresis** *number*—Sets the threshold value for hysteresis. The valid values are from 0 to 15.
modem-offline-detect *number*	Specifies the threshold (number of consecutive ranging misses) to determine if a CM is offline. The valid values are from 4 to 16.
on-failure	Allows you to specify what should be done if the channel is down and the CM is offline.
disable-channel	Allows the CMTS to mark the channel as unusable when a failure is detected.
extended-ranging	Allows the CMTS to continue ranging when a failure is detected.
reset-modem	Enforces the CM to go offline when a failure is detected.

sf-move	Moves the upstream service flows on an impaired upstream channel to another good upstream channel in the transmit channel set of the cable modem without resetting the cable modem. Starting from Cisco IOS-XE 3.15.0S, this option is extended to all service flows for single channel bonding groups, RTPS, NRTPS, UGS and UGS-AD.
NRTPS	Moves NRTPS type service flows.
RTPS	Moves Real-time Polling Service (RTPS) type service flows.
UGS	Moves Unsolicited Grant Service (UGS) type service flows.
UGS-AD	Moves UGS-AD type service flows.
polling-interval *number*	**Note** **polling-interval** keyword is for global configuration mode. Specifies the polling interval for data-burst resiliency in seconds. The valid values are from 5 to 3600.

Command Default

By default, the threshold to determine if a channel is down is not enabled, the CMTS is set to continue ranging when a failure is detected and the threshold to determine if a CM is offline is set to 8.

Command Modes

Interface configuration (config-if) and Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
12.2(33)SCG	This command was modified. The **sf-move RTPS** keyword was added.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.
IOS-XE 3.18.0S	This command was modified for the Cisco cBR Series Converged Broadband Routers. The **data-burst snr** *number* **ufec** *number* **cfec** *number* **hysteresis** *number* keyword was added for interface configuration mode and **data-burst polling-interval** *number* keyword was added for global configuration mode.

Usage Guidelines

The **cable upstream resiliency** command is used to configure the Upstream Channel Bonding feature.

Examples

The following example shows how to configure upstream resiliency with different keywords on a cable interface in slot 5, subslot 1, and port 0 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 5/1/0
Router(config-if)# cable upstream resiliency channel-down-detect 30
Router(config-if)# cable upstream resiliency modem-offline-detect 16
Router(config-if)# cable upstream resiliency on-failure disable-channel
Router(config-if)# cable upstream resiliency sf-move NRTPS
```

```
Router(config-if)# cable upstream resiliency sf-move RTPS
Router(config-if)# cable upstream resiliency sf-move UGS
Router(config-if)# cable upstream resiliency sf-move UGS-AD
```

The following example shows how to configure RTPS type service flow move on a cable interface in slot 7, subslot 0, and port 0 in Cisco IOS Release 12.2(33)SCG:

```
Router#show run all | i sf-move
 no cable upstream resiliency sf-move RTPS

Router#configure terminal
Router(config)#interface cable 7/0/0
Router(config-if)#cable upstream resiliency sf-move RTPS
Router(config-if)#end
Router#
Router#show run interface cable 7/0/0 | i sf-move
 cable upstream resiliency sf-move RTPS
```

The following example shows how to configure the upstream channel data burst resiliency:

```
Router#configure terminal
Router(config)#interface cable 0/0/1
Router(config-if)#cable upstream resiliency data-burst snr 24 ufec 1 cfec 0 hysteresis 3
Router(config-if)#end
```

The following example shows how to set a global time interval to loop all the upstream bonding modems:

```
Router#configure terminal
Router(config)#cable upstream resiliency data-burst polling-interval 60
Router(config)#end
```

Related Commands

Command	Description
interface cable	Configures cable interface.

cable upstream resiliency recover

To automatically recover the cable modem after it is downgraded to upstream partial mode, use the **cable upstream resiliency recover** command in global configuration mode. This feature is enabled by default.

cable upstream resiliency recover delay *seconds* **retry** *times*

Syntax Description

delay *seconds*	Specifies the time in seconds that the CMTS waits before recovering the upstream partial service cable modem.
retry *times*	Specifies the times that the CMTS tries to recover the upstream partial service cable modem. Note that sometimes the CMTS fails to recover the partial service cable modem after the specified times. The retry times is recounted after the cable modem is back to partial service mode again from the full service mode. You can set the retry times to 0 to disable this feature.

Command Default

By default, the delay time is 900 seconds and retry 3 times.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1x	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the upstream resiliency recover:

```
Router#configure terminal
Router(config)#cable upstream resiliency recover 800 retry 3
```

cable upstream rf-adapt (logical channel)

To specify the primary upstream logical channel and the secondary upstream logical channel, use the **cable upstream** *port logical-channel-index* **rf-adapt** [**primary** | **secondary**] command in cable interface configuration mode. To reset to the default settings, use the **no** form of this command.

cable upstream *port logical-channel-index* **rf-adapt** [**primary** | **secondary**]
no cable upstream *port logical-channel-index* **rf-adapt** [**primary** | **secondary**]

Syntax Description

port	Upstream port number. The valid values start with 0 for the first upstream port on the cable interface line card and ends with a value that depends on the number of upstream ports supported by the cable interface line card..
logical-channel-index	Logical channel index. The valid values are 0 or 1.
primary	(Optional) Assigns the logical channel as primary for RF adaptation. By default, logical channel 0 is set as primary.
secondary	(Optional) Assigns the logical channel as secondary for RF adaptation. By default, logical channel 1 is set as secondary.

Command Default

Uses the default configuration. Logical channel 0 is primary and logical channel 1 is secondary.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

It is recommended that logical channel 0 is set as primary, and logical channel 1 is set as secondary.

Examples

The following example shows how to configure primary and secondary logical channels:

```
Router> enable
Router# configure terminal
Router(config)# interface cable 8/0/0
Router(config-if)# cable upstream 0 max-logical-chans 2
Router(config-if)# cable upstream 0 rf-adapt
Router(config-if)# cable upstream 0 1 rf-adapt primary
Router(config-if)# cable upstream 0 0 rf-adapt secondary
```

Related Commands

Command	Description
cable rf-adapt timer	Configures timers for RF adaptation.
cable upstream rf-adapt	Enables RF adaptation on the physical upstream channel.

Command	Description
cable upstream threshold	Configures the upstream for the signal-to-noise ratio (SNR) and forward error correction (FEC) threshold values to be used in determining the allowable noise levels.
cable upstream threshold hysteresis	Configures the hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds.
cable upstream threshold rf-adapt	Configures the upstream RF adaptation threshold value, which prevents excessive relocation of modems from the primary upstream channel to the secondary upstream channel.
show cable modem rf-adapt	Displays the RF adaptation history.
show cable rf-adapt	Displays the downgrade and upgrade candidate lists.

cable upstream rf-adapt

To enable RF adaptation on the physical upstream channel, use the **cable upstream rf-adapt** command in cable interface configuration mode. To disable the RF adaptation, use the **no** form of this command.

cable upstream *port* **rf-adapt**
no cable upstream *port* **rf-adapt**

Syntax Description

port	Upstream port number. The valid values start with 0 for the first upstream port on the cable interface line card and ends with a value that depends on the number of upstream ports supported by the cable interface line card.

Command Default

By default, RF adaptation is disabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream** *port* **rf-adapt** command is available only when the maximum number of logical channels configured using the **cable upstream max-logical-chans** command is greater than 1.

Examples

The following example shows how to enable RF adaptation on cable interface 8/0/0:

```
Router(config)# interface cable 8/0/0
Router(config-if)# cable upstream 0 max-logical-chans 2
Router(config-if)# cable upstream 0 rf-adapt
```

Related Commands

Command	Description
cable rf-adapt timer	Configures timers for RF adaptation.
cable upstream rf-adapt (logical channel)	Configures the primary upstream logical channel and secondary upstream logical channel.
cable upstream threshold	Configures the upstream for the signal-to-noise ratio (SNR) and forward error correction (FEC) threshold values to be used in determining the allowable noise levels.
cable upstream threshold hysteresis	Configures the hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds.

Command	Description
cable upstream threshold rf-adapt	Configures the upstream RF adaptation threshold value, which prevents excessive relocation of modems from the primary upstream channel to the secondary upstream channel.
show cable modem rf-adapt	Displays the RF adaptation history.
show cable rf-adapt	Displays the downgrade and upgrade candidate lists.

cable upstream rng-holdoff

To hold off a cable modem from initial ranging (init rl) on a logical upstream channel on the CMTS router, use the **cable upstream rng-holdoff** command in cable interface configuration mode. To disable the ranging hold-off, use the **no** form of this command.

cable upstream *port-number* **rng-holdoff** *priority*
no cable upstream *port-number* **rng-holdoff** *priority*

Syntax Description

port-number	Cable upstream port number. The valid range depends on the number of upstream channels configured in a MAC domain. For example, if the total number of upstream channels configured is 4, then the valid range for the upstream port number is from 0 to 3.
rng-holdoff*priority*	Specifies the ranging hold-off priority value in the hexadecimal format. The valid range is from 0 to ffffffff. The default value is 0.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream rng-holdoff** command is associated with the CM Steering on the Cisco CMTS Routers feature.

An upstream channel descriptor (UCD) message includes type, length, value (TLV) 18 and 19 for an upstream logical channel based on the channel class ID and ranging hold-off priority configuration. If a ranging hold-off priority value is not configured, the value of TLV 18 becomes zero. If an upstream channel class ID is configured and a ranging hold-off priority value is not configured, the UCD message includes TLV 18 and 19, and the value of TLV 18 becomes zero.

Examples

The following example shows how to specify a ranging hold-off priority value for a logical upstream channel on a cable interface line card on the cisco uBR10012 router:

```
Router# config terminal
Router(config)# interface cable 5/0/0
Router(config-if)# cable upstream 0 rng-holdoff ff
```

Related Commands

Command	Description
cable load-balance exclude	Excludes a cable modem or a group of cable modems from DOCSIS load balance.

Command	Description
cable upstream chan-class-id	Configures a channel class ID for a logical upstream channel on the CMTS router.
show cable modem verbose	Displays information about the registered and unregistered cable modems connected to the CMTS router.

cable upstream scheduling type

To enable various scheduler modes, use the **cable upstream scheduling type** command in interface configuration mode (cable interface only). The no form of this command reverts the scheduler to the default 'docsis' style scheduling mode.

cable upstream *n* **scheduling type** [**ugs** | **rtps** | **nrtps**] **mode** [**llq** | **docsis**]
no cable upstream *n* **scheduling type** [**ugs** | **rtps** | **nrtps**] **mode** [**llq** | **docsis**]

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 15.
ugs	(Optional) Selects scheduling for UGS.
rtps	(Optional) Selects scheduling for rtPS.
nrtps	(Optional) Selects scheduling for nrtPS.
mode	Enables the selection of packet-based Low Level Queueing (LLQ) or TDM-based DOCSIS scheduling.
llq	(Optional) Selects LLQ scheduling.
docsis	(Optional) Selects DOCSIS scheduling.

Command Default

The only default is **docsis**.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.3(13(BC)	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Any combination of **ugs, rtps, rtps, nrtps, llq,** and **docsis** is allowed.

Restrictions:

- To ensure proper operation, Call Admission Control (CAC) must be enabled. When the Low Latency Queueing (LLQ) option is enabled, it is possible for the upstream path to be filled with so many calls that it becomes unusable, making voice quality unacceptable. CAC must be used to limit the number of calls to ensure acceptable voice quality, as well as to ensure traffic other than voice traffic.
- Even if CAC is not enabled, the default (DOCSIS) scheduling mode blocks traffic after a certain number of calls.

Examples

The following example shows how to enable LLQ-type (packet-based) scheduling for UGS services on upstream port 4 on a Cisco CMTS interface:

```
Router(config-if)# cable upstream 4 scheduling type ugs mode llq
```

The following example shows how to enable standard DOCSIS (TDM-based) scheduling for rtPS services on upstream port 4 on a Cisco CMTS interface:

```
Router(config-if)# cable upstream 4 scheduling type rtps mode docsis
```

Related Commands

Command	Description
show interface cable mac-scheduler	Use this command to confirm whether LLQ scheduling is enabled.

cable upstream scrambler

To enable the cable upstream scrambler, use the **cable upstream scrambler** command in cable interface configuration mode. To restore the default configuration value for this command, use the **no** form of this command.

cable upstream *n* **scrambler**
no cable upstream *n* **scrambler**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.

Command Default

Disabled

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
11.3 XA	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command causes CMs to enable their pseudo-random scrambler circuitry to improve the robustness of the upstream receiver on the line card.

The scrambler on the upstream radio frequency (RF) carrier enables CMs on the HFC network to use built-in scrambler circuitry for upstream data transmissions. The scrambler circuitry improves reliability of the upstream receiver on the cable interface line card. The upstream scrambler is activated by default and should not be disabled under normal circumstances.



Caution Scrambler must be activated for normal operation. Deactivate only for prototype CMs that do not support scrambler.

Examples

The following example shows how to activate the upstream scrambler:

```
Router(config-if)# cable upstream 0 scrambler#
```

Related Commands

Command	Description
cable upstream fec	Enables the upstream FEC.
cable upstream frequency	Enters a fixed frequency of the upstream RF carrier for an upstream port.

Command	Description
cable upstream power-level	Sets the input power level for the upstream RF carrier in decibels per millivolt (dBmV).
cable upstream shutdown	Disables the upstream port.

cable upstream-sharing

To specify the upstream sharing scheme for all CBR-CCAP-LC-G2-R line cards in a chassis, use the **cable upstream-sharing** command in global configuration mode.

cable upstream-sharing { **128x8** | **256x4** }

Command Default

The default upstream sharing mode is **256x4**

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Gilbraltar 16.12.1w	This command was introduced.

Usage Guidelines

The **cable upstream-sharing** command allows you to choose the preferred upstream sharing mode for CBR-CCAP-LC-G2-R line cards. The **256x4** mode allows 256 scqam channels and 1:4 sharing ratio per line card. The **128x8** mode allows 128 scqam channels and 1:8 sharing ratio per line card. This command allows you to choose between a higher number of upstream channels at a smaller sharing ratio or a lower number of upstream channels ata larger sharing ratio.

Caution After toggling the mode the **cable upstream-sharing** command requires a chassis reload to take effect. If the RPD and upstream configuration doesn't match the new mode, the cBR rejects the incompatible configurations after chassis reload. We recommend you to modify the the startup config to accommodate the new mode before reloading the chassis.

Note The **cable upstream-sharing** command affects only upstream A-TDMA.

cable upstream shutdown

To disable a single upstream physical or logical channel port, use the **cable upstream shutdown** command in cable interface configuration mode. To enable the upstream port, use the **no** form of this command.

Physical Channel
cable upstream *n* **shutdown**
no cable upstream *n* **shutdown**

Logical Channel
cable upstream *n m* **shutdown**
no cable upstream *n m* **shutdown**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
m	Specifies the logical channel index of 0 or 1.

Command Default

Upstream port is enabled

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	This command was modified with the addition of logical channel index.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable upstream shutdown** command shuts down a single upstream physical or logical port without affecting any of the other upstream or downstream ports on the cable interface.



Note The **cable upstream shutdown** command exists at both physical and logical channel level with minor variations in the command syntax.

When multiple logical channels are configured, the upstream related CLIs are categorized into two groups: physical port level and logical channel level. Logical channel level commands use the format of **cable upstream** *n m* **shutdown**, *where* n denotes the physical port number, and m denotes the logical channel index number.

When multiple logical channels are configured, the **cable upstream shutdown** command at the physical level shuts down the upstream physical port and all the logical channles configured under that physical port. To shut down the entire interface, use the **shutdown** command in cable interface configuration mode.

Examples

The following example shows how to disable the upstream port for the physical channel:

```
Router(config-if)# cable upstream 0 shutdown
```

The following example shows how to disable the upstream port for the logical channel:

```
Router(config-if)# cable upstream 0 0 shutdown
```

Related Commands

Command	Description
shutdown	Shuts down (disables) an interface and all of its ports.

cable upstream spectrum-group

To assign a spectrum group to a single upstream on a cable interface line card, use the **cable upstream spectrum-group** command in interface configuration mode. To remove a spectrum group from an upstream, use the **no** form of this command.

cable upstream *n* **spectrum-group** *group-number*
no cable upstream *n* **spectrum-group** *group-number*

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
group-number	Specifies the spectrum group for which you are specifying a parameter value or specifies the number of the spectrum group you wish to remove from your router configuration. Valid range is from 1 to 32, or from 1 to 40, depending on the Cisco IOS software release.

Command Default

No default behavior or values.

Command Modes

Interface configuration

Command History

Release	Modification
11.3 NA	This command was introduced.
12.2(15)BC2	The maximum number of spectrum groups was increased from 32 to 40 groups per router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers. This command is replaced by **us-channel spectrum-group** command.

Usage Guidelines

This command assigns a spectrum group to a single upstream on the cable interface line card. To configure the spectrum groups, use the set of **cable spectrum-group** commands in global configuration mode.

Note You can also spectrum groups to all of the upstreams on the cable interface using the **cable spectrum-group (interface configuration)** command.

Examples

The following example shows how to assign spectrum group 12 to the first upstream on the cable interface line card in slot 5/0:

```
Router(config)# interface cable 5/0
Router(config-if)# cable upstream 0 spectrum-group 12
Router(config-if)# exit
Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Configures preset modulation profiles that you can apply to one or more upstream cable interfaces when you identify and configure spectrum groups.
cable spectrum-group (global configuration)	Creates and configures a spectrum group.
cable spectrum-group (interface configuration)	Assigns a spectrum group to all of the upstreams on a cable interface line card.
cable spectrum-group hop period	Sets the minimum frequency-hop interval for a cable spectrum group.
cable spectrum-group hop threshold	Specifies a hop threshold for a cable spectrum group.
cable spectrum-group shared	Specifies the upstream ports in a spectrum group can share the same upstream frequency.
cable upstream hopping blind	Disengages the advanced spectrum management features of the Cisco uBR-MC16S and Cisco uBR-MC5X20S/U cable interface line cards by enabling blind frequency hopping behavior.

cable upstream spreading-interval

To specify the spreading interval for Synchronous Code Division Multiple Access (S-CDMA) channels on an upstream channel, use the **cable upstream spreading-interval** command in cable interface configuration mode. To set the spreading interval value to its default setting, use the **no** form of this command.

cable upstream *n* **spreading-interval** *spreading-interval*
no cable upstream *n* **spreading-interval**

Syntax Description

n	Specifies the upstream port. Valid values start with 0 for the first upstream port on the cable interface line card.
spreading-interval	Specifies the spreading interval for S-CDMA channels. Valid values range from 1 to 32, with a default value of 16.

Command Default

The spreading-interval setting cannot be applied if S-CDMA is not configured.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is applicable only for S-CDMA channels. You should configure S-CDMA to apply the spreading-interval.

Examples

The following example sets the spreading interval to 32 on the upstream port 0:

```
Router(config)# interface cable 7/0/4
Router(config-if)# cable upstream 0 spreading-interval 32
Router(config-if)#
```

Related Commands

Command	Description
cable upstream active-codes	Specifies the number of active codes that can be configured on an upstream channel.
cable upstream codes-per-minislot	Specifies the number of codes-per-minislot allowed on an upstream channel.

cable upstream threshold

To configure the upstream for the carrier-to-noise ratio (CNR) or signal-to-noise ratio (SNR) and forward error correction (FEC) threshold values to be used in determining the allowable noise levels, use the **cable upstream threshold** command in cable interface configuration mode. To return to the default values, use the **no** form of the command.

Cisco IOS Releases 12.2(8)BC2 and Earlier
cable upstream *n* **threshold cnr-profile1** *cnr-threshold1* **cnr-profile2** *cnr-threshold2* **corr-fec** *fec-corrected* **uncorr-fec** *fec-uncorrected*
no cable upstream *n* **threshold cnr-profile1** *cnr-threshold1* **cnr-profile2** *cnr-threshold2* **corr-fec** *fec-corrected* **uncorr-fec** *fec-uncorrected*

Cisco IOS Releases 12.3(23)BC, 12.2(33)SCA and Later

Physical Channel
lcable upstream *n* **threshold** {**cnr-profiles** *cnr-threshold1 cnr-threshold2* | **snr-profiles** *snr-threshold1 snr-threshold2* | **hysteresis** *hysteresis-value* | **corr-fec** *fec-corrected* | **uncorr-fec** *fec-uncorrected*}
no cable upstream *n* **threshold** {**cnr-profiles** | **snr-profiles** | **hysteresis** | **corr-fec** | **uncorr-fec**}

Logical Channel
cable upstream *n m* **threshold** {**snr-profiles** *snr-threshold1 snr-threshold2* | **corr-fec** *fec-corrected* | **uncorr-fec** *fec-uncorrected*}
no cable upstream *n m* **threshold** {**snr-profiles** | **corr-fec** | **uncorr-fec**}

Syntax Description

n	Upstream port number. The valid values range from 0 to 3.
m	Logical channel index of 0 or 1.
cnr-profiles	Specifies the CNR threshold in dB.
cnr-threshold1	CNR threshold for the primary modulation profile specified for the upstream. The valid values range from 5 to 35 dB, with a default value of 25 dB. To bypass both the primary and secondary CNR thresholds, set the first parameter (*cnr-threshold1*) to 0. This disallows the second parameter (*cnr-threshold2*), enabling you to bypass both the CNR thresholds.
cnr-threshold2	CNR threshold for the secondary modulation profile specified for the upstream. The valid values range from 5 to 35 dB, with a default value of 15 dB. The secondary threshold value must be lesser than the primary threshold. If the first parameter (*cnr-threshold1*) is set to 0, then the second parameter (*cnr-threshold2*) is not allowed.
snr-profiles	Specifies the SNR threshold in dB.

snr-threshold1	SNR threshold for the primary modulation profile specified for the upstream. This value is also used by the Cable Modem Upstream RF Adaptation feature. The valid values range from 5 to 35 dB, with a default value of 25 dB. You can bypass the primary SNR threshold (*snr-threshold1*) by setting it to 0.
snr-threshold2	SNR threshold for the secondary modulation profile specified for the upstream. The valid values range from 5 to 35 dB, with a default value of 15 dB. The secondary threshold value must be lesser than the primary threshold. Though, you can bypass the primary SNR threshold (*snr-threshold1*) by setting it to 0, you must enter the second parameter (*snr-threshold2*).
hysteresis *hysteresis-value*	Specifies the hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds. The threshold is specified in dB, with a valid range of 0 to 10 dB, and a default value of 3 dB. You can bypass the **hysteresis** threshold by setting the value to 0.
corr-fec *fec-corrected*	Specifies the allowable number of correctable FEC errors for the upstream. The *fec-corrected* parameter is given as a percentage of total packets received on the upstream during the polling period, with a valid range of 1 to 30, and a default of 3. You can bypass the **corr-fec** threshold by setting the value to 0.
uncorr-fec *fec-uncorrected*	Specifies the allowable number of uncorrectable FEC errors for the upstream. The *fec-uncorrected* parameter is given as a percentage of total packets received on the upstream during the polling period, with a valid range of 1 to 30, and a default of 1. You can bypass the **uncorr-fec** threshold by setting the value to 0.

Command Default

Uses the default values.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.1(7)CX1	This command was introduced for Cisco CMTS routers using the Cisco uBR-MC16S cable interface line card.
12.2(8)BC2	Support was added for the Cisco uBR10012 router and the Cisco uBR-LCP2-MC16S cable interface line card. Also, the ranges and defaults for the correctable and uncorrectable FEC error thresholds were changed.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.

Release	Modification
12.2(33)SCC	This command was modified with the addition of **snr-profiles**keyword option and support was added for Cisco uBR-MC5X20H cable interface line card. Also, this command is used at both physical and logical channel level with slight variations in the command syntax for the uBR10012 router.
IOS-XE 3.15.OS	This command was replaced by the **us-channel threshold** command.

Usage Guidelines

Separate CNR or SNR thresholds are assigned to the primary and secondary modulation profiles. Both profiles, however, are assigned the same correctable and uncorrectable FEC values.



Note The uncorrectable FEC error count includes packets that have header checksum errors and "no unique word detected" errors.

The **hysteresis** keyword of the **cable upstream threshold** command configures a hysteresis value to prevent upstream channels from becoming unstable and continuously changing between modulation profiles.

- The hysteresis value is used in dynamic modulation, frequency hopping, and dynamic channel-width changes.
- The hysteresis value is used in conjunction with CNR or SNR thresholds to determine channel configuration upgrade criteria for both advanced and basic spectrum management features.

The range and defaults for the correctable and uncorrectable FEC error thresholds were changed in Cisco IOS Release 12.2(8)BC2.

From Cisco IOS Release 12.2(33)SCC onwards, you can configure two logical channels on a single physical port for the uBR10012 router. When you configure logical channels, the upstream related commands are categorized into two groups: physical port level and logical channel level.

Physical Port Level

Physical port level commands use the format of **cable upstream***n,* where *n* denotes the physical port number.

Logical Channel Level

Logical channel level commands use the format of **cable upstream***n m,* where *n* denotes the physical port number, and *m* denotes the logical channel index number of 0 or 1.

The following restrictions and conditions applies to both physical and logical channel configurations:

- You can bypass both the primary and secondary CNR thresholds by setting the first parameter to 0. This disallows the second parameter, enabling you to bypass both the CNR thresholds.
- If you provide the primary CNR threshold, then you must enter the secondary CNR threshold also.
- You can bypass the primary SNR threshold by setting it to 0. However, you must enter the second parameter. This is required as each threshold is used independently in Three Step Dynamic Upstream Modulation feature.
- You can bypass the **hysteresis, corr-fec,** and **uncorr-fec** thresholds by setting their values to 0.
- For normal plant use, we recommend that the uncorrectable FEC threshold remain at its default of 1 percent to avoid an unacceptable number of errors on the channel.

Cisco IOS Releases 12.2(8)BC2 and Earlier

The following example shows upstream 5 configured with the CNR threshold for the primary modulation profile set to 20 dB, the CNR threshold for the secondary modulation profile set to 10 dB, the correctable FEC error rate set to 5 percent of total packets received on the upstream, and the uncorrectable FEC error rate set to 1 percent of total packets received on the upstream:

```
Router(config)#interface cable 3/0
Router(config-if)# cable upstream 5 threshold cnr-profile1 20 cnr-profile2 10 corr-fec 5
uncorr-fec 1
Router(config-if)#
```

Cisco IOS Releases 12.3(23)BC, 12.2(33)SCA and Later

The following example shows upstream 5 configured with the CNR threshold for the primary modulation profile set to 20 dB, the CNR threshold for the secondary modulation profile set to 10 dB, the correctable FEC error rate set to 5 percent of total packets received on the upstream, and the uncorrectable FEC error rate set to 1 percent of total packets received on the upstream:

```
Router(config)#interface cable 3/0
Router(config-if)# cable upstream 5 threshold cnr-profiles 20 10
Router(config-if)# cable upstream 5 threshold corr-fec 5
Router(config-if)# cable upstream 5 threshold uncorr-fec 1
Router(config-if)#
```

The following example shows upstream 5 configured with the SNR threshold for the primary modulation profile set to 20 dB, the SNR threshold for the secondary modulation profile set to 10 dB, the correctable FEC error rate set to 5 percent of total packets received on the upstream, and the uncorrectable FEC error rate set to 1 percent of total packets received on the upstream:

```
Router(config)# interface cable 3/0
Router(config-if)# cable upstream 5 threshold snr-profiles 20 10
Router(config-if)# cable upstream 5 threshold corr-fec 5
Router(config-if)# cable upstream 5 threshold uncorr-fec 1
Router(config-if)#
```

SNR Example on the Cisco uBR10012 Router Only

The following example shows upstream 5 and logical channel 1 configured with the SNR threshold for the primary modulation profile set to 20 dB, the SNR threshold for the secondary modulation profile set to 10 dB, the correctable FEC error rate set to 5 percent of total packets received on the upstream, and the uncorrectable FEC error rate set to 1 percent of total packets received on the upstream:

```
Router(config)#interface cable 7/0/0
Router(config-if)# cable upstream 5 1 threshold snr-profiles 20 10
Router(config-if)# cable upstream 5 1 threshold corr-fec 5
Router(config-if)# cable upstream 5 1 threshold uncorr-fec 1
Router(config-if)#
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable modulation-profile global-system	Creates a global cable modulation profile that allows to assign any number from 1 to 400 for modulation profiles, irrespective of the DOCSIS mode.
cable upstream hop-priority	Determines the order of the corrective actions to be taken when ingress noise exceeds the allowable value for an upstream.
cable upstream modulation-profile	Configures an upstream for one modulation profile (static profile) or two modulation profiles (dynamic upstream modulation).
cable upstream threshold rf-adapt	Configures the upstream RF adaptation threshold value, which prevents excessive relocation of modems from the primary upstream channel to the secondary upstream channel.
show cable hop	Displays the current hop period and threshold for an upstream, along with other statistics.
show cable modulation-profile	Displays the cable modulation profiles that have been created.

cable upstream threshold hysteresis

To configure a hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds, use the **cable upstream threshold hysteresis** command in cable interface configuration mode. To use the default hysteresis value, use the **no** form of this command.

cable upstream *n* **threshold hysteresis** *hysteresis-in-dB*
no cable upstream *n* **threshold hysteresis**

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
hysteresis-in-dB	Specifies the hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds. The valid values are from 0 to 10 dB.

Command Default

The default value of hysteresis is 3 dB.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.3(23)BC7	This command was first introduced.
IOS-XE 3.15.OS	This command was replaced by the **us-channel threshold hysteresis** command.

Usage Guidelines

The **cable upstream threshold hysteresis** command can be used to configure a hysteresis value to prevent upstream (US) channels from becoming unstable and continuously changing between modulation profiles.

- The hysteresis value is used in dynamic modulation, frequency hopping, and dynamic channel-width changes.
- The hysteresis value is used in conjunction with carrier-to-noise ratio (CNR) or signal-to-noise ratio (SNR) thresholds to determine channel configuration upgrade criteria for both advanced and basic spectrum management features.
- The hysteresis value is used for cable modem upstream RF adaptation upgrades from the secondary to the primary upstream channel.

Examples

The following example configures a hysteresis value to be used in conjunction with the SNR and CNR thresholds for dynamic modulation upgrade.

```
Router(config)#interface cable 3/0
Router(config-if)#cable upstream 0 threshold hysteresis 5
Router(config-if)#
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable upstream hop-priority	Determines the order of the corrective actions to be taken when ingress noise exceeds the allowable value for an upstream. **Note** This command is related to the cable upstream threshold hysteresis command only when using advanced dynamic modulation configuration, that is, when spectrum group is defined for the upstream channel.
cable upstream threshold	Configures the upstream for the carrier-to-noise ratio (CNR) or signal-to-noise ratio (SNR) and forward error correction (FEC) threshold values to be used in determining the allowable noise levels.
cable upstream threshold rf-adapt	Configures the upstream RF adaptation threshold value, which prevents excessive relocation of modems from the primary upstream channel to the secondary upstream channel.
show cable modulation-profile	Displays the cable modulation profiles that have been created.

cable upstream threshold rf-adapt

To configure the upstream RF adaptation threshold value, which prevents excessive relocation of modems from the primary upstream channel to the secondary, use the **cable upstream threshold rf-adapt** command in cable interface configuration mode. To use the default rf-adapt value, use the **no** form of this command.

cable upstream *port* **threshold rf-adapt** *threshold1-in-percent*
no cable upstream *port* **threshold rf-adapt**

Syntax Description

port	Upstream port number. The valid values start with 0 for the first upstream port on the cable interface line card and ends with a value that depends on the number of upstream ports supported by the cable interface line card.
threshold1-in-percent	RF adaptation threshold value in percentage. The valid range is from 1 to 50. The value 0 indicates the RF adaptation threshold is bypassed. The default value is 10 percent.

Command Default

The default value is 10 percent.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The rf-adapt threshold represents a percentage of affected modems relative to the total modem population on a given upstream channel. If the rf-adapt threshold is bypassed, then it is ignored while determining if a downgrade candidate should be relocated. The rf-adapt threshold is applied only to the physical channel and is used to prevent relocation of modems that are downgrade candidates.

The rf-adapt value is used by the upstream RF adaptation application to prevent the relocation of more than *x%* of the total modem population on that upstream channel, during PHY layer impairment.

Examples

The following example shows how to configure the rf-adapt threshold for cable modem upstream RF adaptation.

```
Router(config)# interface cable 8/0/0
Router(config-if)# cable upstream 0 threshold rf-adapt 25
```

Related Commands

Command	Description
cable rf-adapt timer	Configures timers for RF adaptation.
cable upstream rf-adapt	Enables RF adaptation on the physical upstream channel.

Command	Description
cable upstream rf-adapt (logical channel)	Configures the primary upstream logical channel and secondary upstream logical channel.
cable upstream threshold	Configures the upstream for the signal-to-noise ratio (SNR) and forward error correction (FEC) threshold values to be used in determining the allowable noise levels.
cable upstream threshold hysteresis	Configures the hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds.
show cable modem rf-adapt	Displays the RF adaptation history.
show cable rf-adapt	Displays the downgrade and upgrade candidate lists.

cable upstream timing-adjust

To enable upstream timing adjustment for a specified cable interface, use the **cable upstream timing-adjust** command in cable interface configuration mode. To return to the default values, use the **no** form of this command.

cable upstream *n* **timing-adjust** {**continue** *sec* | **threshold** *sec*}
no cable upstream *n* **timing-adjust** {**continue** *sec* | **threshold** *sec*}

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card.
continue *sec*	Sets the minimum timing adjustment that sets **continue** ranging status in seconds. The range for *sec* is 2 to 64 seconds. Default value is 2 seconds.
threshold *sec*	Sets the timing adjustment threshold in seconds. Valid threshold value is 1 to 32 seconds. Default is 1 second.

Command Default

2 seconds for **continue** and 1 second for **threshold**

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0(12)SC	This command was supported on the 12.0 SC release.
12.1(3)T	This command was supported on the 12.1 T release.
12.1(3a)EC	This command was removed and no longer supported on the 12.1 EC and later releases (including those releases, such as 12.1 CX, that are based on the 12.1 EC train).
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To verify whether or not upstream timing adjustment is configured and activated, enter the **show running-config** command and look for the cable interface configuration information. If upstream timing adjustment is enabled, either or both of the **continue** and **threshold** timing adjustment entries are displayed in the **show running-config** output. If both the **continue** and **threshold** upstream timing adjustments are disabled, no timing adjustment entry is displayed in the **show running-config** output.

If you are having trouble, make sure that the cable connections are not loose or disconnected; the cable interface line card is firmly seated in its chassis slot; the captive installation screws are tight; and you have entered the correct slot and port numbers.



Note The **cable timing-adjust** command is applicable only on Cisco IOS Release 12.0(12)SC and Cisco IOS Release 12.1(3)T. It is deprecated and removed on Cisco IOS Release 12.1(3a)EC, 12.1(4)CX, and later releases.

Examples

The following example shows how to set the upstream time adjustment ranging value to 5 seconds:

```
CMTS01(config-if)# cable upstream 0 time-adjust continue 5
```

The following example shows how to set the threshold value to the default of 12 seconds:

```
CMTS01(config-if)# cable upstream 0 time-adjust threshold 12
```

cable upstream unfrag-slot-jitter

To control how much jitter can be tolerated on the corresponding upstream due to unfragmentable slots, use the **cable upstream unfrag-slot-jitter** command in cable interface configuration mode. To disallow all jitter, use the **no** form of this command.

cable upstream *n* **unfrag-slot-jitter** [**limit** *jitter* | **cac-enforce**]
no cable upstream *n* **unfrag-slot-jitter** [**limit** *jitter* | **cac-enforce**]

Syntax Description

n	Specifies the upstream port number. Valid values start with 0 for the first upstream port on the cable interface line card. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 15.
limit *jitter*	Specifies the allowable jitter limit caused by unfragmentable slots, in microseconds (0 to 4,294,967,295).
cac-enforce	Rejects service flows requesting jitter less than the fragmentable slot jitter.

Command Default

By default, the limit is 0 microseconds and the **cac-enforce** option is enabled.

Command Modes

Interface configuration—cable interface only (config-if)

MAC domain profile configuration (config-profile-md)

Command History

Release	Modification
12.1(4)CX	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command controls how much jitter due to unfragmented slots is to be tolerated on each port. If the specified value for the tolerated limit is less than the size of a maximum unfragmentable slot, the MAC scheduler automatically blocks the slots in the scheduling table so that the unfragmentable slot can be accommodated in the blocked space and avoid causing excessive jitter to CBR slots.

The **cac-enforce** option enforces the rule that service flows requesting run-time jitter less than unfragmentable slot jitter should be rejected.

Examples

The following example shows the jitter being set to 10 milliseconds (10,000 microseconds) for upstream port 0 on cable interface 2/0:

```
Router# configure terminal
Router(config)# interface c2/0
Router(config-if)# cable upstream 0 unfrag-slot-jitter limit 10000
Router(config-if)#
```

cable util-interval

To set the load and utilization interval of upstream and downstream physical channels, use the **cable util-interval** command in global configuration mode. To remove the utilization interval, use the **no** form of this command.

cable util-interval *interval*
no cable util-interval *interval*

Syntax Description

interval	Utilization interval for the upstream and downstream channels. The valid range is 1–86400 seconds. **Note** In Cisco IOS XE Dublin 17.12.1y and later, • The maximum supported value is 2000 seconds. If you configure a value greater than 2000 seconds, it is still considered as 2000 seconds. This is because the maximum supported value for the utilization interval of **downstream** channels is 2000. (Maximum supported value for the utilization interval for **upstream** channels remains to be 86400 seconds). • The **docsIf31CmtsDsOfdmChanUtilization** and **docsIfCmtsChannelUtUtilization** MIBs refresh rate is 30 seconds. If the interval value is less than 30 seconds, then the **docsIfCmtsChannelUtUtilization** MIB value is updated as per the configured **cable util interval**. For example if **cable util interval** is configured as 10 seconds, then the MIB is updated every 10 seconds.

Command Default

The utilization interval is not set by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Gibraltar 16.10.1c	The behavior of this command was updated on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Dublin 17.12.1y	The behavior of this command is updated on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Table 23: Release Wise Usage Guidelines

Release	Release Wise Usage Guidelines
IOS-XE 3.15.0S	The **cable util-interval** command configures the same value as the **docsIfCmtsChannelUtilizationInterval** and **ccwbRFChanUtilInterval** objects. The *interval* is used to determine the number of samples that are used to calculate a running average value of utilization. The samples are collected every 10 seconds and a maximum of 30 samples can be stored. It means that when the *interval* is set to 300, utilization is calculated using the last 30 samples. The unit of *interval* is seconds and it is not recommended to set a smaller value as it may cause frequent utilization calculation that will consume more resources on both, the PRE or SUP and cable line card. A value between 60–300 seconds or greater is recommended. **Note** You must set the utilization interval value for the **docsIfCmtsChannelUtilizationInterval** object.
Cisco IOS XE Gibraltar 16.10.1c	In Cisco IOS XE Gibraltar 16.10.1c release, this command does not have effect on OFDM channel utilization from **docsIfCmtsChannelUtilizationInterval** object, use **ccwbRFChanUtilInterval** object instead in this case. Each time the MIB query is performed, utilization is calculated using the last 30 samples and the value is returned. For SCQAM channel, both MIB objects update at the end of the interval that is configured by this command.
Cisco IOS XE Dublin 17.12.1y and later	Starting with Cisco IOS XE Dublin 17.12.1y, use the **cable util-interval** value to determine number of samples that you need to collect. These samples are used to calculate rolling avg utilization value.

Examples

The following example shows how to set the utilization interval for the upstream and downstream channels:

```
Router# configure terminal
Router(config)# cable util-interval 300
```

Related Commands

Command	Description
show running-config	Displays the running configuration for each of the cable interfaces.

cable vc-map

To map a cable modem to a particular permanent virtual connection (PVC) on an Asynchronous Transfer Mode (ATM) interface, use the **cable vc-map** command in global configuration mode. To remove this mapping, use the **no** form of this command.

cable vc-map *mac-address atm-interface vpi/vci* [*cust-name*]
no cable vc-map *mac-address*
no cable vc-map customer *cust-name*

Syntax Description

mac-address	Specifies the hardware (MAC) address for the cable modem whose traffic is to be mapped.
atm-interface	Specifies the outbound ATM interface to which this cable modem should be mapped.
vpi/vci	Specifies the virtual path identifier (VPI) and virtual channel identifier (VCI) on the ATM interface to which this cable modem should be mapped.
cust-name	(Optional) Identifies the customer for this PVC. The *cust-name* can be any arbitrary alphanumeric string, up to 127 characters long.
customer *cust-name*	(Optional) Deletes all PVCs belong to this customer. The *cust-name* can be any arbitrary alphanumeric string, up to 127 characters long.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(11)BC3	This command was introduced for Cisco uBR7100 series and Cisco uBR7246VXR universal broadband routers.
12.2(15)BC2	Support for the **customer** option was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command maps a cable modem, on the basis of its hardware (MAC) address, to a particular PVC on an ATM interface.



Note To use this command, you must first enable the use of Layer 2 tunnels, using the **cable l2-vpn-service atm-vc** command. Then use the **cable vc-map** command to enable the mapping of individual cable modems to specific PVCs.

Examples

The following example shows how to enable the use of Layer 2 tunnels and then map specific CMs to specific PVCS:

```
Router# config terminal
Router(config)# cable l2-vpn-service atm-vc
Router(config)# cable vc-map 0007.0e03.69f9 ATM2/0 1/1
Router(config)# cable vc-map 0010.7bed.9c95 ATM2/0 1/2
Router(config)# exit
Router#
```

The following example shows the same configuration as above, but with the addition of a customer name that identifies the customer that is using each particular PVC:

```
Router# config terminal
Router(config)# cable l2-vpn-service atm-vc
Router(config)# cable vc-map 0007.0e03.69f9 ATM2/0 1/1 ENTERPRISE-CO1
Router(config)# cable vc-map 0010.7bed.9c95 ATM2/0 1/2 ENTERPRISE-CO2
Router(config)# exit
Router#
```

Related Commands

Command	Description
cable l2-vpn-service atm-vc	Enables the use of Layer 2 tunnels for the Customer Premises Equipment (CPE) traffic that is behind cable modems, so that individual CPE traffic can be routed to a particular PVC on an ATM interface.
debug cable l2-vpn	Displays debugging messages for the Layer 2 mapping of cable modems to a particular PVC on an ATM interface.
show cable l2-vpn vc-map	Displays the mapping of one or all cable modems to PVCs on the ATM interfaces.

cable video

To enter the video configuration mode, use the **cable video** command in global configuration mode.

cable video

Syntax Description

This command has no keywords or arguments.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the video configuration mode.

Examples

The following example shows how to enter the video configuration mode:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)#
```

cable video source-switch

To switch to another valid multicast source in certain scenarios, such as maintenance, use the **cable video source-switch**command in privileged EXEC mode.

cable video source-switch {**from-group** *group IP address* **from-source** *source IP address* | **to-group** *new group IP address* **to-source** *source IP address*}

Syntax Description

from-group *group IP address*	Force source switch from a given multicast group.
from-source *source IP address*	Force source switch from a given multicast source.
to-group *group IP address*	Force source switch to this multicast group.
to-source *source IP address*	Force source switch to this multicast source.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Normally, the system automatically switches to the next valid source IP when the current source goes down or fails for some reasons. Only use this command in certain scenarios, such as maintenance.

Examples

The following example shows how to enable wideband auto-reset mode:

```
Router# cable video source-switch to-group 238.11.3.103 to-source 176.52.1.10
%%Current sessions with this source will be reset.
Service will be affected. Is this OK to continue? [Yes/No][confirm]y

1048781    126        Remap       SSM     176.51.1.10,238.11.3.103        0     1
ACTIVE-PSI ON     2404203  2383890  CLEAR    -              SESS_PME1.1.8.184
1048780    127        Data-Piping SSM     176.51.1.10,238.11.3.77         0     -
ACTIVE-PSI ON     2404782  0        CLEAR    -              rw.1.8.185
1048678    140        Remap       SSM     176.52.1.10,238.11.3.85         0     1
ACTIVE-PSI ON     2403607  2384815  CLEAR    -              SESS_PME2.1.8.336
1048679    141        Remap       UDP     174.101.1.2                     49500 1       OFF
        ON     0        0        CLEAR    -              uni1.3.0.1.21.49500
```

cable vrf-steering cable-modem

To steer or direct the cable modems to the first sub-bundle interface that is configured to use the virtual routing and forwarding (VRF) instance, use the **cable vrf-steering cable-modem** command in the cable subinterface configuration mode. To disable this feature, use the **no** form of this command.

cable vrf-steering cable-modem *vrf-name*
no cable vrf-steering cable-modem *vrf-name*

Syntax Description

vrf-name	VRF instance name.

Command Default

Configure a sub-bundle using the **ip vrf forwarding** command first to enable this command.

Command Modes

Subinterface configuration (config-if)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to direct the cable modems to the specified VRF:

Note Create an ACL and route-map to steer the CPEs from the CM interface to the global interface before you steer the CM to the first sub-bundle interface. Use the **ip access-list extended** *access-list name* and **route-map** *route map name* **permit** commands to create an ACL and route-map respectively on the Cisco uBR10012 routers. Use **ip policy route-map** *route map name* command to attach the route-map to the CM's subbundle interface.

```
Router(config-if)#cable vrf-steering cable-modem vrfa
```

Related Commands

Command	Description
cable source-route	Configures the VRF source route on the cable modem's subinterface configuration mode.
ip vrf	Defines a VRF instance and enters the interface configuration mode.
show ip arp vrf	Displays which VRF contains a specific cable modem in the ARP table.

cable wideband auto-reset

To enable wideband auto-reset mode on the CMTS, use the **cable wideband auto-reset** command in global configuration mode. To disable wideband auto-reset mode, use the **no** form of this command.

cable wideband auto-reset
no cable wideband auto-reset

Syntax Description

This command has no keywords or arguments.

Command Default

Wideband auto-reset mode is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the uBR10012 router.
12.3(23)BC	This command was updated.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enable wideband auto-reset mode on the CMTS. If wideband auto-reset mode is enabled, wideband cable modems registered on a cable interface as traditional DOCSIS modems (DOCSIS 1.x/2.0 modems) are auto-reset when the cable interface becomes wideband-capable. When a wideband cable modem auto-resets, it deregisters on the CMTS as a traditional DOCSIS cable modem and immediately attempts to re-register as a wideband cable modem.

A cable interface is considered wideband-capable when at least one fully configured and operational wideband channel has been associated with the interface's traditional DOCSIS (narrowband) channel.

For a fully configured wideband CMTS, wideband cable modems may register as traditional DOCSIS modems for a variety of reasons, such as cable interface line card boot order or line card online insertion and removal (OIR). Rather than defer wideband cable modem registration, wideband cable modems are permitted to register as traditional DOCSIS modems.

If a wideband-capable modem registers as a traditional DOCSIS modem, it registers on a primary downstream channel that has been assigned with the **downstream cable** command to the modem's fiber node if the fiber node is configured. If the modem's fiber node is not configured, the wideband-capable modem can register on any downstream channel that is visible to it (as a traditional cable modem does).



Note In Cisco IOS Release12.3(21)BC, the primary downstream channel is a traditional DOCSIS downstream channel for the fiber node. Beginning in Cisco IOS Release 12.3(23)BC, either an RF channel from the SPA or a Cisco uBR10-MC5X20 downstream channel serves as a primary channel in a fiber node. Beginning in Cisco IOS Release12.3(23)BC if the primary downstream channel for this fiber node is assigned from a SPA downstream, then the **downstream cable** command is not required.

When and if a cable interface becomes wideband capable, wideband cable modems that have registered as traditional DOCSIS modems are reset for CMTS routers with wideband auto-reset mode enabled. These modems are only reset when the interface first becomes wideband-capable and are not reset again if they subsequently fail to register as wideband cable modems.

Examples

The following example shows how to enable wideband auto-reset mode:

```
Router# configure terminal
Router(config)# cable wideband auto-reset
```

Related Commands

Command	Description
cable bundle	Configures a cable interface to belong to a virtual bundle interface.
downstream cable	Assigns a primary downstream channel for a fiber node.



Cable Commands: ca through cr

- ca-interface, on page 957
- ca-system-id, on page 959
- channel-group, on page 960
- channel-id (cable configuration file), on page 962
- check-scg-at-prov, on page 964
- class , on page 966
- clear cable admission control counters, on page 967
- clear cable arp-filter, on page 969
- clear cable bgsync counters, on page 971
- clear cable cmc, on page 972
- clear cable dsg, on page 973
- clear cable flap-list, on page 975
- clear cable hop, on page 977
- clear cable host, on page 980
- clear cable ipc-stats, on page 982
- clear cable load-balance, on page 983
- clear cable load-balance error-statistics, on page 985
- clear cable logging, on page 986
- clear cable modem attribute-masks, on page 988
- clear cable modem cm-status, on page 990
- clear cable modem counters, on page 992
- clear cable modem delete, on page 994
- clear cable modem device-class , on page 998
- clear cable modem flap-counters, on page 1001
- clear cable modem lock, on page 1004
- clear cable modem name, on page 1007
- clear cable modem partial-service, on page 1009
- clear cable modem path-sel , on page 1010
- clear cable modem pnm, on page 1011
- clear cable modem rcs-counts, on page 1013
- clear cable modem reset, on page 1015
- clear cable modem rf-adapt, on page 1019
- clear cable modem service-type-id, on page 1021

- clear cable modem voice, on page 1023
- clear cable multicast ses-cache, on page 1025
- clear cable multicast statistics counter, on page 1028
- clear cable resil-rf-status, on page 1029
- clear cable rf-status, on page 1030
- clear cable rpd all event, on page 1031
- clear cable rpd reset, on page 1032
- clear cable secondary-ip, on page 1034
- clear cable upstream ofdma mer-fec, on page 1036
- clear hccp counters, on page 1037
- clear hccp linecard, on page 1039
- clear packetcable gate counter commit, on page 1040
- clear packetcable rks, on page 1042
- clear pxf, on page 1044
- clear pxf statistics drl all , on page 1046
- clear pxf statistics drl cable-wan-ip, on page 1047
- clear pxf statistics drl wan-non-ip, on page 1048
- clear pxf statistics drl max-rate , on page 1049
- clear redundancy, on page 1050
- cmc, on page 1052
- connection, on page 1053
- controller downstream-oob 55d1-profile, on page 1054
- controller integrated-cable, on page 1055
- controller modular-cable, on page 1057
- controller upstream-cable , on page 1059
- controller upstream-oob 55d1-profile, on page 1060
- cops ip dscp, on page 1061
- cops listeners access-list, on page 1065
- cops tcp window-size, on page 1067
- core-interface, on page 1069
- cp-overrule, on page 1070
- cpd, on page 1071
- cpd cr-id, on page 1072
- cpe max, on page 1073
- cyclic-prefix, on page 1075

ca-interface

To configure the conditional access interface for session based scrambling, use the **ca-interface** command in the DVB scrambling configuration mode. To disable conditional access interface configuration, use the **no** form of this command.

ca-interface linecard *slot/bay ip_address*
no ca-interface linecard *slot/bay*

slot/bay	Specifies the slot and bay of the linecard.
ip_address	Specifies the IP for the conditional access interface.

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the conditional access interface:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ca-interface linecard 7/0 1.24.10.8
```

Related Commands

Command	Description
dvb	Enters DVB scrambling configuration mode.
strong-pairing-enforce	Switches on the NDS strong pairing enforcement
mgmt-ip	Configures the manangement IP for EIS/Broadcast ECMG.
scramble-video-audio	Scrambles only video and audio pids.
route-ecmg	Configures the route to the ECMG server.
check-scg-at-prov	Enables Check SCG at provision time.
tier-based	Enters the tier-based scrambling configuration mode.
ecmg	Enters the ECM Generator configuration mode.

Command	Description
eis	Enters the Event Information Scheduler configuration mode.

ca-system-id

To configure the CA system ID, use the **ca-system-id** command in the DVB scrambling ECMG configuration mode. To void the CA system ID configuration, use the **no** form of this command.

ca-system-id *id sub_id*
no ca-system-id *id sub_id*

id	Specifies the CA system ID in Hex.
sub_id	Specifies the CA sub system ID in Hex.

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the CA system ID:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#ca-system-id 950 1234
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
auto-channel-id	Enables automatic channel ID selection.
connection	Configures the ECMG connection.
ecm-pid-source	Configures the source of ECM PID.
type	Configures the ECMG type.
mode	Configures the application mode of ECMG.
desc-rule	Configures the descriptor rule.
overrule	Overrules the default settings.

channel-group

To add an interface (Gigabit Ethernet or Fast Ethernet) to an EtherChannel Group, and to associate that interface with an EtherChannel link, use the **channel-group** command in interface configuration mode.

To remove an EtherChannel interface from the EtherChannel group, use the **no** form of this command.

channel-group *n*
no channel-group *n*

Cisco cBR Series Converged Broadband Routers
channel-group *n*
link *link-id* | **mode** {**active** | **passive**} [**link** *link-id*]
no channel-group *n*

Syntax Description

n	The identifying number for the EtherChannel group with which to associate this interface. An EtherChannel group can be identified in the range of 1 to 64. Each group can have up to four interfaces on the Cisco uBR10012 and Cisco uBR7200 series routers, only one of which is the primary. Each group can have up to eight interfaces on the Cisco cBR series routers, only one of which is the primary.
link *link-id*	Assigns a link identifier used for load balancing. • *link-id*—Load balancing link identifier. The range is from 1 to 8.
mode	Specifies the Etherchannel mode for the interface.
active	Enables Link Aggregation Control Protocol (LACP) unconditionally.
passive	Enables LACP only if an LACP device is detected.

Command Default

By default, the **channel-group** command has the following behaviors:

- EtherChannel groups and ports are not defined.
- EtherChannel groups and ports are disabled (**off** mode) once configured, and must be enabled.
- The first port assigned to an EtherChannel group is the bundle primary.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(11)BC3	This command was introduced on the Cisco uBR7246VXR router.
12.2(9a)BC	This command was introduced on the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.

Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **no** form of this command also removes the associated EtherChannel ports within the EtherChannel group. For additional information, refer to the EtherChannel on the Cisco CMTS Routers feature document on Cisco.com.

The Cisco cBR series routers support the channel group configuration on the Ten Gigabit Ethernet interface.

Examples

The following example creates an EtherChannel link with a channel group identifier of 1 on the specified port. If this is the first port assigned to EtherChannel group 1, it becomes the primary in that EtherChannel group.

```
Router(config-if)# channel-group etherchannel 1
```

The following example creates an EtherChannel link with a channel group identifier of 3 on the specified port on a Cisco cBR-8 router:

```
Router(config)# interface port-channel 3
Router(config-if)# exit
Router(config)# interface TenGigabitEthernet 5/1/0
Router(config-if)# channel-group 3 mode active
```

Related Commands

Command	Description
show interface port-channel	Displays the EtherChannel interfaces and channel identifiers, with their mode and operational status.

channel-id (cable configuration file)

To create a DOCSIS configuration file that specifies the upstream channel ID for a CM configuration file, use the **channel-id** command in cable config-file configuration mode. To remove the channel ID specification, use the **no** form of this command.

channel-id *upstreamchan-id*
no channel-id

Syntax Description

upstreamchan-id	Specifies the upstream channel ID. Valid range is 0 to 255, depending on the number of actual upstream ports on the cable interface being used.

Command Default

If no upstream channel ID is specified, the CM uses the upstream channel from the Upstream Channel Description (UCD) messages it receives on the downstream channel.

Command Modes

Cable configuration file (config-file)

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the Upstream Channel ID Configuration Setting field in the DOCSIS configuration file. Typically, the CM uses the upstream channel ID that is specified by the CMTS during the registration process, but this command overrides that setting and forces the CM to use the upstream channel specified in the DOCSIS configuration file. If that upstream does not exist, or if the upstream cannot be obtained for some reason, the CM cannot come online.

Note If you are using a telco-return CM, the upstream channel must be 0.

Examples

The following example shows how to set the upstream channel ID for the configuration file to 3. If the CM cannot obtain this upstream channel, it does not come online.

```
Router(config)# cable config-file channeloverride.cm
Router(config-file)# channel-id 3
Router(config-file)# exit
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
access-denied	Disables access to the network.
cpe max	Specifies CPE information.
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.
option	Provides config-file options.
privacy	Specifies privacy options for baseline privacy images.
service-class	Specifies service class definitions for the configuration file.
snmp manager	Specifies Simple Network Management Protocol (SNMP) options.
timestamp	Enables time-stamp generation.

check-scg-at-prov

To enable Check SCG at provision time, use the **check-scg-at-prov** command in the DVB scrambling configuration mode. To disable Check SCG at provision time, use the **no** form of this command.

check-scg-at-prov
no check-scg-at-prov

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When SCG checking at the time of provisioning is enabled, the Simulcrypt Synchroniser (SCS) does not provision the SCG from EIS if the elementary streams or services in the incoming stream do not match the streams or services in SCG provisioning message. When this configuration is disabled, the input transport stream is verified only during scrambling.

The following is an example of how to enable Check SCG at provision time:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#check-scg-at-prov
```

Related Commands

Command	Description
dvb	Enters DVB scrambling configuration mode.
strong-pairing-enforce	Switches on the NDS strong pairing enforcement
mgmt-ip	Configures the manangement IP for EIS/Broadcast ECMG.
scramble-video-audio	Scrambles only video and audio pids.
route-ecmg	Configures the route to the ECMG server.
ca-interface	Configures the conditional access interface.
tier-based	Enters the tier-based scrambling configuration mode.
ecmg	Enters the ECM Generator configuration mode.

Command	Description
eis	Enters the Event Information Scheduler configuration mode.

class

To configure the redundancy class for the redundancy group , use the **class** command in line card redundancy configuration mode. To remove the configuration, use the **no** form of this command.

class 1:N
no class

Syntax Description

1:N	Specifies N+1 redundancy class for the redundancy group.

Command Default

None.

Command Modes

Line card redundancy configuration (config-red-lc)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You cannot change the class while group has members. Remove all the members to change the class.

Examples

The following example shows how to configure 1:N redundancy class on Cisco cBR-8 Series Converged Broadband Routers:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# redundancy
Router(config-red)#  linecard-group 0 internal-switch
Router(config-red-lc)# class 1:N
Class set to 1:N for Redundancy group (0)
Router(config-red-lc)#
```

Related Commands

Command	Description
description	Adds a description to the line card group.
linecard-groupinternal-switch	Creates a line card group for the line card.
member slot	Adds a slot to the redundancy group.
redundancy	Enters redundancy configuration mode.
show redundancy linecard	Displays information about a line card or a line card group.

clear cable admission control counters

To reset all the resource counters on the Cisco CMTS to zero, use the **clear cable admission control counters** command in privileged EXEC mode.

clear cable admission control counters

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(13a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The counters are also set to zero when a given resource is reconfigured. Counters can be displayed using the **show cable admission-control** command.

For additional information, refer to the Admission Control for the Cisco CMTS feature documents on Cisco.com.

Examples

The following example resets configured admission control counters to zero, whether configured in global or interface configuration mode:

```
Router# clear cable admission control counters
```

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for the Cisco CMTS and supporting broadband processing engines (BPEs)
cable admission-control event	Configures and enables Admission Control event types on the Cisco CMTS.
cable admission-control ds-bandwidth	Configures Admission Control downstream bandwidth thresholds on the Cisco CMTS.
cable admission-control us-bandwidth	Configures Admission Control upstream bandwidth thresholds on the Cisco CMTS.
debug cable admission-control	Enables automatic Admission Control troubleshooting processes on the Cisco CMTS.

Command	Description
show cable admission-control	Displays the current Admission Control configuration and status on the Cisco CMTS, or on a specified interface.

clear cable arp-filter

To reset Address Resolution Protocol (ARP) filter statistics displayed by the **show cable arp-filter** command, use the **clear cable arp-filter** command in privileged EXEC mode.

clear cable arp-filter {**bundle** *number* **cable** *slot/port* | *slot/subslot/port*}

Syntax Description

bundle *number*	Resets the ARP filter statistics for the specified virtual bundle interface, where *number* is a value from 1 to 255.
cable *slot*/*port*	(Cisco uBR7100 and Cisco uBR7200 Series Routers) Specifies removal of CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot*/*subslot*/*port*	(Cisco uBR10012 Router) Specifies removal of CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot*/*subslot*/*port*	(Cisco cBR Series Routers) Specifies removal of CMs on the specified cable interface, where: • *slot*—Slot number of the card. Valid slots are 0 to 3 and 6 to 9 on the Cisco cBR-8router. • *subslot*—Subslot number of the card. The valid value is 0 on the Cisco cBR-8router. • *port*—Downstream port number. The valid range is from 0 to 15 on the Cisco cBR-8router.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(17a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **clear cable arp-filter** command to clear the ARP filter statistics that are displayed using the **show cable arp-filter** command.

Examples

This example shows cable ARP filter statistics for virtual bundle interface number 10, followed by a clearing of the ARP filter statistics on that bundle and the resulting display of cleared statistics.

```
Router# show cable arp-filter bundle 10
ARP Filter statistics for Bundle10:
  Replies Rcvd: 3069 total. 3062 unfiltered, 7 filtered
  Requests Forwarded: 1175 total. 1175 unfiltered, 0 filtered
  Requests Sent For IP: 0 total. 0 unfiltered, 0 filtered
Router# clear cable arp-filter bundle 10
Router# show cable arp-filter bundle 10
ARP Filter statistics for Bundle10:
  Replies Rcvd: 0 total. 0 unfiltered, 0 filtered
  Requests Forwarded: 0 total. 0 unfiltered, 0 filtered
  Requests Sent For IP: 0 total. 0 unfiltered, 0 filtered
```

Related Commands

Command	Description
cable arp filter	Controls the number of ARP packets that are allowable for each SID on a cable interface.
clear arp-cache	Refreshes dynamically created entries from the ARP cache.
show cable arp-filter	Displays the total number of ARP replies and requests that have been sent and received, including the number of requests that have been filtered.

clear cable bgsync counters

To clear the background synchronization information on the Cisco CMTS, use the **clear cable bgsync counters** command in global configuration mode.

clear cable bgsync counters

Syntax Description

This command has no arguments or keywords.

Command Modes

Global configuration mode (config)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0S	This command is implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **clear cable bgsync counters** command to clear the background synchronization information statistics on the Cisco CMTS.

Examples

The following example shows how to clear the background synchronization counters on the Cisco CMTS:

```
Router# configure terminal
Router(config)# clear cable bgsync counters
Router(config)#
```

Related Commands

Command	Description
cable bgsync	Sets the data intervals for background synchronization on the Cisco CMTS.
cable bgsync active	Activates background synchronization process on the Cisco CMTS.
show cable bgsync	Displays the information on the background synchronization process.

clear cable cmc

To clear the Cisco CMC information, use the **clear cable cmc** command in privileged EXEC mode.

clear cable cmc {**all** *mac-address*}

Syntax Description

all	Specifies that the information on all Cisco CMCs must be cleared.
mac-address	MAC address of the Cisco CMC for which the information must be cleared.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **clear cable cmc** clears the Cisco CMC. When this command is used, the Cisco CMTS clears all the running data of the Cisco CMC from current database and disconnects the Generic Control Protocol (GCP) connection. Therefore, the Cisco CMC reboots.

The following example shows how to clear the information for all Cisco CMCs:

```
Router# clear cable cmc all
```

The following example shows how to clear the information on the Cisco CMC with the MAC address 0010.2024.7035:

```
Router# clear cable cmc 0010.2024.7035
```

Related Commands

Command	Description
cable cmc	Configures the downstream RF power and FRx on the Cisco CMC.
show cable cmc	Displays the Cisco CMC information.

clear cable dsg

To reset counters related to DOCSIS Set-top Gateway (DSG) tunnels, use the **clear cable dsg** command in privileged EXEC mode.

clear cable dsg

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7100 series and Cisco uBR7246VXR routers.
12.3(13a)BC	This command is obsolete.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

DSG operation is disabled using the **no cable dsg** command, but this does not clear out the DSG-related counter ("mapping entry is used"), so that you can retain its value in case you intend to restart DSG operations again. If, however, you want to reset those counters to zero, use the **clear cable dsg** command.



Note This command resets the "mapping entry is used" counters for all DSG tunnels and interfaces on the router.

Examples

The following example shows how to clear the DSG counters for all cable interfaces on the router, and shows an example of the **show cable dsg** command showing the counters after they have been cleared.

```
Router# show cable dsg stats

DSG statistics information
DSG keepalive is set
Vendor: DDD, Tunnel count: 1
Vendor: BBB, Tunnel count: 2
Vendor name is DDD, tunnel MAC is 0001.0002.0003
Group address is 226.2.2.2, source address is *
  Interface is Cable5/1,   mapping entry is used 2
    Received 5968 packets,  forwarded 5289 packets
    Dropped 679 packets,  last second rate 16878 bits/sec
Router# clear cable dsg

Router# show cable dsg stats

DSG statistics information
Vendor: DDD, Tunnel count: 1
Vendor: BBB, Tunnel count: 2
Vendor name is DDD, tunnel MAC is 0001.0002.0003
```

```
Group address is 226.2.2.2, source address is *
  Interface is Cable5/1,   mapping entry is used 0
    Received 5968 packets,  forwarded 5289 packets
    Dropped 679 packets,  last second rate 16878 bits/sec
```

Related Commands

Command	Description
cable dsg	Enables the DOCSIS Set-Top Gateway (DSG) on a cable interface, and configures its tunnel-mapping parameters.
cable dsg keepalive	Enables keepalive messages over DOCSIS Set-Top Gateway (DSG) tunnels on a cable interface.
debug cable dsg	Enables the display of debugging messages for the operation of the DOCSIS Set-Top Gateway (DSG) feature.
show cable dsg	Displays the current DOCSIS Set-Top Gateway (DSG) tunneling parameters.

clear cable flap-list

To reset the flap-list table for a specific CM or for all CMs connected to the Cisco CMTS router, use the **clear cable flap-list** command in privileged EXEC mode.

clear cable flap-list {*mac-addr* | **all**} [**save-counters**]

Syntax Description

mac-addr	Specifies the 48-bit MAC address (hardware address) of an individual CM to be cleared from the flap-list table.
all	Removes all CMs from the flap-list table.
save-counters	(Optional) Preserves the flap-list counters that are displayed by the **show cable flap-list** command and by using SNMP requests to access the CISCO-CABLE-SPECTRUM-MIB.

Command Default

Clears the flap-list counters.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced.
11.3(7)NA	The **save-counters** option was supported on the Cisco uBR7200 series routers.
12.1(5)EC1	Support was added for the Cisco uBR7100 series routers.
12.2(4)BC1	Support for this command (without the **save-counters** option) was added for the Cisco uBR10012 router.
12.2(15)BC2	The **save-counters** option was supported on the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Cable modems are removed from the flap-list table after the number of days (between 1 and 60) specified by the **cable flap-list aging** global configuration command. Use the **clear cable flap-list** command to remove individual CMs from the flap-list while retaining flapping activity for other CMs, or to clear the entire flap-list table.

Examples

The following example shows how to remove all the CMs from the flap-list table:

```
Router# clear cable flap-list all
```

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a CM in the flap-list table before aging it out of the table.
cable flap-list insertion-time	Sets the insertion time interval that determines whether a CM is placed in the flap list.
cable flap-list miss-threshold	Specifies miss threshold for recording a flap-list event.
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a CM flap-list event.
cable flap-list size	Specifies the maximum number of CMs that can be listed in the flap-list table.
clear cable modem counters	Zeroes the CM counters, including flap-list counters.
clear cable modem reset	Removes a CM from the Station Maintenance List and resets it.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
ping docsis	Sends a DOCSIS ping to a CM and increments the flap-list counters as appropriate.
show cable flap-list	Displays the current contents of the flap list.

clear cable hop

To clear the forward error corrections (FEC) hop counters on one or all cable interfaces on a Cisco CMTS, use the **clear cable hop** command in privileged EXEC mode.

clear cable hop [**cable** {*slot/port* | *slot/subslot/port*} [**upstream** *uport*]]

Cisco cBR Series Converged Broadband Routers
clear cable hop [**upstream-cable** {*slot/card/port*} [**us-channel** {*physical us-channel number*}]]

Syntax Description

cable *slot/port*	(Optional—Cisco uBR7100 and Cisco uBR7200 Series Routers) Specifies removal of CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot/subslot/port*	(Optional—Cisco uBR10012 Router) Specifies removal of CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
upstream *uport*	(Optional) Clears the hop counters on a specific upstream port on a specific cable interface. The valid values for *uport* start with 0 for the first upstream port on the cable interface line card.
upstream-cable *slot/card/port*	(Optional) Clears the hop counters on a specific upstream-cable controller. The valid values start with 0 for the first upstream port on the cable interface line card.
us-channel *physical us-channel number*	(Optional) Clears upstream channel information. Valid values are 0 to 11.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(BC)	This command was integrated into Cisco IOS Release 12.3BC.

Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers. • The **upstream-cable** keyword was added. • The **us-channel** keyword was added.

Usage Guidelines

The **clear cable hop** command clears the correctable and uncorrectable forward error corrections (FEC) counters that are displayed by the **show cable hop** command. You can clear the counters for all interfaces on the Cisco CMTS, for one specific interface (one downstream and its associated upstreams), or for a specific upstream on a cable interface.

Examples

The following example shows how to clear the frequency hop counters on all cable interfaces on the Cisco CMTS, along with sample output from the **show cable hop** command that shows the counters being cleared:

```
Router# show cable hop

Upstream      Port       Poll Missed Min    Missed Hop   Hop     Corr    Uncorr
Port          Status     Rate Poll   Poll   Poll   Thres Period  FEC     FEC
                         (ms) Count  Sample Pcnt   Pcnt  (sec)   Errors  Errors
Cable3/0/U0   15.008 Mhz 1000 * * *set to fixed frequency * * *  2238    133
Cable3/0/U1   admindown  1000 * * *   frequency not set   * * *  0       0
Cable3/0/U2   admindown  1000 * * *   frequency not set   * * *  0       0
Cable3/0/U3   admindown  1000 * * *   frequency not set   * * *  0       0
Router# clear cable hop

Router# show cable hop

Upstream      Port       Poll Missed Min    Missed Hop   Hop     Corr    Uncorr
Port          Status     Rate Poll   Poll   Poll   Thres Period  FEC     FEC
                         (ms) Count  Sample Pcnt   Pcnt  (sec)   Errors  Errors
Cable3/0/U0   15.008 Mhz 1000 * * *set to fixed frequency * * *  0       0
Cable3/0/U1   admindown  1000 * * *   frequency not set   * * *  0       0
Cable3/0/U2   admindown  1000 * * *   frequency not set   * * *  0       0
Cable3/0/U3   admindown  1000 * * *   frequency not set   * * *  0       0
Router#
```

The following example shows how to clear the frequency hop counters on a specific cable interface on the Cisco CMTS:

```
Router# clear cable hop c5/0

Router#
```

The following example shows how to clear the frequency hop counters on a specific upstream on the Cisco CMTS:

```
Router# clear cable hop c5/1/0 upstream 2

Router#
```

The following example shows how to clear the frequency hop counters on a specific upstream on the Cisco cBR Series Converged Broadband Routers:

```
Router# clear cable hop upstream-cable 3/0/3 us-channel 2
Router#
```

Related Commands

Command	Description
show cable hop	Displays cable-hop statistics on a Cisco CMTS.
show cable modem	Displays CM configuration settings.

clear cable host

To clear the host from the router's internal address tables, use the **clear cable host** command in privileged EXEC mode.

clear cable host {*ip-addressmac-address* | **name** *fqdn*}

Cisco cBR Series Converged Broadband Routers
clear cable host {*ip-addressmac-address* | **vrf** {*VPN Routing/Forwarding instance name ip-address*}}

Syntax Description

ip-address	IPv4 or IPv6 address for the device to be cleared.
mac-address	MAC address for the device to be cleared.
name *fqdn*	Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.
vrf	Specifies VPN Routing/Forwarding instance.
VPN Routing/Forwarding instance name	VPN Routing/Forwarding instance name.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.1(5)EC1	Support was added for the Cisco uBR7100 series universal broadband router.
12.2(4)BC1	Support was added for the Cisco uBR10012 universal broadband router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **vrf** keyword was added.

Usage Guidelines

This command removes a host's IP, MAC address, or domain name from the router's internal address tables. This might be necessary to allow a new host to come online from the previous host's CM.

Note If the cleared host continues communicating through the CM, the Cisco CMTS adds the host back to its internal address tables, and the **show interface cable** *interface* **modem** command shows it as having a "static" address. To block the host from any further access, use the **cable source-verify dhcp** command, so that the host cannot access the network unless it obtains an IP address from an authorized DHCP server.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** (not supported for cBR routers) command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Examples

The following example shows how to remove a host's MAC address from the internal address tables on the Cisco CMTS router:

```
Router# clear cable host 0050.7366.17ab
```

The following example shows how to remove a host's domain name from the internal address tables on the Cisco CMTS router:

```
Router# clear cable host cisco
```

The following example shows how to remove a VPN Routing/Forwarding instance on the Cisco cBR Series Converged Broadband Routers:

```
Router# clear cable host vrf cisco 3046:1829:fefb::ddd1
```

Related Commands

Command	Description
cable device	Configures the access list for a CM device or host.
cable host access-group	Configures the access list for the specified hosts.
show cable device access-group	Display the CMs and the hosts behind the CMs on the network.
show cable host access-group	Displays only the hosts behind the CMs on the network.

clear cable ipc-stats

To clear the active database and reset all IPC statistics in the active database to zero, use the **clear cable ipc-stats** command in privileged EXEC mode.

clear cable ipc-stats

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must enable the Cable IPC Statistics Collection tool using the **cable ipc-stats** command before using the **clear cable ipc-stats** command.

Examples

The following example shows how to clear the active database using the **clear cable ipc-stats** command on a Cisco CMTS router:

```
Router# clear cable ipc-stats
cr10k ipc stats is cleared at 03:38:54 PDT Fri Oct 9 2009
Router#
```

Related Commands

Command	Description
cable ipc-stats	Enables the Cable IPC Statistics Collection tool on a Cisco CMTS router.
show cable ipc-stats	Displays statistics of all the IPC messages on a Cisco CMTS router.

clear cable load-balance

To clear the counters or state machine used to track load-balancing operations, use the **clear cable load-balance** command in privileged EXEC mode.

clear cable load-balance { **counters** | **state** | **move-history cable slot/subslot/controller-interface-index** }

Syntax Description

counters	Clears all load balancing statistical counters.
state	Clears all state information in the load balancing state machine. This command will also put all cable interfaces and their upstream channels in the "up" state, unless they are explicitly shut down using the **shutdown** interface configuration command.
move-history	Clears all of the move history entries for one mac-domain.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 17.6.1w	This command was updated. The **move-history** option was introduced.

Examples

The following example shows how to clear all of the counters that track load-balancing operations, resetting them all to zero:

```
Router# clear cable load-balance counters
```

The following example shows how to clear the state machine that is used for load-balancing operations:

```
Router# clear cable load-balance state
```

The following example shows how to clear all the move history entries for one mac-domain:

```
Router# clear cable load-balance move-history cable slot/subslot/controller-interface-index
```

Related Commands

Command	Description
cable load-balance exclude	Excludes a particular cable modem, or all cable modems from a particular vendor, from one or more types of load-balancing operations.
cable load-balance group (global configuration)	Creates and configures a load-balance group.
cable load-balance group (interface configuration)	Assigns a downstream to a load-balance group.
cable load-balance group interval	Configures the frequency of the load-balancing policy updates.
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable load-balance group threshold	Configures the threshold values that a load-balance group should use for load-balancing operations.
cable upstream load-balance group	Assigns an upstream to a load-balance group.
show cable load-balance	Displays real-time statistical and operational information for load-balancing operations.
show cable load-balance docsis-group x move-history	Provides detailed information on modem movement through load balancing.

clear cable load-balance error-statistics

To clear all the failure counters in the error statistics, use the **clear cable load-balance error-statistics** command in privileged EXEC mode.

clear cable load-balance error-statistics

no clear cable load-balance error-statistics

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Example

The following example shows how to clear all the failure counters in the error statistics.

```
Router# clear cable load-balance error-statistics
```

Related Commands

Command	Description
show cable load-balance	Displays real-time configuration, statistical and operational information for load balancing operations on the router.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of the DOCSIS group operations on the router.
cable load-balance docsis30-dynamic-enable	Enables the DOCSIS 3.0 dynamic load balancing on the Cisco CMTS.
show cable load-balance statistics error	Displays information of the DOCSIS 3.0 and DOCSIS 2.0 load balance failure.

clear cable logging

To remove all error messages about bad IP source addresses on the cable interfaces from the error log buffer, or to clear the downstream index buffer, use the **clear cable logging** command in privileged EXEC mode.

clear cable logging {**badipsource** | **downstream-index**}

Cisco cBR Series Converged Broadband Routers
clear cable logging {**badipsource** | **downstream-index** | **layer2events** | **overlapip**}

Syntax Description

badipsource	Clears the log buffer for BADIPSOURCE messages.
downstream-index	Clears the log buffer for downstream index messages.
layer2events	Clears the layer 2 event messages.
overlapip	Clears the overlap ip messages.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(13)EC	This command was introduced for the Cisco uBR7100 series and Cisco uBR7200 series universal broadband routers.
12.2(11)CY	Support was added for the Cisco uBR10012 universal broadband router.
12.2(11)BC2	Support was added to the Release 12.2 BC train for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCG	The **downstream-index** keyword was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **cable logging badipsource** command creates a circular buffer that contains the BADIPSOURCE error messages that the Cisco CMTS generates when it discovers a CM or CPE device using an unauthorized IP address. When the buffer becomes full, the oldest messages are deleted to make room for newer messages.

When you have viewed all of the error messages in the current buffer, use the **clear cable logging** command to clear out the buffer to make room for newer messages.

Examples

The following example shows how to clear the log buffer that contains the bad IP source address error messages:

```
Router# show cable logging summary
Cable logging: BADIPSOURCE Enabled
               Total buffer size (bytes): 1000000
               Used buffer size (bytes) : 36968
               Logged messages          : 231
Router# clear cable logging badipsource

Router# show cable logging summary
Cable logging: BADIPSOURCE Enabled
               Total buffer size (bytes): 1000000
               Used buffer size (bytes) : 0
               Logged messages          : 0
Router#
```

The following example shows how to clear the log buffer that contains the downstream index messages:

```
Router# show cable logging downstream-index

Cable logging: Enabled
               Total buffer size (bytes): 1000000
               Used buffer size (bytes) : 36968
               Logged messages          : 231
Router# clear cable logging downstream-index

Router# show cable logging downstream-index
Cable logging: Enabled
               Total buffer size (bytes): 1000000
               Used buffer size (bytes) : 0
               Logged messages          : 0
Router#
```

Related Commands

cable logging badipsource	Logs error messages about bad IP source addresses on the cable interfaces.
cable logging layer2events	Logs layer 2 messages.
cable logging overlapip	Logs overlap IP messages.
cable logging downstream-index	Logs buffer messages about the downstream indexes.
cable source-verify	Enables verification of IP addresses for CMs and CPE devices on the upstream.
show cable logging	Displays the log of error and buffer messages on the cable interfaces.

clear cable modem attribute-masks

To clear the cable modem attribute masks, use the **clear cable modem attribute-masks** command in privileged EXEC mode.

clear cable modem {*mac-addrip-addr* | **cable** *slot/port* {**all** | **oui** *string* | **reject**}} **attribute-masks**
clear cable modem {*mac-addrip-addr* | **cable** *slot/subslot/port* {**all** | **oui** *string* | **reject**}} **attribute-masks**
clear cable modem {*mac-addrip-addr* | **cable** *slot/subslot/cable-interface-index* {**all** | **oui** *string* | **reject**}} **attribute-masks**

Syntax Description

mac-addr	Specifies the MAC address for the CM.
ip-addr	Specifies the IP address for the CM.
cable *slot*/*port*	(Optional—Cisco uBR7100 and Cisco uBR7200 Series Routers) Specifies removal of CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot/subslot/port*	(Optional—Cisco uBR10012 Router) Specifies removal of CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot/subslot/cable-interface-index*	(Optional—Cisco cBR Series Converged Broadband Routers) Specifies removal of CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. The valid range is from 0 to 3 and 6 to 9. • *subslot*—Specifies the secondary slot number of the cable interface line card. The valid subslot is 0. Depending on the platform and cable interface line card, subslots 0 to 1 could be added. • *cable-interface-index*— Specifies the cable line card MAC domain. Valid range is from 0 to 15, depending on the cable interface line card
all	Resets the flapping counters for all CMs.

oui *string*	Resets the flapping counters for all CMs that match the specified Organization Unique Identifier (OUI). The string parameter can be either the three-byte hexadecimal string (such as 00.00.0C).
reject	Resets the flapping counters for all CMs that are currently in one of the reject states.
attribute-masks	Specifies the attribute mask bitmap in hexadecimal format. Example: 0-FFFFFFFF

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command clears the cable modem attribute masks.

Examples

The following example shows how to clear cable modem attribute masks for CMs:

```
Router# clear cable modem all attribute-masks
Router# clear cable modem oui SA attribute-masks
Router# clear cable modem c5/0/0 offline attribute-masks
```

Related Commands

Command	Description
cable upstream attribute-mask	This command specifies an upstream attribute mask in hexadecimal format.

clear cable modem cm-status

To reset the cable modem status events to zero, use the **clear cable modem cm-status** command in privileged EXEC mode.

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers
clear cable modem [*ip addressmac address* | **cable** *slot/port*] **cm-status**

Cisco uBR10012 Universal Broadband Router
clear cable modem [*ip addressmac address* | **cable** *slot/subslot/cable-interface-index*] **cm-status**

Cisco cBR Series Converged Broadband Routers
clear cable modem [*ip addressmac address* | **cable** *slot/subslot/ cable-interface-index*] **cm-status**

Syntax Description

ip-address	(Optional) IP address of a CM.
mac-address	(Optional) MAC address of a CM.
cable *slot*/ s*ubslot*/ *cable-interface-index*	(Optional) Cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* = 5 to 8 • *subslot* = 0 or 1 • *cable-interface-index* • Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. For Cisco cBR Series Converged Broadband Routers, the following are the valid values: • *slot* = 0 to 3 and 6 to 9 • *subslot* = 0 • *cable-interface-index* = 0 to 15
cable *slot*/*port*	(Optional) Displays information for all CMs on the specified cable interface and downstream port on the Cisco uBR7225VXR and Cisco uBR7246VXR routers, where: • *slot*—Slot where the line card resides. Cisco uBR7246VXR router—The valid range is from 3 to 6 Cisco uBR7225VXR router—The valid range is from 1 to 2 • *port*—Specifies the downstream port number.
cm-status	Resets the CM status events to zero for the specified CM's.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCC	This command was modified to clear the basic receive-statistics of all event code types for a specific CM or a group of CMs.
12.2(33)SCD	This command was modified. Support was added for Cisco uBR7225VXR and Cisco uBR7246VXR routers.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem name	Removes or resets CMs by domain name.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.

clear cable modem counters



Note Effective with Cisco IOS Release 12.2(15)BC1, the **clear cable modem counters** command is replaced by the **clear counters** command. See the **clear counters** command in the Cisco IOS software command reference documentation for more information.

To reset the cable modem (CM) flap-list counters to zero, use the **clear cable modem counters** command in privileged EXEC mode.

clear cable modem {*mac-addrip-addr* | [**cable** {*slot/portslot/subslot/pot*}] {**all** | **oui** *string* | **reject**}} **counters**

Syntax Description

mac-addr	Specifies the 48-bit hardware address (MAC address) of an individual CM.
ip-addr	Specifies the IP address of an individual CM.
cable *slot/port*	(Optional—Cisco uBR7100 and Cisco uBR7200 Series Routers) Specifies removal of CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot*/*subslot*/*port*	(Optional—Cisco uBR10012 Router) Specifies removal of CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
all	Resets the flapping counters for all CMs.
oui *string*	Resets the flapping counters for all CMs that match the specified Organization Unique Identifier (OUI). The *string* parameter can be either the three-byte hexadecimal string (such as 00.00.0C) or a vendor name that has been defined using the **cable modem vendor** command.
reject	Resets the flapping counters for all CMs that are currently in one of the reject states. (See the **show cable modem** command for a description of these states.)

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1 T	This command was introduced.
12.2(11)BC2	Support was added for the **oui** and **reject** options.
12.2(11)BC3	Support for clearing the counters for a particular cable interface was added.
12.2(15)BC1	This command was replaced by the **clear counters** command.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to clear the counters for the CM at IP address 172.16.23.45:

```
Router# clear cable modem 172.16.23.45 counters
```

The following example shows how to clear the counters for all CMs that have an OUI that has been defined as having the vendor name of Cisco using the **cable modem vendor** command:

```
Router# clear cable modem oui Cisco counters
```

The following example shows how to clear the counters for all CMs that are currently in one of the reject states:

```
Router# clear cable modem reject counters
```

Note If running Cisco IOS Release 12.2(15)BC1 or later, use the **clear cable modem flap-counters** command to clear the CM flap-list counters.

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem flap-counters	Resets the CM flap-list counters to zero.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.
clear counters	Resets interface counters and those counters associated with the **show cable modem counters** command.

clear cable modem delete

To remove one or more cable modems (CMs) from the internal address and routing tables on a CMTS router and stop DOCSIS station maintenance messages, use the **clear cable modem delete** command in privileged EXEC mode.

clear cable modem {*ip-addrmac-addr*} **delete**
clear cable modem [**cable** {*slot/portslot/subslot/port*}] {**all** | **non-bonding-capable** [**legacy-ranging**] | **offline** | **oui** *string* | **reject** | **wideband** [**registered-traditional-docsis**] } **delete**

Cisco cBR Series Converged Broadband Routers
clear cable modem {*ip-addr* | **cable** | {*slot/subslot/cable interface index*}*mac-addr* | **all** | **cm-status** | **non-bonding-capable** | {**delete** | **legacy-ranging** | **reset** } | **reject** | {**attribute-masks** | **cm-status** | **delete** | **flap-counters** | **rcs-counts** | **reset** | **rf-adapt** | **service-type-id** | **voice**} | **offline** | {**attribute-masks** | **cm-status** | **delete** | **flap-counters** | **rcs-counts** | **rf-adapt** | **service-type-id** | **voice**} | **online** | {**attribute-masks** | **cm-status** | **delete** | **flap-counters** | **rcs-counts** | **rf-adapt** | **service-type-id** | **voice**} | **oui** | {*string* } | **rcs-counts [Integrated-Cable]** | **wideband** | {**delete** | **registered-traditional-docsis** | **reset**}}

Syntax Description

ip-addr	Specifies removal of an individual CM by its IPv4 or IPv6 address.
mac-addr	Specifies removal of an individual CM by its 48-bit hardware address (MAC address).
cable *slot*/ *port*	(Optional—Cisco uBR7100 and Cisco uBR7200 Series Routers) Specifies removal of CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot*/ *cable interface index*	(Optional— Cisco cBR Series Converged Broadband Routers) Specifies removal of CMs on the specified cable interface, where: • *slot*— Specifies the chassis slot number of the cable interface line card. The valid range is from 0 to 3 and 6 to 9. • *port*—Specifies the secondary slot number of the cable interface line card. The valid subslot is 0. • *cable-interface-index*— Specifies the cable line card MAC domain. Valid range is from 0 to 15, depending on the cable interface line card.

cable *slot/subslot/port*	(Optional—Cisco uBR10012 Router) Specifies removal of CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
all	Specifies removal of all CMs or all CMs associated with a specified cable interface.
non-bonding-capable	Specifies removal of all narrowband CMs that are not capable of downstream channel bonding or all such CMs associated with a specified interface.
legacy-ranging	(Optional) Specifies removal of narrowband CMs that are accessed with legacy initial ranging or all such CMs associated with a specified interface.
offline	Specifies removal of all offline CMs or all such CMs associated with a specified interface.
offline	Specifies removal of all online CMs or all such CMs associated with a specified interface.
oui *string*	Specifies removal of all CMs that match the specified Organization Unique Identifier (OUI) or all such CMs associated with a specified interface. The *string* parameter can be either the three-byte hexadecimal string (such as 00.00.0C) or a vendor name that has been defined using the **cable modem vendor** command.
reject	Specifies removal of all CMs that are currently in one of the reject states or all such CMs associated with a specified interface. (See the **show cable modem** command for a description of these states.)
rcs-counts	Specifies removal of MDD, QAM/FEC failure and recovery counts.
wideband	Specifies removal of all wideband CMs or or all such CMs associated with a specified interface.
registered-traditional-docsis	(Optional) Specifies removal of all wideband CMs that are registered as traditional DOCSIS CMs or all such CMs associated with a specified interface.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(11)BC3	This command was introduced for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 universal broadband routers.

Release	Modification
12.2(15)BC1	The **cable** keyword option was added.
12.3(23)BC	Support was added for the **non-bonding-capable, legacy-ranging, wideband**, and **registered-traditional-docsis** keyword options.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command removes one or more CMs from the CMTS router memory, which causes the CMTS router to stop all DOCSIS station maintenance messages for the specified CMs until they time out and reattempt initial ranging.

Caution The **clear cable modem all delete** command should normally be used only on a test or lab network. If used on a large network, it could impact service for a significant period of time, as it would force all CMs to simultaneously reset and reregister with the Cisco CMTS. In addition, if HCCP N+1 redundancy has also been configured, using the **clear cable modem delete** command can trigger a switchover to one or more Protect interfaces, unless **no keepalive** has also been configured on the cable interfaces.

Examples

The following example shows how to delete the CM at IP address 172.23.45.67:

```
Router# clear cable modem 172.23.45.67 delete
```

The following example shows how to delete all CMs that have a OUI that has been defined as having the vendor name of Cisco using the **cable modem vendor** command:

```
Router# clear cable modem oui Cisco delete
```

The following example shows how to delete all CMs that are currently in one of the reject states:

```
Router# clear cable modem reject delete
```

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem flap -counters	Resets the CM flap-list counters to zero.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem name	Removes or resets CMs by domain name.

Command	Description
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.
show cable modem	Displays information for the registered and unregistered CMs.

clear cable modem device-class

To reset the cable modems by device class type, use the **clear cable modem device-class** command in privileged EXEC mode.

clear cable modem [**Cable** *slot/port/cable-interface-index*] **device-class** {**DVA** {**delete** | **reset**} | **MTA** {**delete** | **reset**} | **PS** {**delete** | **reset**} | **RTR** {**delete** | **reset**} | **STB** {**delete** | **reset**}}

Syntax Description

Cable *slot/port/cable-interface-index*	Specifies the cable modems on the specified cable interface. • *slot*—Specifies the chassis slot number of the cable interface line card. The valid range is from 0 to 9. • *port*—Specifies the sub slot number of the cable interface line card. The valid subslot is 0. • **delete**—Removes the cable modems matching the MTA device class.
DVA	Removes or resets the cable modems for DVA devices. • **reset**—Resets the cable modems matching the DVA device class. • **delete**—Removes the cable modems matching the DVA device class.
MTA	Removes or resets the cable modems for MTA devices. • **reset**—Resets the cable modems matching the MTA device class. • **delete**—Removes the cable modems matching the MTA device class.
PS	Removes or resets the cable modems for PS devices. • **reset**—Resets the cable modems matching the PS device class. • **delete**—Removes the cable modems matching the PS device class.

RTR	Removes or resets the cable modems for Erouter devices. • **reset**—Resets the cable modems matching the RTR device class. • **delete**—Removes the cable modems matching the RTR device class.
STB	Removes or resets the cable modems for STB devices. • **reset**—Resets the cable modems matching the STB device class. • **delete**—Removes the cable modems matching the STB device class.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCJ1	This command was introduced in Cisco uBR Series router.
3.18.1SP	This command was introduced in Cisco cBR Series Converged Broadband Router.

Examples

The following example shows how to reset the MTA device class cable modems on Cable 8/1/0:

```
Router# clear cable modem Cable 8/1/0 device-class MTA reset
```

The following example shows how to remove the STB device class cable modems on Cable 8/1/0:

```
Router# clear cable modem Cable 8/1/0 device-class STB delete
```

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem flap-counters	Resets the CM flap-list counters to zero.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.

Command	Description
clear counters	Resets interface counters and those counters associated with the **show cable modem counters** command.

clear cable modem flap-counters

To reset the cable modem (CM) flap-list counters to zero, use the **clear cable modem flap-counters** command in privileged EXEC mode.

clear cable modem {*ip-addrmac-addr*} **flap-counters**
clear cable modem [**cable** {*slot/portslot/subslot/port*}] {**all** | **offline** | **oui** *string* | **reject**} **flap-counters**

Syntax Description

ip-addr	Resets the flap-list counters for an individual CM by its IPv4 or IPv6 address.
mac-addr	Resets the flap-list counters for an individual CM by its 48-bit hardware address (MAC address).
cable *slot/port*	(Optional—Cisco uBR7100 and Cisco uBR7200 Series Routers) Resets the flap-list counters for all CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot/subslot/port*	(Optional—Cisco uBR10012 Router) Resets the flap-list counters for all CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot/subslot/port*	(Optional—Cisco cBR Series Routers) Resets the flap-list counters for all CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the interface card. Valid slots are 0 to 3 and 6 to 9 on the Cisco cBR-8 router. • *subslot*—Specifies the secondary slot number of the interface card. Valid subslot is 0 on the Cisco cBR-8 router. • *port*—Specifies the cable interface index number. Valid values are 0 to 15 on the Cisco cBR-8 router.
all	Resets the flap-list counters for all CMs or all CMs associated with a specified cable interface.
offline	Resets the flap-list counters for all offline CMs or for all such CMs associated with a specified interface.

oui *string*	Resets the flap-list counters for all CMs that match the specified Organization Unique Identifier (OUI) or for all such CMs associated with a specified interface. The *string* parameter can be either the three byte hexadecimal string (such as 00.00.0C) or a vendor name that has been defined using the **cable modem vendor** command.
reject	Resets the flap-list counters for all CMs that are currently in one of the reject states or for all such CMs associated with a specified interface. (See the **show cable modem** command for a description of these states.)

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **clear cable modem flap-counters** command to reset the flap-list counters associated with the **show cable flap-list** command.

This command only resets flap-list counters. To reset other cable interface counters and those counters associated with the **show cable modem counters** command, use the **clear counters** command.

Examples

The following example shows how to reset the flap-list counters for the CM at IP address 172.16.23.45:

```
Router# clear cable modem 172.16.23.45 flap-counters
```

The following example shows how to reset the flap-list counters for all CMs that have a OUI that has been defined as having the vendor name of Cisco using the **cable modem vendor** command:

```
Router# clear cable modem oui Cisco flap-counters
```

The following example shows how to reset the flap-list counters for all CMs that are currently in one of the reject states:

```
Router# clear cable modem reject flap-counters
```

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.

Command	Description
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem name	Removes or resets CMs by domain name.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.
clear counters	Resets interface counters and those counters associated with the **show cable modem counters** command.

clear cable modem lock

To reset the lock on one or more cable modems (CMs), and to reinitialize them so that they can reregister with a valid DOCSIS configuration file, use the **clear cable modem lock** command in privileged EXEC mode.

clear cable modem {*ip-addrmac-addr*} **lock**
clear cable modem [**cable** {*slot/portslot/subslot/port*}] {**all** | **oui** *string*} **lock**

Syntax Description

ip-addr	Resets the lock for an individual CM by its IPv4 or IPv6 address.
mac-addr	Resets the lock for an individual CM by its 48-bit hardware address (MAC address).
cable *slot/port*	(Optional—Cisco uBR7100 and Cisco uBR7200 Series Routers) Resets the lock for all CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot/subslot/port*	(Optional—Cisco uBR10012 Router) Resets the lock for all CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot/subslot/port*	(Optional—Cisco cBR-8 Router) Resets the lock for all CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable line card. Valid slots are 0 to 3 and 6 to 9. • *subslot*—Specifies the secondary slot number of the cable line card. Valid subslot is 0. • *port*—Specifies the MAC domain index. Valid range is from 0 to 15.
all	Resets the lock for all CMs or all CMs associated with a specified cable interface.
oui *string*	Resets the lock for all CMs that match the specified Organization Unique Identifier (OUI) or for all such CMs associated with a specified interface. The *string* parameter can be either the three-byte hexadecimal string (such as 00.00.0C) or a vendor name that has been defined using the **cable modem vendor** command.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When you have configured the **cable dynamic-secret lock** command on a cable interface, the CMTS "locks" CMs that use a DOCSIS configuration file that fails the CMTS verification check. These CMs are allowed to come online, but with a restrictive QoS configuration that limits their service flows to 10 kbps.

Locked CMs are not allowed to reregister with a valid DOCSIS configuration file until they have been offline, without attempting to reregister, for at least 24 hours. You can manually clear the lock on a CM by using the **clear cable modem lock** command in privileged EXEC mode.

The **clear cable modem lock** command also automatically resets the CMs, so that they will reregister with the CMTS. If the CMs then reregister with a valid DOCSIS configuration file, the CMTS allows the CMs to come online with the requested QoS profiles. If the CMs violate the DOCSIS specifications again, they will be locked again.



Note If a CM is not manually unlocked, it remains locked until it stays offline, without attempting to reregister, for 24 hours. It can also be unlocked by using the **clear cable modem delete** command to manually remove the CM from all of the CMTS internal databases.

Examples

The following example shows how to reset the lock for the CM with the MAC address of 0000.0C01.0203:

```
Router# clear cable modem 0000.0C01.0203 lock
```

The following example shows how to reset the lock for the CM at IP address 172.16.23.45:

```
Router# clear cable modem 172.16.23.45 lock
```

The following example shows how to reset the locks for all CMs that have an OUI that has been defined as having the vendor name of Cisco using the **cable modem vendor** command:

```
Router# clear cable modem oui Cisco lock
```

Related Commands

Command	Description
cable dynamic-secret	Enables the dynamic shared secret feature, so that DOCSIS configuration files are verified with a Message Integrity Check (MIC) that has been created with a dynamically generated shared secret.
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem flap-counters	Resets the CM flap-list counters to zero.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem name	Removes or resets CMs by domain name.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.

clear cable modem name

To remove or reset cable modems (CMs) by domain name, use the **clear cable modem name** command in privileged EXEC mode.

clear cable modem name *fqdn* {**delete** | **reset**}

Syntax Description

fqdn	Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable Domain Name System (DNS) cache on the CMTS router.
delete	Removes the CM with the specified domain name from the Station Maintenance List.
reset	Removes the CM with the specified domain name from the Station Maintenance List and resets it.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCD	This command was modified to remove **flap-counters** and **lock** keywords.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Examples

The following example shows how to delete a CM with the domain name “example”:

```
Router# clear cable modem name example delete
```

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem flap -counters	Resets the CM flap-list counters to zero.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.

clear cable modem partial-service

To reset, re-initiate or delete cable modems that are either in downstream or upstream partial service, use the **clear cable modem partial-service** command in privileged EXEC mode.

clear cable modem partial-service { **all | d30 | d31** } **[ds-partial | us-partial]** { **delete | reinit | reset** }

Syntax Description

all	Specifies all partial service modems
d30	Specifies Docsis 3.0 partial service modems
d31	Specifies Docsis 3.1 partial service modems
delete	Delete the partial service modems
reinit	Re-initiate the partial service modems
reset	Reset the partial service modems
ds-partial	Specifies downstream partial service modems
us-partial	Specifies upstream partial service modems

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1w	This command is updated on the Cisco cBR Series Converged Broadband Routers. The `ds-partial` and `us-partial` keywords are added.

Usage Guidelines

The following example shows how to reset, re-initiate or delete cable modems that are either in downstream:

```
router# clear cable modem partial-service all us-partial reset
router# clear cable modem partial-service all ds-partial reset
router# clear cable modem partial-service d30 us-partial delete
router# clear cable modem partial-service d30 us-partial reinit
```

clear cable modem path-sel

To clear the path selection status for the cable modems, use the **clear cable modem path-sel** command in privileged EXEC mode.

clear cable modem [*ip address* | *mac address* | **all**] **path-sel**

Syntax Description

ip address	Clears the path selection status from the specified IP address.
mac address	Clears the path selection status from the specified MAC address.
all	Clears the path selection status from all the cable modems.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to clear the path selection status for the cable modems.

The following example shows how to clear path selection status for a particular MAC address:

```
router#show cable modem c8fb.26a6.c46a path-sel
 CM c8fb.26a6.c46a Path-Sel Info: N/A
 Path-Sel status has been cleared after register online.
```

Related Commands

Command	Description
show cable modem path-sel	Displays the path selection status of a cable modem.
show cable mac-domain rcc	Displays runtime receive channel configuration (RCC) on a cable line card interface.
show cable mac domain rcc simplified	Shows detailed information for DOCSIS 3.1 capable RCC.

clear cable modem pnm

To clear all the PNM US RxPwr information for cable modems, use the following **clear cable modem pnm us-rxpwr** command in the privileged EXEC mode.

clear cable modem pnm us-rxpwr

To clear all the PNM US RxPwr information for cable modems on a specific OFDMA channel, use the following **clear cable modem pnm us-rxpwr upstream** *<0-15>* command in the privileged EXEC mode.

clear cable modem pnm us-rxpwr upstream *<0-15>*

To clear all the PNM US RxPwr information for cable modems on a specific cable interface, use the following **clear cable modem** *[Cable<slot/0/interface>]* **pnm us-rxpwr Cable** command in the privileged EXEC mode.

clear cable modem Cable *<slot/0/interface>* **pnm us-rxpwr**

To clear the PNM US RxPwr information for a cable modems on a specific cable interface on a specific OFDMA channel, use the following **clear cable modem** *[Cable<slot/0/interface>]* **pnm us-rxpwr upstream** *<0-15>* command in the privileged EXEC mode.

clear cable modem Cable *<slot/0/interface>***pnm us-rxpwr upstream***<0-15>*

To clear the PNM US RxPwr information for a specific cable modem, use the following **clear cable modem** *[H.H.H or A.B.C.D]* **pnm us-rxpwr upstream** command in the privileged EXEC mode.

where [H.H.H] is a specific modem's unique MAC address, and [A.B.C.D] is a specific modem's assigned IP address.

clear cable modem *H.H.H* **pnm us-rxpwr**

clear cable modem *A.B.C.D* **pnm us-rxpwr**

To clear the PNM US RxPwr information for a specific cable modem on a specific US OFDMA channel, use the following **clear cable modem***[H.H.H or A.B.C.D]* **pnm us-rxpwr upstream** *<0-15>* command in privileged EXEC mode.

where *[H.H.H]* is a specific modem's unique MAC address and [A.B.C.D] is a specific modem's assigned IP address.

where *<0-15>* is the upstream OFDMA channel the modem is registered on.

clear cable modem pnm *H.H.H* **pnm us-rxpwr upstream** *<0-15>*

clear cable modem *A.B.C.D* **pnm us-rxpwr upstream** *<0-15>*

Table 24: Syntax Description

Syntax	Description
interface	Interface on which the PNM RxPwr data is cleared for a specified upstream channel.

Syntax	Description
mac address	MAC address of the system for which the PNM RxPwr data is cleared for a specified upstream channel.
ip address	IP address of the system for which the PNM RxPwr data is cleared for a specified upstream channel.
upstream	Modems on a particular upstream channel. The valid range is 0-15.

clear cable modem rcs-counts

To clear the following failure and recovery event counts for all or given RF channels of a CM, use the **clear cable modem rcs-counts** command in privileged EXEC mode:

- MAC Domain Descriptor (MDD)
- QAM/forward error correction (FEC)

clear cable modem [**cable if** | **mac_addr** | **ip_addr**] **rcs-counts** [**modular-cable** *slot/bay/port nb-channel-number*]

Cisco cBR Series Converged Broadband Routers
clear cable modem [**cable if** | **mac_addr** | **ip_addr**] **rcs-counts** [**integrated-cable** *slot/sub-slot/port rf-channel-number*]

Syntax Description

cable if	(Optional) The name of the downstream interface.
mac-address	(Optional) Identifies the MAC address of a CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
ip-address	(Optional) Identifies the IP address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
sub-slot	The valid value is 0.
sub-plot	The valid value is 1.
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.
rf-channel-number	Represents the downstream RF channel number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem name	Removes or resets CMs by domain name.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.

clear cable modem reset

To remove one or more cable modems (CMs) from the Station Maintenance List and reset them, use the **clear cable modem reset** command in privileged EXEC mode.

clear cable modem {*ip-addrmac-addr*} **reset**
clear cable modem [**cable** {*slot/portslot/subslot/port*}] {**all** | **non-bonding-capable** [**legacy-ranging**] | **oui** *string* | **reject** | **wideband** [**registered-traditional-docsis**] } **reset**

Syntax Description

ip-addr	Specifies removal of an individual CM by its IPv4 or IPv6 address.
mac-addr	Specifies removal of an individual CM by its 48-bit hardware address (MAC address).
cable *slot/port*	(Optional—Cisco uBR7100 and Cisco uBR7200 Series Routers) Specifies removal of all CMs on the specified cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot/subslot/port*	(Optional—Cisco uBR10012 Router) Specifies removal of all CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot/subslot/port*	(Optional—Cisco cBR Series Routers) Specifies removal of all CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the interface card. Valid slots are 0 to 3 and 6 to 9 on the Cisco cBR-8 router. • *subslot*—Specifies the secondary slot number of the interface card. Valid subslot is 0 on the Cisco cBR-8 router. • *port*—Specifies the cable interface index number. Valid values are 0 to 15 on the Cisco cBR-8 router.
all	Specifies removal of all CMs or all CMs associated with a specified cable interface.
non-bonding-capable	Specifies removal of all narrowband CMs that are not capable of downstream channel bonding or all such CMs associated with a specified interface.

legacy-ranging	(Optional) Specifies removal of narrowband CMs that are accessed with legacy initial ranging or all such CMs associated with a specified interface.
oui *string*	Specifies removal of all CMs that match the specified Organization Unique Identifier (OUI) or all such CMs associated with a specified interface. The *string* parameter can be either the three-byte hexadecimal string (such as 00.00.0C) or a vendor name that has been defined using the **cable modem vendor** command.
reject	Specifies removal of all CMs that are currently in one of the reject states or all such CMs associated with a specified interface. (See the **show cable modem** command for a description of these states.)
wideband	Specifies removal of all wideband CMs or all such CMs associated with a specified interface.
registered-traditional-docsis	(Optional) Specifies removal of all wideband CMs that are registered as traditional DOCSIS CMs or all such CMs associated with a specified interface.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(2) EC	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
12.2(11)BC2	Support was added for the **oui** and **reject** options.
12.2(15)BC1	The **cable** keyword option was added.
12.3(21)BC	Support was added for the **wideband** and **registered-traditional-docsis** keyword options.
12.3(23)BC	Support was added for the **non-bonding-capable** and **legacy-ranging** keyword options.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command instructs the Cisco CMTS to stop sending DOCSIS station maintenance messages to one or more CMs, which effectively terminates the link to those CMs until those CMs time out and reattempt initial ranging. A CM responds to this by resetting itself. Depending on when the CM received the last station maintenance message, it can take up to 30 seconds before the CM detects the missing station maintenance messages and resets itself.

If the **clear cable modem** {*ip-address* | *mac-address*} **reset** form of the command is used to reset an individual modem, the CMTS router sends a ranging stop message to the specified modem in order to command the modem to reset itself and begin initial ranging more quickly without having to wait for up to 30 seconds to realize it is no longer receiving station maintenance keep-alive opportunities. This behavior is only seen when using the **clear cable modem reset** command for a specific CM.

Tip You can also specify the MAC address or IP address for a CPE device or host, and the Cisco CMTS resets the CM that is associated with that CPE device in its internal database.

In some circumstances, the customer premises equipment (CPE) device behind a CM stops receiving traffic after the CM is reset. This is because the CMTS still has the CPE device listed in its address tables, but the CM does not after being reset, so the traffic passes through the CMTS but is dropped by the CM. To resolve this situation, the CPE device should simply send some type of traffic to the CM, such as a ping packet. (You can also resolve this situation by using the **clear arp-cache** command on the Cisco CMTS router to clear the router's address table, but this is not recommended because it temporarily interrupts all traffic on the router.)

Caution The **clear cable modem all reset** command should normally be used only on a test or lab network. If used on a large network, it could impact service for a significant period of time, as it would force all CMs to simultaneously reset and reregister with the Cisco CMTS.

Note The **clear cable modem all reset** command can result in the CPU utilization temporarily reaching 100 percent for a couple of minutes, as the CPU processes the command for all CMs. The CPU utilization will return to normal within a couple of minutes.

Examples

The following example shows how to reset the CM at IP address 172.23.45.67:

```
Router# clear cable modem 172.23.45.67 reset
```

The following example shows how to reset all CMs that have an OUI that has been defined as having the vendor name of Cisco using the **cable modem vendor** command:

```
Router# clear cable modem oui Cisco reset
```

The following example shows how to reset all CMs that are currently in one of the reject states:

```
Router# clear cable modem reject reset
```

For the Cisco uBR10012 router, the following example shows how to reset all wideband CMs that are registered as traditional DOCSIS modems:

```
Router# clear cable modem wideband registered-traditional-docsis reset
```

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.

Command	Description
clear cable modem flap-counters	Resets the CM flap-list counters to zero.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem name	Removes or resets CMs by domain name.
show cable modem	Displays information for registered and unregistered CMs.

clear cable modem rf-adapt

To clear RF adaptation candidates or history information of the cable modems, use the **clear cable modem rf-adapt** command in privileged EXEC mode.

clear cable modem {*ip-addr*|*mac-addr*|[**cable** {*slot/cable-interface-index*|*slot/subslot/cable-interface-index*}] {**all** | **offline** | **reject** | **oui** *string*}} **rf-adapt** {**candidates** [**downgrade** | **upgrade**] | **history**}

Syntax Description

ip-addr	IPv4 or IPv6 address of the cable modem.
mac-addr	48-bit MAC address of the cable modem.
cable	Specifies the cable interface line card details. • *slot*—Slot where the cable interface line card resides. • *subslot*—(Cisco uBR10012 router only) Secondary slot number of the cable interface line card. • *cable-interface-index*—Downstream port number or MAC domain index of the cable interface line card.
all	Clears the RF adaptation history or candidate status of all cable modems.
offline	Clears the RF adaptation history or candidate status of all offline cable modems.
reject	Clears the RF adaptation history or candidate status of all cable modems in reject state.
oui *string*	Clears the RF adaptation history or candidate status of the cable modems that match the specified Organization Unique Identifier (OUI) or for all cable modems associated with a specified interface. The *string* parameter can be either the three byte hexadecimal string (such as 00.00.0C) or a vendor name that has been defined using the **cable modem vendor** command.
candidates	Clears RF adaptation candidates.
downgrade	(Optional) Clears RF adaptation downgrade candidates.
upgrade	(Optional) Clears RF adaptation upgrade candidates.
history	Clears RF adaptation history.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF3	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **clear cable modem rf-adapt** command is used to configure the Cable Modem Upstream RF Adaption feature.

Use the **clear cable modem rf-adapt history** command to remove the history of all RF adaptation relocations for a given cable modem.

Use the **clear cable modem rf-adapt candidates** command to change the status of a cable modem or group of cable modems that are RF adaptation relocation candidates.

Using the **clear cable modem rf-adapt history** and **clear cable modem rf-adapt candidates** commands do not affect the MAC state of the cable modem.

The table below displays the interface density information.

Table 25: Interface Density Information

CMTS Router	Line Card	Slot	Subslot	Port	Cable Interface Index
Cisco uBR10012	Cisco uBR-MC3GX60V	5 to 8	0 or 1	0 or 4	0 to 14
	Cisco UBR-MC20X20V				0 to 4
	Cisco uBR10-MC5X20				
Cisco uBR7225VXR	All	1 or 2	0 or 1	0 or 1	—
Cisco uBR7246VXR	All	3 to 6	0 or 1	0 or 1	—

Examples

The following example shows how to reset the RF adaptation history for the cable modem at IP address 192.0.2.255:

```
Router# clear cable modem 192.0.2.255 rf-adapt history
```

The following example shows how to reset the RF adaptation downgrade candidates for all cable modems:

```
Router# clear cable modem all rf-adapt candidates downgrade
```

Related Commands

Command	Description
show cable modem rf-adapt	Displays the RF adaptation history.
show cable rf-adapt	Displays RF adaptation information of upgrade and downgrade candidates.

clear cable modem service-type-id

To clear the cable modem service type ID, use the **clear cable modem service-type-id** command in privileged EXEC mode.

clear cable modem {*ip* | **mac** | **name** *domain name* | [[*interface*]] {**all** | **offline** | **oui** *oui* | **reject** | **wideband** | **none-bounding-capable**}} **service-type-id**

Cisco cBR Series Converged Broadband Routers
clear cable modem {*ip* | **mac** | [[*interface*]] {**all** | **offline** | **oui** *oui* | **reject**}} **service-type-id**

Syntax Description

ip	Specifies removal of an individual CM by its IPv4 or IPv6 address.
mac	Specifies removal of an individual CM by its 48-bit hardware address (MAC address).
name *domain name*	Specifies the domain name of the cable modem.
interface	(Optional) Resets the attribute masks of the offline CMs.
all	Specifies removal of all CMs or all CMs associated with a specified cable interface.
offline	Specifies removal of all offline CMs or all such CMs associated with a specified interface.
oui oui	Specifies removal of all CMs that match the specified Organization Unique Identifier (OUI) or all such CMs associated with a specified interface. The string parameter can be either the three-byte hexadecimal string (such as 00.00.0C) or a vendor name.
reject	Specifies removal of all CMs that are currently in one of the reject states or all such CMs associated with a specified interface.
wideband	Specifies removal of all wideband CMs or all such CMs associated with a specified interface.
none-bounding-capable	Specifies removal of all narrowband CMs that are not capable of downstream channel bonding or all such CMs associated with a specified interface.
service-type-id	Specifies the service type identifier.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **name**, **wideband**, and **none-bounding-capable** keywords were removed.

Usage Guidelines

This command clears the cable mdem service type ID.

Examples

The following example shows how to clear cable modem service type ID:

```
Router# clear cable modem all service-type-id
Router# clear cable modem oui SA service-type-id
Router# clear cable modem c3/0/0 offline service-type-id
```

Related Commands

Command	Description
clear cable modem attribute-masks	This command clears the cable modem attribute masks.
show cable modem service-type-id	Displays the modems having service type id.

clear cable modem voice

To clear the voice tag that is set for a cable modem (CM), use the **clear cable modem voice** command in privileged EXEC mode.

clear cable modem {*ip-addrmac-addr*} **voice** {**retries** | **tag**}
clear cable modem [**cable** *slot/subslot/port*] {**all** | **offline** | **oui** *string* | **reject**} **voice** {**retries** | **tag**}

Syntax Description

ip-addr	Specifies removal of an individual CM by its IPv4 or IPv6 address.
mac-addr	Specifies removal of an individual CM by its 48-bit hardware address (MAC address).
retries	Clears the CM downstream retries record.
tag	Clears the CM voice tag.
cable *slot/subslot/port*	(Optional—Cisco uBR10012 Router) Specifies clearing of voice tags for CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot/subslot/port*	(Optional—Cisco cBR Series Routers) Specifies clearing of voice tags for CMs on the specified cable interface, where: • *slot*—Specifies the chassis slot number of the interface card. Valid slots are 0 to 3 and 6 to 9 on the Cisco cBR-8 router. • *subslot*—Specifies the secondary slot number of the interface card. Valid subslot is 0 on the Cisco cBR-8 router. • *port*—Specifies the cable interface index number. Valid values are 0 to 15 on the Cisco cBR-8 router.
all	Specifies clearing of voice tags for all CMs or all CMs associated with a specified cable interface.
offline	Specifies clearing of voice tags for all offline CMs or all such CMs associated with a specified interface.
oui *string*	Specifies clearing of voice tags for all CMs that match the specified Organization Unique Identifier (OUI) or all such CMs associated with a specified interface. The *string* parameter can be either the three byte hexadecimal string (such as 00.00.0C) or a vendor name that has been defined using the **cable modem vendor** command.
reject	Specifies clearing of voice tags for all CMs that are currently in one of the reject states or all such CMs associated with a specified interface. (See the **show cable modem** command for a description of these states).

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to clear the voice tag and retries record for the CM at IP address 172.16.23.45:

```
Router# clear cable modem 172.16.23.45 voice retries
```

Related Commands

Commands	Description
show cable modem voice	Displays the detected voice-enabled modems.
test cable voice	Allows you to manually set the voice tag of a cable modem.

clear cable multicast ses-cache

To clear the multicast replication sessions cache, use the **clear cable ses-cache** command in privileged EXEC mode.

clear cable multicast ses-cable {**all** | **counter** | **interface integrated-cable** *slot/subslot/port:rf-channel* | **modular-cable** *slot/* {*subslotbay*}*/port:interface-number* | **wideband-cable** *slot/* {*subslotbay*}*/port:wideband-channel*}

Syntax Description

all	Clears the cached multicast replication sessions for all interfaces.
counter	Clears multicast replication sessions cache counters.
interface integrated-cable *slot/subslot/port:rf-channel*	Clears the cached multicast replication sessions for a integrated-cable interface. • *slot*—Slot where a line card resides. • subslot—(Cisco uBR10012 only) Secondary slot number of a line card. • *port*—Downstream port number. • *rf:channel*—RF channel number.
interface modular-cable *slot/{subslot | bay}/port:interface-number*	Clears the cached multicast replication sessions for a modular-cable interface. • *slot*—Slot where a SPA interface processor (SIP) or a line card resides. • *subslot*—Secondary slot for a shared port adapter (SPA) or a line card. • *bay*—Bay in a SIP where a SPA is located. • *port*—Downstream port number. • *interface-number*—Modular channel number.
interface wideband-cable *slot/{subslot | bay}/port:wideband-channel*	Clears the cached multicast replication sessions for a wideband-cable interface. • *slot*—Slot where a SPA interface processor (SIP) or a line card resides. • *subslot*—Secondary slot for a shared port adapter (SPA) or a line card. • *bay*—Bay in a SIP where a SPA is located. • *port*—Downstream port number. • *wideband-channel*—Wideband channel number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **clear cable multicast ses-cache** command to clear the multicast replication sessions configured on the interfaces.

The table below displays the valid values for an integrated-cable interface.

Table 26: Integrated Cable Interface Density Information

CMTS Router	Line Card	Slot	Subslot	Port	RF Channel Number
Cisco uBR10012	Cisco uBR-MC3GX60V	5 to 8	0 or 1	0 to 4	0 to 3
	Cisco UBR-MC20X20V				
	Cisco uBR10-MC5X20				
Cisco uBR7225VXR	All	1 or 2	—	0 or 1	—
Cisco uBR7246VXR	All	3 to 6	—	0 or 1	—

The table below displays the valid values for an modular-cable interface.

Table 27: Modular Cable Interface Density Information

Line Card	Slot	Subslot	Bay	Port	Interface Number
Cisco uBR-MC3GX60V	5 to 8	0 or 1	—	0 to 2	0 to 23
Cisco UBR-MC20X20V			—	0 to 5	
Cisco Wideband SPA	—	0 or 1[10]	0 to 3	0	
Cisco Wideband SIP / Cisco SIP-600	1 or 3	—	—	—	

[10] Applicable to SPAs when the SIP is in Slot1 or Slot 3. The subslot is not specified from Cisco IOS Release 12.2(33)SCB onwards.

The table below displays the valid values for an wideband-cable interface.

Table 28: Wideband Interface Density Information

CMTS Router	Line Card	Slot	Subslot	Bay	Port	Wideband Channel
Cisco uBR10012	Cisco uBR-MC3GX60V	5 to 8	0 or 1	—	0 to 4	0 to 31
	Cisco UBR-MC20X20V			—		0 to 5
	Cisco uBR10-MC5X20			—		—
	Cisco Wideband SPA	—	0 or 1[11]	0 to 3	0	—
	Cisco Wideband SIP / Cisco SIP-600	1 or 3	—	—	—	—
Cisco uBR7225VXR	All	1 to 2	—	—	0 or 1	0 to 5
Cisco uBR7246VXR	All	3 to 6	—	—		

[11] Applicable to SPAs when the SIP is in Slot1 or Slot 3. The subslot is not specified from Cisco IOS Release 12.2(33)SCB onwards.

Examples

The following example clears the multicast replication session cache for all interfaces on the Cisco uBR10012 router:

```
Router# clear cable multicast ses-cache all
```

Related Commands

Command	Description
cable multicast ses-cache	Configures the multicast replication session cache on the Cisco uBR10012 router.
show cable multicast ses-cache	Displays the multicast replication session cache information both at the global and interface level of the forwarding interface.

clear cable multicast statistics counter

To reset all multicast statistics counters, use the **clear cable multicast statistics counter** command in privileged EXEC mode.

clear cable multicast statistics counter

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The counters are also set to zero when a given multicast resource is reconfigured. Counters are displayed using the **show cable multicast statistics** command.

Examples

The following example shows how to reset configured multicast statistics index allocation details to zero:

```
Router# clear cable multicast statistics counter
Router#
```

Related Commands

Command	Description
show cable multicast statistics	Displays the multicast statistics index allocation details.
show cable multicast db	Displays the contents of the multicast explicit tracking database.

clear cable resil-rf-status

To reset flap counts and flap time for all or a given RF channel, use the **clear cable resil-rf-status** command in privileged EXEC mode.

clear cable resil-rf-status [**Integrated-Cable** *slot/subslot/port rf-channel-number*]

Syntax Description

Integrated-Cable	(Opional) Specifies that the flap counts and flap time is reset for the given RF channel.
slot	Slot where interface card resides. The range is from 0 to 3 and 6 to 9 on the Cisco cBR-8 router.
subslot	Subslot number of the interface card. The value is 0 on the Cisco cBR-8 router.
port	Port number. The range is from 0 to 7 on the Cisco cBR-8 router.
rf-channel-number	Downstream RF channel number. The range is from 0 to 162 on the Cisco cBR-8 router.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **clear cable rf-status** command.

The following example shows how to reset the flap counts and flap time for RF channel 4:

```
Router# clear cable resil-rf-status Integrated-Cable 3/0/2 4
```

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.

clear cable rf-status

To reset flap counts and flap time for all or a given RF channel, use the **clear cable rf-status** command in privileged EXEC mode.

clear cable rf-status [**modular-cable** *slot/bay/port nb-channel-number*]

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **clear cable resil-rf-status** command on the Cisco cBR Series Converged Broadband Routers.

Related Commands

Command	Description
clear cable flap-list	Resets the flap-list table for a specific CM or for all CMs.
clear cable modem delete	Removes one or more CMs from the internal address and routing tables on a CMTS router and stops DOCSIS station maintenance messages.
clear cable modem lock	Resets the lock on one or more CMs.
clear cable modem name	Removes or resets CMs by domain name.
clear cable modem reset	Removes one or more CMs from the Station Maintenance List and resets them.

clear cable rpd all event

To remove all events on Cisco cBR, use the **clear cable rpd all event** command.

```
clear cable rpd all event
```

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco RPD IOS 1.1	This command was introduced on the Cisco Remote-PHY Devices.

Usage Guidelines

Use this command to clear RPD events.

The following example shows how to clear all RPD events.

```
Router(config)#clear cable rpd all event
Router(config)#show cable rpd event
Load for five secs: 13%/4%; one minute: 10%; five minutes: 10%
Time source is NTP, 17:43:36.424 CST Fri Apr 28 2017
RPD               EventId Level Count LastTime       Message
```

clear cable rpd reset

To reset RPD, use the **clear cable rpd reset** command.

```
clear cable rpd { rpd_mac | all | slot id | group name | interface
TenGigabitEthernet slot/subslot/port } reset [ factory | non-volatile | soft
| hard ]
```

Syntax Description

rpd_mac	Specifies the MAC address of the RPD to reset.
all	Resets all the RPDs.
slot *id*	Specifies the slot of the RPDs to reset.
group *name*	Specifies the group of the RPDs to reset.
interface TenGigabitEthernet *slot/subslot/port*	Specifies the Ten Gigabit Ethernet interface with slot, subslot, and port of the RPDs to reset.
reset	Performs a hard reset together with a legacy GDM reset for backward compatibility.
factory	Restores the factory configuration and performs a hard reset.
non-volatile	Clears most non-volatile configuration and performs a hard reset.
factory	Performs a software reset.
hard	Performs hardware reset using TLV40.1.1 on: • All RPDs • Specific RPD using MAC address • Specific RPD interface • Specific RPD slot

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1x	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Dublin 17.12.1w	The **hard** option is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command works only when cBR-8 router acts as the principal core of the RPD.

The following example shows how to reset RPD.

```
Router#clear cable rpd 1004.9fb1.1300 reset non-volatile
Warning: Do you really want to do this? It will clear most RPD non-volatile configuration!

Confirm to continue? [no]: yes
Router#
```

The following example shows how to reset all the RPD configured on the CBR router using the hard option:

```
Router#clear cable rpd all reset hard
```

The following example shows how to reset a specific RPD configured on the CBR router:

```
Router#clear cable rpd 1004.9fb1.1300 reset hard
```

```
Router#show cable rpd
Load for five secs: 6%/1%; one minute: 7%; five minutes: 7%
Time source is NTP, 10:08:19.582 CST Fri Aug 4 2023

MAC Address     IP Address       I/F       State        Role HA  Auth Name

0018.48fe.e643  10.0.0.1     Te6/1/5   online       Pri  Act N/A  vecima-rpd

1004.9fb1.1300  10.0.0.2     Te6/1/5   offline      Pri  Act N/A  ng13-shelf-node2

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

clear cable secondary-ip

To clear the router's table that links secondary IP addresses to the devices that use them, use the **clear cable secondary-ip** command in privileged EXEC mode.

clear cable secondary-ip interface cable {*slot/portslot/subport/port*} [**all** | **sid** *sid* [*ip-address*]]

Syntax Description

slot/port	(Cisco uBR7100 and Cisco uBR7200 Series Routers) Specifies the cable interface and downstream port, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
slot/subslot/port	Cisco uBR10012 Router) Specifies the cable interface, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
all	Specifies that all IP addresses in the secondary IP address table should be cleared.
sid *sid*	Specifies that all IP addresses for a particular Service ID (SID) should be cleared. The valid range is 1 to 8191.
ip-address	(Optional) Specifies that the IP address for a particular CM or CPE device should be cleared.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(13)EC	This command was introduced for the Cisco uBR7100 series and Cisco uBR7200 series universal broadband routers.
12.2(11)BC1	Support was added for the Cisco uBR10012 universal broadband router.
12.2(11)BC2	This command was removed because it is no longer needed, because of database changes.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.

Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To support BPI and BPI+ operations with CMs and CPE devices that use secondary IP addresses, the CMTS maintains a database that links the known secondary IP addresses to the SIDs used by those devices. When the CMTS and CM need to renew their public keys, the CMTS uses this database to ensure that all IP addresses are sufficiently updated to allow proper routing and fast switching.



Tip You can display the list of known IP addresses per SID by using the **show interface cable sid** command.

If you encounter apparent problems with secondary IP addressing, or if you want to manually clear the table of IP addresses for a particular SID, use the **clear cable secondary-ip** command.

One possible situation that might occur is if a CM first assigns a secondary IP address to one CPE device, but later that same IP address is assigned to another CPE device behind a different CM. If this happens, the IP address will continue to show up as a secondary IP address for the original CM until that CM renews its public keys. This will not affect network connectivity for either CPE or CM. You can, however, clear the unneeded secondary IP address from the CMTS database using the **clear cable secondary-ip** command.

Examples

The following example shows how to clear all of the secondary IP addresses for a particular cable interface:

```
Router# clear cable secondary-ip interface cable 3/0 all
```

The following example shows how to clear the secondary IP addresses for all CM and CPE devices on cable interface 1/0 that are using SID 5:

```
Router# clear cable secondary-ip interface cable 1/0 sid 5
```

The following example shows how to clear the secondary IP addresses for the CM and CPE devices on cable interface 5/0 that are using SID 113 and IP address 10.10.17.3:

```
Router# clear cable secondary-ip interface cable 5/0 sid 113 10.10.17.3
```

Related Commands

Command	Description
show interface cable sid	Displays information for a particular SID, including the known secondary IP addresses.

clear cable upstream ofdma mer-fec

To clear OFDMA MER and FEC counts, use the **clear cable upstream ofdma mer-fec** command in privileged EXEC mode.

clear cable upstream ofdma mer-fec { all | upstream-cable *slot/card/port* **us-channel** *us_channel_number* **}**

Syntax Description

all	Clears Upstream OFDMA MER and FEC on the entire chassis.
upstream-cable *slot/card/port* **us-channel** *us_channel_number*	Clears Upstream OFDMA MER and FEC on a specific OFDMA upstream channel.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS XE Gibraltar 16.12.1y	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to clear Upstream OFDMA MER and FEC on the entire chassis.:

```
Router# clear cable upstream ofdma mer-fec all
Check all IUCs are cleared in the entire cbr8
```

The following example shows how to clear Upstream OFDMA MER and FEC on a specific OFDMA upstream channel:

```
Router# clear cable upstream ofdma mer-fec upstream-cable 1/0/0 us-channel 15
```

clear hccp counters

To reset the counters for one or all Hot Standby Connection-to-Connection Protocol (HCCP) groups, use the **clear hccp counters** command in privileged EXEC mode.

clear hccp [*group* | **all**] **counters**

Syntax Description

group	Clears the counters for the specified group number. The valid range is 1 to 255.
all	Clears the counters for all HCCP groups.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.3(21)BC	This command is obsolete on the Cisco uBR7246VXR router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command clears the counters that are displayed by the **show hccp** and**show hccp interface** commands. You can clear the counters for a single HCCP group, or all HCCP groups.

Examples

The following example shows the counters for group 1 being reset to 0:

```
Router# clear hccp 1 counters
```

The following example shows the counters for all groups being reset to 0:

```
Router# clear hccp all counters
```

Related Commands

Command	Description
hccp working	Designates a cable interface on a CMTS in the specified group to be a Working CMTS.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

clear hccp linecard

To clear information about the Hot Standby Connection-to-Connection Protocol (HCCP) startup and switchover flow and unused events associated with cable line cards, use the **clear hccp linecard** command in privileged EXEC mode.

clear hccp linecard {**fsm** | **nullfsm**} **buffer**

Syntax Description

fsm	The HCCP state transition flow (startup and switchover flow). Each line card member in an HCCP group is controlled by a state machine, which controls the HCCP startup and switchover flow.
nullfsm	The HCCP members that received unused or redundant events. This option is used only for debugging.
buffer	Buffer for saving HCCP state transition flow.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to clear entries for the HCCP startup and switchover flow using the **clear hccp linecard** command on a Cisco CMTS router:

```
Router# clear hccp linecard fsm buffer
```

Related Commands

Command	Description
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.
show hccp linecard	Displays line card level HCCP group information.

clear packetcable gate counter commit

To clear the specified gate counter for PacketCable Multimedia (PCMM) or Dynamic Quality of Service (DQoS) for PC, use the **clear packetcable gate counter commit** command in Privileged EXEC mode.

clear packetcable gate counter commit [**dqos** | **multimedia**]

Syntax Description

dqos	Clears PC DQoS gate counters.
multimedia	Clears PCMM gate counters.

Command Default

The committed gate counter is reset to zero by default with router restart, and gates are not cleared periodically by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
12.3(13a)BC	This command was modified to support PCMM on the Cisco uBR10012 router and the Cisco uBR7246VXR router. The **dqos** and **multimedia** keywords were added.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to reset the gate counter being used to track the total number of committed gates. The CMTS router maintains a count of the total number of gates committed from the router's last startup. This command can be used to either clear all the gate commit counts, or to specifically clear the counts for DQoS- or multimedia-based gates.

A **show** command is used to display the total number of gates committed on the CMTS.

Examples

The following example shows the committed gate counter being reset to zero:

```
Router# clear packetcable gate counter commit
```

Related Commands

Command	Description
packetcable authorize vanilla-docsis-mta	Allows non-DQoS MTAs to send DOCSIS DSX messages.
packetcable gate maxcount	Sets the maximum number of PCMM gates in the gate database.

Command	Description
packetcable multimedia	Enables and displays PacketCable Multimedia processing on the Cisco CMTS.
packetcable timer multimedia T1	Sets the default timeout value for T1timer used in PCMM gate processing.

clear packetcable rks

To clear the record keeping server (RKS) entries when there are no calls associated with the RKS server, use the **clear packetcable rks** command in privileged EXEC mode.

clear packetcable rks {**ip_addr** *ip_addr port* | **all**}

Syntax Description

ip_addr *ip_addr*	Indicates the IP address of the RKS server to be cleared.
port	Indicates the UDP port of the RKS server to be cleared.
all	Indicates that information about all RKS servers will be cleared.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCD	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **clear packetcable rks** command is used to clear the unwanted IP addresses of the RKS servers from the RKS server group list.



Note This command clears the IP addresses of only those RKS servers that are currently not being used. In other words, if the reference count of an RKS server is a non-zero value, that entry will not cleared from the RKS server group list.



Tip You can verify the value of reference count (ref-cnt) by executing the **show packetcable event** command with the **rks-group** keyword.

Examples

The following sample shows how to clear the RKS server with IP address 2.39.26.8 on port 1816:

```
router#
 clear packetcable rks ip_addr 2.39.26.8 1816
```

The following sample shows how to clear the entries of all RKS servers:

```
router#
 clear packetcable rks all
```

Related Commands

Command	Description
show packetcable event	Displays information about the servers that are configured on the Cisco CMTS router for PacketCable operations.

clear pxf

To clear Parallel eXpress Forwarding (PXF) counters and statistics, use the **clear pxf** command in privileged EXEC mode.

clear pxf [**dma counters** | **interface** *interface* | **statistics** {**context** | **diversion** | **drop** | **ip** | **ipv6**} | **xcm counters**]

Syntax Description

dma counters	(Optional) Clears the direct memory access (DMA) PXF counters.
interface *interface*	(Optional) Clears the PXF counters on the specified interface.
statistics	(Optional) Type of PXF statistics to clear. The options are: •**context**—Current and historical loads on the PXF. •**diversion**—Traffic diverted from the PXF. •**drop**—Dropped packets and bytes. •**ip**— IP and ICMP statistics. •**ipv6**—IPv6 statistics.
xcm counters	Clears the PXF Error Code Correction (ECC) counters.

Command Default

Clears the PXF Error Code Correction (ECC) counters.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(22)S	This command was introduced on the Cisco 10000 series router.
12.2(1)XF1	This command was introduced on the Cisco uBR10012 router.
12.2(4)XF1	The **xcm counters** option was introduced to support the Performance Routing Engine (PRE1) module on the Cisco uBR10012 router.
12.3(7)XI1	This command was integrated into Cisco IOS Release 12.3(7)XI1.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC. The **context** and **ipv6** keyword options are not supported.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. The **ipv6** keyword option is not supported.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If no interface is specified, the command clears PXF counters on all interfaces. The clear pxf command clears counters associated with the **show pxf dma**, **show pxf interface**, **show pxf statistics**, and **show pxf xcm** commands.

Cisco uBR10012 Universal Broadband Router

Not all keyword options are supported in the Cisco IOS software for the Cisco uBR10012 universal broadband router. See the command history table for the unsupported keyword options by release.

The **clear pxf xcm counters** command is supported only on the PRE1 and later processors for the Cisco uBR10012 router. This command is not supported on the PRE processor.

Examples

The following sample clears PXF statistics for serial interface 1/0/0:

```
router#
 clear pxf interface serial 1/0/0
```

The following sample clears PXF statistics on all interfaces:

```
router#
 clear pxf interface
```

Related Commands

Command	Description
show pxf cpu statistics	Displays PXF CPU statistics.
show pxf dma	Displays the current state of DMA buffers, error counters, and registers on the PXF engine.
show pxf interface	Displays a summary of the statistics accumulated by column 0 of the PXF for an interface.
show pxf statistics	Displays chassis-wide, summary PXF statistics
show pxf xcm	Displays information about the servers that are configured on the Cisco CMTS router for PacketCable operations.

clear pxf statistics drl all

To clear all the entries in all the DRL statistics table, use the **clear pxf statistics drl all** command in privileged EXEC mode.

clear pxf statistics drl all

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCJ	This command was introduced.

Example

The following example shows how to clear all the entries in all the DRL statistics table:

```
Router#clear pxf statistics drl all
```

Related Commands

Command	Description
clear pxf statistics drl max-rate	Clears the DRL max-rate statistics on the WAN interface.

clear pxf statistics drl cable-wan-ip

To clear the PXF DRL cable/wan-ip statistics table, use the **clear pxf statistics drl cable-wan-ip** command in privileged EXEC mode.

clear pxf statistics drl cable-wan-ip

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **show platform hardware qfp active infrastructure punt sbrl** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the drop count to zero for all entries in the PXF DRL cable/wan-ip statistics table. It does not change any other value.

Examples

The following example shows how to clear cable-wan-ip statistics:

```
Router# clear pxf statistics drl cable-wan-ip
```

Related Commands

Command	Description
clear pxf statistics drl wan-non-ip (for uBR series router)	This command set the drop count to zero for all entries in the PXF DRL wan-non-ip statistics table.

clear pxf statistics drl wan-non-ip

To clear the PXF DRL wan-non-ip statistics, use the **clear pxf statistics drl wan-non-ip** command in privileged EXEC mode.

clear pxf statistics drl wan-non-ip

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **show platform software punt-policer clear** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the drop count to zero for all entries in the PXF DRL wan-non-ip statistics table.

Examples

The following example shows how to clear the PXF statistics in wan-non-ip:

```
Router# clear pxf statistics drl wan-non-ip
```

Related Commands

Command	Description
clear pxf statistics drl cable-wan-ip	This command sets the drop count to zero for all entries in the cable or wan-ip statistics table.

clear pxf statistics drl max-rate

To clear the DRL max-rate statistics on the WAN interface, use the **clear pxf statistics drl max-rate** command in privileged EXEC mode.

clear pxf statistics drl max-rate

Syntax Description

threshold	The packet threshold value. The valid range is 0 to 4294967295.
output modifiers	The following output modifiers are used. • begin—Begins with the line that match. • exclude—Excludes the lines that match. • include—Includes the lines that match. • redirect—Redirects the output to the URL. • section—Filters a section of the output. • tee—Copies output to the URL.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCH3	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **show platform software punt-policer clear** command on the Cisco cBR Series Converged Broadband Routers.

Example

The following example shows how to clear DRL max-rate statistics on the WAN interface:

```
Router#clear pxf statistics drl max-rate wan
   dropped   divert_code
 No max-rate WAN drops
```

Related Commands

Command	Description
service divert-rate-limit max-rate	Sets per-divert-code rate limit on the WAN interface
clear pxf statistics drl max-rate	Clears the DRL max-rate statistics on the WAN interface.

clear redundancy

To clear the counters and history information that are used by the Redundancy Facility (RF) subsystem, use the **clear redundancy** command in privileged EXEC mode.

clear redundancy {**counters** | **history**}

Cisco cBR Series Converged Broadband Routers
clear redundancy {**counters** | **history** | **idb-sync-history** | **linecard history**}

Syntax Description

counters	Clears the RF counters that are maintained by the RF subsystem.
history	Clears the history of RF activity that is maintained by the RF subsystem.
idb-sync-history	Clears the Interface Descriptor Blocks (IDB) synchronization history of RF activity that is maintained by the RF subsystem.
linecard history	Clears the line card redundancy information. • **history**—Clears the line card redundancy history logs.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(4)XF1	This command was introduced for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **idb-sync-history** and **linecard** keywords were added.

Usage Guidelines

The **clear redundancy**command clears the following information, which is shown by the **show redundancy** command:

- **counters**—Number of messages sent and received, buffers used, and synchronization errors.
- **history**—RF subsystem activity, such as checkpoint messages sent between RF clients.
- **idb-sync-history**—(On Cisco cBR series routers) RF subsystem activity, such as IDB synchronization information.
- **linecard history**—(On Cisco cBR series routers) Line card redundancy history information.

Examples

The following example shows how to clear the RF counters that are displayed by the **show redundancy** command:

```
Router# clear redundancy counters
```

The following example shows how to clear the RF history information that is displayed by the **show redundancy** command:

```
Router# clear redundancy history
```

The following example shows how to clear the RF IDB synchronization history information that is displayed by the **show redundancy** command on the Cisco cBR series routers:

```
Router# clear redundancy idb-sync-history
```

The following example shows how to clear the line card redundancy history information that is displayed by the **show redundancy** command on the Cisco cBR series routers:

```
Router# clear redundancy linecard history
```

Related Commands

Command	Description
show redundancy	Displays the current redundancy state.

cmc

To configure the Cisco CMC in a channel group, use the **cmc** command in channel group configuration mode. To disable the configuration, use the **no** form of the command.

cmc *mac-address*

no cmc *mac-address*

Syntax Description

mac-address	MAC address of the Cisco CMC.

Command Default

Cisco CMC is not configured.

Command Modes

Channel group configuration (config-ch-group)

Command History

Release	Modification
12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can configure up to four Cisco CMCs in a channel group.

The following example shows how to configure a Cisco CMC in a channel group:

```
Router# configure terminal
Router(config)# cable channel-group 1
Router(config-ch-group)# cmc 0010.2024.7035
```

Related Commands

Command	Description
cable channel-group	Configures channel group.
show cable channel-group	Displays the channel group information.

connection

To configure the ECMG connection, use the **connection** command in the DVB scrambling ECMG configuration mode. To void the ECMG connection configuration, use the **no** form of this command.

connection id *id* **priority** *priority ip_address port*
no connection id *id*

id *id*	Specifies the connection ID.
priority *priority*	Specifies the connection priority.
ip_address port	Specifies the connection IP address and port.

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the ECMG connection:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#connection id 1 priority 1 1.200.1.81 8888
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
auto-channel-id	Enables automatic channel ID selection.
ecm-pid-source	Configures the source of ECM PID.
ca-system-id	Configures the CA system ID.
type	Configures the ECMG type.
mode	Configures the application mode of ECMG.
desc-rule	Configures the descriptor rule.
overrule	Overrules the default settings.

controller downstream-oob 55d1-profile

To configure the OOB downstream controller profile, use the **controller downstream-oob 55d1-profile** command in global configuration mode.

controller downstream-oob 55d1-profile *id*

Syntax Description

Syntax Description

id	Specifies the OOB downstream controller profile ID.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the OOB downstream controller profile.

Examples

The following example shows how to enter the OOB downstream controller profile configuration mode:

```
Router# configure terminal
Router(config)# controller downstream-oob 55d1-profile 1
Router(config-profile)#
```

Related Commands

Command	Description
ds-channel	Configures the OOB downstream channel.

controller integrated-cable

To enter controller configuration mode to configure the controller interface for an integrated DOCSIS 3.0 cable interface line card, use the **controller integrated-cable** command in global configuration mode.

Cisco uBR10012 Router and Cisco cBR Series Converged Broadband Routers
controller integrated-cable *slot/subslot/port*

Cisco uBR7225VXR and Cisco uBR7246VXR Routers
controller integrated-cable *slot/port*

Syntax Description

integrated-cable *slot/subslot/port*	Identifies the cable interface. For the Cisco uBR10012 router: • *slot*—Slot where the line card resides. The valid range is from 5 to 8. • *subslot*—Subslot where the line card resides. Available slots are 0 or 1. • *port*—Downstream controller number on the line card. Valid port values are from 0 to 4. For the Cisco cBR series router: • *slot*—Slot where the interface card resides. The valid range is from 0 to 3 and 6 to 9 on the Cisco cBR-8 router. • *subslot*—Subslot where the interface card resides. The valid value is 0 on the Cisco cBR-8 router. • *port*—Controller port number. The valid values are from 0 to 7 on the Cisco cBR-8 router.

integrated-cable *slot/port*	Identifies the cable interface on the Cisco uBR7246VXR or Cisco uBR7225VXR router.
	• *slot*—Slot where the line card resides.
	  • Cisco uBR7246VXR router: The valid range is from 3 to 6.
	  • Cisco uBR7225VXR router: The valid range is from 1 to 2.
	• *port*—Downstream port number on the line card. The valid port value is 0 or 1.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCD	This command was modified. Added support for the controller interface configuration on Cisco uBR7246VXR and Cisco uBR7225VXR universal broadband routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enter controller configuration mode to configure the controller interface in slot 5, subslot 1, and port 0 of the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# controller integrated-cable 5/1/0
```

The following example shows how to enter controller configuration mode to configure the controller interface in slot 3, subslot 0, and port 0 of the Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# controller integrated-cable 3/0/0
```

Related Commands

Command	Description
annex modulation	Sets the annex and modulation rates for each RF channel.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel rf-power	Sets the RF power output level.
rf-channel rf-shutdown	Enables or disables an RF channel.

controller modular-cable

To enter controller configuration mode to configure the wideband modular interface controller, use the **controller modular-cable** command in global configuration mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
controller modular-cable *slot/subslot/bay*

Cisco IOS Release 12.2(33)SCB and later releases
controller modular-cable
slot/bay/portslot/subslot/controller

Syntax Description

slot/subslot/bay or *slot/bay/port*	The Wideband SPA slot, subslot, bay, and port. • *slot*—Slot where the Wideband SIP resides. The valid values are 1 and 3. • *subslot*—Subslot where the Wideband SIP resides. The valid value is 0. • *bay*—Wideband SIP bay where the SPA resides. The valid range is from 0 to 3. • port—Port number on the SPA. The valid value is always 0.
slot/subslot/controller	Modular cable line card slot, subslot, and controller. • *slot*—Modular cable line card slot. The valid values are 5, 6, 7, and 8. • *subslot*—Modular cable line card subslot. The valid values are 0 and 1. • *controller*—Modular cable line card controller. The valid range is from 0 to 2.

Command Default

The command mode is unchanged.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was modified. The addressing format for the modular cable interface was changed from *slot/subslot/bay* to *slot/bay/port.*
12.2(33)SCE	This command was modified. This command now supports the Cisco uBR-MC3GX60V cable interface line card. The addressing format *slot/subslot/controller* for the modular-cable line card was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command indicates where the wideband modular interface controller is located and enters controller configuration mode. The modular interface controller could be either a SPA, or a Cisco uBR-MC3GX60V cable interface line card.

Examples

The following example shows how to enter the controller configuration mode for the Cisco Wideband SPA in slot 1, subslot 0, and bay 0.

```
Router# configure terminal
Router(config)# controller modular-cable 1/0/0
```

The following example shows how to enter the controller configuration mode for the Cisco uBR-MC3GX60V line card in slot 8, subslot 1, and controller-unit-number 1.

```
Router# configure terminal
Router(config)# controller modular-cable 8/1/1
```

Related Commands

Command	Description
annex modulation	Sets the annex and modulation for the Cisco Wideband SPA.
cable rf-channel	Associates an RF channel on a Cisco Wideband SPA with a wideband channel.
ip-address (controller)	Sets the IP address of the Cisco Wideband SPA FPGA.
modular-host subslot	Specifies the modular-host line card for the Cisco Wideband SPA.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.
rf-channel description	Specifies the description for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address, and UDP port for each RF channel.
rf-channel network delay	Specifies the CIN delay for each RF channel.

controller upstream-cable

To configure upstream-cable controller, use the **controller upstream-cable** command in global configuration mode. To restore the default value, use the **no** form of this command.

contoller upstream-cable *slot/subslot/controller port number*
no contoller upstream-cable *slot/subslot/controller port number*

Syntax Description

slot/subslot/controller port number	The *slot*, *subslot* and *controller port number*. The valid range values are: • *slot* - The valid range is from 0 to 9. • *subslot* - The valid subslot is 0. • *contoller port number* - The valid range is from 0 to 15.

Command Default

Cable linecards are created for all the 16 controllers (0 - 15) by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **controller upstream-cable** command to configure upstream-cable controller in global configuration mode.

Examples

The following example shows how to configure upstream cable controller using **contoller upstream-cable** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)#
```

Related Commands

Command	Description
controller integrated-cable	Configures the Integrated-cable controller.

controller upstream-oob 55d1-profile

To configure the OOB upstream controller profile, use the **controller upstream-oob 55d1-profile** command in global configuration mode.

controller upstream-oob 55d1-profile *id*

Syntax Description

Syntax Description

id	Specifies the OOB upstream controller profile ID.

Command Default

None

Command Modes

Global configuration (config)

Command History

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the OOB upstream controller profile.

Examples

The following example shows how to enter the OOB upstream controller profile configuration mode:

```
Router# configure terminal
Router(config)# controller upstream-oob 55d1-profile 1
Router(config-profile)#
```

Related Commands

Command	Description
us-channel	Configures the OOB upstream channel.

cops ip dscp

To specify the Common Open Policy Service (COPS) Differentiated Services Code Point (DSCP) markings for COPS messages that are transmitted by the Cisco router, use the **cops ip dscp** command in global configuration mode. To remove this configuration, use the **no** form of this command.

cops ip dscp [**0-63** | **default** | **af11-af43** | **cs1-cs7**]
nocops ip dscp [**0-63** | **default** | **af11-af43** | **cs1-cs7**]

Syntax Description

The values for this command specify the markings with which COPS messages are transmitted. The following values are supported for the Cisco CMTS router.

0-63	DSCP value ranging from 0-63.
af11	Use AF11 dscp (001010)
af12	Use AF12 dscp (001100)
af13	Use AF13 dscp (001110)
af21	Use AF21 dscp (010010)
af22	Use AF22 dscp (010100)
af23	Use AF23 dscp (010110)
af31	Use AF31 dscp (011010)
af32	Use AF32 dscp (011100)
af33	Use AF33 dscp (011110)
af41	Use AF41 dscp (100010)
af42	Use AF42 dscp (100100)
af43	Use AF43 dscp (100110)
cs1	Use CS1 dscp (001000) [precedence 1]
cs2	Use CS2 dscp (010000) [precedence 2]
cs3	Use CS3 dscp (011000) [precedence 3]
cs4	Use CS4 dscp (100000) [precedence 4]
cs5	Use CS5 dscp (101000) [precedence 5]
cs6	Use CS6 dscp (110000) [precedence 6]
cs7	Use CS7 dscp (111000) [precedence 7]
default	Use default dscp (000000)

ef	Use EF dscp (101110)

Command Default

- This command is disabled by default.
- For messages transmitted by the Cisco router, the default DSCP value is 0.
- For incoming connections to the Cisco router, by default, the COPS engine takes the DSCP value used by the COPS server that initiates the TCP connection.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to the Cisco CMTS.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This feature allows you to change the Differentiated Services Code Point (DSCP) marking for COPS messages that are transmitted or received by the Cisco router. Cisco IOS Release 12.3(13a)BC supports this function with the **cops ip dscp** command. The **cops ip dscp** command changes the default IP parameters for connections between the Cisco router and COPS servers in the cable network.

DSCP values are used in Quality of Service (QoS) configurations on a Cisco router to summarize the relationship between DSCP and IP precedence. This command allows COPS to remark the packets for either incoming or outbound connections.

The default setting is 0 for outbound connections. On default incoming connections, the COPS engine takes the DSCP value from the COPS server initiating the TCP connection.

Note This feature affects all TCP connections with all COPS servers.

- The **cops ip dscp** command allows the Cisco router to re-mark the COPS packets for either incoming or outbound connections.
- This command affects all TCP connections with all COPS servers.
- This command does not affect existing connections to COPS servers. Once you issue this command, this function is supported only for new connections after that point in time.
- For messages transmitted by the Cisco router, the default DSCP value is 0.
- For incoming connections to the Cisco router, the COPS engine takes the DSCP value used by the COPS server that initiates the TCP connection, by default.

For additional information about this feature and related commands, refer to the “COPS Engine Operation on the Cisco CMTS Routers” feature document on Cisco.com.

Examples

The following basic example illustrates the use of this command:

The following example illustrates the cops ip dscp command with supported command variations:

```
Router(config)# cops ip dscp ?
 <0-63>   DSCP value
 af11     Use AF11 dscp (001010)
 af12     Use AF12 dscp (001100)
 af13     Use AF13 dscp (001110)
 af21     Use AF21 dscp (010010)
 af22     Use AF22 dscp (010100)
 af23     Use AF23 dscp (010110)
 af31     Use AF31 dscp (011010)
 af32     Use AF32 dscp (011100)
 af33     Use AF33 dscp (011110)
 af41     Use AF41 dscp (100010)
 af42     Use AF42 dscp (100100)
 af43     Use AF43 dscp (100110)
 cs1      Use CS1  dscp (001000) [precedence 1]
 cs2      Use CS2  dscp (010000) [precedence 2]
 cs3      Use CS3  dscp (011000) [precedence 3]
 cs4      Use CS4  dscp (100000) [precedence 4]
 cs5      Use CS5  dscp (101000) [precedence 5]
 cs6      Use CS6  dscp (110000) [precedence 6]
 cs7      Use CS7  dscp (111000) [precedence 7]
 default  Use default dscp (000000)
 ef       Use EF   dscp (101110)
Router(config)# cops ip dscp 63
```

The following example specifies the COPS server and enables COPS for RSVP on the server. Both of these functions are accomplished by using the **ip rsvp policy cops** command on the Cisco uBR10012 router. By implication, the default settings for all remaining COPS for RSVP commands are accepted.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# ip rsvp policy cops servers 161.44.130.168 161.44.129.6
Router(config)# exit
```

The following examples display three views of the COPS for RSVP configuration on the router, which can be used to verify the COPS for RSVP configuration.

The following example displays the policy server address, state, keepalives, and policy client information:

```
Router# show cops servers
COPS SERVER: Address: 161.44.135.172. Port: 3288. State: 0. Keepalive: 120 sec
Number of clients: 1. Number of sessions: 1.
    COPS CLIENT: Client type: 1.  State: 0.
```

The following example displays the policy server address, the ACL ID, and the client/server connection status:

```
Router# show ip rsvp policy cops
COPS/RSVP entry. ACLs: 40 60
PDPs: 161.44.135.172
Current state: Connected
Currently connected to PDP 161.44.135.172, port 0
```

The following example displays the ACL ID numbers and the status for each ACL ID:

```
Router# show ip rsvp policy
Local policy: Currently unsupported
COPS:
```

```
ACLs: 40 60 . State: CONNECTED.
ACLs: 40 160 . State: CONNECTING.
```

Related Commands

Command	Description
cops listeners access-list	Configures access control lists (ACLs) for inbound connections to all COPS listener applications on the Cisco CMTS.
cops tcp window-size	Overrides the default TCP receive window size that is used by COPS processes.
debug packetcable cops	Enables debugging processes for PacketCable with the COPS engine.
debug packetcable gate control	Enables and displays debugging processes for PacketCable gate control.
debug packetcable subscriber	Enables and displays debugging processes for PacketCable subscribers.
show cops servers	Displays COPS server addresses, port, state, keepalives, and policy client information.
show debug	Displays current debugging information that includes PacketCable COPS messages on the Cisco CMTS.
show ip rsvp policy	Displays policy server addresses, ACL IDs, and client/server connection status.

cops listeners access-list

To configure access control lists (ACLs) for inbound connections to all Common Open Policy Service (COPS) listener applications on the Cisco CMTS router, user the **cops listeners access-list** command in global configuration mode. To remove this setting from the Cisco CMTS router, us the **no** form of this command.

cops listeners access-list {*acl-numacl-name*}
no cops listeners access-list {*acl-numacl-name*}

Syntax Description

acl-num	Numeric identifier that identifies the access list to apply to the current interface. For standard access lists, the valid range is 1 to 99; for extended access lists, the valid range is 100 to 199. For IPv4 access list number, the normal range is 1 to 199 and extended range is 1300 to 2699 on the Cisco cBR series routers.
acl-name	Alphanumeric identifier of up to 30 characters, beginning with a letter that identifies the ACL to apply to the current interface.

Command Default

Access lists are not configured by default on the Cisco CMTS router.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When using ACLs with cable monitor and the Cisco uBR10012 router, combine multiple ACLs into one ACL, and then configure cable monitor with the consolidated ACL. For more information about cable monitor on the Cisco uBR10012 router, refer to the “Cable Monitor and Intercept Features for the Cisco CMTS” documentation on Cisco.com.

Examples

The following example illustrates a short access list configuration for the COPS listener feature:

```
Router# cops listeners access-list 40
```

Related Commands

Command	Description
cops ip dscp	Specifies the COPS DSCP markings for COPS messages that are transmitted by the Cisco router
cops tcp window-size	Overrides the default TCP receive window size that is used by COPS processes.

Command	Description
debug packetcable cops	Enables debugging processes for PacketCable with the COPS engine.
debug packetcable gate control	Enables and displays debugging processes for PacketCable gate control.
debug packetcable subscriber	Enables and displays debugging processes for PacketCable subscribers.
show cops servers	Displays COPS server addresses, port, state, keepalives, and policy client information.
show debug	Displays current debugging information that includes PacketCable COPS messages on the Cisco CMTS.
show ip rsvp policy	Displays policy server addresses, ACL IDs, and client/server connection status.

cops tcp window-size

To override the default TCP receive window size on the Cisco CMTS router, use the **cops tcp window-size** command in global configuration mode. This setting allows you to prevent the COPS server from sending too much data at one time. To return the TCP window size to a default setting of 4K, use the **no** form of this command.

cops tcp window-size *bytes*
no cops tcp window-size

Syntax Description

bytes	This is the TCP window size setting in bytes. This value can range from 516 to 65535 bytes.

Command Default

The default COPS TCP window size is 4000 bytes.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(13a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command does not affect existing connections to COPS servers. Once you issue this command, this function is supported only for new connections after that point in time.

Examples

The following example configures the TCP window size to be 64000 bytes.

```
Router(config)# cops tcp window-size 64000
```

Related Commands

Command	Description
cops ip dscp	Specifies the Common Open Policy Service (COPS) Differentiated Services Code Point (DSCP) markings for COPS messages that are transmitted by the Cisco router
cops listeners access-list	Configures access control lists (ACLs) for inbound connections to all COPS listener applications on the Cisco CMTS.
debug packetcable cops	Enables debugging processes for PacketCable with the COPS engine.
debug packetcable gate control	Enables and displays debugging processes for PacketCable gate control.
debug packetcable subscriber	Enables and displays debugging processes for PacketCable subscribers.

Command	Description
show cops servers	Displays COPS server addresses, port, state, keepalives, and policy client information.
show debug	Displays current debugging information that includes PacketCable COPS messages on the Cisco CMTS.
show ip rsvp policy	Displays policy server addresses, ACL IDs, and client/server connection status.

core-interface

To configure the core-interface, use the **core-interface** command in RPD configuration mode. To void the core-interface configuration, use the **no** form of this command.

core-interface tengigabitethernet *slot/port/interface*

no core-interface tengigabitethernet *slot/port/interface*

Syntax Description

slot/port/interface	Specifies the slot, port and interface of the core-interface.

Command Default

None

Command Modes

RPD configuration (config-rpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the core-interface configuration mode.

The following example shows how to configure the core-interface:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/0/1
Router(config-rpd-core)#
```

Related Commands

Command	Description
principal	Specifies RPD as principal.
network-delay dlm	Configures DEPI latency measurement.
rpd-ds	Configures RPD downstream port.
rpd-us	Configures RPD upstream port.

cp-overrule

To overrule and specify the crypto period duration, use the **cp-overrule** command in the DVB scrambling EIS configuration mode. To restore the default crypto period duration, use the **no** form of this command.

cp-overrule *duration*
no cp-overrule

duration	Specifies the crypto period duration in seconds.

Command Default

None

Command Modes

DVB scrambling EIS configuration mode (config-video-encrypt-dvb-eis)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command overrules and specifies the crypto period duration. The valid range is from 1 to 3600 seconds.

The following is an example of how to overrule and specify the crypto period duration:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#eis EIS-1 id 1
Router(config-video-encrypt-dvb-eis)#cp-overrule 60
```

Related Commands

Command	Description
overwrite-scg	Enables Scrambling Control Group (SCG) overwrite.
eis	Enters the Event Information Scheduler configuration mode.
listening-port	Configures the listening TCP port.

cpd

To enable the Control Point Discovery (CPD) feature, use the **cpd** command in global configuration mode. To disable CPD, use the **no** form of this command.

cpd
no cpd

Syntax Description

This command has no keywords or arguments.

Command Default

CPD is enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.
12.2(33)SCA	This command was integrted into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows the cpd enabled on a router:

```
Router(config)# cpd
```

Related Commands

Command	Description
cpd cr-id	Configures a control relationship identifier.

cpd cr-id

To configure a Control relationship identifier (CR ID), the the **cpd cr-id** command in global configuration mode. To disable the CR ID, use the **no** form of this command.

cpd cr-id *cr id number*
no cpd cr-id

Syntax Description

cr id number	Control relationship identifier. The valid range is from 1 to 65535.

Command Default

The CR ID is configured as 1.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows the control relationship identifier configured as 236:

```
Router(config)# cpd cr-id 236
```

Related Commands

Command	Description
cpd	Enables CPD functionality.

cpe max

To create a DOCSIS configuration file that specifies the maximum number of CPE devices that can use the CM to connect to the cable network, use the **cpe max** command in cable config-file configuration mode. To remove the CPE specification, use the **no** form of this command.

cpe max *cpe-num*
no cpe max

Syntax Description

cpe-num	Specifies the number of CPEs. Valid range is 1 to 254.

Command Default

A maximum of one CPE device can use the CM to connect to the cable network.

Command Modes

Cable config-file configuration (config-file)

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The CM enforces the limitation imposed by the **cpe max** command, but the CMTS might enforce its own lower number of CPE devices. On Cisco CMTS routers, a *cpe-num* value of 0 enables an unlimited number of hosts, but on some CMs, this value provides only 0 hosts.

Examples

The following example shows how to set the maximum CPE value for the configuration file:

```
Router(config)# cable config-file channeloverride.cm
Router(config-file)# cpe max 3

Router(config-file)# exit
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
access-denied	Disables access to the network.
channel-id	Specifies upstream channel ID.

Command	Description
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.
option	Provides config-file options.
privacy	Specifies privacy options for baseline privacy images.
service-class	Specifies service class definitions for the configuration file.
snmp manager	Specifies Simple Network Management Protocol (SNMP) options.
timestamp	Enables time-stamp generation.

cyclic-prefix

To specify the channel cyclic-prefix, use the **cyclic-prefix** command in OFDM channel profile configuration mode. To undo the cyclic-prefix assignment, use **no** form of this command.

cyclic-prefix [**192** | **256** | **512** | **768** | **1024**]

no cyclic-prefix

Command Default

192

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the channel cyclic-prefix.

Examples

The following example shows how to specify the channel cyclic-prefix:

```
Router# configure terminal
Router(config)# cable downstream ofdm-channel-profile 21
Router(config-ofdm-chan-prof)# cyclic-prefix 1024
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
description (OFDM channel profile)	Specify a user defined description for the profile.
interleaver-depth	Specify the channel interleaver-depth.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-control	Specify default modulation or profile as the channel control profile.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.



Cable Commands: d through h

- default-nit-reference, on page 1079
- default-onid, on page 1080
- default-psi-interval, on page 1081
- depi-class, on page 1082
- depi-tunnel, on page 1084
- depi cin-failover, on page 1086
- depi eqam-stats, on page 1088
- desc-rule, on page 1089
- description (bonding-group), on page 1090
- description (cable fiber-node), on page 1092
- description (OFDM channel profile), on page 1093
- description (OFDM modulation profile), on page 1094
- description (redundancy-linecard), on page 1095
- dest-ip, on page 1096
- diagnostic load, on page 1097
- diagnostic ondemand action-on-failure, on page 1099
- diagnostic unload, on page 1101
- disable-auto-restart, on page 1103
- do-not-insert, on page 1104
- docsis-channel-id, on page 1105
- docsis-policy, on page 1106
- docsis-version, on page 1107
- downstream, on page 1108
- downstream cable, on page 1110
- downstream downstream-cable, on page 1112
- downstream downstream-cable rf-channel, on page 1113
- downstream integrated-cable rf-channel (interface), on page 1114
- downstream local upstream, on page 1116
- downstream modular-cable rf-channel (channel group), on page 1117
- downstream modular-cable rf-channel (interface), on page 1118
- downstream modular-cable rf-channel, on page 1120
- ds-channel, on page 1122
- duration, on page 1123

- dvb, on page 1126
- ecm-pid-source, on page 1127
- ecmg, on page 1129
- ecmg (Tier-based), on page 1130
- eis, on page 1131
- enable (Tier-based), on page 1132
- enabled (enforce-rule), on page 1133
- encrypt, on page 1135
- enforced qos-profile, on page 1136
- event-profile, on page 1139
- exception pxf, on page 1140
- facility-alarm (ubr10012), on page 1142
- factory-reset all, on page 1145
- factory-reset all secure, on page 1147
- fail-to-clear, on page 1149
- fail-to-clear-duration, on page 1150
- filter pid vcg, on page 1151
- filter program vcg, on page 1152
- freq-profile, on page 1153
- frequency, on page 1154
- guardband-override (OFDM channel profile), on page 1155
- hccp authentication, on page 1157
- hccp authentication key-chain, on page 1159
- hccp bypass version, on page 1161
- hccp channel-switch, on page 1163
- hccp check version, on page 1167
- hccp ds-switch, on page 1169
- hccp lockout, on page 1171
- hccp protect, on page 1173
- hccp resync, on page 1175
- hccp revertive, on page 1177
- hccp reverttime, on page 1179
- hccp switch, on page 1181
- hccp timers, on page 1183
- hccp track, on page 1185
- hccp unlockout, on page 1188
- hccp working, on page 1190
- hw-module bay reload, on page 1192
- hw-module shutdown (ubr10012), on page 1193
- hw-module slot , on page 1196
- hw-module slot pos, on page 1198
- hw-module slot srp, on page 1200
- hw-module subslot , on page 1202

default-nit-reference

To configure Network Information Table (NIT) reference, use the **default-nit-reference** command in the video configuration mode.

default-nit-reference *PID*

Syntax Description

PID	The NIT reference PID. The reference PID must be in the range of 1 to 8190.

Command Default

None

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS XE Fuji 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The NIT helps in conveying information about the physical organization of the multiplexes and transport streams (TS) carried through a specific network and also the characteristics of the network.

Use the **no default-nit-reference** command to remove the configured NIT PID.

The following example shows how to configure the NIT reference.

```
configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
 cable video
   default-nit-reference ?
    <1-8190>  1-8190

   default-nit-reference 100
%%All existing sessions will be updated with default-nit-reference.
Re-configure Default NIT reference? [Yes/No][confirm]
```

default-onid

To set the default ONID number, use the **default-onid** command in the video configuration mode.

default-onid *number*

Syntax Description

number	The ONID number. By default, the system ONID is 0, which is commonly used in North America. If the default value of the ONID is used, the TSID must be unique. If you change the ONID, the TSID-ONID pair must be unique. The ONID must be in the range of 0 to 65535.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the deault system ONID.

The following example shows how to change the default ONID number:

```
configure terminal
cable video
default-onid 1580
```

default-psi-interval

To set the default Program Specific Information (PSI) interval number, use the **default-psi-interval** command in the video configuration mode.

default-psi-interval *number*

Syntax Description

number	The PSI interval number. By default, PSI interval is 100 msec. The PSI interval must be in the range of 40 to 1000 msec.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the default PSI interval.

The following example shows how to change the default PSI interval:

```
configure terminal
cable video
default-psi-interval 400
```

depi-class

To create a template of Downstream External PHY Interface (DEPI) control plane configuration settings, which different pseudowire classes can inherit, and to enter the DEPI class configuration mode, use the **depi-class** command in global configuration mode. To remove a specific DEPI class configuration, use the **no** form of this command.

depi-class *depi-class-name*
no depi-class *depi-class-name*

Syntax Description

depi-class-name	Name of the DEPI class. The *depi-class-name* argument must be specified to configure multiple sets of DEPI control parameters.

Command Default

No DEPI classes are defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **depi-class** *depi-class-name* command allows you to configure a DEPI class template that consists of configuration settings used by different pseudowire classes. The **depi-class** command enters DEPI class configuration mode, where DEPI control plane parameters are configured.

You must use the same DEPI class in the pseudowire configuration at both ends of a Layer 2 control channel.

Examples

The following example shows how to enter DEPI class configuration mode to create a DEPI class configuration template for the class named SPA0:

```
Router# configure terminal
Router(config)# depi-class SPA0
Router(config-depi-ctrl SPA0)#
```

Related Commands

Command	Description
l2tp-class	Creates a template of Layer 2 Tunnel Protocol (L2TP) control plane configuration settings that can be inherited by different pseudowire classes and enters the L2TP class configuration mode.
depi-tunnel	Creates a template of Downstream External PHY Interface (DEPI) tunnel configuration settings, which different pseudowire classes can inherit, and enters the DEPI data session configuration mode.
show depi tunnel	Displays all active control connections.

Command	Description
show depi session	Displays established DEPI data sessions.

depi-tunnel

To create a template of Downstream External PHY Interface (DEPI) tunnel configuration settings, which different pseudowire classes can inherit, and to enter the DEPI data session configuration mode, use the **depi-tunnel** command in the global configuration mode or subinterface configuration mode. To remove a configured DEPI tunnel, use the **no** form of this command.

depi-tunnel *depi-tunnel-name*
no depi-tunnel *depi-tunnel-name*

Syntax Description

depi-tunnel-name	Name of the DEPI tunnel.

Command Default

This command has no default behavior or values.

Command Modes

Global configuration (config)

Subinterface configuration (config-subif)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **depi-tunnel** creates a template of DEPI tunnel configuration settings. The DEPI data session inherits the control plane configuration settings of a depi-control template.

The following depi data session configuration options are available in this mode:

- l2tp-class
- depi-class
- dest-ip
- tos

Examples

The following example shows how to create a template of DEPI tunnel configuration settings in the global configuration mode and enter the DEPI data session configuration mode:

```
Router# configure terminal
Router(config)# depi-tunnel rf6
Router(config-depi-tunnel)#
```

The following example shows how to create a template of DEPI tunnel configuration settings in the subinterface configuration mode:

```
Router(config)# interface qam 6/4.1
Router(config-subif)# depi-tunnel 0
```

Related Commands

Command	Description
l2tp-class	Creates a template of Layer 2 Tunnel Protocol (L2TP) control plane configuration settings, which different pseudowire classes can inherit, and enters the L2TP class configuration mode.
depi-class	Creates a template of Downstream External PHY Interface (DEPI) control plane configuration settings, which different pseudowire classes can inherit, and enters the DEPI class configuration mode.
dest-ip	Assigns an IP address to the destination network.
tos	Configures the Type of Service (ToS) byte in the header of Layer 2 tunneled packets.
show depi tunnel	Displays all active control connections.
show depi session	Displays established DEPI data sessions.

depi cin-failover

To enable a failover when Converged Interconnect Network (CIN) failure occurs on Downstream External PHY Interface (DEPI), use the **depi cin-failover** command in global configuration mode. To disable the failover when the CIN fails on the DEPI, use the **no** form of this command.

depi cin-failover [**cpu-threshold** {**high** *threshold_value* | **low** *threshold_value*}]
no depi cin-failover

Syntax Description

cpu-threshold	Configures the CPU threshold on the line card.
high	Sets the high threshold level. Default value is 95.
low	Sets the low threshold level. Default value is 85.
threshold_value	Threshold value of CPU usage in percentage. The valid range is from 0 to 100.

Command Default

The DEPI CIN failover configuration is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
12.2(33)SCF4	This command was modified. The **cpu-threshold** keyword was added to the command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If DEPI Control Plane High Availability is configured, the **depi cin-failover** command, which is configured globally, triggers a cable line card switchover when a CIN failure occurs.

The **depi cin-failover cpu-threshold** command allows you to set a CPU threshold to alter when a failover due to CIN failure is allowed to happen.

- When the **high** threshold is reached, a failover due to CIN failure is disabled.
- If (and only if) the **high** threshold was reached, the CPU will have to drop lower than the configured **low** threshold before a failover due to CIN failure is enabled again.



Note In Cisco IOS Release 12.2(33)SCE, DEPI CIN triggered failover is automatically enabled with control plane DEPI. The **depi cin-failover** command is introduced in Cisco IOS Release 12.2(33)SCF and is disabled by default.

Examples

The following example shows how to configure a CIN failover:

```
Router(config)# depi
```

```
Router(config)# depi cin-failover
Router(config)# exit
```

The following example shows how to set the CPU threshold value:

```
Router(config)# depi
Router(config)# depi cin-failover cpu-threshold high 95 low 85
Router(config)# exit
```

Related Commands

Command	Description
show depi tunnel	Displays all active control connections.
show depi session	Displays information about DEPI sessions.

depi eqam-stats

To enable debugging information for Downstream External PHY Interface (DEPI) EQAM statistics on the Cisco CMTS router, use the **depi eqam-stats** command in global configuration mode. To disable debugging information, use the **no** form of this command.

depi eqam-stats
no depi eqam-stats

Syntax Description

This command has no arguments or keywords.

Command Default

The DEPI EQAM statistics configuration is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Cisco RF Gateway 10 sends EQAM statistics to the Cisco CMTS router. No other EQAM supports the EQAM statistics feature.

Examples

The following example shows how to configure DEPI EQAM statistics on the Cisco CMTS router:

```
Router# configure terminal
Router(config)# depi eqam-stats
```

Related Commands

Command	Description
show depi session	Displays information about DEPI sessions.

desc-rule

To configure the descriptor rule, use the **desc-rule** command in the DVB scrambling ECMG configuration mode. To void the descriptor rule configuration, use the **no** form of this command.

desc-rule *descriptor_name* [**id** *id*]
no desc-rule *descriptor_name*

descriptor_name	Specifies the descriptor name.
id	Specifies the descriptor ID.

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the descriptor rule:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#desc-rule desc_8_1 id 1
Router(config-video-encrypt-dvb-ecmg-desc)#
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
do-not-insert	Prohibits inserting standard descriptors.
add-priv-data	Adds private data to the descriptor

description (bonding-group)

To add a description for a bonding group on the Cisco CMTS router, use the **description** command in cable interface configuration mode. To remove a description for a bonding group, use the **no** form of this command.

description *description*
no description

Syntax Description

description	Specifies a description for the bonding group. The character-string can be up to 128 characters long.

Command Default

By default, description for a bonding group does not exist.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **description** command is used to configure the Upstream Channel Bonding feature.

The **description** command adds a comment to the configuration to provide information about the bonding group.

Examples

The following example shows how to specify a description for bonding group 1:

```
Router# configure terminal

Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# interface cable 8/0/0
Router(config-if)# cable upstream bonding-group 1
Router(config-upstream-bonding)# description UBG1
Router(config-upstream-bonding)# end
Router# show running interface cable 8/0/0
Building configuration...
Current configuration : 1443 bytes
!
interface Cable8/0/0
 downstream Modular-Cable 8/0/0 rf-channel 0-3
 cable ip-init apm
 cable mtc-mode
 no cable packet-cache
 cable bundle 6
 cable upstream max-ports 4
 cable upstream bonding-group 1
  description UBG1
  upstream 0
  upstream 1
```

```
upstream 2
upstream 3
attributes 80000000
```

Related Commands

Command	Description
cable fiber-node	Enters cable fiber-node configuration mode to configure a fiber node.
upstream cable connector	Specifies the upstream channel ports for a fiber node.

description (cable fiber-node)

To specify a description for a fiber node, use the **description** command in cable fiber-node configuration mode. To remove a description for a fiber node, use the **no** form of this command.

description *description*
no description

Syntax Description

description	Specifies a description for the cable fiber node. The character-string can be up to 80 characters long.

Command Default

If the **description** command is not issued, a description does not exist.

Command Modes

Cable fiber-node configuration (config-fiber-node)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **description** command adds a comment to the configuration to provide information about the fiber node.

Examples

The following example shows how to specify a description for fiber node 5:

```
Router# configure terminal
Router(config)# cable fiber-node 5
Router(config-fiber-node)# description Branch office 5
```

Related Commands

Command	Description
cable fiber-node	Enters cable fiber-node configuration mode to configure a fiber node.
downstream cable	Assigns a primary downstream channel for a fiber node.
downstream modular-cable rf-channel	Specifies the RF channels that are available for wideband channels on a fiber node.
upstream cable connector	Specifies the upstream channel ports for a fiber node.

description (OFDM channel profile)

To specify a user defined description for the profile, use the **description** command in OFDM channel profile configuration mode. To remove the description, use **no** form of this command.

description *description*

no description

Syntax Description

description	Specify a user defined description for the profile.

Command Default

None

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify a user defined description for the profile.

Examples

The following example shows how to specify a user defined description for the profile:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# description 512-1k-4k
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
interleaver-depth	Specify the channel interleaver-depth.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-control	Specify default modulation or profile as the channel control profile.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

description (OFDM modulation profile)

To specify a user defined description for the profile, use the **description** command in OFDM modulation profile configuration mode. To remove the description, use **no** form of this command.

description *description*

no description

Syntax Description

description	Specify a user defined description for the profile up to 64 characters.

Command Default

None

Command Modes

OFDM modulation profile configuration (config-ofdm-mod-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify a user defined description for the profile.

Examples

The following example shows how to specify a user defined description for the profile:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 21
Router(config-ofdm-mod-prof)# description 512-1k-4k
```

Related Commands

Command	Description
cable downstream ofdm-modulation-profile	Define the OFDM modulation profile on the OFDM channel.
assign	Assign modulations to subcarriers.
start-frequency	(Optional) Specify the starting frequency associated with the first configurable subcarrier in the profile determined by the width.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.
width	Specify width of profile in Hz.

description (redundancy-linecard)

To configure description for the line card redundancy group, use the **descrption** command in line card redundancy configuration sub-mode. To remove the configuration, use the **no** form of this command.

description *group-description*
no description

Syntax Description

group-description	Specifies the description for the line card redundancy groups.

Command Default

Description is not configured.

Command Modes

Line card redundancy configuration (config-red-lc)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The description string has a maximum limit of 127 characters.

Examples

The following example shows how to configure redundancy group description on Cisco cBR-8 Series Converged Broadband Routers:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# redundancy
Router(config-red)#  linecard-group 0 internal-switch
Router(config-red-lc)# description Redundancy Group0
Router(config-red-lc)#
```

Related Commands

Command	Description
class	Configures redundancy class on the line card.
member slot	Adds a slot to the line card redundancy group.
linecard-group internal-switch	Creates a line card group for the line card.
redundancy	Configures line card redundancy.
show redundancy linecard	Displays information about a redundant line card or a line card group.

dest-ip

To assign an IP address to the edge quadrature amplitude modulation (EQAM), use the **dest-ip** command in DEPI tunnel configuration mode. To remove a specific destination IP address, use the **no** form of this command.

dest-ip *dest-ip-address*
no dest-ip *dest-ip-address*

Syntax Description

dest-ip-address	IP address of the EQAM.

Command Default

This command has no default behavior or values.

Command Modes

DEPI tunnel configuration

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **dest-ip** *dest-ip-address* command allows you to configure the IP address of the EQAM.

Examples

The following example shows how to assign 1.3.4.155 as the destination IP address:

```
Router# configure terminal
Router(config)# depi-tunnel rf6
Router(config-depi-tunnel)# dest-ip 1.3.4.155
```

Related Commands

Command	Description
l2tp-class	Creates a template of Layer 2 Tunnel Protocol (L2TP) control plane configuration settings, which different pseudowire classes can inherit, and enters the L2TP class configuration mode.
depi-class	Creates a template of Downstream External PHY Interface (DEPI) control plane configuration settings, which different pseudowire classes can inherit, and enters the DEPI class configuration mode.
depi-tunnel	Specifies the name of the depi-tunnel and enters the DEPI tunnel configuration mode.
tos	Configures the Type of Service (ToS) byte in the header of Layer 2 tunneled packets.
show depi tunnel	Displays all active control connections.
show depi session	Displays established DEPI data sessions.

diagnostic load

To load a Field Diagnostic image to the line card for field diagnostic testing, enter the **diagnostic load** command.

diagnostic load {**slot** *slot* | **subslot** *slot/subslot*} **image-url** [**autostart test** {**all port** *port-number*}]

Syntax Description

slot	Specifies that the line card unloading the Field Diagnostic image is in a full slot as opposed to a subslot.
subslot	Specifies that the line card unloading the Field Diagnostic image is in a subslot as opposed to a full slot.
slot-number	Specifies the number of the slot where the line card unloading the Field Diagnostic image is located on the router.
subslot-number	Specifies the number of the subslot where the line card unloading the Field Diagnostic image is located on the router.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(16)BX	This command was introduced.
12.3(13)BC	This command was integrated into Cisco IOS Release 12.3(13)BC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show diagnostic result** output will be lost once a Field Diagnostic image is successfully unloaded off a line card. If you want to retain the results of the Field Diagnostic test, enter **show diagnostic result** and copy the output into a separate file before entering **diagnostic unload** to unload the Field Diagnostic image off the line card.

Entering this command successfully will resume normal line card operation.

If a line card needs to be placed back online immediately and a Field Diagnostic test is in progress, enter **diagnostic stop** to stop the in-progress Field Diagnostic test before entering **diagnostic unload** to unload the Field Diagnostic image off the line card.

Examples

In the following example, the Field Diagnostic image is unloaded off of the line card in slot 2. Note that the command is not successfully executed until confirmed at the screen prompt.

```
 Router# diagnostic unload slot 2
********************************************************************************
WARNING:All Field Diagnostics test results and information will be unavailable
to both the "show diagnostic result <target>" and "show
diagnostic content <target>" commands. To save the test results,
cancel the unloading process and enter the "show diagnostic result
<target>" command. Copy the output into a file, then re-enter the
```

```
"diagnostic unload <target>" command to restore normal line
card operation.
********************************************************************************
% Are you sure that you want to perform this operation?
[no]:y FDIAG [slot 2]> Unloading the Field
Diagnostics image and restoring the original run-time image, please wait ...
FDIAG [slot 2]> Field Diagnostics image was successfully unloaded
```

Related Commands

Command	Description
diagnostic event-log size	Sets the size of the event table.
diagnostic load	Loads the Field Diagnostic image onto the line card.
diagnostic ondemand action-on-failure	Sets the number of errors allowed in the Field Diagnostic test before the Field Diagnostic test is stopped.
diagnostic ondemand iterations	Sets the number of times each specific Field Diagnostic test will be run when a Field Diagnostic test is initiated.
diagnostic start	Starts Field Diagnostic testing on the line card.
diagnostic stop	Stops an in-progress Field Diagnostic test.
show diagnostic content	Shows the Field Diagnostic test list for a particular line card.
show diagnostic events	Displays the history of Field Diagnostic events since the last system reload.
show diagnostic ondemand settings	Shows the diagnostic on-demand settings.
show diagnostic result	Shows the results of the Field Diagnostic test.
show diagnostic ood-status	Displays various status information, such as line card slot and name, Field Diagnostic image status, and previous Field Diagnostic test results.

diagnostic ondemand action-on-failure

To set an error count limit or to stop testing once a diagnostic error event is detected, use the **diagnostic ondemand action-on-failure** command.

diagnostic ondemand action-on-failure [**continue** *failure-limit* | **stop**]

Syntax Description

continue*failure-limit*	Specifies that Field Diagnostic testing should continue on the line card after a failed test occurs. The *failure-limit* specifies the number of failed tests that can be detected before testing on the line card should stop. A *failure-limit* of 0 means testing should continue regardless of the number of failed tests. **Note** The *failure-limit* is the number of failed tests, not errors within a single test. For example, if four errors occur during a single test, the *failure-limit* for that individual test would be 1, not 4.
stop	Specifies that Field Diagnostic testing should stop when an error event occurs.

Command Default

If this command is not entered, a default *failure-limit* of 0 is used. Therefore, testing will continue regardless of the number of errors unless the **diagnostic ondemand action-on-failure** command is used to change the default setting.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(16)BX	This command was introduced.
12.3(13)BC	This command was integrated into Cisco IOS Release 12.2(13)BC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **diagnostic ondemand action-on-failure** settings cannot be saved to a Cisco IOS configuration file. Therefore, the **diagnostic ondemand action-on-failure** command will need to be re-entered each time a router is reset or power cycled if the action-on-failure settings should be maintained.

The **show diagnostic ondemand settings** command can be used to verify the **diagnostic ondemand action-on-failure** setting.

The **show diagnostic events event-type error** command can be used to gather additional information about an error event.

Examples

In the following example, the diagnostic on-demand iteration and action-on-failure settings are changed using **diagnostic ondemand iterations** and **diagnostic ondemand action-on-failure**. The changed settings are then confirmed using **show diagnostic ondemand settings**.

```
Router# diagnostic ondemand iterations 2
Router# diagnostic ondemand action-on-failure stop
```

```
Router# show diagnostic ondemand settings

Test iterations = 2
```

Related Commands

Command	Description
diagnostic event-log size	Sets the size of the event table.
diagnostic load	Loads the Field Diagnostic image onto the line card.
diagnostic ondemand action-on-failure	Sets the number of errors allowed in the Field Diagnostic test before the Field Diagnostic test is stopped.
diagnostic ondemand iterations	Sets the number of times each specific Field Diagnostic test will be run when a Field Diagnostic test is initiated.
diagnostic start	Starts Field Diagnostic testing on the line card.
diagnostic stop	Stops an in-progress Field Diagnostic test.
show diagnostic content	Shows the Field Diagnostic test list for a particular line card.
show diagnostic events	Displays the history of Field Diagnostic events since the last system reload.
show diagnostic ondemand settings	Shows the diagnostic on-demand settings.
show diagnostic result	Shows the results of the Field Diagnostic test.
show diagnostic ood-status	Displays various status information, such as line card slot and name, Field Diagnostic image status, and previous Field Diagnostic test results.

diagnostic unload

To unload the Field Diagnostic on the line card and resume normal line card operation, enter the **diagnostic unload** command.

diagnostic unload {**slot** *slot-number* | **subslot** *slot-number*/*subslot-number*}

Syntax Description

slot	Specifies that the line card unloading the Field Diagnostic image is in a full slot as opposed to a subslot.
subslot	Specifies that the line card unloading the Field Diagnostic image is in a subslot as opposed to a full slot.
slot-number	Specifies the number of the slot where the line card unloading the Field Diagnostic image is located on the router.
subslot-number	Specifies the number of the subslot where the line card unloading the Field Diagnostic image is located on the router.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(16)BX	This command was introduced.
12.3(13)BC	This command was integrated into Cisco IOS Release 12.3(13)BC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show diagnostic result** output will be lost once a Field Diagnostic image is successfully unloaded off a line card. If you want to retain the results of the Field Diagnostic test, enter **show diagnostic result** and copy the output into a separate file before entering **diagnostic unload** to unload the Field Diagnostic image off the line card.

Entering this command successfully will resume normal line card operation.

If a line card needs to be placed back online immediately and a Field Diagnostic test is in progress, enter **diagnostic stop** to stop the in-progress Field Diagnostic test before entering **diagnostic unload** to unload the Field Diagnostic image off the line card.

Examples

In the following example, the Field Diagnostic image is unloaded off of the line card in slot 2. Note that the command is not successfully executed until confirmed at the screen prompt.

```
Router# diagnostic unload slot 2

 ********************************************************************************
 WARNING:All Field Diagnostics test results and information will be
```

```
          unavailable to both the "show diagnostic result <target>" and
          "show diagnostic content <target>" commands.
          To save the test results, cancel the unloading process and enter
          the "show diagnostic result <target>" command. Copy the output
          into a file, then re-enter the "diagnostic unload <target>" command
          to restore normal line card operation.
 ********************************************************************************

% Are you sure that you want to perform this operation? [no]:y
FDIAG [slot 2]> Unloading the Field Diagnostics image and restoring the original run-time
image, please wait ...

FDIAG [slot 2]> Field Diagnostics image was successfully unloaded
```

Related Commands

Command	Description
diagnostic event-log size	Sets the size of the event table.
diagnostic load	Loads the Field Diagnostic image onto the line card.
diagnostic ondemand action-on-failure	Sets the number of errors allowed in the Field Diagnostic test before the Field Diagnostic test is stopped.
diagnostic ondemand iterations	Sets the number of times each specific Field Diagnostic test will be run when a Field Diagnostic test is initiated.
diagnostic start	Starts Field Diagnostic testing on the line card.
diagnostic stop	Stops an in-progress Field Diagnostic test.
show diagnostic content	Shows the Field Diagnostic test list for a particular line card.
show diagnostic events	Displays the history of Field Diagnostic events since the last system reload.
show diagnostic ondemand settings	Shows the diagnostic on-demand settings.
show diagnostic result	Shows the results of the Field Diagnostic test.
show diagnostic ood-status	Displays various status information, such as line card slot and name, Field Diagnostic image status, and previous Field Diagnostic test results.

disable-auto-restart

To disable the automatic process restart, use the **disable-auto-restart** command in the process restart configuration mode. To disable this function, use the **no** form of this command.

```
disable-auto-restart

no disable-auto-restart
```

Command Default

None

Command Modes

Process restart configuration (config-process-restart)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command disables the automatic process restart.

The following example shows how to disable the automatic process restart.

```
Router# configure terminal
Router(config)# process-restart
Router(config-process-restart)# disable-auto-restart
```

Related Commands

Command	Description
lcha-preferred	Selects the LCHA when it is possible

do-not-insert

To prohibit inserting standard descriptors, use the **do-not-insert** command in the DVB scrambling ECMG descriptor configuration mode. To void the configuration, use the **no** form of this command.

do-not-insert {**all** | **ecm-ids** *id*}
no do-not-insert {**all** | **ecm-ids** *id*}

all	Do not insert standard descriptors for all ecm ids.
ecm-ids *id*	Do not insert standard descriptors for specified ecm ids.

Command Default

None

Command Modes

DVB scrambling ECMG descriptor configuration mode (config-video-encrypt-dvb-ecmg-desc)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to prohibit inserting standard descriptors:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#desc-rule desc_8_1 id 1
Router(config-video-encrypt-dvb-ecmg-desc)#do-not-insert ecm-ids 81,82,83,84,85
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
add-priv-data	Adds private data to the descriptor

docsis-channel-id

To configure the downstream channel ID, use the **docsis-channel-id** command in the rf-channel configuration mode. To set the docsis channel ID to its default value, use the **no** form of this command.

docsis-channel-id *dcid*
no docsis-channel-id *dcid*

Syntax Description

dcid	Specifies a downstream channel ID. Valid values are 1 to 255 as 0 is invalid, reserved for network management.

Command Default

The unit number of the downstream device, starting with a value of 1.

Command Modes

rf-channel configuration—(config-rf-chan)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable downstream channel-id** command.

Usage Guidelines

Use this command to ensure that each downstream channel has a unique ID when there are multiple Cisco CMTS routers at a headend facility.

Caution Changing the downstream channel ID of an active channel automatically disconnects all connected CMs and forces them to go offline and reregister with the CMTS router, as required by the DOCSIS specifications.

Examples

The following example shows how to configure the downstream channel on the cable interface line card in slot 6 of a Cisco CMTS router with a channel ID of 44:

```
Router(config)#controller integrated-Cable 3/0/0
Router(config-controller)#rf-chan 0
Router(config-rf-chan)#docsis-channel-id 1
```

The following example shows how to restore the downstream channel ID configuration to the default configuration:

```
Router(config-rf-chan)#no docsis-channel-id 1
```

docsis-policy

To assign a policy to a DOCSIS load balancing group, use the **docsis-policy** command in the config-lb-group configuration mode. The policy becomes the default policy assigned to the CM, if the CM does not choose a different policy. To remove the assigned policy, use the **no** form of this command.

docsis-policy *n*
no docsis-policy

Syntax Description

n	Load balancing group policy number. The policy number can range from 0 to 4294967295.

Command Default

No default behavior or values.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to assign a policy to a DOCSIS load balancing group on the CMTS, using the **docsis-policy** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# docsis-policy 1
Config: Last Batch 0, 63 bytes
cable load-balance docsis-group 1 index 81
docsis-policy 1
end
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

docsis-version

To configure the DOCSIS version of the CM for the CMTS tag, use the **docsis-version** command in the cmts-tag configuration mode. To remove the configured DOCSIS version from the CMTS tag, use the **no** form of this command.

[**exclude**] **docsis-version** *docsis-version*
no docsis-version *docsis-version*

Syntax Description

exclude	(Optional) Configures the CMTS tag to exclude the specified DOCSIS version.
docsis-version	DOCSIS version for the CMTS tag. You can select one of the following DOCSIS versions to match the DOCSIS modems: • docsis10 - Matches DOCSIS 1.0 modems • docsis11 - Matches DOCSIS 1.1 modems • docsis20 - Matches DOCSIS 2.0 modems • docsis30 - Matches DOCSIS 3.0 modems.

Command Default

No default behavior or values.

Command Modes

CMTS tag mode (cmts-tag)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the specified DOCSIS version for the CMTS tag using the **docsis-version** command:

```
Router# configure terminal

Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(cmts-tag)# docsis-version docsis10
```

Related Commands

Command	Description
cable load-balance docsis-group	To configure a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	To display real-time configuration, statistical and operational information for load balancing operations on the router.
cable tag	To configure a tag for a DOCSIS load balancing group on the CMTS.

downstream

To set downstream radio frequency (RF) channels, use the **downstream** command in the config-lb-group configuration mode. To reset the downstream RF channels, use the **no** form of this command.

Cisco uBR7200 Series Routers
downstream cable {*slot* | */port*}
no downstream cable {*slot* | */port*}

Cisco uBR10012 Router
downstream {**cable** {*slot* | */port*} | **Integrated-Cable** {*slot* | */subslot* | */bay*} {**rf-channel** *group list*} | **Modular-Cable** {*slot* | */subslot* | */bay*} {**rf-channel** *group list*}}
nodownstream {**cable** {*slot* | */port*} | **Integrated-Cable** {*slot* | */subslot* | */bay*} {**rf-channel** *group list*} | **Modular-Cable** {*slot* | */subslot* | */bay*} {**rf-channel** *group list*}}

Cisco cBR Series Converged Broadband Routers
downstream Integrated-Cable {*slot /subslot/downstream controller index* } **rf-channel** *group list*
no downstream Integrated-Cable {*slot /subslot/downstream controller index* } **rf-channel** *group list*

Syntax Description

cable {*slot/port*}	Specifies the CMTS interface slot and port numbers.
cable {*slot/subslot/port*}	Specifies the CMTS interface slot, subslot, and port numbers.
Integrated-Cable{**rf-channel** *group list*}{*slot/subslot/bay*}	Specifies the integrated cable interface with the list of port numbers that range in the associated RF channel. Slot, subslot, and bay numbers of the integrated cable interface is also specified.
Modular-Cable {**rf-channel** *group list*}} {*slot/subslot/bay*}	Specifies the modular cable interface with the list of port numbers that range in the associated RF channel. It also specifies slot, subslot, and bay numbers of the modular cable interface.
Integrated-Cable {*slot /subslot/downstream controller index* } **rf-channel** *group list*	Specifies the downstream channels from a particular downstream controller to include in the DOCSIS load balancing group. The downstream controller is identified by a combination of slot, subslot and the downstream controller index. A list of channel numbers follows the **rf-channel** keyword.

Command Default

No default behavior or values.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set downstream RF channels to a DOCSIS load balancing group on the CMTS, using the **downstream** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# downstream cable 1/1
Router(config-lb-group)# downstream Integrated-Cable 5/0/0 rf-channel 2
Router(config-lb-group)# downstream Modular-Cable 1/0/0 rf-channel 4
```

The following example shows how to set downstream RF channels to a DOCSIS load balancing group on the CMTS, using the **downstream** command in Cisco cBR Series Converged Broadband Routers.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# downstream Integrated-Cable 3/0/3 rf-channel 2
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

downstream cable

To assign a primary downstream channel for a fiber node, use the **downstream cable** command in cable fiber-node configuration mode. To remove a primary downstream channel for a fiber node, use the **no** form of the command.

downstream cable {*slot* | */subslot* | */port*}
nodownstream cable {*slot* | */subslot* | */port*}

Syntax Description

slot	The slot used for the cable interface line card. Valid values are 5 to 8.
subslot	The subslot used for the cable interface line card. Valid values are 0 or 1.
port	The downstream port that can be used as a primary downstream channel. Valid values are 0 to 4.

Command Default

If the **downstream cable** command is not issued, no primary downstream channel is assigned to the fiber node.

Command Modes

Cable fiber-node configuration

Command History

Release	Modification
12.3(21)BC	This command was introduced for the uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For each fiber node, a traditional DOCSIS downstream channel is used to carry MAC management and signaling messages, and the associated traditional DOCSIS upstream channel is used for return data traffic and signaling. The traditional DOCSIS downstream channel used in this way is called the *primary downstream channel* .

The **downstream cable** command assigns a primary downstream channel for a fiber node. Each fiber node must be assigned at least one primary downstream channel and can be assigned multiple primary downstream channels. Cisco IOS software decides which primary downstream channel to use for the fiber node from the set of channels assigned with **downstream cable.** Assigning more than one primary channel to a fiber node with the **downstream cable** command can be useful for load-balancing purposes.

Note If the primary downstream channel for the fiber node is assigned from a SPA downstream, then the **downstream cable** command is not required.

If a wideband-capable modem registers as a traditional DOCSIS 2.0 modem, it will register on a downstream channel as follows:

- If the modem's fiber node has been assigned a primary downstream channel with the **downstream cable** command, the modem registers on that downstream channel.

If the modem's fiber node has not been assigned a primary downstream channel with the **downstream cable** command, the modem can register on any downstream channel that is visible to it.

Examples

The following example shows how to assign a primary downstream channel for fiber node 5. The primary downstream channel is the downstream port located on the cable interface line card at slot/subslot/port 6/0/0.

```
Router# configure terminal

Router(config)# cable fiber-node 5
Router(config-fiber-node)# downstream cable 6/0/0
```

Related Commands

Command	Description
cable fiber-node	Enters cable fiber-node configuration mode so that you can configure a fiber node.
description (cable fiber-node)	Specifies a description for a fiber node.
downstream modular-cable rf-channel	Specifies the RF channels that are available for wideband channels on a fiber node.
upstream cable connector	Specifies the upstream channel ports for a fiber node.

downstream downstream-cable

To configure the downstream controller in the fiber node, use the **downstream downstream-cable**command in the fiber node configuration mode. To void the downstream controller configuration in the fiber node, use the **no** form of this command.

downstream downstream-cable *slot/subslot/port*

no downstream downstream-cable *slot/subslot/port*

Syntax Description

slot/subslot/port	Specifies the slot, subslot and port of the downstream controller.

Command Default

None

Command Modes

Fiber node configuration (config-fiber-node)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the downstream controller in the fiber node.

Examples

The following example shows how to configure the downstream controller in the fiber node:

```
Router# configure terminal
Router(config)# cable fiber-node 1
Router(config-fiber-node)# downstream downstream-cable 3/0/0
```

Related Commands

Command	Description
cable fiber node	Enters fiber node configuration mode.
upstream upstream-cable	Configures the upstream controller in the fiber node.

downstream downstream-cable rf-channel

To associate a set of upstream channels to the downstream channels in the Remote-PHY configuration, use the **downstream downstream-cable rf-channel** command in interface configuration mode. To void the configuration, use the **no** form of this command.

downstream downstream-cable *slot/subslot/port* **rf-channel** *rf-channel* [**profile** *name*[**upstream** *grouplist*]]
no downstream downstream-cable *slot/subslot/port* **rf-channel** *rf-channel* [**profile** *name*[**upstream** *grouplist*]]

Syntax Description

slot/subslot/port	Specifies the slot, subslot and port of the downstream controller.
rf-channel	Specifies association of the downstream channels to the channel group domain.
name	Specifies the downstream controller profile.
grouplist	Specifies the logical identifier of upstream channels serving these downstream RF channels.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to associate a set of upstream channels to the downstream channels in the Remote-PHY configuration.

Examples

The following example shows how to use the **downstream downstream-cable rf-channel** command on the Cisco cBR Series Converged Broadband Routers.

```
Router# configure terminal
Router(config)# interface cable 3/0/0
Router(config-if)# downstream downstream-cable 3/0/0 rf-channel 1 upstream 1
```

Related Commands

Command	Description
interface cable	Configures a cable interface.
upstream upstream-cable us-channel	Associates a set of physical upstream channels with the Mac Domain.

downstream integrated-cable rf-channel (interface)

To associate a set of upstream channels to the integrated downstream channels on the Cisco CMTS router, use the **downstream integrated-cable rf-channel** command in interface configuration mode.

downstream integrated-cable *slot*/*subslot*/*port* **rf-channel** *rf-channels* [**upstream** *grouplist*]

Syntax Description

slot	Identifies the chassis slot where the Cisco cable interface line card resides. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco cBR Series Converged Broadband Routers— The valid ranges are from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. For Cisco cBR Series Converged Broadband Routers, the valid subslot is 0.
port	Downstream port (controller) number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4. • Cisco cBR Series Converged Broadband Routers— The valid range is from 0 to 7.
rf-channel *rf-channel*	Specifies association of the downstream channels to the channel group domain. The valid range is from 0 to 3. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 162.
upstream *grouplist*	Specifies the logical identifier of upstream channels serving these downstream RF channels. The valid range is from 0 to 7. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 15.

Command Default

No default upstream channels are configured with the integrated downstream channels.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Release	Modification
IOS-XE 3.18.0SP	This command was modified on the Cisco cBR Series Converged Broadband Routers. The *rf-channel* range is 0 to 162 now.

Usage Guidelines

The **downstream integrated-cable rf-channel** command is used for:

- Configuring the Cisco UBR-MC20X20V Cable Interface Line Card
- Configuring the Cisco uBR-MC88V Cable Interface Line Card

Examples

The following example shows how to use the **downstream integrated-cable rf-channel** command on the Cisco uBR10012 router.

```
Router# configure terminal
Router(config)# interface cable 7/0/0
Router(config-if)# downstream integrated-Cable 7/0/0 rf-channel 1 upstream 1
```

The following example shows how to use the **downstream integrated-cable rf-channel** command on the Cisco cBR Series Converged Broadband Routers.

```
Router# configure terminal
Router(config)# interface cable 3/0/0
Router(config-if)# downstream integrated-Cable 3/0/0 rf-channel 1 upstream 1
```

Related Commands

Command	Description
cable upstream max-ports	Configures the maximum number of upstreams on a MAC domain on a line card.

downstream local upstream

To restrict the set of Cisco uBR10-MC5X20 upstreams associated with the Cisco uBR10-MC5X20 downstreams, use the **downstream local upstream** command in interface configuration mode.

downstream local upstream *grouplist*

Syntax Description

grouplist	Specifies the number of upstreams associated with the Cisco uBR10-MC5X20 downstream channels.

Command Default

All upstreams under the cable interface are associated with the Cisco uBR10-MC5X20 downstreams.

Command Modes

Interface configuration mode (config-if)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to restrict a set of Cisco uBR10-MC5X20 upstreams to Cisco uBR10-MC5X20 downstreams. This restricts MAC management messages (MMM) to be sent to the specified upstreams only.

Examples

The following example shows how the **downstream local upstream** command is used in the Cisco uBR10012 router.

```
Router# configure terminal
Router (config)# interface cable 5/1/0
Router(config-if)# downstream local upstream 0-1
```

Related Commands

Command	Description
downstream cable	Assigns a primary downstream channel for a fiber node.

downstream modular-cable rf-channel (channel group)

To configure downstream RF channels for a channel group, use the **downstream modular-cable rf-channel** command in channel group configuration mode. To disable the configuration, use the **no** form of the command.

downstream modular-cable *slot/subslot/port* **rf-channel** *grouplist*

no downstream modular-cable *slot/subslot/port* **rf-channel** *grouplist*

Syntax Description

modular-cable *slot/subslot/port*	Specifies the modular-cable interface. • *slot*—Chassis slot number of the cable interface line card. The valid range is from 5 to 8. • *subslot*—Secondary slot number of the cable interface line card. The valid range is from 0 to 1. • *port*—Port number on the line card. The valid range is from 0 to 2.
rf-channel *grouplist*	Specifies the list of downstream RF channels. • *grouplist*—Range of downstream RF channel numbers. The valid range is from 0 to 23. The value can be one or more RF channel numbers, a range of channel numbers separated by a hyphen, or a combination of both.

Command Default

Downstream RF channels are not configured.

Command Modes

Channel group configuration (config-ch-group)

Command History

Release	Modification
12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A channel group can have up to 16 downstream RF channels.

The following example shows how to configure a downstream RF channel for a channel group:

```
Router# configure terminal
Router(config)# cable channel-group 1
Router(config-ch-group)# downstream Modular-Cable 7/1/0 rf-channel 0-15
```

Related Commands

Command	Description
cable channel-group	Configures channel group.
show cable channel-group	Displays the channel group information.

downstream modular-cable rf-channel (interface)

To associate a set of Cisco uBR10-MC5X20 upstreams with individual modular downstream channels from the SPA into a given cable MAC domain, use the **downstream modular-cable rf-channel** command in interface configuration mode.

Cisco IOS Release 12.3(23)BC
downstream modular-cable *slot/subslot/bay* **rf-channel** *rf channels* [**upstream** *grouplist*]

Cisco IOS Release 12.2(33)SCB and later
downstream modular-cable *slot/bay/port* **rf-channel** *rf channels* [**upstream** *grouplist*]

Cisco IOS Release 12.2(33)SCE and later
downstream modular-cable *slot/subslot/controller* **rf-channel** *rf channels* [**upstream** *grouplist*]

Syntax Description

slot	Slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs. For the Cisco uBR-MC3GX60V cable interface line card, the cable interface slot values range from 5 to 8.
subslot	Subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	Bay in a SIP where a SPA is located. The valid values are 0 (upper bay) and 1 (lower bay).
port	Interface number on the SPA.
controller	Modular-Cable controller number. The valid values are 0 to 2. **Note** This option is available only on the Cisco uBR-MC3GX60V cable interface line card and on the Cisco router running Cisco IOS Release 12.2(33)SCE and later releases.
rf-channel	Specifies the association of a continuous range of RF channels within the SPA downstream.
rf channels	Range of RF channel physical ports on the SPA FPGA.
upstream	Specifies a set of ranges of upstream to allow association of a noncontiguous list of upstreams to one or more SPA downstreams. If the range is not specified, all the upstreams in the MAC domain are associated.
grouplist	Number of upstreams with the modular cable downstream channel.

Command Default

By default, all upstream channels in an interface are associated with the modular downstream channels in the same interface.

Command Modes

Interface configuration (**config-if**)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for the modular cable interface from *slot/subslot/bay* to *slot/bay/port*.
12.2(33)SCE	This command was modified to change the valid range of *slot*.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to create primary-capable channels by associating a single or a set of Cisco uBR10-MC 5X20 upstream channels with individual modular downstream channels on a fiber node. When a primary-capable channel is created, the same modular downstream channel cannot be used as a primary-capable channel in another MAC domain. However, it can be used as non-primary-capable channel in another MAC domain.

Examples

The following example shows how to use the **downstream modular-cable rf-channel** command on the Cisco uBR10012 router.

```
Router# configure terminal
Router (config)# interface cable 5/1/0

Router(config-if)# downstream modular-cable 1/0/0
 rf-channel 0-2
 upstream 0-1 4-5
```

Related Commands

Command	Description
downstream modular-cable rf-channel	Specifies the RF channels that are available for wideband channels on a fiber node.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.

downstream modular-cable rf-channel

To specify the RF channels that are available for wideband channels on a fiber node, use the **downstream modular-cable rf-channel** command in cable fiber-node configuration mode. To remove RF channels that are available for wideband channels on a fiber node, use the **no** form of this command.

Cisco IOS Release 12.3(23)BC
downstream modular-cable *slot/subslot/bay* **rf-channel** {*rf-portlow-high*}
no downstream modular-cable *slot/subslot/bay* **rf-channel** {*rf-portlow-high*}

Cisco IOS Release 12.2(33)SCB
downstream modular-cable *slot/bay/port* **rf-channel** {*rf-portlow-high*}
no downstream modular-cable *slot/bay/port* **rf-channel** {*rf-portlow-high*}

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
rf-port	Specifies the RF channel physical port on the Wideband SPA FPGA. Valid values for *rf-port* depend on the configuration set with the **annex modulation** command.
low-high	A range of RF channel physical ports on the Wideband SPA FPGA. The *low* and *high* values are separated by a hyphen.

Command Default

If the **downstream modular-cable rf-channel** command is not issued, no RF channels are configured for wideband channels on the fiber node.

Command Modes

Cable fiber-node configuration (fiber-node)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was modified to change the addressing format for the modular cable interface from *slot/subslot/bay* to *slot/bay/port*.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **downstream modular-cable rf-channel** command makes RF channels available for use on a fiber node. Fiber node software configuration mirrors the physical topology of the cable network. The **cable rf-channel** command configures the RF channels that will be used for a wideband channel on a Wideband SPA.

The Cisco uBR10012 router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command.

Note Effective with Cisco IOS Release 12.3(23)BC, the **annex modulation** command is obsolete and **annex** and **modulation** are included as keyword options in the **rf-channel frequency** command.

- For annex A and 256 QAM, each Wideband SPA supports 18 RF channels. In this case, valid values for the *rf-port* argument are 0 to 17.
- For all other cases, the SPA supports 24 RF channels. In these cases, valid values for the *rf-port* argument are 0 to 23.

A fiber node can be configured to have RF channels from one or both Wideband SPAs. However, a wideband channel cannot be comprised of RF channels from two different SPAs.

Each time the **downstream modular-cable rf-channel** command is issued for a fiber node, the set of RF channels that are available for use on that fiber node is added to in a cumulative manner. For example, if the following **downstream modular-cable rf-channel** commands were issued, the set of RF channels available for fiber node 1 is RF channels 0 to 10 on the Wideband SPA in slot/subslot/bay 1/0/0.

```
Router# configure terminal
Router(config)# cable fiber-node 1
Router(config-fiber-node)# downstream modular-cable 1/0/0 rf-channel 0-5
Router(config-fiber-node)# downstream modular-cable 1/0/0 rf-channel 6-10
```

Examples

The following example shows how to specify that RF channels 0 to 7 on a Wideband SPA will be available for use on fiber node 5. The Wideband SPA is located in slot/subslot/bay 1/0/0.

```
Router# configure terminal
Router(config)# cable fiber-node 5
Router(config-fiber-node)# downstream modular-cable 1/0/0 rf-channel 0-7
```

Related Commands

Command	Description
cable fiber-node	Enters cable fiber-node configuration mode to configure a fiber node.
description (cable fiber-node)	Specifies a description for a fiber node.
downstream cable	Assigns a primary downstream channel for a fiber node.
upstream cable connector	Specifies the upstream channel ports for a fiber node.

ds-channel

To configure the OOB downstream channel, use the **ds-channel** command in the profile configuration mode. To void the OOB downstream channel configuration, use the **no** form of this command.

ds-channel 0 {frequency *f-value* **| poweradjust** *p-value* **| rf-mute | shutdown}**

no ds-channel 0 {frequency | poweradjust | rf-mute | shutdown}

Syntax Description

f-value	Specifies the OOB downstream channel frequency value.
p-value	Specifies the OOB downstream channel poweradjust value.

Command Default

None

Command Modes

Profile configuration (config-profile)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the OOB downstream channel.

Examples

The following example shows how to configure the OOB downstream channel:

```
Router# configure terminal
Router(config)# controller downstream-oob 55d1-profile 1
Router(config-profile)# ds-channel 0 frequency 70000000
Router(config-profile)# ds-channel 0 poweradjust 1
```

Related Commands

Command	Description
controller downstream-oob 55d1-profile	Configures the OOB downstream controller profile.

duration

To specify the time period and sample rate to be used for monitoring subscribers, use the **duration** command in enforce-rule configuration mode. To reset an enforce-rule to its default values, use the **no** form of this command.

duration *minutes* **avg-rate** *rate* **sample-interval** *minutes* [**penalty** *minutes*] {**upstream** | **downstream**} [**enforce**]
no duration

Cisco cBR Series Converged Broadband Routers
duration *minutes* **avg-rate** *rate* **sample-interval** *minutes* [**penalty-period** *minutes*] {**upstream** | **downstream**} [**enforce**]
no duration

Syntax Description

minutes	Specifies the size of the sliding window (in minutes) during which subscriber usage is monitored. The valid range is 10 to 44640 with a default of 360 (6 hours).
avg-rate *rate*	Specifies the average sampling rate in kilobits per second for the specified duration. The valid range is 1 to 400000 kilobits with no default.
sample-interval *minutes*	Specifies how often (in minutes) the CMTS router should sample a service flow to get an estimate of subscriber usage. The valid range is 1 to 30, with a default value of 15.
penalty *minutes*	(Optional) Specifies the period (in minutes) during which a cable modem (CM) can be under penalty. The valid range is 1 to 10080.
penalty-period *minutes*	(Optional) Specifies the period for which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile. The valid range is 1 to 10080.
upstream	Specifies monitoring of traffic in the upstream direction.
downstream	Specifies monitoring of traffic in the downstream direction.
enforce	(Optional) Specifies that the enforce-rule QoS profile should be applied automatically if a user violates their registered QoS profile.

Command Default

The **duration** value defaults to 360 minutes (6 hours), and the **sample-interval** value defaults to 15 minutes.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(9a)BC	This command was introduced. This command replaces the **monitoring-duration** command.

Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD2	The **penalty** keyword option was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **penalty** keyword was removed and **penalty-period** was added.

Usage Guidelines

Note This command is applicable only after the **monitoring-basics** command is configured with the keyword **legacy**.

When you enable an enforce-rule, the CMTS router periodically checks the bandwidth being used by subscribers to determine whether any subscribers are consuming more bandwidth than that specified by the avg-rate configured in enforce-rule. The CMTS router keeps track of subscribers using a sliding window that begins at each sample interval and continues for the duration period and average rate.

For example, with the default sample interval of 15 minutes and the default sliding window period of 360 minutes, the CMTS router samples the bandwidth usage every 15 minutes and counts the total bytes transmitted at the end of each 360-minute period. Each sample interval begins a new sliding window period for which the CMTS router keeps track of the total bytes transmitted.

Note Changing the **duration** *minutes*, **avg-rate** *rate*, or **sample-interval** *minutes* values resets the byte counters for that particular enforce-rule and begins a new sliding window period.

When you change the configuration of a currently active enforce-rule, that rule begins using the new configuration immediately to manage the cable modems tracked by this enforce-rule.

The **penalty** duration, which is configured using this command, is unique to weekdays, and takes precedence over the global penalty duration configured using the **penalty-period** command.

When you use the **show running-configuration** command to display the configuration, the keyword options for the **duration** command are truncated. In the following example, "pen" represents **penalty**, "do" represents **downstream**, and "enf" represents **enforce**:

```
Router# show running-configuration
.
.
.
duration 10 avg-rate 1 sample-interval 10 pen 11 do enf
```

For more information about the Subscriber Traffic Management feature and to see an illustration of a sample monitoring window, refer to the Subscriber Traffic Management for the Cisco CMTS Routers feature document on Cisco.com.

Examples

The following example shows an enforce-rule being configured for a sliding window that is 20 minutes in length, an **avg-rate** of 1 kilobit per second, and a sampling interval of every 10 minutes.

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential
Router(enforce-rule)# duration 20 avg-rate 1 sample-interval 10 penalty 11 do enf
```

The following example shows an enforce-rule being configured on a Cisco cBR Series Converged Broadband Router:

```
Router# configure terminal

Router(config)# cable qos enforce-rule test
Router(enforce-rule)# duration 10 avg-rate 2 sample-interval 1 penalty-period 20 downstream
 enforce
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
debug cable subscriber-monitoring	Displays enforce-rule debug messages for subscriber traffic management on the Cisco CMTS routers.
monitoring-basics	Specifies the type of monitoring for subscriber traffic management on a Cisco CMTS router.
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
penalty-period	Specifies the period for which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule. This command is applicable only for DOCSIS 1.0 cable modems.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profile. This command is applicable only for DOCSIS 1.0 cable modems.
service-class (enforce-rule)	Specifies a service class (enforced or registered) that should be used for cable modem monitoring in an enforce-rule. This command is applicable for DOCSIS 1.1 or later cable modems.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.
weekend duration	Configures different subscriber monitoring options over weekends on a Cisco CMTS router.

dvb

To enter the DVB scrambling configuration mode, use the **dvb** command in video encryption configuration mode.

dvb

Syntax Description

This command has no keywords or arguments.

Command Modes

Video encryption configuration (config-video-encrypt)

Command History

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enter the DVB scrambling configuration mode.

Examples

The following example shows how to enter the DVB scrambling configuration mode:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# encryption
Router(config-video-encrypt)# dvb
Router(config-video-encrypt-dvb)#
```

ecm-pid-source

To configure the source of ECM PID, use the **ecm-pid-source** command in the DVB scrambling ECMG configuration mode.

ecm-pid-source {**auto** *lower_limit upper_limit* | **ecm-id** | **sid**}

auto *lower_limit upper_limit*	ECM PID is determined internally by the system in the range between lower limit and upper limit.
ecm-id	ECM ID specified in the SCG will be used as the ECM PID.
sid	ECM PID is choosen automatically from the Service ID PID Range.

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

It is recommended to use **auto** option for the customers using:

- Session based scrambling by providing pids in the Scrambling Control Group (component based scrambling)
- Tier based scrambling

The following is an example of how to configure the source of ECM PID:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#ecm-pid-source sid
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
auto-channel-id	Enables automatic channel ID selection.
connection	Configures the ECMG connection.

Command	Description
ca-system-id	Configures the CA system ID.
type	Configures the ECMG type.
mode	Configures the application mode of ECMG.
desc-rule	Configures the descriptor rule.
overrule	Overrules the default settings.

ecmg

To enter the ECM Generator configuration mode, use the **ecmg** command in the DVB scrambling configuration mode. To void the ECMG configuration, use the **no** form of this command.

ecmg *ecmg_name* [**id** *id*]
no ecmg *ecmg_name*

ecmg_name	Specifies the ECMG name.
id	Specifies the ECMG ID.

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to enter the ECM Generator configuration mode:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#
```

Related Commands

Command	Description
mode	Configures the application mode of ECMG.
auto-channel-id	Enables automatic channel ID selection.
connection	Configures the ECMG connection.
ecm-pid-source	Configures the source of ECM PID.
ca-system-id	Configures the CA system ID.
type	Configures the ECMG type.
desc-rule	Configures the descriptor rule.
overrule	Overrules the default settings.

ecmg (Tier-based)

To configure the tier-based scrambling, use the **ecmg** command in the tier-based scrambling configuration mode. To void the tier-based scrambling configuration, use the **no** form of this command.

ecmg {**id** *id* | **name** *name*}**access-criteria** *hex_access_criteria*
no ecmg {**id** *id* | **name** *name*}

id *id*	Specifies the ECMG ID.
name *name*	Specifies the ECMG name.
access-criteria *hex_access_criteria*	Specifies the access criteria per ECMG.

Command Default

None

Command Modes

Tier-based scrambling configuration mode (config-video-encrypt-dvb-tier)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the tier-based scrambling:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#tier-based
Router(config-video-encrypt-dvb-tier)#ecmg id 1 access-criteria 1234512345
```

Related Commands

Command	Description
tier-based	Enters tier-based scrambling configuration mode.
enable	Enables the tier-based scrambling.

eis

To enter the Event Information Scheduler configuration mode, use the **eis** command in the DVB scrambling configuration mode. To void the Event Information Scheduler configuration, use the **no** form of this command.

eis *server_name* [**id** *id*]
no eis *server_name*

server_name	Specifies the EIS server name.
id	Specifies the EIS connection ID.

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to enter the Event Information Scheduler configuration mode:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#eis EIS-1 id 1
Router(config-video-encrypt-dvb-eis)#
```

Related Commands

Command	Description
overwrite-scg	Enables Scrambling Control Group (SCG) overwrite.
listening-port	Configures the listening TCP port.
cp-overrule	Overrules and specifies the crypto period duration.

enable (Tier-based)

To enable the tier-based scrambling, use the **enable** command in the tier-based scrambling configuration mode. To disable the tier-based scrambling, use the **no** form of this command.

enable
no enable

Command Default

None

Command Modes

Tier-based scrambling configuration mode (config-video-encrypt-dvb-tier)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

It is recommended to disable tier based scrambling before modifying any configuration under tier-based section. Enable it again after the modification is complete.

The following is an example of how to enable the tier-based scrambling:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#tier-based
Router(config-video-encrypt-dvb-tier)#enable
```

Related Commands

Command	Description
tier-based	Enters tier-based scrambling configuration mode.
ecmg	Configures the tier-based scrambling.

enabled (enforce-rule)

To activate an enforce-rule and begin subscriber traffic management on a Cisco CMTS router, use the **enabled** command in enforce-rule configuration mode. To disable the enforce-rule without deleting it, use the **no** form of this command.

enabled
no enabled

Syntax Description

This commands has no keywords or arguments.

Command Default

Enforce-rules are disabled.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(9a)BC	This command was integrated into Cisco IOS Release 12.3(9a)BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

An enforce-rule is created and configured using the **cable qos enforce-rule** command, but it is not activated until you run the **enabled** command. Use the **no enabled** command to disable an enforce-rule without removing it from the CMTS configuration. When you disable an enforce-rule, all cable modems with that rule's registered QoS profile are no longer tracked by the Subscriber Traffic Management feature and all cable modems in penalty are moved to their registered QoS profile.

Examples

The following example shows an enforce-rule being enabled:

```
Router# configure terminal
Router(config)# cable qos enforce-rule residential
Router(enforce-rule)# enabled
```

The following example shows an enforce-rule being disabled. The rule remains in the CMTS configuration file.

```
Router# configure terminal
Router(config)# cable qos enforce-rule residential
```

```
Router(enforce-rule)# no enabled
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers that violate their registered QoS profiles.
qos-profile registered	Specifies the registered QoS profile that should be use for this enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

encrypt

To enable encryption on a virtual carrier group, use the **encrypt** command in virtual carrier group configuration mode. To disable the encryption, use the **no** form of this command.

encrypt
no encrypt

Command Default

None.

Command Modes

Virtual carrier group configuration (config-video-vcg)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables encryption on a virtual carrier group.

Examples

The following example shows how to enable encryption on a virtual carrier group:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# virtual-carrier-group vod id 1
Router(config-video-vcg)# encrypt
```

Related Commands

Command	Description
virtual-carrier-group	Defines a virtual carrier group.
virtual-edge-input-ip	Defines a virtual edge input.
service-type	Specifies the service type of the virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
show cable video virtual-carrier-group	Displays the virtual carrier group information.

enforced qos-profile

Note Effective with Cisco IOS Release 12.3(9a)BC, the **enforced qos-profile** command is replaced by the **qos-profile enforced** command.

To specify a quality of service (QoS) profile that should be enforced when users violate their registered QoS profiles, use the **enforced qos-profile** command in enforce-rule configuration mode. To delete the enforced QoS profile from the enforce-rule, use the **no** form of this command.

enforced qos-profile *profile-id* [**no-persistence**]
no enforced qos-profile *profile-id* [**no-persistence**]

Syntax Description

profile-id	Specifies the QoS profile to be enforced. The valid range is 0 to 16383, with a default of 0.
no-persistence	(Optional) Specifies that the enforced QoS profile should not remain in force when a cable modem reboots. Instead, when a cable modem (CM) that is in the penalty period reboots, it is automatically removed from the penalty period and assigned the QoS profile that is specified in its DOCSIS configuration file. The default is without this option, so that enforced QoS profiles remain in effect for cable modems across reboots.

Command Default

The profile ID defaults to 0, and enforced QoS profiles are persistent across cable modem reboots.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(9a)BC	This command was replaced by the **qos-profile enforced** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Both the originally provisioned QoS profile and the enforced QoS profile must be created on the Cisco CMTS router. This command does not support profiles that are created by the cable modem.

An enforce-rule can specify an enforced QoS profile, which is automatically applied to subscribers that transmit more traffic than what is allowed by their registered QoS profile. The enforced QoS profile remains in effect during the penalty time period (see the **penalty-period** command). At the end of the penalty period, the subscriber returns to their registered QoS profile.

If a cable modem reboots while it is in its penalty time period, it continues using the enforced QoS profile, unless the service provider has manually changed the cable modem's registered QoS profile using the **cable modem qos profile** command.

When you change the enforced QoS profile for a currently active enforce-rule, any cable modems using this rule that are currently in the penalty period continue using the previously configured enforced QoS profile. Any cable modems that enter the penalty period after this configuration change, however, use the new enforced QoS profile.

An enforced QoS profile must already have been created on the Cisco CMTS router before you can assign it to an enforce-rule. If the rule does not exist, the system displays an error message.

When the **no-persistence** option is specified, the enforced QoS profile is still automatically applied to subscribers that violate their bandwidth requirements. However, when the cable modem reboots, the Cisco CMTS router allows the cable modem to use the QoS profile that is specified in its DOCSIS configuration file.

The **no-persistence** option can be used when initially using subscriber traffic management to identify potential problem applications and users. When repeat offenders are identified, they can then be assigned enforce-rules that do not use the **no-persistence** option, so that they remain in the penalty period even if they reboot their cable modems.



Note In software releases prior to Cisco IOS Release 12.3(9a)BC, the system automatically applies the enforced QoS profile to violators only if the **enforce** keyword has been used with the **activate-rule at-byte-count** command.

Examples

The following example shows profile 12 being assigned as the enforced QoS profile to an enforce-rule:

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential

Router(enforce-rule)# enforced qos-profile 12
```

The following example shows profile 12 being assigned as the enforced QoS profile to an enforce-rule, but with the **no-persistence** option specified, so that the enforced QoS profile does not remain in force if the cable modem reboots:

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential

Router(enforce-rule)# enforced qos-profile 12 no-persistence
```

The following example shows the error message that is displayed when the specified QoS profile does not exist on the CMTS:

```
Router# configure terminal

Router(config)# cable qos enforce-rule test
Router(enforce-rule)# enforced qos-profile 98
The qos profile 98 doesn't exist or it's a cm created QoS profile
```

Related Commands

Command	Description
activate-rule at-byte-count	Specifies the number of bytes that a subscriber can transmit during the monitoring period on a Cisco CMTS router.
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers that violate their registered QoS profiles.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

event-profile

To apply a GQI announce event profile to a specific LED, use the **event-profile** command in global configuration mode.

event-profile *name*

Syntax Description

Command	Description
name	Name of the GQI announce event profile.

Command Default

None.

Command Modes

Global configuration mode (config).

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to apply a GQI announce event profile (gqi-led-1) to a LED (led5) using the **event-profile** command:

```
cable video
logical-edge-device led5 id 5
    gqi protocol
       event-profile gqi-led-1
```

Related Commands

Command	Description
showcable video announce-event-profile	Displays the configuration of the GQI announce event profile and a list of LEDs that use the profile.
announce-event-profile	Configures the GQI announce event profile.

exception pxf

To control the core dumps that are generated when an exception occurs in one of the Parallel eXpress Forwarding (PXF) columns, use the **exception pxf** command in global configuration mode. To disable the creation of core dumps during PXF exceptions, use the **no** form of this command.

exception pxf {**core-file** *filename* | **flash** *device* | **style** {**full** | **localized** | **minimal** | **smart**}}
no exception pxf {**core-file** | **flash** | **style**}

Syntax Description

core-file *filename*	Sets the filename for the core-dump file generated during a PXF exception.
flash *device*	Specifies the Flash memory device on which to save the core-dump file generated during a PXF exception.
style	Specifies the type of core-dump file to be generated during a PXF exception.
full	Creates a full core-dump file of all PXF columns.
localized	Creates a core-dump file of the PXF column that failed, along with its neighboring columns.
minimal	Creates a core-dump file that contains the data related to the PXF exception.
smart	Creates a core-dump file that contains the data related to the PXF exception.

Command Default

The profile ID defaults to 0, and enforced QoS profiles are persistent across cable modem reboots.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Note Use the **exception pxf** command only under the direction of a technical support representative. Creating a core dump can disrupt network operations. The core dump is a large binary file that can be interpreted only by technical personnel who have access to source code and detailed memory maps.

Examples

The following example shows how to specify that the Cisco uBR10012 router should create a minimal core-dump file for PXF exceptions, and that this file should be named ubr10k-pxf and be written to the disk1 device:

```
Router# configure terminal
Router(config)# exception pxf style minimal
Router(config)# exception pxf core-file ubr10k-pxf
Router(config)# exception pxf flash disk1:
Router(config)#
```

Related Commands

Command	Description
show pxf xcm	Displays the current state of error checking and correcting (ECC) for the External Column Memory (XCM) on the Parallel eXpress Forwarding (PXF) processor.

facility-alarm (ubr10012)

To set the temperature thresholds at which the Performance Routing Engine (PRE) module generates a critical, major, or minor alarm to warn of potential equipment damage, use the **facility-alarm** command in global configuration mode. To disable the temperature alarms, use the **no** form of this command.

facility-alarm {**core-temperature** | **intake-temperature**} {**critical exceed-action shutdown** | **major** [*temp*] | **minor** [*temp*]}
no facility-alarm {**core-temperature** | **intake-temperature**} {**critical exceed-action shutdown** | **major** [*temp*] | **minor** [*temp*]}

Cisco cBR Series Converged Broadband Routers
facility-alarm critical exceed-action shutdown
no facility-alarm critical exceed-action shutdown

Syntax Description

core-temperature	Specifies the temperature threshold for the temperature sensors near the center of the PRE module.
intake-temperature	Specifies the temperature threshold for the temperature sensors at the air intake slots.
critical exceed-action shutdown	In Cisco IOS Release 12.2(11)BC1 and later releases, specifies that a critical temperature alarm should shut down the router after two minutes. This was the default behavior in previous releases.
major [*temp*]	Specifies the temperature, in degrees Centigrade, at which the PRE module generates a major alarm to warn of potential damage from excessive temperatures. The valid range for *temp* is 20 to 67 degrees Centigrade, with a default of 58 for the core temperature threshold and 54 for the intake-temperature threshold.
minor [*temp*]	Specifies the temperature, in degrees Centigrade, at which the PRE module generates a minor alarm to warn of potential damage from excessive temperatures. The valid range for *temp* is 20 to 67 degrees Centigrade, with a default of 50 for the core temperature threshold and 45 for the intake-temperature threshold.

Command Default

If no specific temperature is given, that particular facility alarm is reset to its default value. The default core temperature thresholds are 85 (critical), 58 (major), and 50 (minor). The default intake-temperature thresholds are 72 (critical), 54 (major), and 45 (minor) degrees Centigrade.

In Cisco IOS releases previous to Cisco IOS Release 12.2(11)BC1, a critical alarm automatically shuts down the router after two minutes to prevent temperature damage. In Cisco IOS Release 12.2(11)BC1 and later, a critical alarm by default does not shut down the router.



Note The default temperature thresholds for the critical core and intake temperatures were changed in Cisco IOS Release 12.2(11)BC1.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(1)XF1	This command was introduced for the Cisco uBR10012 router.
12.2(11)BC1	The **critical exceed-action shutdown** option was added. In addition, the default value for the core critical temperature threshold was raised from 57 to 67 degrees Centigrade, and the default value for the intake critical temperature threshold was raised from 60 to 85 degrees Centigrade.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Note The **facility-alarm core-temperature critical** and **facility-alarm intake-temperature critical** commands are available only if the **service internal** command is defined in the configuration.

The PRE module on the Cisco uBR10012 router contains temperature sensors that monitor the temperature at the air intake slots and on the PRE module itself. The **facility-alarm** command configures the router for the temperature thresholds that will generate a minor, major, or critical alarm, so as to notify the system operators of the temperature problem before excessive heat can damage the router or any of its components.

Before Cisco IOS Release 12.2(11)BC1, a critical alarm would also automatically shut down the router after two minutes. Cisco IOS Release 12.2(11)BC1 made this automatic shutdown a configurable option, so that the system operators can decide whether or not a critical alarm should power down the router.

As a general rule, do not disable the automatic shutdown of the router unless you have a systems operator available to immediately respond to any critical temperature alarms, because this could result in system damage. Typically, the primary reason to disable the automatic shutdown would be if you are replacing the fan tray assembly and want to ensure that the router does not power down if the procedure takes longer than expected.

Note A line card also automatically shuts itself down if the temperature exceeds operational levels. In addition, the AC and DC PEMs also automatically power down if they exceed their operational temperature. However, high temperatures could still cause damage to other components if the problem is not quickly resolved.

Examples

The following example shows how to configure the Cisco uBR10012 router so that it generates a minor alarm when the intake temperature exceed 55˚C:

```
Router# configure terminal
Router(config)# facility-alarm intake-temperature minor 55
```

The following example shows how to configure the Cisco uBR10012 router to automatically shut down if the high temperature continues for more than two minutes:

```
Router# configure terminal
Router(config)# service internal
Router(config)# facility-alarm core-temperature critical exceed-action shutdown
```

The following example shows how to disable the automatic shutdown feature for both the core and intake temperatures. A critical alarm is still generated when the default critical temperatures are exceeded, but the router does not automatically shut itself down:

```
Router# configure terminal
Router(config)# no facility-alarm core-temperature critical exceed-action shutdown
Router(config)# no facility-alarm intake-temperature critical exceed-action shutdown
```

The following commands disable major and minor alarms for both the core and intake temperature thresholds (but critical alarms are still generated):

```
Router# configure terminal
Router(config)# no facility-alarm core-temperature major
Router(config)# no facility-alarm core-temperature minor
Router(config)# no facility-alarm intake-temperature major
Router(config)# no facility-alarm intake-temperature minor
```

The following commands show how to disable critical temperature alarm on Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# facility-alarm critical exceed-action shutdown
Router(config)#
Router(config)# no facility-alarm critical exceed-action shutdown
Router(config)#
```

Related Commands

Command	Description
clear facility-alarm	Clears some or all of the facility alarms on the Cisco uBR10012 router.
show facility-alarm status	Displays the current temperature thresholds that will trigger a facility alarm.

factory-reset all

To reset the device to factory defaults, use the **factory-reset all** command in privileged EXEC mode. This method is called as Fast Factory Reset.



Note

- Partitions accessed by BinOS only have their file tables cleared; the file content is visible with a raw device dump.
- The **factory-reset all** does not sanitize all the storage devices. To perfom factory reset and device sanitization use the Secure Factory Reset command: **factory-reset all secure**.

factory-reset all

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	In this release, instead of only deleting the private configure encryption key, the command deletes all the non-admin users in ACT2.
Cisco IOS XE Cupertino 17.9.1w	In this release, the partitions are cleared, the device is repartitioned and reformated. In previous releases, the partitions are retained and each partition is cleared and reformated.
Cisco IOS XE Everest 16.6.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The following example shows how to perform Fast Factory Reset.

Examples

```
Router# factory-reset all
The factory reset operation is irreversible for all operations. Are you sure? [confirm]
The following will be deleted as a part of factory reset:
1: All writable file systems and personal data
2: OBFL logs
3: Licenses
4: Userdata and Startup config 5: Rommon variables
6: User Credentials
7: nvram private cfg encryption key in ACT2

Only this SUP will be reset. To reset peer SUP, run factory reset
on peer SUP when this sup is not doing factory reset.
```

```
Current running image will be restored to bootflash after reset. If current image
is a private image with sensitive data, reload with Cisco release image first.

The SUP will reload to perform factory reset.

The reset can take a while to finish with secure option.
1. DO NOT UNPLUG THE POWER OR INTERRUPT THE OPERATION!
2. DO NOT RELOAD PEER SUP!
3. DO NOT START FACTORY RESET ON PEER SUP!

Are you sure you want to continue? [confirm] Y
Enabling factory reset for this reload cycle

*Jan 01 00:42:08.633: %IOSXEBOOT-4-FACTORY_RESET: (rp/0): Start FAST Factory Reset

.
.
.
.
4,209 100% 6.28kB/s 0:00:00 (xfr#2, to-chk=0/3)
sync cached data to storage. may take a few minutes. please wait ...

*Jan 01 00:46:24.952: %IOSXEBOOT-4-FACTORY_RESET: (rp/0): Factory reset
successful. Continuing with reboot ...
!
!
```

factory-reset all secure

To perform factory reset and device sanitization use the **factory-reset all secure** command. This method is called as Secure Reset. The following folders are cleared as part of this procedure:

- User info in ACT2 is cleared.
- NVRAM that stores IOS configuration and data. For CBR-8, NVRAM and its backup are partitions on eUSB flash device.
- `/bootflash/` - For CBR-8, bootflash is a partition on eUSB flash device.
- `/obfl/` - For CBR8, OBFL folder is a partition on eUSB flash device.
- `/csl_p/` - For CBR8, csl_p folder is a partition on eUSB flash device.
- `/harddisk/` - For CBR8, the harddisk folder is a partition on SSD.

factory-reset all secure

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	In this release, instead of only deleting the private configure encryption key, the command deletes all the non-admin users in ACT2.
Cisco IOS XE Cupertino 17.9.1w	In this release, the partitions are cleared, the device is repartitioned and reformated. In previous releases, the partitions are retained and each partition is cleared and reformated.

Usage Guidelines

The following example shows how to perform Secure Reset.

Examples

```
Router# factory-reset all secure
The factory reset operation is irreversible for securely reset all. Are you sure? [confirm]
The following will be deleted as a part of factory reset:
1: All writable file systems and personal data
2: OBFL logs
3: Licenses
4: Userdata and Startup config
5: Rommon variables
6: User Credentials
7: nvram private cfg encryption key in ACT2

Only this SUP will be reset. To reset peer SUP, run factory reset
on peer SUP when this sup is not doing factory reset.
```

```
Current running image will be restored to bootflash after reset.
If current image is a private image with sensitive data, reload
with Cisco release image first.

The SUP will reload to perform factory reset.

The reset can take a while to finish with secure option.
1. DO NOT UNPLUG THE POWER OR INTERRUPT THE OPERATION!
2. DO NOT RELOAD PEER SUP!
3. DO NOT START FACTORY RESET ON PEER SUP!

Are you sure you want to continue? [confirm] Y
Enabling factory reset for this reload cycle

*May 11 12:21:20.945: %IOSXEBOOT-4-FACTORY_RESET: (rp/0): Start SECURE Factory Reset

.
.
.
.
.
*May 11 14:22:01.374: %IOSXEBOOT-4-FACTORY_RESET: (rp/0): Factory reset successful.
Continuing with reboot ...
!
!
```

fail-to-clear

To configure fail-to-clear feature, use the **fail-to-clear** command in global configuration mode. Fail-to-clear feature is applicable only to DVB tier-based scrambling sessions.

```
fail-to-clear
```

This command has no arguments or keywords.

Command Default

By default, this feature is not enabled.

Command Modes

Global configuration mode (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The command is used to control the configured DVB-encrypted sessions to function without encryption, when encryption fails for a session. The fail-to-clear feature is applicable only to DVB tier-based scrambling.

The following example shows how to configure **fail-to-clear**.

```
Router>enable
Router#config terminal
Router(config)#cable video
Router(config-video)#mgmt-intf VirtualPortGroup 0
Router(config-video)#encryption
Router(config-video-encrypt)#linecard 7/0 ca-system dvb scrambler dvb-csa
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#mgmt-ip 10.10.1.1
Router(config-video-encrypt-dvb)#ecmg tier-ecmg-1 id 1
Router(config-video-encrypt-dvb-ecmg)#mode tier-based
Router(config-video-encrypt-dvb-ecmg)#type standard
Router(config-video-encrypt-dvb-ecmg)#ca-system-id 4748 0
Router(config-video-encrypt-dvb-ecmg)#ecm-pid-source sid
Router(config-video-encrypt-dvb-ecmg)#connection id 1 priority 1 10.10.1.1 8888
Router(config-video-encrypt-dvb-ecmg)#exit
Router(config-video-encrypt-dvb)#tier-based
Router(config-video-encrypt-dvb-tb)#ecmg id 1 access-criteria 1234512345
Router(config-video-encrypt-dvb-tb)#fail-to-clear
Router(config-video-encrypt-dvb-tb)#enable
```

fail-to-clear-duration

To configure fail-to-clear-duration feature, use the **fail-to-clear-duration** command in global configuration mode. Fail-to-clear-duration feature is applicable only to session-based scrambling for DVB CAS encryption.

`fail-to-clear-duration` *duration in sec*

Command Default

By default the duration is set to 0.

Command Modes

Global configuration mode (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The command is used to control the configured DVB-encrypted sessions to function without encryption for a configured duration, when encryption fails for a session. The fail-to-clear-duration feature is applicable only to session-based scrambling for DVB CAS encryption.

The following example shows how to configure **fail-to-clear-duration**..

```
Router>enable
Router#config terminal
Router(config)#cable video
Router(config-video)#mgmt-intf VirtualPortGroup 0
Router(config-video)#encryption
Router(config-video-encrypt)#linecard 7/0 ca-system dvb scrambler dvb-csa
Router(config-video-encrypt-dvb-conf)#exit
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#scramble-video-audio
Router(config-video-encrypt-dvb)#route-ecmg 10.10.1.1 255.255.255.224 TenGigabitEthernet4/1/2
 10.10.1.1
Router(config-video-encrypt-dvb)#mgmt-ip 10.10.1.1
Router(config-video-encrypt-dvb)#eis eis-1 id 1
Router(config-video-encrypt-dvb-eis)#listening-port 8890
Router(config-video-encrypt-dvb-eis)#fail-to-clear-duration 400
Router(config-video-encrypt-dvb-eis)#exit
Router(config-video-encrypt-dvb)#ca-interface linecard 1/0 10.10.1.1 vrf vrf_script_red_1
Router(config-video-encrypt-dvb)#ecmg ecmg-7 id 7
```

filter pid vcg

To configure PID rule, use the **filter pid vcg** command in video configuration mode.

filter pid vcg *vcg*

Syntax Description

vcg	Specifies the virtual carrier group.

Command Default

None.

Command Modes

Video configuration (config)

Command History

Release	Modification
IOS-XE 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a filter rule for a table-based unicast session on input port number 1 with vei-ip 198.51.100.1

```
logical-edge-device led1 id 1
        protocol table-based
              virtual-edge-input-ip 198.51.100.1 input-port-number 1
              vcg vcg1
              active
table-based
       vcg vcg1
             rf-channel 2
                 session unicast input-port 1 start-udp-port 49152 processing-type passthru
```

The corresponding filter rule is shown below:

```
filter pid vcg vcg1
   rf-channel 2
      vei-ip 198.51.100.1 udp-port 49152
   pid 120
   pid 20-30
```

filter program vcg

To configure program filtering, use the **filter program vcg** command in video configuration mode.

filter program vcg *vcg*

Syntax Description

vcg	Specifies the virtual carrier group.

Command Default

None.

Command Modes

Video configuration (config)

Command History

Release	Modification
IOS-XE 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a program filter rule for a table-based unicast session on input port number 1 with vei-ip 198.51.100.1

```
logical-edge-device led1 id 1
        protocol table-based
              virtual-edge-input-ip 198.51.100.1 input-port-number 1
              vcg vcg1
              active
table-based
       vcg vcg1
             rf-channel 2
                 session unicast input-port 1 start-udp-port 49152 processing-type passthru
```

The corresponding filter rule is shown below:

```
filter program vcg vcg1
   rf-channel 2
      vei-ip 198.51.100.1 udp-port 49152
   program 10
   program 20
   program 30-40
```

freq-profile

To define the frequency profile for the RF port, use the **freq-profile** command in the RF channel sub configuration mode. This command is available only on CBR-D30-DS-MOD, and is not applicable for CBR-D31-DS-MOD.

freq-profile *value*

Syntax Description

value	Number of the frequency profile for the RF port. The default value is 0. The valid range for system defined values is 0-3 and for user defined values is 4-15.

Command Default

The default value is 0.

Command Modes

RF channel sub configuration mode (config-rf-chan)

Command History

Release	Modification
Cisco IOS-XE Release 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to define the QAM profile number.

The following example shows how to define the QAM profile number:

```
router#configure terminal
router(config)#controller integrated-cable 3/0/0
router(config-controller)#rf-chan 5 10
router(config-rf-chan)#type video
router(config-rf-chan)#frequency 723000000
router(config-rf-chan)#rf-output alt
router(config-rf-chan)#power-adjust 0
router(config-rf-chan)#qam-profile 4
router(config-rf-chan)#exit
router(config-controller)#exit
router(config)#exit
router#show controller integrated-Cable 3/0/0 rf-channel 5 10
Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output
 5   TEST   UP   723000000  VIDEO  B    256   5361  I32-J4       164  34     ALT
 10  TEST   UP   753000000  VIDEO  B    256   5361  I32-J4       169  34     ALT
```

Related Commands

Command	Description
cable downstream freq-profile	Set the frequency profile for the cable interface line card.
frequency	Defines the RF channel radio frequency.
show cable freq-profile	Displays information about the frequency profile.

frequency

To define the frequency for the RF channel, use the **frequency** command in the RF channel sub configuration mode.

frequency *number*

Syntax Description

number	Radio frequency for the RF channel. The valid range is from 48000000-999000000.

Command Default

None.

Command Modes

RF channel sub configuration mode (config-rf-chan)

Usage Guidelines

This command is used to define the RF channel frequency.

The following example shows how to define the RF channel frequency:

```
router#configure terminal
router(config)#controller integrated-cable 3/0/0
router(config-controller)#rf-chan 0 2
router(config-rf-chan)#frequency 93000000
router(config-rf-chan)#exit
router(config-controller)#exit
router#show controller integrated-Cable 3/0/0 rf-channel 0-2

Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output
0     UP   UP   93000000   DOCSIS  B    256   5361  I32-J4       1    34     NORMAL
1     UP   UP   99000000   DOCSIS  B    256   5361  I32-J4       2    34     NORMAL
2     UP   UP   105000000  DOCSIS  B    256   5361  I32-J4       3    34     NORMAL
```

Related Commands

Command	Description
controller integrated-cable	Enters the controller configuration mode.
rf-chan	To enter the RF channel sub configuration mode.
qam-profile	Defines the QAM profile number.
rf-output	Defines the QAM output mode.
type	Defines the QAM data type.
power-adjust	Defines the channel power level.

guardband-override (OFDM channel profile)

To configure the guard band of an OFDM channel, use the **guardband-override** command in OFDM channel profile configuration mode. To undo the guard band configuration, use **no** form of this command.

guardband-override *value*

no guardband-override

Syntax Description

value	0 to 4000000 in 50000Hz increments.

Command Default

None.

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.1SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the guard band of an OFDM channel with the range of 0 to 4MHz. No guardband override is configured by default. In this case, the guard band is based on the roll off and spacing in OFDM channel profile.

Examples

The following example shows how to specify the guard band:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# guardband-override 240000
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-control	Specify default modulation or profile as the channel control profile.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

Command	Description
interleaver-depth	Specify the channel interleaver-depth.

hccp authentication

To specify the authentication algorithm on a working or protect cable interface, or both use the **hccp authentication** command in cable interface configuration mode. To disable authentication on a Working CMTS or Protect CMTS, use the **no** form of this command.

hccp *group* **authentication** {**md5** | **text**}
no hccp *group* **authentication** {**md5** | **text**}

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
md5	Authentication algorithm. In Cisco IOS Release 12.1(3a)EC, MD5 is the only authentication algorithm supported.
text	Unencrypted text specification. Rather than automatically encrypting the authentication key-chain when using the MD5 authentication algorithm, Cisco IOS software simply passes the authentication key-chain as standard, unencrypted text.

Command Default

The default authentication algorithm is MD5.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.2(15)BC1	Support was added for the Cisco uBR-MC5X20U/S BPE on the Cisco uBR10012 router.
12.3(17a)BC2	Support was added for the Cisco uBR-MC5X20H BPE on the Cisco uBR10012 router.
12.3(21)BC	This command is obsolete on the Cisco uBR7246VXR router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command together with the **hccp authentication key-chain** command to enable and specify the type of N+1 redundancy authentication you will use in your protection scheme.

Examples

The following example shows how to specify MD5 as the authentication algorithm for group 1:

```
Router(config-if)# hccp 1 authentication md5
```

Related Commands

Command	Description
hccp authentication key-chain	Enables authentication on a given interface and specifies one or more keys that can be used to perform authentication for a specified group.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp authentication key-chain

To enable authentication and define one or more authentication keys to use in a specified group, use the **hccp authentication key-chain** command in cable interface configuration mode. To disable authentication, use the **no** form of this command. The key chains you define must match one or more key chains configured in the Working CMTS or Protect CMTS configuration file.

hccp *group* **authentication key-chain** *key-chain*
no hccp *group* **authentication key-chain** [*key-chain*]

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
key-chain	A text string matching a key chain in the Working CMTS or Protect CMTS configuration file. A key chain must have at least one key and can have up to 2,147,483,647 keys.

Command Default

No default behavior or values

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.2(15)BC1	Support was added for the Cisco uBR-MC5X20U/S BPE on the Cisco uBR10012 router.
12.3(17a)BC2	Support was added for the Cisco uBR-MC5X20H BPE on the Cisco uBR10012 router.
12.3(21)BC	This command is obsolete on the Cisco uBR7246VXR router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command in conjunction with the **hccp authentication** command to enable and specify the type of 1+1 redundancy authentication you will use in your protection scheme.

Note You cannot perform authentication on a specified group until you have first defined at least one authentication key chain in global configuration mode.

Examples

The following excerpt from a configuration file enables authentication using the MD5 algorithm and defines the authentication key "cisco1" for group 1:

```
!
key chain cisco1
 key 1
   key-string abcdefg
 key 2
   key-string 123456789
!
...
!
interface cable 3/0
   hccp 1 authentication md5
   hccp 1 authentication key-chain cisco1
!
```

Related Commands

Command	Description
hccp authentication	Specifies the authentication algorithm for the Working CMTS or Protect CMTS.
hccp authentication key-chain	Enables authentication on a given interface and specifies one or more keys that can be used to perform authentication for a specified group.
key-chain	Defines one or more key chains for authentication between the Working CMTS or Protect CMTS.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp bypass version

To enter bypass version mode for a specific Hot Standby Connection-to-Connection Protocol (HCCP) group, in which the hardware and software version checks are not performed before switching over to a protect interface, use the **hccp bypass version** command in privileged EXEC mode.

hccp *group* **bypass version**

Syntax Description

group	The group number for the specified interface. The valid range is 1 to 255.

Command Default

Normal HCCP operations (**hccp** *group* **check version**), where hardware and software version checks are made between the Working and Protect cable interface line cards.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(4)XF1, 12.2(4)BC1	This command was introduced for the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card with the Cisco RF Switch.
12.2(8)BC2	Support was added for the Cisco uBR10012 router using the Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards with the Cisco RF Switch.
12.2(11)BC1	Support was added for the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards with the Cisco RF Switch.
12.2(15)BC1	Support was added for the Cisco uBR-MC5X20U/S BPE on the Cisco uBR10012 router.
12.3(17a)BC2	Support was added for the Cisco uBR-MC5X20H BPE on the Cisco uBR10012 router.
12.3(21)BC	This command is obsolete on the Cisco uBR7246VXR router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, the Cisco CMTS verifies that the Working and Protect cable interfaces are using the same versions of software and hardware, so as to avoid potential incompatibilities during a switchover. The hardware check verifies that the Working and Protect cable interface line cards are compatible. The software check verifies that the two cards are running the same major versions of software. If either of these two conditions is not true, the CMTS by default does not perform the switchover.

You can override these version checks for a particular HCCP group by using the **hccp bypass version** command. After you give this command, the Cisco CMTS does not check the hardware or software versions of the two cable interfaces before performing a switchover. To return to normal HCCP operations, so that version checks are made for a group, use the **hccp check version** command.

Note Two cable interface line cards are compatible when the Protect card has at least the same number of upstreams or downstreams as the Working card. The exceptions to this are that the Cisco uBR-MC16E card can be protected only by another Cisco uBR-MC16E card. Also, the DOCSIS versions of the Cisco uBR-MC16 card can be protected only by another Cisco uBR-MC16C card. You cannot use the Cisco uBR-MC28C card to protect a Cisco uBR-MC16B/C/S card.

Examples

The following example shows how to disable the hardware and software version checks for HCCP group number 20. After giving this command, the Cisco CMTS will switchover from the Working to Protect interface in group 20 without first verifying the cards' compatibility:

```
Router# hccp 20 bypass version
Router#
```

Related Commands

Command	Description
hccp check version	Exits bypass version mode, and returns to normal HCCP operation.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp channel-switch

To configure the Cisco CMTS so that a Cisco RF Switch or Vecima (Wavecom) upconverter becomes a Hot Standby Connection-to-Connection Protocol (HCCP) member in a particular HCCP group, use the **hccp channel-switch** command in cable interface configuration mode. To remove the configuration for the Cisco RF Switch or upconverter, use the **no** form of this command.

hccp *group* **channel-switch** *member-id switch-name* **rfswitch-group** *rfswitch-ip-address module-bitmap position*
hccp *group* **channel-switch** *member-id switch-name* **rfswitch-module** *rfswitch-ip-address module-number position*
hccp *group* **channel-switch** *member-id switch-name* **tty-switch** [**aux** | **console** | **vty**] *line-number port*
hccp *group* **channel-switch** *member-id switch-name* {**wavecom-hd** | **wavecom-ma**} *prot-ip-address protect-module work-ip-address work-module*
no hccp *group* **channel-switch** *member-id switch-name*

Syntax Description

group	The group number for the specified interface. The valid range is 1 to 255.
member-id	The member number within the specified group. The valid range is 1 to 255.
switch-name	(Optional) Alpha-numeric string specifies the name of the Cisco RF Switch.
rfswitch-group	Specifies that this is the configuration for a Cisco RF Switch group.
rfswitch-module	Specifies that this is the configuration for a Cisco RF Switch module.
rfswitch-ip-address	Specifies the IP address of the Cisco RF Switch to which the CMTS is connected.
module-bitmap	Specifies the module-bitmap in hexadecimal. The valid range is 0 to FFFFFFFF. **Tip** See the TAC-authored *N+1 Tips and Configuration* document on Cisco.com for more information on the format of the bitmap, and for a worksheet that can be used to calculate the bitmap.
module-number	Specifies the module number on the Cisco RF Switch. The valid range is 1 to 255. **Note** This setting must be configured on the Cisco RF Switch as well as the Cisco CMTS.
position	Specifies the position for the Working channel on the Cisco RF Switch. The valid range is 1 to 8.
tty-switch	Specifies the configuration of a Cisco RF Switch that is controlled by its TTY line. You can further specify the type of port being used to control the switch. By default, one of the Cisco RF Switch's serial ports is used, or you can use the **aux**, **console**, or **vty** lines. **Note** Ensure that the switch's DIP switch is set to 00.
aux	(Optional) Specifies that the auxiliary port is being used to control the Cisco RF Switch.
console	(Optional) Specifies that the console port is being used to control the Cisco RF Switch.

vty	(Optional) Specifies that a Virtual Terminal connection (Telnet connection) is being used to control the Cisco RF Switch.
line-number	Specifies the line number on which the Cisco RF Switch is receiving control information for this CMTS. The valid range is 0 to 17 for the default serial port, 0 for the aux port, 0 for the console port, and 0 to 99 for the vty port.
port	Specifies the port number being used on the Cisco RF Switch. The valid range is 1 to 255.
wavecom-hd	Specifies that this is the configuration for a Vecima (Wavecom) HD4040 and QHD4040 upconverter.
wavecom-ma	Specifies that this is the configuration for a Vecima (Wavecom) DUAL4040D, MA4040D, or UC4040D upconverter.
prot-ip-address	Specifies the IP address for the upconverter used for the Protect interface used for this cable interface.
protect-module	Specifies the module number on the upconverter used for the Protect interface to be used for this cable interface. The valid range is 1 to 255.
work-ip-address	Specifies the IP address for the upconverter used for the Working interface used for this cable interface.
work-module	Specifies the module number on the upconverter used for the Working interface to be used for this cable interface. The valid range is 1 to 255.

Command Default

The CMTS is not configured to use a Cisco RF Switch by default, and no cable interfaces are configured for N+1 redundancy by default.

Command Modes

Interface configuration—cable interface only (config-if)

Command History

Release	Modification
12.2(4)XF1, 12.2(4)BC1	This command was introduced for the Cisco uBR10012 router, replacing the **hccp ds-switch** command for use with the Cisco RF Switch.
12.2(8)BC2	Support was added for the Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards on the Cisco uBR10012 router.
12.2(11)BC1	Support was added for the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.3(21)BC	This command is obsolete on the Cisco uBR7246VXR router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must configure each Working and Protect cable interface for use with the Cisco RF Switch, typically specifying one **hccp channel-switch** command to configure the Cisco RF Switch information, and another **hccp channel-switch** command to configure the upconverter.

The Protect interface is configured with the same **hccp channel-switch** commands as those that are used on the Working interface. However, typically, the same Protect interface is configured with multiple **hccp channel-switch** commands to protect multiple Working interfaces.

Examples

The following example shows the cable interface 8/1/0 being configured as member 1 for the Working interface of HCCP group 1. This interface is configured to use the Wavecom HD4040 upconverter with the IP address of 10.97.1.21. The upconverter's module number 2 (B) is used for the Protect interface, and module number 16 (P) is used for the Working interface. The interface uses the Cisco RF Switch at IP address 10.97.1.20, using a module bitmap of AA200000 in switch slot 1.

```
Router# configure terminal
Router(config)# interface cable8/1/0

Router(config-if)# hccp 1 working 1

Router(config-if)# hccp 1 channel-switch 1 uc wavecom-hd 10.97.1.21 2 10.97.1.21 16

Router(config-if)# hccp 1 channel-switch 1 rfswitch rfswitch-group 10.97.1.20 AA200000 1
```

The following example shows the corresponding configuration for the Protect interface for member 1 of HCCP group 1, which is cable interface 5/1/0 on the same chassis. The **hccp channel-switch** commands are identical to those used for cable interface 8/1/0.

```
Router# configure terminal

Router(config)# interface cable5/1/0

Router(config-if)# hccp 1 protect 1 10.97.1.8

Router(config-if)# hccp 1 channel-switch 1 uc wavecom-hd 10.97.1.21 2 10.97.1.21 16

Router(config-if)# hccp 1 channel-switch 1 rfswitch rfswitch-group 10.97.1.20 AA200000 1
```

Typically, the same Protect interface is used to protect multiple Working cable interfaces. For example, this same interface could be configured as follows to protect a Working interface that is using module number 14 (N) on the same Wavecom HD4040 upconverter, using slot 2 in the RF Switch.

```
Router# configure terminal

Router(config)# interface cable5/1/0

Router(config-if)# hccp 1 protect 2 10.97.1.8

Router(config-if)# hccp 1 channel-switch 2 uc wavecom-hd 10.97.1.21 2 10.97.1.21 14

Router(config-if)# hccp 1 channel-switch 2 rfswitch rfswitch-group 10.97.1.20 AA200000 2
```

Related Commands

Command	Description
hccp check version	Exits bypass version mode, and returns to normal HCCP operation.

Command	Description
hccp ds-switch	Specifies the downstream upconverter module for a Working CMTS or Protect CMTS (deprecated command).
hccp protect	Allows you to configure a Cisco CMTS to be a Protect CMTS for a specified Working CMTS in a 1+1 redundancy environment.
hccp working	Allows you to designate a Cisco CMTS to be a Working CMTS in a 1+1 redundancy environment.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp check version

To exit bypass version mode and return to normal Hot Standby Connection-to-Connection Protocol (HCCP) operations for a specific HCCP group, use the **hccp check version** command in privileged EXEC mode.

hccp *group* **check version**

Syntax Description

group	The group number for the specified interface. The valid range is 1 to 255.

Command Default

Normal HCCP operations (**hccp***group* **check version**), where hardware and software version checks are made between the Working and Protect cable interface line cards.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(4)XF1, 12.2(4)BC1	This command was introduced for the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card with the Cisco RF Switch.
12.2(8)BC2	Support was added for the Cisco uBR10012 router using the Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards with the Cisco RF Switch.
12.2(11)BC1	Support was added for the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards with the Cisco RF Switch.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, the Cisco CMTS verifies that the Working and Protect cable interfaces are using the same versions of software and hardware, so as to avoid potential incompatibilities during a switchover. The hardware check verifies that the Working and Protect cable interface line cards are compatible. The software check verifies that the two cards are running the same major versions of software. If either of these two conditions is not true, the CMTS by default does not perform the switchover.

You can override these version checks for a particular HCCP group by using the **hccp bypass version** command. After you give this command, the Cisco CMTS does not check the hardware or software versions of the two cable interfaces before performing a switchover. To return to normal HCCP operations, so that version checks are made for a group, use the **hccp check version** command.



Note Two cable interface line cards are compatible when the Protect card has at least the same number of upstreams or downstreams as the Working card. The exceptions to this are that the Cisco uBR-MC16E card can be protected only by another Cisco uBR-MC16E card. Also, the DOCSIS versions of the Cisco uBR-MC16 card can be protected only by another Cisco uBR-MC16C card. You cannot use the Cisco uBR-MC28C card to protect a Cisco uBR-MC16B/C/S card.

Examples

The following example shows how to cancel a previous **hccp bypass version** command for HCCP group 1 and to return to normal HCCP operations:

```
Router# hccp 1 check version

Router#
```

Related Commands

Command	Description
hccp bypass version	Enters bypass version mode for a specific HCCP group, in which the hardware and software version checks are not performed before switching over to a protect interface.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp ds-switch

To specify the downstream upconverter module for a Working CMTS or Protect CMTS, use the **hccp ds-switch** command in cable interface configuration mode. To negate a downstream upconverter assignment, use the **no** form of this command.

Note This command has been deprecated in current Cisco IOS releases and has been replaced by the **hccp channel-switch** command.

hccp *group* **ds-switch** *member make host-ipaddr host-module peer-ipaddr peer-module*
no hccp *group* **ds-switch** *member*

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
member	The member number within the specified group.
make	The maker of the specified upconverter. Currently, only the Wavecom upconverter is supported (**wavecom**).
host-ipaddr	The IP address of the upconverter module[12] to which the host CMTS is connected.
host-module	The upconverter module number to which the host CMTS is connected. This location is expressed as a simple numeric designation.
peer-ipaddr	The IP address of the upconverter module to which the peer (or remote) CMTS is connected.
peer-module	The upconverter module number to which the peer (or remote) CMTS is connected. This location is expressed as a simple numeric designation.

[12] The identification of the upconverter module is important to define when the host or peer CMTS is connected to a channel switch housing multiple modules. For example, the Wavecom MA4040D upconverter chassis offers a maximum of 10 independent frequency agile upconverters.

Command Default

Upconverter specification and activation is disabled by default and must be specified before switching can take place.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	This command was deprecated and replaced by the **hccp channel-switch** command.

Release	Modification
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

It is necessary to configure the downstream upconverter module for all Protect CMTS and Working CMTS systems. If you do not specify the downstream upconverter module for all Protect CMTS and Working CMTS systems, you cannot switch between a Protect CMTS and Working CMTS.

Examples

The following excerpt from a configuration file specifies module 2 on a Wavecom upconverter at IP address 1.1.11.3 as the host switch module connected to Working CMTS 1 and module 1 on the same Wavecom upconverter (with the same IP address location) as the peer or remote switch module connected to the Protect CMTS:

```
hccp 1 working 1
hccp ds-switch 1 wavecom 1.1.11.3 2 1.1.11.3 1
```

Related Commands

Command	Description
hccp channel-switch	(replaces the **hccp ds-switch** command).
hccp protect	Allows you to configure a Cisco CMTS to be a Protect CMTS for a specified Working CMTS in a 1+1 redundancy environment.
hccp working	Allows you to designate a Cisco CMTS to be a Working CMTS in a 1+1 redundancy environment.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp lockout

To prevent a Working CMTS from automatically switching to a Protect CMTS in the same group, use the **hccp lockout** command in privileged EXEC mode.



Note This command is applicable only to Working CMTS in a given group. Issuing this command on a Protect CMTS has no effect.

hccp *group* **lockout** *member*

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
member	The member number within the specified group.

Command Default

By default, the **hccp lockout** command is inactive.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Typically the **hccp lockout** command is used to disable HCCP switchovers before removing the HCCP configuration on the Working interface. Otherwise, when you remove the HCCP configuration from the Working interface, the Protect interface assumes the Working interface has failed and switches over.

You might also want to prevent a Working CMTS from automatically switching back to a Protect CMTS for testing or additional configuration purposes. For example, you might want to fully test protecting cable interfaces on your Cisco CMTS before returning it to protect status.

Examples

The following example shows how to activate the lockout feature of a Working CMTS in group 1:

```
Router# hccp 1 lockout
```

Related Commands

Command	Description
hccp unlockout	Negates the effects of the **hccp lockout** EXEC command, making the CMTS available for automatic switchover from a Working CMTS to a Protect CMTS.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp protect

To configure a particular cable interface to protect another cable interface in the same group, use the **hccp protect** command in cable interface configuration mode. To undo a particular host cable interface protection assignment, use the **no** form of this command.

hccp *group* **protect** *member ipaddr*
no hccp *group* **protect** *member*

Syntax Description

group	The group number of both the Working and Protect cable interfaces. Valid values are any number from 1 to 255, inclusive.
member	The member number of the specified Working cable interface. Valid values are any number from 1 to 255, inclusive.
ipaddr	An IP address for any working interface (other than protected cable interfaces) installed in the Working CMTS that can transmit and receive redundancy status messages.

Command Default

No default behavior or values

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The protect cable interface must be configured identically to the working cable interface, which typically means the interfaces must be the same card type. However, when the Cisco uBR-MC16S card is used, it can be used with either another Cisco uBR-MC16S card or a Cisco uBR-MC16C card.

The following table shows how a switchover affects the enhanced spectrum management features of the Cisco uBR-MC16S card.

Table 29: Switchover Operation for a Cisco uBR-MC16C/Cisco uBR-MC16S Configuration

Working Cable Interface	Protect Cable Interface	Operation After Switchover
Cisco uBR-MC16C	Cisco uBR-MC16S	The protect card (Cisco uBR-MC16S) uses the same upstream frequency as the working card, but after the system stabilizes, the protect card begins using the enhanced spectrum management features of the Cisco uBR-MC16S card, as configured on the protect CMTS.
Cisco uBR-MC16S	Cisco uBR-MC16C	The protect card (Cisco uBR-MC16C) uses the same upstream frequency as the working card. If the upstream becomes unstable, the Cisco uBR-MC16C performs only blind frequency hopping.
Cisco uBR-MC16S	Cisco uBR-MC16S	The protect card initially uses the same upstream frequency as the working card, but after the system stabilizes, the protect card continues using the enhanced spectrum management features of the Cisco uBR-MC16S card.

Examples

The following example configures host cable interface 4/0 to protect member 2 of group 2 at IP address 1.1.11.2:

```
Router(config)# interface cable 4/0

Router(config-if)# hccp 2 protect 2 1.1.11.2
```

Related Commands

Command	Description
cable downstream rf-power	Sets the RF power output level on a cable interface line card with an integrated upconverter (including the ability to specify an override or delta power value for a Protect interface).
hccp working	Configures a specified cable interface to be a working member of a given group.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp resync

To manually synchronize the Inter-database between the Working and Protect interfaces for a particular member in an Hot Standby Connection-to-Connection Protocol (HCCP) group, use the **hccp resync** command in privileged EXEC mode.

hccp *group* **resync** *member*

Syntax Description

group	The group number for the specified interface. The valid range is 1 to 255.
member	The member ID to be resynchronized. The valid range is 1 to 255.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(4)XF1, 12.2(4)BC1	This command was introduced for the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card with the Cisco RF Switch.
12.2(8)BC2	Support was added for the Cisco uBR10012 router using the Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards with the Cisco RF Switch.
12.2(11)BC1	Support was added for the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards with the Cisco RF Switch.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco CMTS automatically synchronizes the Working and Protect interfaces to ensure that when a switchover occurs, the Protect interface will run with a configuration that is identical to that of the Working interface. However, if you are troubleshooting HCCP problems, you can manually resynchronize the databases using the **hccp resync** command before performing any switchover tests.

Note When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter a **show** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Examples

The following example shows how to manually resynchronize the Inter-database between the Working and Protect interfaces for member 4 in HCCP group 13:

```
Router# hccp 13 resync 4

Router#
```

Related Commands

Command	Description
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp revertive

To configure a cable interface on a Protect CMTS that has assumed working capacity to automatically revert back to the Working CMTS, use the **hccp revertive** command in cable interface configuration mode. To disable the ability for the specified cable interface to automatically revert back to protect status, use the **no** form of this command.

hccp *group* **revertive**
no hccp *group* **revertive**

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.

Command Default

Enabled

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.3(21)BC	This command is obsolete on the Cisco uBR7246VXR router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Using this command in conjunction with the **hccp reverttime** command gives you the ability to set up your protecting cable interfaces to automatically switch between working and protecting capacity without your intervention. Otherwise, whenever a switchover has occurred, you must manually reactivate the failed Working CMTS and manually return the Protect CMTS to protect status using the **hccp switch** command.

Tip If you are using the **hccp revertive** command on a cable interface, do not also configure the **hccp track** command. Configuring both commands on the same interface can cause multiple switchovers on the same fault.

Using hccp track with hccp revertive

As a general rule, if you are using the **hccp track** command on a cable interface, do not also configure the **hccp revertive** command without also configuring **no keepalive** on the cable interface. Configuring both commands on the same interface, along with keepalives, can cause multiple switchovers on the same fault.

If you want to use keepalives along with both the **hccp track** and **hccp revertive** commands,use the **hccp track** command on both the Working and Protect interfaces, so that the Working interfaces on the same card track each other and the Protect interfaces on the same card track each other. The following table summarizes the guidelines for using these three commands:

Table 30: Possible hccp track and hccp revertive Configurations

hccp track (Working I/Fs)	hccp track (Protect I/Fs)	hccp revertive	keepalive Configuration
Yes	No	No	**keepalive** or **no keepalive**
Yes	No	Yes	**no keepalive**
Yes	Yes	Yes	**keepalive** or **no keepalive**

Examples

The following example shows cable interface 4/0 on a Protect CMTS in group 2 being configured to automatically revert to protect status after the Working CMTS peer has returned to active duty:

```
router(config)# interface cable 4/0
router(config-if)# hccp 2 revertive
```

Related Commands

Command	Description
hccp reverttime	Specifies the time that the Working CMTS waits before automatically switching back to a Working CMTS following system switchover.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp reverttime

To specify the amount of time a Protect interface waits before automatically reverting back to a Working interface following a system switchover, use the **hccp reverttime** command in cable interface configuration mode on the Working CMTS. To set the revert-time back to its default value, use the **no** form of this command.

hccp *group* **reverttime** *revert-time*
no hccp *group* **reverttime**

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
revert-time	The amount of time (in minutes) that a Protect interface waits before automatically switching back to a Working interface following a system switchover. The allowable range in Cisco IOS Release 12.2(15)BC2 and earlier releases is 1 to 65,535 minutes, with a default of 30 minutes. In Cisco IOS Release 12.3(3)BC and later releases, the allowable range is 1 to 35791 minutes, with a default of 30 minutes.

Command Default

30 minutes

Command Modes

Interface configuration (cable interface only, on the Working CMTS)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.3(3)BC	The allowable range for the revert time period was changed to 1 to 35791 minutes (which is approximately 2^31 milliseconds).
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the revert-time on the cable interfaces on the Working CMTS so that the Working CMTS will automatically resume normal operations and the Protect CMTS will automatically resume normal protect operations, in case an operator forgets to manually switch the Working CMTS back into operation after fixing the original problem.

The Working CMTS first counts down two minutes of suspend time before starting to count down the revert-time. Any failures that occur within this two-minute suspend time are considered part of the same failure.

This means that the actual time that the Working CMTS will attempt to switch back after a switchover is two minutes plus the revert-time. For example, if the revert-time is set to its default of 30 minutes, the Working CMTS will attempt to switch back into operation 32 minutes after the initial switchover to the Protect CMTS.

After the suspend time has occurred, a failure in the Protect CMTS will cause a switchover to the Working CMTS, regardless of whether the revert-time has expired or not. You can force such a failure in the Protect CMTS, and restore the Working CMTS to operation without waiting for the revert-time, by using the **cable power off** and **cable power on** commands to turn off and turn on the protect interface on the Protect CMTS.

When choosing a revert-time, take into account all possible sources of failures, including third-party equipment. For example, an upconverter failure can trigger a switchover to the Protect CMTS. You should configure the revert-time so that the Working CMTS does not switch back into operation until technicians have had sufficient time to fix the equipment failure.



Tip To disable the revert-time feature, use the **no** version of the **hccp revertive** command on the Protect CMTS.

Examples

The following example shows cable interface 3/0 on a Working CMTS in group 2 being configured to wait 15 minutes before automatically reverting back to working status after a system switchover:

```
router(config)# interface cable 3/0
router(config-if)# hccp 2 reverttime 15
```

The following example shows how to give the **no** form of this command, which resets the interface back to its default value of 30 minutes.

```
router(config)# interface cable 5/1/0
router(config-if)# no hccp 2 reverttime
```

Related Commands

Command	Description
hccp revertive	Configures a cable interface on a Protect CMTS to automatically revert back to a Working CMTS.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp switch

To manually switch a Protect CMTS with its Working CMTS peer (or vice versa), use the **hccp switch** command in privileged EXEC mode.

hccp *group* **switch** *member*

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
member	The member number for the specified interface. Valid values are any number from 1 to 255, inclusive.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.2(11)BC3	This command is automatically disabled for approximately 2 to 3 seconds after a PRE module switches over to allow the system to stabilize before performing another switchover.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command overrides any configuration you may have made on your Protect CMTS and Working CMTS using the **hccp revert** and **hccp reverttime** commands. In addition, you can issue the **hccp switch** command on either a Protect CMTS or a Working CMTS to force it to change places with its peer.

Examples

The following example shows the host Protect CMTS being configured to assume traffic responsibility for member 2 Working CMTS in group 2:

```
Router# hccp 2 switch 2R
```

Related Commands

Command	Description
hccp lockout	Prevents a Working CMTS from automatically switching to a Protect CMTS in the same group.
hccp unlockout	Negates the effects of the **hccp lockout** command, making the CMTS available for automatic switchover from a Working CMTS to a Protect CMTS.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp timers

To configure HELLO packet interval and hold time for a specified group on a Protect CMTS, use the **hccp timers** command in cable interface configuration mode. To erase the HELLO interval and hold time configuration and to assume the default values for each parameter, use the **no** form of this command.

Note Issuing the **no** form of this command erases any manual HELLO interval and hold time values and automatically resets them to their default values.

hccp *group* **timers** *hello-time hold-time*
no hccp *group* **timers** [*hello-time hold-time*]

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
hello-time	The HELLO packet interval (in milliseconds) between subsequent HELLO packet transmissions. The acceptable range is 1666 to 5,000 milliseconds, inclusive.
hold-time	The time (in milliseconds) that a Protect CMTS will wait before assuming control of voice traffic for a Working CMTS that has failed to acknowledge a series of HELLO packets. The acceptable range is 5,000 to 25,000 milliseconds, inclusive.

Command Default

The default HELLO interval is 2,000 milliseconds, and the default hold time is 6,000 milliseconds.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows the HELLO interval and hold time on a Protect CMTS in group 2 being configured to 1,750 and 3,000 milliseconds, respectively:

```
Router(config)# interval c4/0

Router(config-if)# hccp 2 timers 1750 3000
```

Related Commands

Command	Description
hccp protect	Configures a particular cable interface to protect another peer cable interface in the same group.
hccp working	Configures a specified cable interface to be a working member of a given group.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp track

To configure a cable interface on a Working CMTS or Protect CMTS to enable automatic switchover based on the interface state, use the **hccp track** command in cable interface configuration mode. To disable the automatic switchover based on interface state, use the **no** form of this command.

hccp *group* **track** [*interface*]
no hccp *group* **track** [*interface*]

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
interface	Specifies another cable interface (the default is the current cable interface).

Command Default

Enabled for the current interface

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables automatic switchover of one interface when a tracked interface switches over from “up” to “down.”

Typically, this command is used to allow all interfaces on one card to track one another, so that if one interface goes down and switches over to the Protect, all other interfaces can also switch over, allowing the Protect card to assume full operation for these interfaces. This allows support engineers to troubleshoot the problem on the Working interface, or to remove and replace the Working card, if necessary, without interfering with traffic.

Using hccp track with hccp revertive

As a general rule, if you are using the **hccp track** command on a cable interface, do not also configure the **hccp revertive** command without also configuring **no keepalive** on the cable interface. Configuring both commands on the same interface, along with keepalives, can cause multiple switchovers on the same fault.

If you want to use keepalives along with both the **hccp track** and **hccp revertive** commands,use the **hccp track** command on both the Working and Protect interfaces, so that the Working interfaces on the same card track each other and the Protect interfaces on the same card track each other. The following table summarizes the guidelines for using these three commands:

Table 31: Possible hccp track and hccp revertive Configurations

hccp track (Working I/Fs)	hccp track (Protect I/Fs)	hccp revertive	keepalive Configuration
Yes	No	No	**keepalive** or **no keepalive**
Yes	No	Yes	**no keepalive**
Yes	Yes	Yes	**keepalive** or **no keepalive**

Examples

The following example shows switchover behavior being enabled on a Cisco CMTS in group 2:

```
Router(config)# interface c3/0

Router(config-if)# hccp 2 track

Router(config-if)# keepalive
Router(config-if)#
```

The following example shows two Cisco uBR-LCP2-MC28C cards being used in a Cisco uBR10012 router, with each downstream being configured for a separate HCCP group. The card in slot 5/1 is being configured as the Working interfaces and the card in slot 6/1 is being configured as the Protect interfaces.

The two downstreams on each card track each other, so if one downstream fails and switches over, the other can do so as well, allowing the Protect card to assume full control of both interfaces. Similarly, when the Working interfaces come back into service, both Protect interfaces switch back at the same time.

```
Router(config)# interface cable c5/1/0

Router(config-if)# hccp 1 working 1
Router(config-if)# hccp 1 track c5/1/1

Router(config-if)# keepalive 3

Router(config-if)# exit

Router(config)# interface cable c5/1/1

Router(config-if)# hccp 2 working 1

Router(config-if)# hccp 2 track c5/1/0

Router(config-if)# keepalive 3
Router(config-if)# exit

Router(config)# interface cable c6/1/0

Router(config-if)# hccp 1 protect 1
```

```
 ip-address-of-mgmt-lan

Router(config-if)# hccp 1 track c6/1/1

Router(config-if)# keepalive 3

Router(config-if)# exit
Router(config)# interface cable c6/1/1

Router(config-if)# hccp 2 protect 1
ip-address-of-mgmt-lan

Router(config-if)# hccp 2 track c6/1/0

Router(config-if)# keepalive 3

Router(config-if)#
```

Related Commands

Command	Description
keepalive	A global configuration command that allows you to specify the keepalive message transmission interval on a Working CMTS or Protect CMTS.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp unlockout

To reverse the effects of the **hccp lockout** command—that is, to make a Working CMTS available for automatic switchover to Protect CMTS, use the **hccp unlockout** command in privileged EXEC mode.

hccp *group* **unlockout** *member*

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
member	The member number within the specified group.

Command Default

By default, the **hccp unlockout** command is active for all groups and members.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command reverses the effect of the **hccp lockout** command. Once you have reconfigured or tested your Protect CMTS, issuing this command manually reintroduces the CMTS back into your 1+1 redundancy protection scheme.

Note This command is applicable only on a Working CMTS in a given group. Issuing this command on a Protect CMTS has no effect.

Examples

The following example shows the lockout feature of a Working CMTS in group 1 being deactivated:

```
hccp 1 unlockout
```

Related Commands

Command	Description
hccp lockout	Prevents a Working CMTS from automatically switching to a Protect CMTS in the same group.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hccp working

To designate a cable interface on a CMTS in the specified group to be a Working CMTS, use the **hccp working** command in cable interface configuration mode. To remove a Working CMTS assignment, use the **no** form of this command.

hccp *group* **working** *member*
no hccp *group* **working** *member*

Syntax Description

group	The group number for the specified interface. Valid values are any number from 1 to 255, inclusive.
member	The member number for the specified interface. Valid values are any number from 1 to 255, inclusive.

Command Default

No default behavior or values

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3a)EC	This command was introduced for the Cisco uBR7200 series routers.
12.1(7)EC1	Support was added for the Cisco uBR-MC16S cable interface line card.
12.2(4)XF1, 12.2(4)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC28C card.
12.2(8)BC2	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR10012 router and Cisco uBR-LCP-MC16C, Cisco uBR-LCP-MC16E, and Cisco uBR-LCP-MC16S cards.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When N+1 HCCP redundancy is configured, the Protect interface switches over and becomes the active interface when it detects a situation similar to the following:

- The Working interface is removed from the chassis, is powered down, or is reset
- The Working interface crashes
- The Working interface no longer sends out regular keepalive messages
- The Working interface loses connectivity with the cable network

The Protect cable interface must be configured identically to the Working cable interface, which typically means the interfaces should be the same card type. However, when the Cisco uBR-MC16S is used, it can be used with either another Cisco uBR-MC16S card or a Cisco uBR-MC16C card.

The table below shows how a switchover affects the enhanced spectrum management features of the Cisco uBR-MC16S card.

Table 32: Switchover Operation for a Cisco uBR-MC16C/Cisco uBR-MC16S Configuration

Working Cable Interface	Protect Cable Interface	Operation After Switchover
Cisco uBR-MC16C	Cisco uBR-MC16S	The protect card (Cisco uBR-MC16S) uses the same upstream frequency as the working card, but after the system stabilizes, the protect card begins using the enhanced spectrum management features of the Cisco uBR-MC16S card, as configured on the protect CMTS.
Cisco uBR-MC16S	Cisco uBR-MC16C	The protect card (Cisco uBR-MC16C) uses the same upstream frequency as the working card. If the upstream becomes unstable, the Cisco uBR-MC16C performs only blind frequency hopping.
Cisco uBR-MC16S	Cisco uBR-MC16S	The protect card initially uses the same upstream frequency as the working card, but after the system stabilizes, the protect card continues using the enhanced spectrum management features of the Cisco uBR-MC16S card.

Examples

The following example shows cable interface 4/0 being designated as a Working CMTS interface as member number 2 of group 2:

```
Router(config)# interface cable 4/0

Router(config-if)# hccp 2 working 2
```

Related Commands

Command	Description
hccp protect	Configures a particular cable interface to protect another cable interface in the same group.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

hw-module bay reload

To reload the software and restart a SPA, use the **hw-module bay reload** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
hw-module bay *slot/subslot/bay* **reload**

Cisco IOS Release 12.2(33)SCB
hw-module bay *slot/bay/port* **reload**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was modified to change the addressing format for a SPA from *slot/subslot/bay* to *slot/bay/port.*
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **hw-module bay reload** command reloads the software and restarts a SPA.

Examples

The following example shows how to reload the software for the Cisco Wideband SPA in slot 1, subslot 0, and bay 1.

```
Router# hw-module bay 1/0/1 reload

Router#
```

Related Commands

Command	Description
hw-module shutdown	Shuts down a PRE1 module, line card, SIP, or SPA.

hw-module shutdown (ubr10012)

To shut down a particular Performance Routing Engine (PRE1) module, line card, Wideband SIP or Wideband SPA, use the **hw-module shutdown (ubr10012)** command in global configuration mode. To activate a specific PRE1, line card, Wideband SIP or Wideband SPA, use the **no** form of this command.

hw-module {**main-cpu** | **pre** {**A** | **B**} | **sec-cpu** | **slot** *slot-number* | **subslot** *slot/subslot* | **bay** *slot/subslot/bay*} **shutdown** [**unpowered**]
nohw-module {**main-cpu** | **pre** {**A** | **B**} | **sec-cpu** | **slot** *slot-number* | **subslot** *slot/subslot* | **bay** *slot/subslot/bay*} **shutdown** [**unpowered**]

Syntax Description

main-cpu	Shuts down the PRE1 module that is currently acting as the active PRE1 module.
pre {**A**|**B**}	Shuts down the PRE1 module that is physically in either PRE slot A (left slot) or PRE slot B (right slot).
sec-cpu	Shuts down the PRE1 module that is currently acting as the standby PRE1 module.
slot *slot-number*	Shuts down the line cards that are physically present in the specified *slot-number* (valid range is 1 to 8).
subslot *slot/subslot*	Shuts down the line card or SIP that is physically present in the slot with the specified slot and subslot numbers. The following are the valid values: • *slot* = 1 to 8 • *subslot* = 0 or 1
bay *slot/subslot/bay*	Shuts down the SPA in the location specified by the *slot/subslot/bay* argument. The following are the valid values: • *slot* = 1 to 3 • *subslot* = 0 or 1 (0 is always specified) • *bay* = 0 (upper bay) or 1 (lower bay)
unpowered	Used with the Wideband SPA, shuts down the SPA and its interfaces, and leaves them in an administratively down state without power.

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
12.2(4)XF	This command was introduced for the Cisco uBR10012 router.
12.3(21)BC	Support was added for the Cisco Wideband SIP and Cisco 1-Gbps Wideband SPA.

Usage Guidelines

The **hw-module shutdown (ubr10012)** command shuts down in a controlled manner a particular Performance Routing Engine (PRE1) module, line card, Wideband SIP or Wideband SPA. To activate a specific PRE1, line card, Wideband SIP, or Wideband SPA, use the **no** form of this command.

Caution Shutting down the active PRE1 module will trigger a switchover, so that the standby PRE1 module becomes the active PRE1 module.

Examples

The following example shows the standby PRE1 module being shut down:

```
Router(config)# hw-module sec-cpu shutdown
Router(config)#
```

The following example shows the active PRE1 module being shut down (which will trigger a switchover to the standby PRE1 module):

```
Router(config)# hw-module main-cpu shutdown
Router(config)#
```

The following example shows the PRE1 module in PRE1 slot B being shut down:

```
Router(config)# hw-module pre B shutdown
Router(config)#
```

Note The **hw-module pre B shutdown** command shuts down the PRE1 module that is physically present in slot B, regardless of whether the module is the active or standby PRE1 module.

The following example shows how to deactivate and verify deactivation for the Cisco Wideband SPA located in slot 1, subslot 0, bay 0. In the output of the **show hw-module bay oir** command, notice the “admin down” in the Operational Status field.

```
Router# configure terminal
Router(config)# hw-module bay 1/0/0 shutdown unpowered
%SPAWBCMTS-4-SFP_MISSING: Wideband-Cable 1/0/0, 1000BASE-SX SFP missing from port 0
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:1, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:2, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:3, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:4, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:5, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:6, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:7, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:8, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:9, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:10, changed state to down
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:11, changed state to down
...
Router# show hw-module bay 1/0/0 oir
Module         Model              Operational Status
-------------- ------------------ ------------------------
bay 1/0/0      SPA-24XDS-SFP      admin down
```

The following example shows how to activate and verify activation for the Cisco Wideband SPA located in slot 1, subslot 0, bay 0. In the output of the **show hw-module bay oir** command, notice the "ok" in the Operational Status field.

```
Router# configure terminal
Router(config)# no hw-module bay 1/0/0 shutdown
%SPAWBCMTS-4-SFP_OK: Wideband-Cable 1/0/0, 1000BASE-SX SFP inserted in port 0
%SPAWBCMTS-4-SFP_LINK_OK: Wideband-Cable 1/0/0, port 0 link changed state to up
%SNMP-5-LINK_UP: LinkUp:Interface Wideband-Cable1/0/0:0 changed state to up
%LINK-3-UPDOWN: Interface Cable1/0/0:0, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:1, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:2, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:3, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:4, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:5, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:6, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:7, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:8, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:9, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:10, changed state to up
%LINK-3-UPDOWN: Interface Wideband-Cable1/0/0:11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Wideband-Cable1/0/0:0, changed state to up
...
Router# show hw-module bay 1/0/0 oir
Module         Model              Operational Status
-------------- ------------------ -------------------------
bay 1/0/0      SPA-24XDS-SFP      ok
```

Related Commands

Command	Description
hw-module reset	Resets a PRE1 module or line card.
hw-module reload	Reloads the software in and restarts a Cisco 1-Gbps Wideband SPA.
redundancy force-failover main-cpu	Forces a manual switchover between the active and standby PRE1 modules.

hw-module slot

To control a component in a slot, use the **hw-module slot** command in Privileged EXEC mode.

hw-module slot *slot-inumber* { {**logging onboard** { **disable** | **enable** } } | { **reload** [**force**] } | {**start** } | {**stop** [**force**] } }

Syntax Description

slot-number	The line cards that are physically present in the specified slot. Valid range is 0 to 9, F0 to F1 and R0 to R1.
logging	Specifies the logging commands.
onboard	Specifies the onboard commands.
disable	Disables the onboard logging commands.
enable	Enables the onboard logging commands.
reload	Restarts the line card.
force	Proceeds without prompting for a confirmation.
start	Activates the line card in the slot.
stop	Deactivates the line card in the slot.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.16.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **hw-module slot** command to power-on, shutdown and power-cycle the line card.

Examples

The following example shows the status of line card in slot 4:

```
Router# show logging onboard slot 4 status
Status: Disabled
```

The following example shows how to enable onboard logging commands on line card in slot 2:

```
Router# hw-module slot 4 logging onboard enable
```

The following example shows how to reload a line card in slot 1:

Warning All modems will go offline and all the services will be impacted.

```
Router# hw-module slot 4 reload
```

The following example shows how to start a line card in slot 2:

```
Router# hw-module slot 4 start
```

The following example shows how to stop a line card in slot 3:

Warning All modems will go offline and all the services will be impacted.

```
Router# hw-module slot 4 stop
```

Related Commands

Command	Description
show platform	Displays platform information.

hw-module slot pos

To configure a line card slot for Packet over SONET (POS) operation, use the **hw-module slot pos** command in privileged EXEC mode. To remove the configuration for a line card slot, use the **no** form of this command.

hw-module slot *slot-number* **pos**
no hw-module slot *slot-number* **pos**

Syntax Description

slot-number	Resets the line cards that are physically present in the specified *slot-number* (valid range is 1 to 8).

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(11)BC3	This command was introduced for the Cisco uBR10012 OC-48 Dynamic Packet Transport (DPT) Interface Module for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must first use the **hw-module slot pos** command to preconfigure a line card slot for POS operation of the Cisco uBR10012 OC-48 DPT card before you can configure the card with any further commands. You must also use the **card 1oc48dpt/pos-1** command to configure the card slot for the proper card type.



Note If you have previously used the **hw-module slot srp** command to configure line card slots for Spatial Reuse Protocol (SRP) operation, you must first cancel that configuration using the **no hw-module slot srp** command before you can configure the slots for POS operation using the **hw-module slot pos** command.

Examples

The following example shows the Cisco uBR10012 OC-48 DPT line card in slot 3 being configured for POS operation:

```
Router# hw-module slot 3 pos

Router# card 3/0 1oc48dpt/pos-1
```

The following example shows the Cisco uBR10012 OC-48 DPT line cards in slots 3 and 4 being reconfigured from SRP operation to POS operation:

```
Router# no hw-module slot 3 srp

Router# no hw-module slot 4 srp

Router# hw-module slot 3 pos
```

```
Router# card 3/0 1oc48dpt/pos-1
Router# hw-module slot 4 pos
Router# card 4/0 1oc48dpt/pos-1
```

Related Commands

Command	Description
hw-module reset	Resets a PRE1 module or line card.
hw-module shutdown (ubr10012)	Shuts down a PRE1 module or line card.
hw-module slot srp	Configures a line card slot for SRP operation.

hw-module slot srp

To configure a line card slot for Spatial Reuse Protocol (SRP) operation, use the **hw-module slot srp** command in privileged EXEC mode. To remove the configuration for a line card slot, use the **no** form of this command.

hw-module slot *slot-number* **srp**
no hw-module slot *slot-number* **srp**

Syntax Description

slot-number	Resets the line cards that are physically present in the specified *slot-number* (valid range is 1 to 8).

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(11)BC3	This command was introduced for the Cisco uBR10012 OC-48 Dynamic Packet Transport (DPT) Interface Module for the Cisco uBR10012 router.
12.2(33)SCB	This command is obsolete.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must first use the **hw-module slot srp** command to preconfigure a line card slot for SRP operation of a pair of Cisco uBR10012 OC-48 DPT cards before you can configure the cards with any further commands. You must also use the **card 1oc48dpt/pos-1** command to configure each card slot for the proper card type.

Tip The Cisco uBR10012 OC-48 DPT line cards support SRP operation only when installed in adjacent odd- and even-numbered slots (such as slots 1 and 2 or 3 and 4). You need to use the **hw-module slot srp** command only for the lower-numbered (odd-numbered) slot to preconfigure both slots of the SRP pair.

Note If you have previously used the **hw-module slot pos** command to configure line card slots for Packet over SONET (POS) operation, you must first cancel that configuration using the **no hw-module slot pos** command before you can configure the slots for POS operation using the **hw-module slot srp** command.

Examples

The following example shows the Cisco uBR10012 OC-48 DPT line cards in slots 1 and 2 being configured for POS operation:

```
Router# hw-module slot 1 srp

Router# card 1/0 1oc48dpt/pos-1
```

```
Router# card 2/0 1oc48dpt/pos-1
```

The following example shows the Cisco uBR10012 OC-48 DPT line cards in slots 3 and 4 being reconfigured from POS operation to SRP operation:

```
Router# no hw-module slot 3 pos

Router# no hw-module slot 4 pos
Router# hw-module slot 3 srp
Router# card 3/0 1oc48dpt/pos-1

Router# card 4/0 1oc48dpt/pos-1
```

Related Commands

Command	Description
hw-module reset	Resets a PRE1 module or line card.
hw-module shutdown (ubr10012)	Shuts down a PRE1 module or line card.
hw-module slot pos	Configures a line card slot for POS operation.

hw-module subslot

To control a component in subslot, use the **hw-module subslot** command in Privileged EXEC mode.

hw-module subslot *card slot/subslot number* { {**reload** [**force**] } | {**start** } | {**stop** [**force**] } }

Syntax Description

reload	Restarts the targeted subslot.
force	Proceeds without prompting for a confirmation.
start	Activates the targeted subslot.
stop	Deactivates the targeted subslot.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.16.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **hw-module subslot** command to enable, stop and restart the RF-PICs after upgrading the RF-PIC firmware. This command does not support SUP-PIC command.

Examples

The following example shows how to force reload a line card present in subslot 1:

Warning All modems will go offline and all the services will be impacted.

```
Router# hw-module subslot 0/1 reload force
```

The following example shows how to start a line card in subslot 2:

```
Router# hw-module subslot 0/2 start
```

The following example shows how to force stop a line card in subslot 3:

Warning All modems will go offline and all the services will be impacted.

```
Router# hw-module subslot 0/3 stop force
```

Related Commands

Command	Description
show platform	Displays platform information.



Cable Commands: i through p

- identifier, on page 1209
- init-tech-list, on page 1210
- init-tech-ovr, on page 1211
- interface cable, on page 1213
- interface cable-modem, on page 1215
- interface integrated-cable, on page 1217
- interface modular-cable, on page 1219
- interface port-channel, on page 1221
- interface virtualportgroup, on page 1223
- interface wideband-cable, on page 1224
- interleaver-depth (QAM profile), on page 1227
- interleaver-depth (OFDM channel profile), on page 1229
- interval, on page 1230
- ip (virtual-arpd), on page 1231
- ip (virtual-om), on page 1232
- ip address, on page 1233
- ip address docsis, on page 1234
- ip-address (controller), on page 1236
- ip dhcp ping packet 0, on page 1238
- ip dhcp pool, on page 1241
- ipdr associate, on page 1244
- ipdr authorization , on page 1246
- ipdr collector, on page 1247
- ipdr exporter ack-timeout, on page 1249
- ipdr exporter connection active, on page 1250
- ipdr exporter keepalive, on page 1251
- ipdr exporter max-unacked, on page 1252
- ipdr exporter start, on page 1253
- ipdr session, on page 1254
- ipdr session (global configuration), on page 1255
- ipdr template, on page 1257
- ipdr type, on page 1260
- ipv6 address, on page ?

- issu linecard abortversion, on page 1263
- issu linecard acceptversion, on page 1265
- issu linecard changeversion, on page 1266
- issu linecard loadversion, on page 1268
- issu linecard prepareversion, on page 1269
- issu linecard process stop, on page 1271
- issu linecard reloadversion, on page 1273
- issu linecard runversion, on page 1275
- jitter, on page 1276
- join-group, on page 1277
- keepalive, on page 1278
- lacp fast-switchover, on page 1279
- lacp max-bundle, on page 1280
- lacp min-bundle, on page 1281
- lacp port-priority, on page 1282
- lacp system-priority, on page 1284
- lane start-freq, on page 1285
- lc-control-plane-timeout, on page 1286
- lc-us-scheduler-timeout, on page 1287
- lcha-preferred, on page 1288
- license feature evaluation disable, on page 1289
- license feature evaluation enable, on page 1291
- linecard, on page 1293
- linecard-group (redundancy), on page 1295
- listening-port, on page 1296
- logging cmts ipc-cable, on page 1297
- logging cmts sea, on page 1299
- logical-edge-device, on page 1301
- load-interval, on page 1302
- low-latency, on page 1303
- mac-addr-filter, on page 1304
- mac-address, on page 1305
- mgmt-intf virtualportgroup, on page 1307
- main-cpu, on page 1308
- maintenance-mode, on page 1310
- match, on page 1312
- match rule, on page 1313
- max-carrier, on page 1315
- max-comp-time, on page 1316
- max-ofdm-spectrum, on page 1318
- max-streams, on page 1319
- member slot , on page 1321
- method, on page 1323
- mgmt-ip, on page 1325
- mgmt-ip (DVB), on page 1327
- microcode (uBR10012), on page 1328

- microcode reload (uBR10012), on page 1330
- min-cp-duration, on page 1332
- mode, on page 1334
- modular-host subslot, on page 1336
- modulation, on page 1338
- monitoring-basics, on page 1339
- monitoring-duration, on page 1341
- mute, on page 1344
- multicast-label, on page 1345
- multicast-pool, on page 1346
- multicast-uplink, on page 1347
- name, on page 1348
- nc, on page 1349
- network, on page 1350
- network-delay, on page 1352
- nls, on page 1353
- nls ag-id auth-key, on page 1354
- nls resp-timeout, on page 1355
- ofdm-freq-excl-band, on page 1356
- ofdm channel-profile, on page 1357
- onid, on page 1358
- oui, on page 1359
- output-rate, on page 1360
- override, on page 1362
- overrule, on page 1363
- overwrite-scg, on page 1365
- packetcable, on page 1366
- packetcable authorize vanilla-docsis-mta, on page 1368
- packetcable element-id, on page 1370
- packetcable gate maxcount, on page 1372
- packetcable gate send-subscriberID, on page 1374
- **packetcable multimedia**, on page 1375
- packetcable timer, on page 1376
- pcr-based-source-switch, on page 1378
- peak-time1, on page 1379
- penalty-period, on page 1383
- periodic-rel-pxf enable, on page 1387
- ping docsis, on page 1388
- ping docsis pnm, on page 1393
- platform power protection, on page 1394
- platform punt-policer, on page 1396
- platform punt-sbrl, on page 1398
- platform aom pending-thresh, on page 1401
- pilot-scaling, on page 1402
- pme cem, on page 1403
- pme mgmt-ip, on page 1405

- pme vodsid, on page 1406
- policy, on page 1407
- power-adjust, on page 1408
- power-tilt, on page 1409
- prefix, on page 1410
- principal, on page 1412
- privacy, on page 1413
- profile, on page 1415
- profile-control, on page 1416
- profile-data, on page 1418
- profile-description, on page 1420
- profile-ncp, on page 1421
- protect-tunnel, on page 1422
- protocol, on page 1423
- provider-name, on page 1424
- psi-interval, on page 1425
- show ptp clock running, on page 1426
- pxf-fail-switchover-trap enable, on page 1427

identifier

To configure the MAC address of the RPD, use the **identifier** command in RPD configuration mode. To void the MAC address configuration, use the **no** form of this command.

identifier *mac_address*

no identifier

Syntax Description

mac_address	Specifies the MAC address of the RPD.

Command Default

None

Command Modes

RPD configuration (config-rpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the MAC address of the RPD.

The following example shows how to configure the MAC address of the RPD:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# identifier 0004.9f03.0214
```

Related Commands

Command	Description
cable rpd	Enters the RPD configuration mode.

init-tech-list

To set the DCC initialization techniques that the CMTS can use to load balancing cable modems, use the **init-tech-list** command in the config-lb-group configuration mode. To reset the DCC initialization techniques, use the **no** form of this command.

init-tech-list *grouplist* [**ucc**]
no init-tech-list

Syntax Description

grouplist	DCC initialization technique list.
ucc	(Optional) Determines whether Upstream Channel Change (UCC) can be used for modems during dynamic upstream load balancing.

Command Default

No default behavior or values.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set the DCC initialization techniques on a DOCSIS load balancing group on the CMTS, using the **init-tech-list** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# init-tech-list 1 ucc
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

init-tech-ovr

To set DCC initialization techniques that override the physical upstream channel pair, use the **init-tech-ovr** command in the config-lb-group configuration mode.

Cisco uBR10012 Router
init-tech-ovr cable*slot/subslot/port upstream* **cable** *slot/subslot/port upstream***init-tech-listinit-tech-list***0 -4* **[ucc]**

Cisco uBR7225VXR and Cisco uBR7246VXR Routers
init-tech-ovr cable*slot/subslot/port upstream* **cable** *slot/subslot/port upstream***init-tech-listinit-tech-list***0 -4* **[ucc]**

Syntax Description

cable *slot/subslot/port upstream*	Specifies the CMTS interface slot, subslot, port number, and upstream parameters that are to be overridden. • *slot*—Slot where the line card resides. The permitted range is from 5 to 8. • *subslot*—Subslot where the line card resides. The available slots are 0 or 1. • *port*—The downstream controller number on the line card. The permitted *port* range is from 0 to 4.
cable *slot/subslot/port upstream*	Specifies the CMTS interface slot, subslot, port number, and upstream channel ID parameters that will override the CMTS interface and upstream channel.

cable *slot/port upstream*	Specifies the CMTS interface slot, port number, and upstream parameters that are to be overridden.
	• *slot*—Slot where the line card resides.
	  • Cisco uBR7225VXR router—The valid range is from 1 to 2.
	  • Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• *port*—Downstream controller number on the line card. The permitted *port* values are 0 or 1.

cable *slot/port upstream*	Specifies the CMTS interface slot, port number, and upstream parameters that will override the CMTS interface and upstream channel.
init-tech-list *0-4*	Specifies the DCC initialization technique list ranging from 0 to 4 for the upstream channel pair.
ucc	Determines whether Upstream Channel Change (UCC) can be used for modems during dynamic upstream load balancing.

Command Default

None

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **init-tech-list** command accepts an upstream that is not added into the load balancing group. The upstream channel pair is invalid until the upstream is added. When the load balancing group is removed, all upstream channel pairs are also removed.

Examples

The following example shows how to set DCC initialization techniques that override the physical upstream channel pair to a DOCSIS load balancing group on the CMTS, using the **init-tech-ovr** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group
1
Router(config-lb-group)# init-tech-ovr cable
1/0 1 cable
1/1 2 1
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

interface cable

To configure a cable interface, use the **interface cable** command in global configuration mode.

interface cable {*slot/port slot/subslot/port*}

Cisco IOS Release 12.2(33)SCE and later
interface cable {*slot/cable-interface-index slot/subslot/cable-interface-index*}

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR Series Converged Broadband Routers— The valid range is from 0 to 3 and from 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. For Cisco cBR Series Converged Broadband Routers, the valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR Series Converged Broadband Routers— The valid range is from 0 to 15.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
12.3(23)BC	This command was integrated into Cisco IOS Release 12.3(23)BC.

Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.
12.2(33)SCD	This command was modified to support Cisco uBR7225VXR and Cisco uBR7246VXR routers.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure a cable interface in slot 5, and port 0 on a Cisco uBR7246VXR or Cisco uBR7225VXR router:

```
Router# configure terminal
Router(config)# interface cable 5/0
```

The following example shows how to configure a cable interface in slot 8, subslot 0, and port 0 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 8/0/0
```

The following example shows how to configure a Cisco uBR-MC3GX60V cable interface line card in slot 5, subslot 0, and cable interface index 13 (MAC domain index) on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable 5/0/13
```

The following example shows how to configure a Cisco uBR-MC3GX60V cable interface line card in slot 1, subslot 0, and cable interface index 13 (MAC domain index) on a Cisco cBR Series Converged Broadband Routers:

```
Router# configure terminal
Router(config)# interface cable 1/0/13
```

Related Commands

Command	Description
interface integrated-cable	Specifies a integrated cable interface.
interface modular-cable	Specifies a modular cable interface.
interface wideband-cable	Specifies a wideband cable interface.

interface cable-modem

To enter interface configuration mode for the cable interface on a router, use the **interface cable-modem** command in global configuration mode.

Cisco uBR904, uBR905, uBR924, uBR925 cable access routers, Cisco CVA122 Cable Voice Adapter
interface cable-modem *number*

Syntax Description

number	Identifies the cable interface (always **0**).

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
11.3(4)NA	This command was introduced for the Cisco uBR904 cable access router.
12.0(4)XI1	Support was added for the Cisco uBR924 cable access router.
12.1(3)XL	Support was added for the Cisco uBR905 cable access router.
12.1(5)XU1	Support was added for the Cisco CVA122 Cable Voice Adapter.
12.2(2)XA	Support was added for the Cisco uBR925 cable access router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When this command is used, the router switches from global configuration mode to interface configuration mode.

Examples

The following example shows how to enter interface configuration mode for the router's cable interface and then to enter the available interface configuration commands:

```
Router(
config)#
interface cable-modem
0
Router(config-if)# cable-modem ?
  compliant    Enter compliant modes for interface
  downstream   Downstream channel characteristics
  fast-search  Enable/disable the DS fast search
  upstream     upstream channel characteristics
  voip         Options for Voice over IP traffic over the cable interface
Router(config-if)#
```

Related Commands

Command	Description
cable-modem compliant bridge	Enables DOCSIS-compliant bridging on the cable interface.

Command	Description
cable-modem downstream saved channel	Modifies the saved downstream channel setting and upstream power value on the cable interface.
cable-modem upstream preamble qpsk	Enables the QPSK modulation scheme in the upstream direction from the cable interface to the CMTS.
cable-modem voip best-effort	Allows voice traffic to be transmitted on the upstream using a best-effort QoS.

interface integrated-cable

To configure integrated cable interface on a cable interface line card, use the **interface integrated-cable** command in global configuration mode.

Cisco uBR10012 Universal Broadband Router
interface integrated-cable *slot/subslot/port:rf-channel*

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Router
interface integrated-cable *slot/subslot/port:rf-channel*

Cisco cBR Series Converged Broadband Routers
interface integrated-cable *slot/subslot/port:rf-channel*

Syntax Description

slot	Identifies the chassis slot where the cable interface line card resides. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco cBR Series Converged Broadband Routers— The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. For Cisco cBR Series Converged Broadband Routers, the valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4. • Cisco cBR Series Converged Broadband Routers— The valid range is from 0 to 7.
rf-channel	RF channel number. The valid range is from 0 to 162.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0SP	This command was modified on the Cisco cBR Series Converged Broadband Routers. The *rf-channel* range is 0 to 162 now.

Usage Guidelines

The **interface integrated-cable** command is used to configure the following line cards:

- Configuring the Cisco uBR-MC20X20V Cable Interface Line Card
- Configuring the Cisco uBR-MC88V Cable Interface Line Card

The **interface integrated-cable** command is supported on Cisco cBR Converged Broadband Routers and also on Cisco uBR-MC88V and Cisco UBR-MC20X20V line cards.

Examples

The following example shows how to configure a integrated cable interface in slot 7, subslot 0, and port 0 on a Cisco UBR-MC20X20V cable interface line card:

```
Router# configure terminal
Router(config)# interface integrated-cable 7/0/0:1
```

Related Commands

Command	Description
show interface integrated-cable	Displays the current configuration and status for an integrated channel.

interface modular-cable

To configure a modular cable interface, use the **interface modular-cable** command in global configuration mode.

Cisco IOS Releases 2.3(21)BC, 12.3(23)BC, and 12.2(33)SCA
interface modular-cable*slot/subslot/bay:nb-channel-number*

Cisco IOS Release 12.2(33)SCB
interface modular-cable*slot/subslot/bay:nb-channel-number*

Cisco IOS Release 12.2(33)SCE
interface modular-cable*slot/subslot/bay:nb-channel-number*

Syntax Description

slot	Identifies the chassis slot where the Cisco Cable line card, or Cisco Wideband Shared Port Adaptor (SPA) is located.
	• For the Cisco Cable line cards, the valid range is from 5 to 8.
	• For the Cisco Wideband SPA, the valid values are:
	  • *slot*—1 or 3 (for SIP-600)
	  • *slot*—1 (for Wideband SIP)
	Note
	In Cisco IOS Release 12.2(33)SCE, support for configuring modular-cable interface on the Cisco uBR-MC3GX60V cable line card is introduced.

subslot	Identifies the subslot where the Cisco Cable line card is located. • For the Cisco Cable line cards, the valid value is 0 or 1. **Note** In Cisco IOS Release 12.2(33)SCE, support for configuring modular-cable interface on the Cisco uBR-MC3GX60V cable line card is introduced.
bay	Identifies the bay where the Cisco Wideband SPA is located. The valid range is from 0 to 3.
port	Identifies the port on the Cisco Cable line card, or the Cisco Wideband SPA in the specified *slot*/*subslot* or *slot*/*bay*. • For the Cisco UBR-MC20X20V cable interface line card, the valid range for is from 0 to 5. • For the Cisco uBR-MC3GX60V cable interface line card, the valid range is from 0 to 2. • For the Cisco Wideband SPA, the valid value is 0.
nb-channel-number	Identifies the narrowband channel number.
interface-number	Identifies the modular-cable interface number. The valid range is from 0 to 23.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
12.3(23)BC	This command was integrated into Cisco IOS Release 12.3(23)BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was modified to change the addressing format for the modular cable interface from *slot/subslot/bay:nb-channel-number* to *slot/bay/port:nb-channel-number*.
12.2(33)SCE	Support for configuring modular-cable interface on the Cisco uBR-MC3GX60V cable line card was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure a modular cable interface in slot 1, bay 3, and channel 23 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface modular-cable 1/3/0:23
```

The following example shows how to configure a modular cable interface in slot 5, subslot 1, and port 2 on a Cisco uBR-MC3GX60V cable line card.

```
Router# configure terminal
Router(config)# interface modular-cable 5/1/2:0
```

Related Commands

Command	Description
cable attribute-mask	Specifies an attribute mask value for a modular cable interface.
interface wideband-cable	Specifies a wideband cable interface.
interface cable	Specifies a cable interface.

interface port-channel

To create an EtherChannel interface on the Cisco Cable Modem Termination System (CMTS), use the **interface port-channel** command in global configuration mode. To remove this EtherChannel port from the Cisco CMTS, use the **no** form of this command.

interface port-channel *n*
no interface port-channel *n*

Syntax Description

number	Identifying port channel number for this interface (EtherChannel port). The range is 1 to 64.

Command Default

By default, EtherChannel groups and ports are not defined, and they are disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(11)BC3	This command was introduced on the Cisco uBR7246VXR router.
12.2(9a)BC	This command was introduced on the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The first EtherChannel interface configured becomes the bundle primary for all EtherChannel interfaces in the group. That is, the MAC address of the first EtherChannel interface is the MAC address for all EtherChannel interfaces in the group. If the first EtherChannel interface is later removed, the second EtherChannel interface to be configured becomes the bundled primary by default.

Repeat this configuration on every EtherChannel port to be bundled into:

- FastEtherChannel (FEC) or GigabitEtherChannel (GEC) group on the Cisco uBR10012 and Cisco uBR7200 series routers.
- Ten Gigabit EtherChannel (Ten GEC) group on the Cisco cBR series routers.

This configuration must be present on all EtherChannel interfaces before the EtherChannel group can be configured.

Examples

The following example configures the port to have an EtherChannel port number of 1 within its EtherChannel group. The EtherChannel group is defined with the **channel-group** command.

```
Router(config-if)# interface port-channel 1
```

Related Commands

Command	Description
channel-group	Assigns an EtherChannel port to an EtherChannel group.

Command	Description
show interface port-channel	Displays the EtherChannel interfaces and channel identifiers, with their mode and operational status.

interface virtualportgroup

To configure a VirtualPortGroup interface, use the **interface** command in the global configuration mode. To delete the VirtualPortGroup created, use the **no** form of the command.

interface virtualportgroup *number*
no interface virtualportgroup *number*

Syntax Description

number	Specifies the Virtual Port Group number. Valid range is 0 to 31.

Command Default

None.

Command Modes

Global configuration mode (config)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to configure a VirtualPortGroup interface. If a VirtualPortGroup interface is configured, you will need to assign a primary IP address to it. You can also configure a secondary IP address on the VirutalPortGroup interface, similar to a gigabit Ethernet interface IP address configuration. You can assign only one secondary IP address.

The following example shows how to configure a VirtualPortGroup interface:

```
Router#configure terminal
Router(config)#interface VirtualPortGroup0
Router(config-if)#ip address 1.23.2.1 255.255.255.0
Router(config-if)#ip address 1.23.2.2 255.255.255.0 secondary
Router(config-if)#end
```

Related Commands

Command	Description
mgmt-intf	Define a cable video management interface.
show run interface VirtualPortGroup	Displays the VirtualPortGroup interface configuration.
show run | include mgmt-intf	Displays the cable video management interface configuration.
show interfaces VirtualPortGroup	Displays the VirtualPortGroup interface state.

interface wideband-cable

To configure a wideband cable interface, use the **interface wideband-cable** command in global configuration mode.

Cisco uBR10012 Universal Broadband Router

Cisco IOS Releases 12.3(21)BC, 12.3(23)BC, and 12.2(33)SCA
interface wideband-cable *slot*/*subslot*/*bay*:*wideband-channel*

Cisco IOS Releases 12.3(21)BC, 12.3(23)BC, and 12.2(33)SCB
interface wideband-cable *slot*/*bay*/*port*:*wideband-channel*

Cisco IOS Releases 12.3(21)BC, 12.3(23)BC, and 12.2(33)SCC
interface wideband-cable *slot* / {*subslotbay*} /*port*:*wideband-channel*

Cisco IOS Releases 12.3(21)BC, 12.3(23)BC, and 12.2(33)SCE
interface wideband-cable *slot* /*subslot*/*controller*:*wideband-channel*

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers

Cisco IOS Releases 12.3(21)BC, 12.3(23)BC, and 12.2(33)SCD
interface wideband-cable *slot* / /*port*:*wideband-channel*

Cisco cBR Series Converged Broadband Routers
interface wideband-cable *slot* /*subslot*/*controller*:*wideband-channel*

Syntax Description

slot	The slot where a SIP or cable line card resides.
	• Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• Cisco uBR7225VXR router—The valid range is from 1 to 2.
	• Cisco uBR10012 router—The valid range for:
	  • Cable line card is from 5 to 8
	  • SIP is 1 and 3
	• Cisco cBR Series Converged Broadband Routers— The valid range is from 0 to 3 and 6 to 9.

subslot	The subslot where a SIP or cable line card resides.
	• Cisco uBR10012 router—The valid value for:
	  • Cable line card in slot 5 to 8 is 0 or 1
	  • SPAs in a SIP in slot 1 or 3, prior to Cisco IOS Release 12.2(33)SCB is 0 or 1. For Cisco IOS Release 12.2(33)SCB and later, subslot is not specified.
	• For Cisco cBR Series Converged Broadband Routers, the valid subslot is 0.

bay	The bay in a SIP where a SPA is located. The valid range is from 0 to 3.

controller	Controller index for the modular cable. The valid range is from 0 to 2. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 7.

port	Specifies the port number.
	• Cisco uBR7246VXR router and Cisco uBR7225VXR router—The valid range is from 0 to 1.
	• Cisco uBR10012 router—The valid value for:
	  • Slot 1 and 3 is 0
	  • Slot 5 to 8 is from 0 to 4

wideband-channel	Represents the wideband channel number.
	• Cisco uBR10012 router—The valid range for:
	  • Cisco UBR-MC20X20V cable interface line card is from 0 to 5.
	  • Cisco uBR-MC3GX60V cable interface line card and SPAs is from 0 to 31.
	• Cisco uBR7246VXR and Cisco uBR7225VXR routers—The valid range is from 0 to 5.
	• Cisco cBR Series Convereged Broadband Routers—The valid range is from 0 to 162.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
12.3(23)BC	This command was integrated into Cisco IOS Release 12.3(23)BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was modified to change the addressing format for the wideband cable interface from *slot/subslot/bay:wideband-channel* to *slot/bay/port:wideband-channel*.
12.2(33)SCD	This command was modified. Support was added for Cisco uBR7225VXR and Cisco uBR7246VXR routers.
12.2(33)SCE	Support was added for Cisco uBR-MC3GX60V cable interface line card on the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.
IOS-XE 3.18.0SP	This command was modified on Cisco cBR Series Converged Broadband Routers. The *wideband-channel* range is 0 to 162 now.

Examples

The following example shows how to configure a wideband cable interface in slot 1, bay 3, and port 0 on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface wideband-cable 1/3/0:0
```

The following example shows how to configure a wideband cable interface in slot 5, subslot 1, and port 2 on a Cisco uBR-MC3GX60V cable line card.

```
Router# configure terminal
Router(config)# interface wideband-cable 5/1/2:0
```

The following example shows how to configure a wideband cable interface in slot 1, and port 0 on a Cisco uBR7225VXR or Cisco uBR7246VXR router:

```
Router# configure terminal
Router(config)# interface wideband-cable 1/0:0
```

Related Commands

Command	Description
cable downstream attribute-mask	Specifies an attribute mask value for a wideband cable interface.
cable rf-channels	Associates RF channels on the router with a wideband interface and allocate bandwidth.
cable bundle	Specifies bundle number for bundling of cable interfaces.
interface modular-cable	Specifies a modular cable interface.
interface cable	Specifies a cable interface.

interleaver-depth (QAM profile)

To set the interleaver-depth for a specific QAM profile, use the **interleaver-depth** command in QAM profile configuration mode.

interleaver-depth {**I12-J17** | **I128-J1** | **I128-J2** | **I128-J3** | **I128-J4** | **I128-J5** | **I128-J6** | **I128-J7** | **I128-J8** | **I16-J8** | **I32-J4** | **I64-J2** | **I8-J16**}

Syntax Description

I12-J17	INTERLEAVER-I-12-J-17 for Annex A or C
I128-J1	INTERLEAVER-I-128-J-1 for Annex B
I128-J2	INTERLEAVER-I-128-J-2 for Annex B
I128-J3	INTERLEAVER-I-128-J-3 for Annex B
I128-J4	INTERLEAVER-I-128-J-4 for Annex B
I128-J5	INTERLEAVER-I-128-J-5 for Annex B
I128-J6	INTERLEAVER-I-128-J-6 for Annex B
I128-J7	INTERLEAVER-I-128-J-7 for Annex B
I128-J8	INTERLEAVER-I-128-J-8 for Annex B
I16-J8	INTERLEAVER-I-16-J-8 for Annex B
I32-J4	INTERLEAVER-I-32-J-4 for Annex B
I64-J2	INTERLEAVER-I-64-J-2 for Annex B
I8-J16	INTERLEAVER-I-8-J-16 for Annex B

Command Default

None

Command Modes

QAM profile configuration (config-qam-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the interleaver-depth for a specific QAM profile.

Examples

The following example shows how to set the interleaver-depth for a specific QAM profile:

```
Router# configure terminal
```

```
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)# interleaver-depth I12-J17
```

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.
annex	Set the MPEG framing format.
modulation	Set the QAM modulation format.
spectrum-inversion	Set the spectrum-inversion on or off.
symbol-rate	Set the symbol rate.

interleaver-depth (OFDM channel profile)

To specify the channel interleaver-depth, use the **interleaver-depth** command in OFDM channel profile configuration mode. To undo the interleaver-depth assignment, use **no** form of this command.

interleaver-depth *value*

no interleaver-depth

Syntax Description

value	1 to 16 for 25 KHz spacing, 1 to 32 for 50 KHz spacing.

Command Default

16

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the channel interleaver-depth.

Examples

The following example shows how to specify the channel interleaver-depth:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# interleaver-depth 3
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-control	Specify default modulation or profile as the channel control profile.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

interval

To set the duration of time the CMTS waits before checking the load on an interface, use the **interval** command in the load balancing group configuration mode. To reset the duration of time, use the **no** form of this command.

interval *seconds*
no interval

Syntax Description

seconds	The polling interval for the CMTS to determine the current load on each cable interface. The valid range is from 1 to 1000. The default value is 10 seconds in Cisco IOS Release 12.2(33)SCE and earlier. The default value is 30 seconds in Cisco IOS Release 12.2(33)SCE1 and later.

Command Default

None

Command Modes

Load balancing group configuration (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCE1	This command was modified. The default value for this **command** was changed from 10 seconds to 30 seconds.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set the duration of time that the CMTS waits before checking the load on the interface, using the **interval** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# interval
50
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real time configuration, statistical, and operational information for load balancing operations on the router.

ip (virtual-arpd)

To configure the virtual advanced return path demodulator (ARPD) source IP address, use the **ip** command in OOB virtual ARPD configuration mode. To void the virtual ARPD source IP configuration, use the **no** form of this command.

ip *ip subnet_mask* **[vrf]**

no ip *ip*

Syntax Description

ip	Specifies the virtual ARPD source IP address.
subnet_mask	Specifies the virtual ARPD source subnet mask.

Command Default

None

Command Modes

OOB Virtual ARPD configuration (config-oob-varpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the virtual ARPD source IP address.

Examples

The following example shows how to configure the virtual ARPD source IP address:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)# virtual-arpd 1
Router(config-oob-varpd)# ip 225.225.225.225 255.255.255.0
```

Related Commands

Command	Description
virtual-arpd	Defines a virtual ARPD configuration.
nc	Configures the network controller for virtual ARPD.
source-id	Configures the source ID for virtual ARPD.

ip (virtual-om)

To configure the virtual OOB modulator (OM) source IP address, use the **ip** command in OOB virtual OM configuration mode. To void the virtual OM source IP configuration, use the **no** form of this command.

ip *ip subnet_mask* **[vrf]**

no ip *ip*

Syntax Description

ip	Specifies the virtual OM source IP address.
subnet_mask	Specifies the virtual OM source subnet mask.

Command Default

None

Command Modes

OOB Virtual OM configuration (config-oob-vom)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the virtual OM source IP address.

Examples

The following example shows how to configure the virtual OM source IP address:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)# virtual-om 1
Router(config-oob-vom)# ip 225.225.225.225 255.255.255.0
```

Related Commands

Command	Description
virtual-om	Defines a virtual OM configuration.
join-group	Joins multicast group address.

ip address

To specify the IP address range for multicast pool, use the **ip address** command in multicast pool configuration mode. To void the IP address configuration, use the **no** form of this command.

ip address *ip mask*

no ip address

Syntax Description

ip mask	Specifies the IP address and subnet musk for the DEPI multicast pool.

Command Default

None

Command Modes

Multicast pool configuration (config-multicast-pool)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the IP address range for multicast pool.

The following example shows how to specify the IP address range for multicast pool:

```
Router# configure terminal
Router(config)# cable depi multicast pool 1
Router(config-multicast-pool)# ip address 225.225.225.0 255.255.255.0
```

Related Commands

Command	Description
cable depi multicast pool	Configures the DEPI multicast pool.

ip address docsis

To specify that the cable access router should use the DHCP protocol, as required by the DOCSIS specification, to assign an IP address for its cable interface, use the **ip address docsis** command in cable interface configuration mode. To disable the use of DHCP, use the **no** form of this command.

Cisco uBR905, uBR924, uBR925 cable access routers, Cisco CVA122 Cable Voice Adapter
ip address docsis
no ip address docsis

Syntax Description

There are no key words or arguments for this command.

Command Default

The cable access router uses the DHCP protocol, as required by the DOCSIS specification, to assign an IP address to its cable interface during system power-on.

Command Modes

Interface configuration (cable interface only)

Command History

Release	Modification
12.1(3)XL	This command was introduced for the Cisco uBR905 cable access router.
12.1(4)T	Support was added for the Cisco uBR924 cable access router.
12.1(3)XL	Support was added for the Cisco uBR905 cable access router.
12.1(5)XU1	Support was added for the Cisco CVA122 Cable Voice Adapter.
12.2(2)XA	Support was added for the Cisco uBR925 cable access router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **ip address docsis** command configures the cable access router so that it obtains its IP address from a DHCP server at system power-on, which is a requirement for DOCSIS operation. This is the default mode of operation. If the configuration for the cable interface does not include any form of **ip address** command, the cable access router defaults to configuring the cable interface with the **ip address docsis** command.

Configuring the cable interface with any other form of the **ip address** command or with the **no ip address docsis** command prevents the cable access router from operating in DOCSIS networks. This mode of operation should be used only in lab or test networks.

Note Earlier Cisco IOS software releases for the cable access routers used either the **ip address negotiated** or the **ip address dhcp** command to specify that the cable interface should obtain its IP address from a DHCP server. These commands should no longer be used to configure the router's cable interface.

Examples

The following example shows how to configure the cable access router so that it obtains the IP address for its cable interface from a DHCP server:

```
Router(config)# interface cable-modem 0
Router(config-if)# ip address docsis
Router(config-if)# exit
Router(config)#
```

Related Commands

Command	Description
cable-modem dhcp-proxy	Specifies that a DHCP server should provide the IP address for the router's Ethernet interface or for a NAT address pool.
ip http dhcp	Specifies the use of the DHCP protocol to obtain an IP address for any interface except the cable interface at system power-on.
ip http negotiated	Specifies that a serial interface should use the PPP/IPCP to obtain an IP address at system power-on

ip-address (controller)

To set the IP address of the Wideband SPA FPGA, use the **ip-address (controller)** command in controller configuration mode. To remove the IP address of the Wideband SPA FPGA, use the **no** form of this command.

ip-address *ip-address*
no ip-address *ip-address*

Syntax Description

ip-address	IP address for the Wideband SPA FPGA.

Command Default

No IP address is set for the Wideband SPA FPGA.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the IP address for the Wideband SPA FPGA. This address is used as the source IP address for packets that the Wideband SPA transmits to the EQAM device.

Examples

The following example shows how to set the IP address of the Wideband SPA FPGA. The SPA is located in slot 1, subslot 0, bay 0.

```
Router(config)# controller modular-cable 1/0/0

Router(config-controller)# ip-address 192.168.200.6
```

Related Commands

Command	Description
annex modulation	Sets the annex and modulation for the Wideband SPA.
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
modular-host subslot	Specifies the modular-host line card.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.

Command	Description
rf-channel network delay	Specifies the CIN delay for each RF channel.
rf-channel description	Specifies the description for each RF channel.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.

ip dhcp ping packet 0

To instruct the DHCP server to assign an IP address from its pool without first sending an ICMP ping to test whether a client is already currently using that IP address, use the **ip dhcp ping packet 0** command in global configuration mode. Use the no form of this command to remove this configuration.

ip dhcp ping packet 0

no ip dhcp ping packet 0

Syntax Description

This command has no additional keywords or arguments.

Command Default

By default, the DHCP server pings a pool address twice before assigning a particular address to a requesting client. If the ping is unanswered, the DHCP server assumes that the address is not in use and assigns the address to the requesting client.

Command Modes

Global configuration

Command History

Release	Modification
12.1 EC	Command support introduced on the Cisco CMTS.

Usage Guidelines

Disabling the ping option can speed up address assignment when a large number of modems are trying to connect at the same time. However, disabling the ping option can also result in duplicate IP addresses being assigned if users assign unauthorized static IP addresses to their CPE devices.

For additional information about DHCP configuration on the Cisco CMTS, refer to the following documents on Cisco.com:

- *Filtering Cable DHCP Lease Queries on the Cisco CMTS*
- *DHCP and Time-of-Day Services on the Cisco CMTS*

Examples

The following example of the show version command illustrates configuration of this feature on the Cisco CMTS:

```
version 12.1
no service pad
! provides nice timestamps on all log messages
service timestamps debug datetime msec localtime
service timestamps log uptime
! turn service password-encryption on to encrypt passwords
no service password-encryption
! provides additional space for longer configuration file
service compress-config
! supports a large number of modems / hosts attaching quickly
service udp-small-servers max-servers no-limit
!
hostname Router
!
boot system disk0:
!
```

```
no cable qos permission create
no cable qos permission update
cable qos permission modems
! permits cable modems to obtain Time of Day (TOD) from uBR7100
cable time-server
!
! High performance DOCSIS config file, additional options may be added
!   10 Mbit/sec download, 128 Kbit/sec upload speed, 10 Kbit/sec guaranteed upstream
! NOTE: cable upstream 0 admission-control 150 will prevent modems from
!   connecting after 150% of guaranteed-bandwidth has been allocated to
!   registered modems. This can be used for peek load balancing.
! max-burst 1600 prevents a modem with concatenation turned on from consuming
!   too much wire time, and interfering with VoIP traffic.
! cpe max 8 limits the modem to 8 hosts connected before the CMTS refuses
!   additional host MAC addresses.
! Timestamp option makes the config file only valid for a short period of time.
!
cable config-file platinum.cm
  service-class 1 max-upstream 128
  service-class 1 guaranteed-upstream 10
  service-class 1 max-downstream 10000
  service-class 1 max-burst 1600
  cpe max 8
  timestamp
!
! Medium performance DOCSIS config file, additional options may be added
!   5 Mbit/sec download, 128 Kbit/sec upload speed
!
cable config-file gold.cm
  service-class 1 max-upstream 64
  service-class 1 max-downstream 5000
  service-class 1 max-burst 1600
  cpe max 3
  timestamp
!
! Low performance DOCSIS config file, additional options may be added
!   1 Mbit/sec download, 64 Kbit/sec upload speed
!
cable config-file silver.cm
  service-class 1 max-upstream 64
  service-class 1 max-downstream 1000
  service-class 1 max-burst 1600
  cpe max 1
  timestamp
!
! No Access DOCSIS config file, used to correctly shut down an unused cable modem
!   1 kbit/sec download, 1 Kbit/sec upload speed, with USB/ethernet port shut down.
!
cable config-file disable.cm
  access-denied
  service-class 1 max-upstream 1
  service-class 1 max-downstream 1
  service-class 1 max-burst 1600
  cpe max 1
  timestamp
!
ip subnet-zero
! Turn on cef switching / routing, anything but process switching (no ip route-cache)
ip cef
ip cef accounting per-prefix
! Disables the finger server
no ip finger
! Prevents CMTS from looking up domain names / attempting to connect to
!   machines when mistyping commands
```

```
no ip domain-lookup
! Prevents issuance of IP address that is already in use.
ip dhcp ping packets 0
```

Related Commands

Command	Description
cable dhcp-giaddr policy	Sets the DHCP *giaddr* field of DHCP request packets to the primary address for cable modems and the secondary address for CPE devices, allowing the use of separate address pools for the different clients.
cable dhcp-parse option	Enables the parsing of certain DHCP options.
cable helper-address	Enables load-balancing of DHCP requests from cable modems and CPE devices by specifying different DHCP servers according to the cable interface or subinterface.
ip dhcp ping packet 0	Instructs the DHCP server to assign an IP address from its pool without first sending an ICMP ping to test whether a client is already currently using that IP address.
ip dhcp relay information option	Configures the DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages.
ip dhcp smart-relay	Enables the DHCP relay agent on the CMTS to automatically switch a cable modem or CPE device to a secondary DHCP server or address pool if the primary DHCP server does not respond to three successive requests.

ip dhcp pool

To create a DHCP address pool and enter DHCP pool configuration file mode, use the **ip dhcp pool** command in global configuration mode. To remove a configured DHCP pool, use the **no** form of this command.

Syntax Description

Provide a name for the DHCP address pool

name	The *name* can be either an arbitrary string, such as service, or a number, such as **1**.

Command Default

DHCP pool names are not configured by default.

Command Modes

Global configuration

Command History

Release	Modification
12.1 EC	Command support introduced on the Cisco CMTS.

Usage Guidelines

Disabling the ping option can speed up address assignment when a large number of modems are trying to connect at the same time. However, disabling the ping option can also result in duplicate IP addresses being assigned if users assign unauthorized static IP addresses to their CPE devices.

For additional information about DHCP configuration on the Cisco CMTS, refer to the following documents on Cisco.com:

- https://www.cisco.com/c/en/us/td/docs/cable/cmts/config_guide/b_cbr_docsis_full_book_xe16_12/b_cbr_docsis_full_book_xe16_12_chapter_0111001.pdf Filtering Cable DHCP Lease Queries on the Cisco CMTS.
- http://www.cisco.com/en/US/docs/ios/cable/configuration/guide/cmts_services.html *DHCP and Time-of-Day Services on the Cisco CMTS*

Examples

The following example configures a DHCP pool with the name indicated, and enables additional configuration in the DHCP pool configuration mode:

```
Router# configure terminal
Router(config)# ip dhcp pool local
Router(dhcp-config)#
```

The following examples illustrate additional configurations that are typical for a DHCP pool configured when starting with the **ip dhcp pool** command, or with additional DHCP configuration commands.

```
ip dhcp pool cm-platinum
   network 10.128.4.0 255.255.255.0
   bootfile platinum.cm
   next-server 10.128.4.1
   default-router 10.128.4.1
   option 2 hex ffff.8f80
   option 4 ip 10.1.4.1
   option 7 ip 10.1.4.1
   lease 7 0 10
!
```

```
ip dhcp pool cm-gold
   network 10.129.4.0 255.255.255.0
   bootfile gold.cm
   next-server 10.129.4.1
   default-router 10.129.4.1
   option 2 hex ffff.8f80
   option 4 ip 10.1.4.1
   option 7 ip 10.1.4.1
   lease 7 0 10
!
ip dhcp pool cm-silver
   network 10.130.4.0 255.255.255.0
   bootfile silver.cm
   next-server 10.130.4.1
   default-router 10.130.4.1
   option 2 hex ffff.8f80
   option 4 ip 10.1.4.1
   option 7 ip 10.1.4.1
   lease 7 0 10
!
ip dhcp pool DisabledModem(0010.aaaa.0001)
    host 10.128.1.9 255.255.255.0
    client-identifier  0100.10aa.aa00.01
    bootfile disable.cm
!
ip dhcp pool DisabledModem(0020.bbbb.0002)
    host 10.128.1.10 255.255.255.0
    client-identifier  0100.20bb.bb00.02
    bootfile disable.cm
!
ip dhcp pool DisabledModem(1010.9581.7f66)
   host 10.128.1.11 255.255.255.0
   client-identifier 0100.1095.817f.66
   bootfile disable.cm
!
ip dhcp pool hosts
    network 10.254.1.0 255.255.255.0
    default-router 10.254.1.1
    dns-server 10.254.1.1 10.128.1.1
    domain-name ExamplesDomainName.com
    lease 7 0 10
!
```

Related Commands

Command	Description
cable dhcp-giaddr policy	Sets the DHCP *giaddr* field of DHCP request packets to the primary address for cable modems and the secondary address for CPE devices, allowing the use of separate address pools for the different clients.
cable dhcp-parse option	Enables the parsing of certain DHCP options.
cable helper-address	Enables load-balancing of DHCP requests from cable modems and CPE devices by specifying different DHCP servers according to the cable interface or subinterface.
ip dhcp ping packet 0	Instructs the DHCP server to assign an IP address from its pool without first sending an ICMP ping to test whether a client is already currently using that IP address.

Command	Description
ip dhcp relay information option	Configures the DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages.
ip dhcp smart-relay	Enables the DHCP relay agent on the CMTS to automatically switch a cable modem or CPE device to a secondary DHCP server or address pool if the primary DHCP server does not respond to three successive requests.

ipdr associate

To associate the Collector with a session, use the **ipdr associate** command in global configuration mode. To remove the association, use the **no** form of this command.

ipdr associate *session_id collector_name priority*
no ipdr associate *session_id collector_name*

Syntax Description

session_id	The unique IPDR session ID.
collector_name	The collector name. The name should not contain extra spaces.
priority	The priority value between the session and the collector. The value range is 1 to 10. A value of 1 indicates that the highest priority.

Command Default

An association with the session will not be created.

Command Modes

Global configuration mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to associate the Collector with a session. Once the Collector is configured, the Exporter sends data to the Collector. IPDR supports redundant collector and consistent streaming continues when a collector is down or not functioning.

The no form of the command will only remove the association for the stopped session.

Note The collector and the session should be configured before running this command.

Examples

The following example configures a Collector.

```
Router# configure terminal
Router(config)#ipdr associate 1 federal 1
```

Related Commands

Command	Description
ipdr collector	Configures the IPDR Collector details.
show ipdr collector	Displays the collector information, message statistics and event for all the sessions that are associated with the collector.

Command	Description
ipdr session	Adds a session to the IPDR Exporter.

ipdr authorization

To enable the Internet Protocol Detail Record (IPDR) authorization, use **ipdr authorization** command in global configuration mode. To remove the configuration, use the **no** form of this command.

ipdr authorization
no ipdr authorization

Syntax Description

This command has no arguments or keywords.

Command Default

This IPDR authorization will be disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCI2	This command was introduced.

Usage Guidelines

The IPDR authorization is disabled by default. Use the **ipdr authorization** command to enable IPDR authorization. You can include it in the start-up configuration file as well. Whether IPDR authorization is enabled or not, any Collector coming from the bundle side will always be rejected.

Examples

The following example shows how to enable IPDR authorization:

```
Router#configure terminal
Router(config)#ipdr authorization
IPDR authorization is enabled.
Router(config)#
```

Related Commands

Command	Description
ipdr collector	Configures the Internet Protocol Detail Record (IPDR) Collector details.

ipdr collector

To configure the Internet Protocol Detail Record (IPDR) Collector details, use the **ipdr collector** command in global configuration mode. To remove the Collector, use the **no** form of this command.

ipdr collector *collector_name ip_addr* [*port*]
no ipdr collector *collector_name*

Cisco IOS Release 12.2(33)SCI2
ipdr collector *collector_name ip_addr* [*port*][**nat-address** *ip_addr* [*port*]]
no ipdr collector *collector_name*

Syntax Description

collector_name	The collector name. The name should not contain extra spaces.
ip_addr	The collector IP address.
port	(Optional) The collector port value. The default port number will be considered if the value is not entered.
nat-address *ip_addr*	(Optional) The collector's Network Address Translation (NAT) in IP header.

Command Default

A Collector will not be configured.

Command Modes

Global configuration mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCI2	This command was integrated into Cisco IOS Release 12.2(33)SCI2. The **nat-address** keyword was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to configure an IPDR Collector and authenticate the IPDR protocol. Once the Collector is configured, the Exporter sends data to the Collector. User must provide the collector name and the IP address. Port number is used when an exporter creates an active connection.

The no form of the command will remove a specific IPDR Collector. If the collector is associated with an active session, you should stop the session before using the no command.

Examples

The following example configures a Collector.

```
Router# configure terminal
Router(config)#ipdr collector federal 192.0.2.0
```

Related Commands

Command	Description
show ipdr collector	Displays the collector information, message statistics and event for all the sessions that are associated with the collector.
ipdr session	Adds a session to the IPDR Exporter.

ipdr exporter ack-timeout

To set IPDR Exporter acknowledged records timeout value, use the **ipdr exporter ack-timeout** command in global configuration mode. To disable the acknowledged records timeout value, use the **no** form of this command.

ipdr exporter ack-timeout *time_interval*
no ipdr exporter ack-timeout

Syntax Description

time_interval	Acknowledged records timeout count. The valid range is from 5 to 60 seconds. The default value is 60.

Command Default

This command is enabled when the IPDR Exporter is running.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(33)SCG	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows you to set acknowledged records timeout value for a session.

Note Restart the IPDR Exporter for the timer values to take effect.

Examples

The following example shows how to configure the acknowledged records timeout value on the Cisco CMTS router:

```
Router# configure terminal
Router(config
)# ipdr exporter ack-timeout 60
Router(config)# ipdr exporter start
```

Related Commands

Command	Description
show ipdr exporter	Displays information about the IPDR Exporter state on the Cisco CMTS router.

ipdr exporter connection active

To enable the IPDR exporter to start connection, use the **ipdr exporter connection-active** command in global configuration mode. To enable collectors to start connection, use the **no** form of this command. It does not support to change connection type when the exporter is started. Stop exporter then change to another type.

ipdr exporter connection-active [source-interface *interface***]**
no ipdr exporter connection-active

Syntax Description

source-interface	Specifies the interface on which the connection is established.

Command Default

By default, the IPDR exporter process will not be started.

Command Modes

Global configuration mode

Command History

Release	Modification
IOS XE Gibraltar 16.12.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the IPDR exporter to start connection.

The **no** form of the command will change the IPDR Exporter connection mode to default.

Examples

The following example allows the IPDR Exporter to start connection on the TenGigabitEthernet port 4/1/0 of the CMTS.

```
Router# configure terminal
Router(config)#ipdr exporter connection-active source-interface TenGigabitEthernet4/1/0
```

Related Commands

Command	Description
show ipdr exporter	Displays information about the IPDR Exporter state.
show ipdr collector	Displays the collector information, message statistics and event for all the sessions that are associated with the collector.
ipdr collector	Configures the Internet Protocol Detail Record (IPDR) Collector details.

ipdr exporter keepalive

To set the keepalive timer value on the IPDR exporter, use the **ipdr exporter keepalive** command in global configuration mode. To disable the keepalive timer value, use the **no** form of this command.

ipdr exporter keeepalive *time_interval*
no ipdr exporter keepalive

Syntax Description

time_interval	Keepalive timer count. The valid range is from 5 to 300 seconds. The default value is 300.

Command Default

This command is enabled when the IPDR Exporter is running.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(33)SCG	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows you to set the keeplive timeout value for a session.

Note Restart the IPDR Exporter for the keepalive timer values to take effect.

Examples

The following example shows how to configure the keepalive value on the Cisco CMTS router:

```
Router# configure terminal
Router(config
)# ipdr exporter keepalive 300
Router(config)# ipdr exporter start
```

Related Commands

Command	Description
show ipdr exporter	Displays information about the IPDR Exporter state on the Cisco CMTS.

ipdr exporter max-unacked

To set the maximum number of unacknowledged records on the IPDR exporter, on the Cisco CMTS, use the **ipdr exporter max unacked** command in global configuration mode. To reset the maximum number of unacknowledged records, use the **no** form of this command.

ipdr exporter max-unacked *records*
no ipdr exporter max-unacked

Syntax Description

records	Number of unacknowledged records. The valid range is from 5 to 200 records. The default value is 200.

Command Default

This command is enabled when IPDR Exporter is running.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(33)SCG	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows you to set the maximum number of unacknowledged records for a session.

Note Restart the IPDR Exporter for the number of records to take effect.

Examples

The following example shows how to configure the number of unacknowledged records configured on the Cisco CMTS router:

```
Router# configure terminal
Router(config
)# ipdr exporter max-unacked 200
Router(config)# ipdr exporter start
```

Related Commands

Command	Description
show ipdr exporter	Displays information about the IPDR Exporter state on the Cisco CMTS router.

ipdr exporter start

To enable the CMTS application, to start the Internet Protocol Detail Record (IPDR) Exporter process to connect the exporter and the collector, use the **ipdr exporter start** command in global configuration mode. To terminate the connection between the exporter and collector, use the **no** form of this command.

ipdr exporter start [ipv6]
no ipdr exporter start

Syntax Description

ipv6	Configure IPDR in IPv6 mode.

Command Default

By default, the IPDR exporter process will not be started.

Command Modes

Global configuration mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS XE Gibraltar 16.12.1	This command was updated to include **ipv6** keyword.

Usage Guidelines

This command allows the user to explicitly start the IPDR Exporter and connect to the collector. As a default behavior, the command will initiate all the sessions configured in the Exporter to a "Start" state.

The **no** form of the command will stop the IPDR Exporter process. The command will also clear the connection with the collector while retaining other configurations.

Examples

The following example starts the IPDR Exporter process on the CMTS.

```
Router# configure terminal
Router(config)#ipdr exporter start
```

Related Commands

Command	Description
show ipdr exporter	Displays information about the IPDR Exporter state.
show ipdr collector	Displays the collector information, message statistics and event for all the sessions that are associated with the collector.
ipdr collector	Configures the Internet Protocol Detail Record (IPDR) Collector details.

ipdr session

To start or stop a specific session, use the **ipdr session** command in the privileged EXEC mode.

ipdr session *session_id* {**start** | **stop**}

Syntax Description

session_id	The unique IPDR session ID.
start	The keyword to start the session.
stop	The keyword to stop the session.

Command Default

No sessions are started.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to start or stop a specific session. This command can be executed only when the IPDR exporter is started.

Note The user has to stop the session before configuring any tasks if the session is active.

Examples

The following example enables the user to start a session.

```
Router# configure terminal
Router(config)#ipdr session 1 start
```

Related Commands

Command	Description
ipdr exporter start	Starts the IPDR Exporter and connects to the collector.
show ipdr exporter	Displays information about the IPDR Exporter state.
ipdr associate	Associates the Collector with a session.

ipdr session (global configuration)

To enable the CMTS application to add a session to the Internet Protocol Detail Record (IPDR) exporter, use the **ipdr session** command in global configuration mode. To remove the session, use the **no** form of this command.

ipdr session *session_id session_name session_descr*
no ipdr session *session_id*

Syntax Description

session_id	The unique IPDR session ID.
session_name	The session name. The name should not contain extra spaces.
session_descr	The description of the session.

Command Default

No sessions are added to the IPDR exporter. It depends on the status of the IPDR exporter. After configuring one session;if the status of exporter is started, then the session is started automatically.

Command Modes

Global configuration mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to add a session to the IPDR exporter. User should provide session ID, session name and session description for every session.

The **no** form of the command will remove a specific session. Once a session is removed, the template and other information associated with the session is also lost.

Note You can not update template details or other details when a session already created.

Examples

The following example adds a session to the Exporter.

```
Router# configure terminal
Router(config)#ipdr session  1 test no_descr
```

Related Commands

Command	Description
ipdr exporter start	Starts the IPDR exporter and connects to the collector.
show ipdr exporter	Displays information about the IPDR exporter state.

Command	Description
ipdr associate	Associates the IPDR collector with a session.

ipdr template

To add an Internet Protocol Detail Record (IPDR) template to the IPDR session on the Cisco CMTS, use the **ipdr template** command in global configuration mode. To remove the template, use the **no** form of this command.

ipdr template *session_id template_name*
no ipdr template *session_id template_name*

Syntax Description

session_id	Unique IPDR Session ID.
template_name	Template name.

Command Default

The IPDR template is not added to the IPDR session.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCG	A new template SERVICE-FLOW is added to the event-based and ad-hoc session types.
12.2(33)SCH5	A new template is defined for CM-STATUS and the old template is renamed as CM-STATUS-2008.
12.2(33)SCI1	This command is integrated from Cisco IOS Release 12.2(33)SCH5.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to add an IPDR template to the desired session (based on session ID) on the Cisco CMTS.



Note You can only add the system-supported templates. The list can be viewed by entering "?" at the command prompt.

Examples

The following example displays the **show running-config** command output of the configured IPDR sessions and types:

```
Router(config)# do show running-config | i ipdr
ipdr session 1 test test
ipdr session 2 event2 event2
ipdr session 3 ad-hoc3 ad-hoc3
ipdr type 1 time-interval 15
ipdr type 2 event
```

```
ipdr type 3 event
```

The following example shows the templates available in a timer-interval session.

```
Router# ipdr template 1 ?
  CM-STATUS       DOCSIS-CMTS-CM-REG-STATUS-TYPE template
  CM-US           DOCSIS-CMTS-CM-US-STATS-TYPE template
  DIAGLOG-DETAIL  DOCSIS-DIAG-LOG-DETAIL-TYPE template
  SAMIS-TYPE1     DOCSIS-SAMIS-TYPE-1 template
  SAMIS-TYPE2     DOCSIS-SAMIS-TYPE-2 template
  SPECTRUM        DOCSIS-SPECTRUM-MEASUREMENT-TYPE template
  TEST            Template for test
```

The following example shows how to add the SAMIS_TYPE1 template in a timer-interval session.

```
Router(config)# ipdr template 1 SAMIS-TYPE1
```

The following example shows how to view the templates available in an event-based session.

```
Router(config)# ipdr template 2 ?
  CM-STATUS       DOCSIS-CMTS-CM-REG-STATUS-TYPE template
  CPE-TYPE        DOCSIS-CPE-TYPE template
  DIAGLOG-DETAIL  DOCSIS-DIAG-LOG-DETAIL-TYPE template
  DIAGLOG-EVENT   DOCSIS-DIAG-LOG-EVENT-TYPE template
  DS-UTIL         DOCSIS-CMTS-DS-UTIL-STATS-TYPE template
  SAMIS           OSSI2.0 SAMIS template
  SERVICE-FLOW    SERVICE-FLOW-TYPE template
  TEST            Template for test
  TOPOLOGY        DOCSIS-CMTS-TOPOLOGY-TYPE template
  US-UTIL         DOCSIS-CMTS-US-UTIL-STATS-TYPE template
```

The following example shows how to view the templates available in an ad-hoc session.

```
Router(config)# ipdr template 3 ?
  CM-STATUS       DOCSIS-CMTS-CM-REG-STATUS-TYPE template
  CPE-TYPE        DOCSIS-CPE-TYPE template
  DIAGLOG-DETAIL  DOCSIS-DIAG-LOG-DETAIL-TYPE template
  DIAGLOG-EVENT   DOCSIS-DIAG-LOG-EVENT-TYPE template
  DS-UTIL         DOCSIS-CMTS-DS-UTIL-STATS-TYPE template
  SAMIS           OSSI2.0 SAMIS template
  SERVICE-FLOW    SERVICE-FLOW-TYPE template
  TEST            Template for test
  TOPOLOGY        DOCSIS-CMTS-TOPOLOGY-TYPE template
  US-UTIL         DOCSIS-CMTS-US-UTIL-STATS-TYPE template
```

The following example shows the templates available in a timer-interval session for Cisco IOS Release 12.2(33)SCH5:

```
Router(config)# ipdr template 1 ?

  CM-STATUS       DOCSIS-CMTS-CM-REG-STATUS-TYPE template
  CM-STATUS-2008  DOCSIS-CMTS-CM-REG-STATUS-TYPE-2008 template
  CPE-TYPE        DOCSIS-CPE-TYPE template
  DIAGLOG-DETAIL  DOCSIS-DIAG-LOG-DETAIL-TYPE template
  DIAGLOG-EVENT   DOCSIS-DIAG-LOG-EVENT-TYPE template
  DS-UTIL         DOCSIS-CMTS-DS-UTIL-STATS-TYPE template
  SAMIS           OSSI2.0 SAMIS template
```

```
SERVICE-FLOW    SERVICE-FLOW-TYPE template
TEST            Template for test
TOPOLOGY        DOCSIS-CMTS-TOPOLOGY-TYPE template
US-UTIL         DOCSIS-CMTS-US-UTIL-STATS-TYPE template
```

Related Commands

Command	Description
ipdr exporter start	Starts the IPDR Exporter on the Cisco CMTS and connects to the collector.
show ipdr exporter	Displays information about the IPDR Exporter state on the Cisco CMTS.
ipdr session	Adds a session to the IPDR Exporter on the Cisco CMTS.

ipdr type

To configure the IPDR session type, use the **ipdr type** command in global configuration mode. The IPDR session types that can be defined using this command are event type, time-interval type, and the ad hoc type.

Use the **no** form of the command to reset the session type to the default "event" type.

ipdr type *session_id* [**ad-hoc** | **event** | **time-interval** *value*]
no ipdr type *session_id*

Syntax Description

session id	IPDR session ID. Range is from 1 to 255.
ad-hoc	The ad hoc session type.
event	The event session type.
time-interval *value*	The time-interval session type. Interval range is from 15 to 1440 minutes.

Command Default

The IPDR session type is not defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCD2	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to define the specific IPDR session type.

Note Once the IPDR session type is configured, the templates supported by this IPDR type are automatically associated with it.

Examples

The following example shows how to configure the IPDR “time-interval” session type for a time interval of 15 minutes.

```
Router> enable
Router# configure terminal
Router(config)# ipdr type 1 time-interval 15
```

Related Commands

Command	Description
cable ipdr cm-us-status interval	Displays a cable modem’s upstream channel status information.

Command	Description
cable ipdr docs-spectrum interval	Sets the interval between different spectrum measurements' data for a CMTS.
cable ipdr diaglog interval	Sets the time interval between different diagnostic logs' data for a CMTS.
cable ipdr cm-status interval	Displays the CMTS and cable modem registration status information.

Related Commands

To configure IPv6 segment routing (SRv6), use the **ipv6 address** command in the global configuration mode.

ipv6 address {*ipv6_address_prefixprefix_length*} **segment-routing**
no ipv6 address {*ipv6_address_prefixprefix_length*} **segment-routing**

ipv6_address_prefix	IPv6 prefix associated with a particular SAV group, specified in the X:X:X:X::/X format.
prefix_length	Length of the IPv6 prefix. The valid range is from 0 to 128

Command Default

None.

Command Modes

Global configuration mode (config)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to configure IPv6 Segment Routing. You can also configure multiple IPv6 addresses for SRv6 under the same interface. An IPv6 address with a prefix SID can also be associated with SRv6. to define a local prefix as an SID, use the following commands:

```
ipv6-sr prefix-sid
```

Use the **no ipv6-sr prefix-sid** command to disable the local prefix SID.

The following example shows how to configure IPv6 segment routing.

```
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#inter Ether0/0
Router(config-if)#ipv6 address 2001::0DB8/32 segment-routing
Router(config-if-sr-ipv6)#ipv6-sr prefix-sid
Router(config-if-sr-ipv6)#exit
Router(config-if)#exit
Router(config)#exit
```

The following example shows how to configure multiple IPv6 addresses for SRv6 under the same interface.

```
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#inter Ether 0/0
Router(config-if)# ipv6 address 110::110/64 segment-routing
Router(config-if)# ipv6 address 111::111/64 segment-routing
Router(config-if-sr-ipv6)#ipv6-sr prefix-sid
Router(config-if-sr-ipv6)#end
```

Related Commands

Command	Description
ipv6-sr prefix-sid	Defines a local prefix as an SID.

issu linecard abortversion

To roll back the current image version on a single line card or multiple line cards to the previous version, use the **issu linecard abortversion** command in the privileged EXEC mode.

Note This command is used to roll back the versions on redundant line cards only.

```
issu linecard abortversion {all|lc slot/subslot} [forced]
```

Syntax Description

all	All redundant line cards.
l*c_slot*	The line card slot number.
subslot	The line card sub slot number.
forced	(Optional) The ISSU would ignore potential service outage and line card incompatibility errors and proceed with abortversion instead of stopping and error handling.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to roll back to prior image on working or primary line card on a single or multiple line cards to the previous versions.

Note The **issu linecard reloadversion** command is used to reload a line card with the original version of images.

The following example rolls back the specific redundant line card's image version.

```
Router# configure terminal
Router(config)#issu linecard abortversion
```

Related Commands

Command	Description
issu linecard acceptversion	Accepts the new image version on the working line card.
issu linecard loadversion	Loads a specific image version on the primary line card.

Command	Description
issu linecard prepareversion	Determines if the image version on the line card has to be upgraded or downgraded to the route processor's image version.
issu linecard reloadversion	Reloads the new loaded image on a working or a primary line card.
issu linecard runversion	Runs the new loaded image on a working or a primary line card.
issu linecard changeversion	Starts the upgrade or downgrade activity of the image version for a single line card or multiple line cards.

issu linecard acceptversion

To accept the new image version on the working line card, use the **issu linecard acceptversion** command in the privileged EXEC mode.

issu linecard acceptversion *lc slot* [*/subslot*]

Syntax Description

lc_slot	The line card slot number.
subslot	The line card sub slot number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to accept the new image version on the working line card. The command also indicates the completion of changing the image version for the specific line card and allows the ISSU of the next line card in the queue.

Examples

The following example indicates a command accepting the image version on the slot 7 of the line card.

```
Router# configure terminal
Router(config)#issu linecard acceptversion 7/0
```

Related Commands

Command	Description
issu linecard abortversion	Rolls back to the prior image on working/primary line card.
issu linecard loadversion	Loads a specific image version on the primary line card.
issu linecard prepareversion	Determines if the image version on the line card has to be upgraded or downgraded to the route processor's image version.
issu linecard reloadversion	Reloads the new loaded image on a working or a primary line card.
issu linecard runversion	Runs the new loaded image on a working or a primary line card.
issu linecard changeversion	Starts the upgrade or downgrade activity of the image version for a single line card or multiple line cards.

issu linecard changeversion

To start the upgrade or downgrade activity of the image version for a single working line card or multiple working line cards, use the **issu linecard changeversion** command in the privileged EXEC mode.



Note Effective with Cisco IOS Release 12.2(33)SCH2, the issu linecard changeversion command is used to check and upgrade the line card images automatically during the RP-only ISSU process.

issu linecard changeversion { **all** | **stop***slot_1 [/subslot_1]*} **. . .** [*slot_n [/subslot_n]*] [**forced**]

Syntax Description

all	All redundant line cards.
slot_1	The slot number for the first line card.
subslot_1	The sub slot number for the first line card.
slot_n	The slot number for the n th line card.
subslot_n	The sub slot number for the n th line card.
forced	(Optional) The ISSU would ignore potential service outage and line card incompatibility errors and proceed with changeversion instead of stopping and error handling.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to start the upgrade or downgrade activity of the image version for a single line card or multiple line cards. Here the line cards are of the primary or working type only.

Using the all option, you can change the image version of all the redundant line cards instead of specifying explicity each of the line card.

Using the stop option, you can stop the version change process for a line card.

Examples

The following example displays the command and uses the all option.

```
Router# configure terminal
Router(config)#issu linecard changeversion all
```

The following example displays the command and uses the slot value of 6.

```
Router# configure terminal
Router(config)#issu linecard changeversion 6/0
```

Related Commands

Command	Description
issu linecard abortversion	Rolls back to the prior image on working/primary line card.
issu linecard acceptversion	Accepts the new image version on the working line card.
issu linecard loadversion	Loads a specific image version on the primary line card.
issu linecard prepareversion	Determines if the image version on the line card has to be upgraded or downgraded to the route processor's image version.
issu linecard reloadversion	Reloads the new loaded image on a working or a primary line card.
issu linecard runversion	Runs the new loaded image on a working or a primary line card.

issu linecard loadversion

To load a specific image version on the primary line card, use the **issu linecard loadversion** command in the privileged EXEC mode.

issu linecard loadversion *slot* [*/subslot*]

Syntax Description

slot	The line card slot number.
subslot	The line card sub slot number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to load a specific image version on the working line card.

Examples

The following example shows the command that loads the image version on a line card with the slot number 7.

```
Router# configure terminal
Router(config)#issu linecard loadversion 7/0
```

Related Commands

Command	Description
issu linecard abortversion	Rolls back to the prior image on working/primary line card.
issu linecard acceptversion	Accepts the new image version on the working line card.
issu linecard prepareversion	Determines if the image version on the line card has to be upgraded or downgraded to the route processor's image version.
issu linecard reloadversion	Reloads the new loaded image on a working or a primary line card.
issu linecard runversion	Runs the new loaded image on a working or a primary line card.
issu linecard changeversion	Starts the upgrade or downgrade activity of the image version for a single line card or multiple line cards.

issu linecard prepareversion

To determine if the image version on the line card has to be upgraded or downgraded to the route processor's image version, use the **issu linecard prepareversion** command in the privileged EXEC mode.

issu linecard prepareversion *lc_slot* [*/subslot*] [**forced**]

Syntax Description

lc_slot	The line card slot number.
subslot	The line card sub slot number.
forced	(Optional) The ISSU would ignore potential service outage and line card incompatibility errors and proceed with prepareversion instead of stopping and error handling.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to check if the image version on the line card has to be upgraded or downgraded to the route processor's image version.

This command also checks if the line card has a valid redundancy configuration. If the line card does not have a valid configuration, then the user has to reload the line card using the **issu linecard reloadversion** command.

Examples

The following example shows the command executed for a line card with a slot value of 7.

```
Router# configure terminal
Router(config)#issu linecard prepareversion 7/0
```

Related Commands

Command	Description
issu linecard abortversion	Rolls back to the prior image on working/primary line card.
issu linecard acceptversion	Accepts the new image version on the working line card.
issu linecard loadversion	Loads a specific image version on the primary line card.
issu linecard reloadversion	Reloads the new loaded image on a working or a primary line card.
issu linecard runversion	Runs the new loaded image on a working or a primary line card.

Command	Description
issu linecard changeversion	Starts the upgrade or downgrade activity of the image version for a single line card or multiple line cards.

issu linecard process stop

Note Effective with Cisco IOS Release 12,2(33)SCG and later, issu linecard process stop is no longer supported on the Cisco CMTS router.

To stop the automatic line card ISSU process, use the issu linecard process stop command in privileged EXEC mode mode.

issu lineccard process stop

Syntax Description

This command has no arguments or keywords.

Command Default

This command is enabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCG	This command is obsolete.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the issu linecard process stop command to interrupt the automatic ISSU process continuing to the next line card

Associated Features:

The issu linecard process stop command is associated with following features:

Cisco IOS In Service Software Upgrade Process

Example

The following example shows how to stop the ISSU process:

```
Router> enable
Router# issu linecard process stop
```

Related Commands

Command	Description
issu linecard abortversion	Rolls back to the prior image on working/primary line card.
issu linecard acceptversion	Accepts the new image version on the working line card.
issu linecard loadversion	Loads a specific image version on the primary line card.

Command	Description
issu linecard prepareversion	Determines if the image version on the line card has to be upgraded or downgraded to the route processor's image version.
issu linecard reloadversion	Reloads the new loaded image on a working or a primary line card.
issu linecard runversion	Runs the new loaded image on a working or a primary line card.
issu linecard changeversion	Starts the upgrade or downgrade activity of the image version for a single line card or multiple line cards.

issu linecard reloadversion

To reload the new loaded image on a working or a primary line card, use the **issu linecard reloadversion** command in the privileged EXEC mode.

issu linecard prepareversion {**original** | **target**} {**all***[slot_1 [subslot_1]... [slot_n [/subslot_n]]*}

Syntax Description

original	The original image version.
all	All redundant line cards.
slot_1	The slot number for the first line card.
subslot_1	The sub slot number for the first line card.
slot_n	The slot number for the n th line card.
subslot_n	The sub slot number for the n th line card.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to reload the new loaded image on a working or a primary line card.

This command can be used for the following line card conditions.

- Line cards that are not configured with redundancy, and do not support Minimal Disruptive Restart (MDR.)
- Line cards which are capable of line card redundancy which were rolled back due to an unsuccessful **changeversion** command.

Examples

The following example shows the command executed with the original keyword.

```
Router# configure terminal
Router(config)#issu linecard reloadversion original 8/0
```

The following example shows the command executed with the target keyword.

```
Router# configure terminal
Router(config)#issu linecard reloadversion target 8/0
```

Related Commands

Command	Description
issu linecard abortversion	Rolls back to the prior image on working or primary line card.
issu linecard acceptversion	Accepts the new image version on the working line card.
issu linecard loadversion	Loads a specific image version on the primary line card.
issu linecard prepareversion	Determines if the image version on the line card has to be upgraded or downgraded to the route processor's image version.
issu linecard runversion	Runs the new loaded image on a working or a primary line card.
issu linecard changeversion	Starts the upgrade or downgrade activity of the image version for a single linecard or multiple line cards.

issu linecard runversion

To run the new loaded image on a working or a primary line card, use the **issu linecard runversion** command in the privileged EXEC mode.

issu linecard runversion *lc_slot*[*/subslot*] [**forced**]

Syntax Description

lc_slot	The line card slot number.
subslot	The line card sub slot number.
forced	(Optional) The ISSU would ignore potential service outage and line card incompatibility errors and proceed with runversion instead of stopping and error handling.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command allows the user to run the new loaded image on a working or a primary line card.

Examples

The following example displays the command executed to run the loaded image in the line card slot 7.

```
Router# configure terminal
Router(config)#issu linecard runversion 7/0
```

Related Commands

Command	Description
issu linecard abortversion	Rolls back to the prior image on the working/primary line card.
issu linecard acceptversion	Accepts the new image version on the working line card.
issu linecard loadversion	Loads a specific image version on the primary line card.
issu linecard prepareversion	Determines if the image version on the line card has to be upgraded or downgraded to the route processor's image version.
issu linecard reloadversion	Reloads the new loaded image on a working or a primary line card.
issu linecard changeversion	Starts the upgrade or downgrade activity of the image version for a single linecard or multiple line cards.

jitter

To set session jitter, use the **jitter** command in cable video configuration mode. To disable session jitter, use the **no** form of this command.

jitter {**sdv** | **vod** | **broadcast** | **gaming** | **table-based**}*value*
no jitter {**sdv** | **vod** | **broadcast** | **gaming** | **table-based**}*value*

Command Default

None.

Command Modes

Cable video configuration (config-video)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set session jitter:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# jitter gaming 5
```

Related Commands

Command	Description
show cable video jitter	Displays the session jitter information.

join-group

To join multicast group address, use the **join-group** command in OOB virtual OM configuration mode. To void the virtual OM configuration, use the **no** form of this command.

join-group *ip* **source-ip** *ip* **out-group** *ip*

no join-group *ip* **source-ip** *ip* **out-group** *ip*

Syntax Description

join-group *ip*	Specifies the group IP address.
source-ip *ip*	Specifies the SSM source IP address.
out-group *ip*	Specifies the local OM group IP address.

Command Default

None

Command Modes

OOB Virtual OM configuration (config-oob-vom)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to join multicast group address.

Examples

The following example shows how to join multicast group address:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)# virtual-om 1
Router(config-oob-vom)# join-group 235.1.1.1 source-ip 2.3.4.5 out-group 239.2.2.2
```

Related Commands

Command	Description
virtual-om	Defines a virtual OM configuration.
ip	Configures the virtual OM source IP address.

keepalive

To set the default ONID number, use the **default-onid** command in the video configuration mode.

default-onid *number*

Syntax Description

number	The ONID number. By default, the system ONID is 0, which is commonly used in North America. If the default value of the ONID is used, the TSID must be unique. If you change the ONID, the TSID-ONID pair must be unique. The ONID must be in the range of 0 to 65535.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the deault system ONID.

The following example shows how to change the default ONID number:

```
configure terminal
cable video
default-onid 1580
```

lacp fast-switchover

To enable Link Aggregation Control Protocol (LACP) 1:1 link redundancy, use the **lacp fast-switchover** command in interface configuration mode. To disable LACP 1:1 link redundancy, use the **no** form of this command.

lacp fast-switchover
no lacp fast-switchover

Syntax Description

This command has no arguments or keywords.

Command Default

LACP 1:1 link redundancy is disabled by default.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS 12.2(33)SCJ	This command was introduced.

Usage Guidelines

Prior to entering the **lacp fast-switchover** command, you must ensure the following:

- The port channel protocol type is LACP.
- The **lacp max-bundle 1**command has been entered on the port channel. The **lacp fast-switchover** command will not affect the **lacp max-bundle** command.

When you enable LACP 1:1 link redundancy, based on the system priority and port priority, the port with the higher system priority chooses the link as the active link and the other link as the standby link. When the active link fails, the standby link is selected as the new active link without taking down the port channel. When the original active link recovers, it reverts to its active link status. During this change-over, the port channel is also up.



Note We recommend that you configure two ports only (one active and one hot-standby) in the bundle for optimum performance.

Examples

This example shows how to enable LACP 1:1 link redundancy:

```
Router(config-if)# lacp fast-switchover
```

Related Commands

Command	Description
lacp max-bundle	Assigns and configures an EtherChannel interface to an EtherChannel group.
show etherchannel	Displays the EtherChannel information for a channel.

lacp max-bundle

To define the maximum number of active bundled Link Aggregation Control Protocol (LACP) ports allowed in a port channel, use the **lacp max-bundle** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

lacp max-bundle *max-bundles number*
no lacp max-bundle

Syntax Description

max-bundles	Maximum threshold of active member links allowed in the LACP bundle. The range from is 1 to 8. The maximum threshold value must be greater than or equal to the minimum threshold value.

Command Default

A maximum number of active bundled ports is not configured.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS 12.2(33)SCJ	Support for this command was introduced.

Usage Guidelines

The value specified in the *max-bundles* argument determines the number of active links that are bundled in the port channel. The remaining links are in hot-standby mode.

Examples

This example shows how to set 3 ports to bundle in port channel 2:

```
Router(config)# interface port-channel 2
Router(config-if)# lacp max-bundle 3
Router(config-if)#
```

Related Commands

Command	Description
interface port-channel	Creates a port-channel virtual interface and puts the CLI in interface configuration mode.
ip address	Sets a primary or secondary IP address on an interface.
show etherchannel	Displays the EtherChannel information for a channel.
show interfaces port-channel	Displays traffic that is seen by a specific port channel.

lacp min-bundle

To define the minimum number of active bundled LACP ports allowed in a port channel, use the **lacp min-bundle** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

lacp min-bundle *min-bundle*
no lacp min-bundle

Syntax Description

min-bundle	Minimum threshold of active member links allowed in the LACP bundle. The range is from 1 to 8. The default is 1.

Command Default

The port-channel operational state will be "Down" only when there are no active links in the channel. If there are one or more active links, the port-channel state will be "Up."

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS 12.2(33)SCJ	This command was introduced.

Usage Guidelines

Use the **lacp min-bundle** command to configure the minimum number of active links allowed in an LACP bundle. When the number of active links falls below this minimum threshold, the port channel shuts down.

Examples

This example shows how to set the minimum number of active links to five ports:

```
Device(config-if)# lacp min-bundle 5
```

Related Commands

Command	Description
interface port-channel	Creates a port-channel virtual interface and enters interface configuration mode.
ip address	Sets a primary or secondary IP address on an interface.
show etherchannel	Displays the EtherChannel information for a channel.
show interfaces port-channel	Displays traffic that is seen by a specific port channel.

lacp port-priority

To set the LACP priority for a physical interface, use the **lacp port-priority** command in interface configuration mode. To return to the default setting, use the **no** form of this command.

lacp port-priority *priority*

no lacp port-priority

Syntax Description

priority	Integer that indicates the priority for the physical interface. The range is from 0 to 65535. The default is 32768.

Command Default

The default port priority is set.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
Cisco IOS 12.2(33)SCJ	This command was introduced.

Usage Guidelines

You may assign a port priority to each port on a device running Link Aggregation Control Protocol (LACP). You can specify the port priority by using the **lacp port-priority** command at the command-line interface (CLI) or use the default port priority (32768) that is carried as part of the LACP protocol data unit (PDU) exchanged with the partner. Port priority is used to decide which ports should be put in standby mode when a hardware limitation or the **lacp max-bundle** command configuration prevents all compatible ports from aggregating. Priority is supported only on port channels with LACP-enabled physical interfaces.

Note A high priority number means a low priority.

Port priority together with port number form a port identifier.

To verify the configured port priority, issue the **show lacp** command.

Examples

This example shows how to set a priority of 23700 for an interface:

```
Device> enable
Device#  configure terminal
Device(config)#  interface ethernet 0/0
Device(config-if)# lacp port-priority 23700
Device(config-if)#
```

Related Commands

Command	Description
channel-group	Assigns and configures an EtherChannel interface to an EtherChannel group.
debug lacp	Enables debugging of LACP activities.

Command	Description
lacp max-bundle	Defines the maximum number of active bundled LACP ports allowed in a port channel.
lacp system-priority	Sets the priority of the system.
show lacp	Displays information about LACP activity on the device.

lacp system-priority

To set the priority for a system, use the **lacp system-priority** command in global configuration mode. To return to the default setting, use the **no** form of this command.

lacp system-priority *priority*

no lacp system-priority

Syntax Description

priority	Integer that indicates the LACP priority for the system. The range is from 0 to 65535. The default is 32768.

Command Default

The default system priority is set.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS 12.2(33)SCJ	This command was introduced.

Usage Guidelines

You can assign a system priority to each device running Link Aggregation Control Protocol (LACP). You can specify the system priority by using the **lacp system-priority** command at the command-line interface (CLI) or use the default system priority (32768) that is carried as part of the LACP protocol data unit (PDU) exchanged with the partner. System priority is used with the MAC address of the device to form the system ID and also is used during negotiation with other systems. Priority is supported only on port channels with LACP-enabled physical interfaces.

Note A high priority number means a low priority.

To verify the configured system priority, issue the **show lacp** command.

Examples

The following example shows how to set a system priority of 25500 for a device:

```
Router> enable
Router# configure terminal
Router(config)# lacp system-priority 25500
```

Related Commands

Command	Description
channel-group	Assigns and configures an EtherChannel interface to an EtherChannel group.
debug lacp	Enables debugging of LACP activities.
lacp port-priority	Sets the priority of a port.
show lacp	Displays information about LACP activity on the device.

lane start-freq

To set the start frequency for a specific lane, use the **lane start-freq** command from frequency profile configuration mode.

lane *lane_id***start-freq** *start-freq*

Syntax Description

lane_id	Specifies the ID of the lane that the start frequency to be set.
start-freq	Configures the start frequency for the lane.

Command Default

None

Command Modes

Frequency profile configuration (config-freq-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the start frequency for a specific lane.

Examples

The following example shows how to set start frequency for a specific lane:

```
Router# Configure terminal
Router(config)# cable downstream freq-profile 4
Router(config-freq-prof)# lane 1 start-freq 45000000
```

Related Commands

Command	Description
cable downstream freq-profile	Set the start frequency for a specific lane.

lc-control-plane-timeout

To set the interval of monitoring cable line card control plane process restart, use the **lc-control-plane-timeout** *time* command in the process restart configuration mode.

```
lc-control-plane-timeout time
```

Syntax Description

time	Cable line card control plane process restart monitoring interval in seconds.

Command Default

None

Command Modes

Process restart configuration (config-process-restart)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the interval of monitoring cable line card control plane process restart.

The following example shows how to set the interval of monitoring cable line card control plane process restart.

```
Router# configure terminal
Router(config)# process-restart
Router(config-process-restart)# lc-control-plane-timeout 200
```

Related Commands

Command	Description
lc-us-scheduler-timeout	Sets the interval of monitoring cable line card upstream scheduler process restart.
restart-retry	Sets the retrying times for process restart.

lc-us-scheduler-timeout

To set the interval of monitoring cable line card upstream scheduler process restart, use the **lc-us-scheduler-timeout** *time* command in the process restart configuration mode.

```
lc-us-scheduler-timeout time
```

Syntax Description

time	Cable line card upstream scheduler process restart monitoring interval in seconds.

Command Default

None

Command Modes

Process restart configuration (config-process-restart)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the interval of monitoring cable line card upstream scheduler process restart.

The following example shows how to set the interval of monitoring cable line card upstream scheduler process restart.

```
Router# configure terminal
Router(config)# process-restart
Router(config-process-restart)# lc-us-scheduler-timeout 200
```

Related Commands

Command	Description
lc-control-plane-timeout	Sets the interval of monitoring cable line card control plane process restart.
restart-retry	Sets the retrying times for process restart.

lcha-preferred

To select the LCHA when it is possible, use the **lc-control-plane-timeout** command in the process restart configuration mode. To disable this function, use the **no** form of this command.

```
lcha-preferred

no lcha-preferred
```

Command Default

None

Command Modes

Process restart configuration (config-process-restart)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command selects the LCHA when it is possible.

The following example shows how to select the LCHA when it is possible.

```
Router# configure terminal
Router(config)# process-restart
Router(config-process-restart)# lcha-preferred
```

Related Commands

Command	Description
disable-auto-restart	Disables the automatic process restart.

license feature evaluation disable

To disable an evaluation license for Cisco uBR-MC3GX60V and Cisco UBR-MC20X20V cable interface line cards on the Cisco uBR10012 router, use the **license feature evaluation disable** command in global configuration mode.

license feature evaluation disable {**DS_license** | **US_license** | **all** }**subslot** *slot/subslot*

Syntax Description

disable	Disables an evaluation license for a cable interface line card.
DS_License	Disables a downstream evaluation license for a cable interface line card.
US_License	Disables an upstream evaluation license for a cable interface line card.
all	Disables both downstream and upstream evaluation licenses for a cable interface line card.
subslot *slot/subslot*	• *slot*—Slot where the line card resides. The valid range is from 5 to 8. • *subslot*—Secondary slot number of the cable interface line card. The valid value is 0 or 1.

Command Default

A cable interface line card evaluation license is disabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Evaluation licenses are temporary and used to evaluate a feature set on a new line card. Ensure that an equivalent permanent license is installed on the Cisco CMTS before the evaluation license expires to avoid any service disruptions.

Examples

The following example shows how to disable both downstream and upstream evaluation licenses for a cable interface line card on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# license feature evaluation disable all subslot 5/0
```

The following example shows how to disable a downstream evaluation license for a cable interface line card on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# license feature evaluation disable DS_License subslot 6/0
```

The following example shows how to disable an upstream evaluation license for a cable interface line card on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# license feature evaluation disable US_License subslot 6/1
```

Related Commands

Command	Description
license feature evaluation enable	Enables an evaluation license for Cisco uBR-MC3GX60V and Cisco UBR-MC20X20V cable interface line cards.

license feature evaluation enable

To enable an evaluation license for Cisco uBR-MC3GX60V and Cisco UBR-MC20X20V cable interface line cards on the Cisco uBR10012 router, use the **license feature evaluation enable** command in global configuration mode.

license feature evaluation enable {**DS_License** | **US_License** | **all** }**subslot** *slot/subslot*

Syntax Description

enable	Enables an evaluation license for a cable interface line card.
DS_License	Enables a downstream evaluation license for a cable interface line card.
US_License	Enables an upstream evaluation license for a cable interface line card.
all	Enables both downstream and upstream evaluation licenses for a cable interface line card.
subslot *slot/subslot*	• *slot*—Slot where the cable interface line card resides. The valid range is from 5 to 8. • *subslot*—Secondary slot number of the cable interface line card. The valid value is 0 or 1.

Command Default

A cable interface line card evaluation license is not enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Evaluation licenses are temporary and used to evaluate a feature set on a new cable interface line card. Ensure that an equivalent permanent license is installed on the Cisco CMTS router before the evaluation license expires to avoid any service disruptions.

Examples

The following example shows how to enable both downstream and upstream evaluation licenses for a cable interface line card on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# license feature evaluation enable all subslot 5/0
```

The following example shows how to enable a downstream evaluation license for a cable interface line card on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# license feature evaluation enable DS_License subslot 6/0
```

The following example shows how to enable an upstream evaluation license for a cable interface line card on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# license feature evaluation enable US_License subslot 6/1
```

Related Commands

Command	Description
license feature evaluation disable	Disables an evaluation license for Cisco uBR-MC3GX60V and Cisco UBR-MC20X20V cable interface line cards.

linecard

To define the encryption type of a linecard, use the **linecard** command in the encryption configuration mode. To remove the configuration, use the **no** form of this command.

linecard *slot / bay*
ca-system {**pme scrambler** *dvs042* | **powerkey scrambler** *des* | **powerkey scrambler** *dvb-csa* | **dvb scrambler** *dvb-csa* | **dualcrypt scrambler** *dvb-csa*}
no linecard *slot / bay*
ca-system {**pme scrambler** *dvs042* | **powerkey scrambler** *des* | **powerkey scrambler** *dvb-csa* | **dvb scrambler** *dvb-csa* | **dualcrypt scrambler** *dvb-csa*}

Syntax Description

slot / bay	• *slot*—Specifies the slot number. The valid range is from 0 to 9. • *bay*—Specifies the bay number. The valid value is 0.
ca-system	Specifies the encryption type of the virtual carrier group. • *pme*—Sets to privacy mode encryption. • *powerkey*—Sets to powerkey encryption. • *dvb*—Sets to DVB encryption. • *dualcrypt*—Sets to Dualcrypt encryption.
pme scrambler *dvs042*	Specifies the scrambler algorithm for privacy mode encryption.
powerkey scrambler *des*| *dvb-csa*	Specifies the scrambler algorithm for powerkey encryption.
dvb scrambler *dvb-csa*	Specifies the scrambler algorithm for DVB encryption.
dualcrypt scrambler *dvb-csa*	Specifies the scrambler algorithm for DualCrypt encryption.

Command Default

None.

Command Modes

Encryption configuration (config-video-encrypt)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Everest 16.5.1	This command was updated to support DualCrypt encryption on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines the encryption type of a linecard.

Examples

The following example shows how to configure the encryption for the linecard:

```
Router# configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#linecard 7/0 ca-system powerkey scrambler des
```

The following example shows how to configure the Dualcrypt encryption mode:

```
Router(config)#cable video
Router(config-video)#mgmt-intf VirtualPortGroup 0
Router(config-video)#encryption
Router(config-video-encrypt)#linecard 8/0 ca-system dualcrypt scrambler dvb-csa
```

Related Commands

Command	Description
encrypt	Enables encryption on a virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
virtual-edge-input-ip	Configures a virtual edge input.
virtual-carrier-group	Defines a virtual carrier group.

linecard-group (redundancy)

To configure the redundancy group, use the **linecard-group** command in redundancy configuration mode. To remove the configuration, use the **no** form of this command.

linecard-group *group-id* **internal-switch**
no linecard-group *group-id* **internal-switch**

Syntax Description

group-id	The line card group identifier. The valid value is 0 on the Cisco cBR-8 Router.
internal-switch	Sets the redundancy type to internal switch.

Command Default

None.

Command Modes

Redundancy configuration (config-red)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Line card group members must be removed before removing the redundancy group configuration.

Examples

The following example shows how to configure the redundancy group:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# redundancy
Router(config-red)#  linecard-group 0 internal-switch
Router(config-red-lc)#
```

Related Commands

Command	Description
class	Configures redundancy class on the line card.
description	Adds a description to the line card group.
member slot	Adds a slot to the line card redundancy group.
redundancy	Configures line card redundancy.
show redundancy linecard	Displays information about a redundant line card or a line card group.

listening-port

To configure the listening TCP port, use the **listening-port** command in the DVB scrambling EIS configuration mode. To void the listening TCP port configuration, use the **no** form of this command.

listening-port *port*
no listening-port *port*

port	Specifies the listening TCP port.

Command Default

None

Command Modes

DVB scrambling EIS configuration mode (config-video-encrypt-dvb-eis)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the listening TCP port:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#eis EIS-1 id 1
Router(config-video-encrypt-dvb-eis)#listening-port 8890
```

Related Commands

Command	Description
cp-overrule	Overrules and specifies the crypto period duration.
overwrite-scg	Enables Scrambling Control Group (SCG) overwrite.
eis	Enters the Event Information Scheduler configuration mode.

logging cmts ipc-cable

To enable debug logging for the cable inter-processor communication (IPC) software, use the **logging cmts ipc-cable** command from the global configuration mode. To disable logging of these messages, use the **no** form of the command.

Note Use this command for debugging purpose only.

logging cmts ipc-cable log-level
[*alertscriticaldebuggingemergencieserrorsinformationalnotificationswarnings*]
no logging cmts ipc-cable log-level
[*alertscriticaldebuggingemergencieserrorsinformationalnotificationswarnings*]

Syntax Description

log-level	Configures the log severity level. Logs with severity equal to or higher than the specified log-level are logged in log buffer.
level=emergencies	Emergency severity level indicates system is unusable. The default severity level for emergencies syslog messages is 0.
level=alerts	Alerts severity level indicates that immediate action is needed. The default severity level for alerts syslog messages is 1.
level=critical	Critical severity level indicates the critical condition of the system. The default severity level for critical syslog messages is 2.
level=errors	Errors severity level indicates the error conditions. The default severity level for errors syslog messages is 3.
level=warnings	Warning severity level warns the network administrator. The default severity level for warnings syslog messages is 4.
level=notifications	Notification severity level indicates normal but significant condition of the system. The default severity level for notification syslog messages is 5.
level=informational	Informational severity level provides additional information about the system. The default severity level for informational syslog messages is 6.
level=debugging	Debugging severity level provides debugging messages. The default severity level for debugging syslog messages is 7.

Command Default

By default, the log-level is set to ‘errors’.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.

Usage Guidelines

Each cable IPC debug log has a severity level. The **logging cmts ipc-cable** command allows you to selectively enable cable IPC debug logs based on the log severities. Each debug log has a debug-enable flag that is set by the **debug cmts ipc-cable** command in Privileged EXEC mode. A debug log is recorded only if its severity is equal to or higher than the configured log-level, and if its debug enable flag is set.

Examples

The following example shows how to enable all the cable IPC debug logs:

```
Router(config)# logging cmts ipc-cable log-level debugging
```

The following example shows how to disable debug logging for the cable IPC:

```
Router(config)# no logging cmts ipc-cable log-level debugging
```

Related Commands

Command	Description
debug cmts ipc-cable	Sets the debug-enable flag for the cable IPC debug logs.
show cmts ipc-cable	Displays statistics of all IPC messages on a Cisco CMTS router.

logging cmts sea

To enable the logging of syslog messages to System Event Archive (SEA), use the **logging cmts sea** command from global configuration mode. To disable logging of syslog messages to SEA, use the **no** form of the command.

logging cmts sea
no logging cmts sea

Syntax Description

syslog-level *level*	(Optional) Configures the level of syslog messages inclusive of and above the specified level which will be stored in the SEA log file.
Possible values for level are: *level=emergencies*	Emergency security level indicates system is unusable. The default severity level for emergency syslog messages is 0.
level=alerts	Alerts severity level indicates that immediate action is needed. The default severity level for alerts syslog messages is 1.
level=critical	Critical severity level indicates the critical condition of the system. The default severity level for critical syslog messages is 2.
level=errors	Errors severity level indicates the error conditions. The default severity level for errors syslog messages is 3.
level=warnings	Warning severity level warns the network administrator. The severity level for warning syslog messages is 4.
level=notifications	Notification severity level indicates normal but significant condition of the system. By default severity level for syslog messages is configured as ‘normal’. The default severity level for notification syslog messages is 5.
level=informational	Informational severity level provides additional information about the system. The default severity level for informational syslog messages is 6.
level=debugging	Debugging severity level provides debugging messages. The default severity level for debugging syslog messages is 7.

Command Default

By default, storing of syslog messages to SEA log file is enabled, with the severity-level of syslog messages being set to ‘notification’.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use **the logging cmts sea command is used to enable the logging of syslog messages to SEA log file. To change the severity-level of syslog messages inclusive of and above the level to be stored in SEA log file, specify the command logging cmts sea [syslog-level** *level***].**

Examples

The following example shows how to enable logging of syslog messages to SEA log file on the Cisco uBR10012 router:

```
Router(config)# logging cmts sea
```

The following example shows how to disable logging of syslog messages to SEA log file on the Cisco uBR10012 router:

```
Router(config)# no logging cmts sea
```

The following example shows how to change the severity-level of syslog messages inclusive of and above the level being stored in the SEA log file:

```
Router(config)# logging cmts sea syslog-level warning
```

Related Commands

Command	Description
clear logging system	Clears the event records stored in the SEA.
copy logging system	Copies the archived system events to another location.
logging system	Enables or disables the SEA logging system.

logical-edge-device

To define a logical edge device, use the **logical-edge-device** command in video configuration mode. To delete a logical edge device, use the **no** form of this command.

logical-edge-device *name* [**id** *id*]
no logical-edge-device *name* [**id** *id*]

Syntax Description

logical-edge-device *name*	Specifies the logical edge device name.
id *id*	Specifies the logical edge device identifier.

Command Default

None.

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines a logical edge device.

Examples

The following example shows how to define a logical edge device:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# logical-edge-device vod id 1
```

Related Commands

Command	Description
protocol	Specifies the protocol used in the logical edge device.
show cable video logical-edge-device	Displays the logical edge device information.

load-interval

To change the length of time for which data is used to compute load statistics, use the **load-interval** command in MAC domain profile configuration mode, wideband-cable interface profile configuration mode, or downstream profile configuration mode. To void the configuration, use the **no** form of this command.

load-interval *seconds*
no low-latency *seconds*

Command Default

None.

Command Modes

MAC domain profile configuration (config-profile-md)

Wideband-cable interface profile configuration (config-profile-wb)

Downstream profile configuration (config-profile-ds)

Command History

Release	Modification
Cisco IOS XE Fuji 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Gibraltar 16.10.1c	This command was modified to support downstream profile configuration mode on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set load interval:

```
Router# configure terminal
Router(config)# cable profile mac-domain MD
Router(config-profile-md)# load-interval 30
```

low-latency

To set low latency VCG, use the **low-latency** command in virtual carrier group configuration mode. To disable low latency VCG, use the **no** form of this command.

low-latency
no low-latency

Command Default

None.

Command Modes

Virtual carrier group configuration (config-video-vcg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set low latency VCG:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# virtual-carrier-group vod id 1
Router(config-video-vcg)# low-latency
```

Related Commands

Command	Description
show cable video low-latency linecard	Displays the linecard low latency information

mac-addr-filter

To configure MAC filtering, use the **mac-addr-filter** command in the interface configuration mode. To disable MAC filtering, use the **no** form of this command.

mac-addr-filter
no mac-addr-filter

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
IOS-XE 3.18.1SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the MAC filtering for a backhaul interface:

```
Router# configure terminal
Router(config)# interface tenGigabitEthernet 4/1/0
Router(config-if)#mac-addr-filter
Router(config-if)#end
```

Related Commands

Command	Description
show platform software iomd	Verifies the MAC filtering status.

mac-address

To define the MAC address for a logical edge device, use the **mac-address** command in the logical edge device protocol configuration mode. To reset to default configuration, use the **no** form of this command.

mac-address *mac-address*
no mac-address *mac-address*

Syntax Description

mac-address	Specifies the MAC address for a logical edge device.

Command Default

None

Command Modes

Logical edge device protocol configuration (config-video-led-protocol)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Each logical edge device requires a unique MAC address. MAC address is required only when you configure the logical edge device with GQI protocol.

Tip Use the following command to get the chassis MAC address:

show diag all eeprom detail | include MAC

```
Chassis MAC Address : 54a2.120e.3000
MAC Address block size : 1024
```

Increment the least significant digit of the Chassis MAC address to give a unique identifier (mac-address) for each logical edge device. Example: 54a2.120e.3001.

The MAC address for a logical edge device should be unique with respect to the GQI server and it should not relate to a real MAC address.

Examples

The following example shows how to define the MAC address for a logical edge device:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)#logical-edge-device vod id 1
Router#(config-video-led)protocol gqi
Router#(config-video-led-protocol)mac-address 0800.270e.25b8
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.

Command	Description
protocol	Specifies the protocol used in the logical edge device.
mgmt-ip	Defines the local management IP address for a logical edge device.
server	Defines the server IP address of the session resource manager.
vcg	Specifies the virtual carrier group assigned to the logical edge device.
virtual-edge-input-ip	Defines a virtual edge input.
show cable video logical-edge-device	Displays the logical edge device information.
show cable video gqi connections	Displays the GQI connection information of the logical edge device with the Session Resource Manager.
show diag all eeprom detail | include MAC	Displays the chassis MAC address information.

mgmt-intf virtualportgroup

To configure the cable video management interface, use the **mgmt-intf virtualportgroup** command in the video configuration mode. To delete the management interface created, use the **no** form of the command.

mgmt-intf virtualportgroup *number*
no mgmt-intf virtualportgroup *number*

Syntax Description

VirtualPortGroup *number*	Defines the specified Virtual Port Group as the management interface. Valid range is 0 to 31.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to configure the cable video management interface.

The following example shows how to change the default ONID number:

```
Router#configure terminal
Router(config)#cable video
Router(config-video)#mgmt-intf VirtualPortGroup0
```

Related Commands

Command	Description
interface virtualportgroup	Defines a VirtualPortGroup interface.
show run interface virtualportgroup	Displays the VirtualPortGroup interface configuration.
show run | include mgmt-intf	Displays the cable video management interface configuration.
show interfaces virtualportgroup	Displays the VirtualPortGroup interface state.

main-cpu

To enter main-CPU redundancy configuration mode, so that you can configure the synchronization of the active and standby Performance Routing Engine (PRE1) modules or Supervisor cards, use the **main-cpu** command in redundancy configuration mode.

main-cpu

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

Redundancy configuration (config-r)

Cisco RF Gateway 10

Redundancy configuration (config-red)

Command History

Release	Modification
12.2(4)XF	This command was introduced for the Cisco uBR10012 router.
12.2(11)BC3	Support for the **switchover timeout** command was added.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(44)SQ	This command was integrated into Cisco IOS Release 12.2(44)SQ. Support for the Cisco RF Gateway 10 was added.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When you enter main-CPU redundancy configuration mode, the prompt changes to the following:

```
Router(config-r-mc)#
```

After you enter main-CPU redundancy configuration mode, you can use the **auto-sync** command to specify which files are synchronized between the active and standby PRE1 modules or Supervisor cards. In Cisco IOS Release 12.2(11)BC3 and later releases, you can also use the **switchover timeout** command to specify the amount of time that the standby PRE1 module should wait when it first detects that the active PRE1 module is not active and when it initiates a switchover and becomes the active PRE1 module.

To leave main-CPU redundancy configuration mode and to return to redundancy configuration mode, use the **exit** command.

Examples

The following example shows how to enter main-CPU redundancy mode and the commands that are available there:

```
Router# config t

Router(config)# redundancy

Router(config-r)# main-cpu

Router(config-r-mc)# ?

Main Cpu redundancy configuration commands:
  auto-sync   Sync elements
  exit        Exit from main-cpu configuration mode
  no          Negate a command or set its defaults
  switchover  Configuration of switchover
Router(config-r-mc)#
```

Cisco RF Gateway 10

The following example shows how to enter main-CPU redundancy mode, and its associated commands:

```
Router# configure terminal

Router(config)# redundancy

Router(config-red)# main-cpu

Router(config-r-mc)# ?

Main CPU redundancy configuration commands:
  auto-sync  Sync elements
  default    Set a command to its defaults
  exit       Exit from main-cpu configuration mode
  no         Negate a command or set its defaults
```

Related Commands

Command	Description
associate slot	Logically associate slots for APS processor redundancy
auto-sync	Configures which files are synchronized between the active and standby PRE1 modules or Supervisor cards.
redundancy	Enters redundancy configuration mode.
switchover timeout	Configures the switchover timeout period of the PRE1 module.

maintenance-mode

To configure the PRE1 modules on the router for maintenance mode, use the **maintenance-mode** command in redundancy configuration mode. To return to normal operations, use the **no** form of this command.

maintenance-mode
no maintenance-mode

Syntax Description

This command has no keywords or arguments.

Command Default

Normal operations (**no maintenance-mode**)

Command Modes

Redundancy configuration

Command History

Release	Modification
12.2(4)XF	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When the Cisco uBR10012 router is configured with redundant PRE1 modules, the active PRE1 module automatically synchronizes the configuration, network state information, and other information with the standby PRE1 module, so that if a switchover occurs, the standby module can restore normal operations quickly. You can use the **maintenance-mode** command to disable this automatic synchronization of the PRE1 modules, and to disable the reporting of any faults on the standby module to the active module.

Note The **maintenance-mode** command disables the ability of the Cisco uBR10012 router to switchover PRE1 modules and should be used only while upgrading the router or troubleshooting network problems.

Examples

The following example shows how to disable the automatic PRE1 module synchronization on the Cisco uBR10012 router and enter maintenance mode:

```
Router# config t

Router(config)# redundancy

Router(config-r)# maintenance-mode
Router(config-r)# exit
Router(config)#
```

The following example shows how to leave maintenance mode and return to normal operations, which includes the automatic synchronization of the PRE1 modules:

```
Router# config t

Router(config)# redundancy
```

```
Router(config-r)# no maintenance-mode
Router(config-r)# exit
Router(config)#
```

Related Commands

Command	Description
auto-sync	Configures which files are synchronized between the active and standby PRE1 modules.
redundancy	Enters redundancy configuration mode.

match

To configure the matching option for the DHCP IPv4 profile, use the **match**command in DHCP IPv4 profile configuration mode. To void the configuration, use the **no**form of this command.

match option { **43 suboption** *type* | **hex** *value* | | **60 hex** *value* }
no match option { **43 suboption** *type* | **hex** *value* | | **60 hex** *value* }

Syntax Description

option	Specifies the matching option.
suboption*type*	Specifies the suboption for the option 43.
hex*value*	Specifies the HEX pattern

Command Default

None.

Command Modes

DHCP IPv4 profile configuration (config-dhcpv4-profile)

Release	Modification
IOS XE Fuji 16.8.1	Thiscommand was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the matching option:

```
Router# configure terminal
Router(config)# cable dhcp ipv4 profile DEVICE1
Router(config-dhcpv4-profile)# match option 43 suboption 100 hex 123456
Router(config-dhcpv4-profile)# match option 60 hex *efef*
```

Related Commands

Command	Description
cable dhcp ipv4 profile	Enters the IPv4 DHCP profile configuration mode.

match rule

To configure the match rule, rule priority and related action in the selected cable multicast authorization profile, use the **match rule** command in interface configuration mode. To disable a cable multicast authorization profile match, use the **no** form of this command.

match rule [*ipv4ipv6*] [*source-prefix*] [*group-prefix*] **priority** [*priority-value*] [*permitdeny*]
no match rule [*ipv4ipv6*] [*source-prefix*] [*group-prefix*] **priority** [*priority-value*] [*permitdeny*]

Syntax Description

match rule [*ipv4* | *ipv6*]	Specifies the matching source rule. Though CLI allows IPv6 to be configured, only IPv4 is supported in the CMTS.
source-prefix	(Optional) Specifies the matching source address prefix. Example: 223.1.1.1/16
group-prefix	(Optional) Specifies the matching group address prefix. Example: 223.1.1.1/16
priority [*priority-value*]	Specifies the priority of the cable multicast authorization profile. Priority value range is: 0-255.
permit	The argument *permit* allows specified packets to be forwarded.
deny	The argument *deny* allows to specified packets to be rejected.

Command Default

Cable multicast authorization is disabled.

Command Modes

Interface configuration—cable interface only (config-mauth)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the cable multicast authorization profile match to be used.

Examples

The following example shows how to use the selected multicast authorization profile match:

```
Router(config-mauth)# match rule rule1
```

Related Commands

Command	Description
cable multicast authorization enable default-action	This command enables the cable multicast authorization features. If the multicast authorization feature is disabled, all defined authorization profiles are ineffective.
cable multicast authorization profile-name	Defines the cable multicast authorization profile.
show cable multicast authorization	Displays the list of defined multicast authorization profiles and all CMs associated with corresponding profiles.

max-carrier

To specify the maximum number of carriers, use the max-carrier command in the controller sub configuration mode.

max-carrier *value*

Syntax Description

value	Value for the maximum number of carriers. Valid range is from 0 to 128.

Command Default

The default value is 128.

Command Modes

Controller sub configuration mode (config-controller).

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced.

Usage Guidelines

This command is used to specify the maximum number of carriers on an RF port.

```
router#configure terminal
router (config)#controller Integrated-Cable 3/0/0
router (config-controller)#max-carrier 96
router (config-controller)#end
router #show controllers Integrated-Cable 3/0/0 rf-port

  Admin:  UP  MaxCarrier: 96  BasePower: 32 dBmV  Mode: normal
```

max-comp-time

To configure the maximum time needed by ECMG to compute an ECM, use the **max-comp-time** command in the DVB scrambling ECMG overrule configuration mode. To void the maximum time configuration, use the **no** form of this command.

max-comp-time *time*
no max-comp-time

max-comp-time *time*	Specifies the maximum computing time in millisecond.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the maximum time needed by ECMG to compute an ECM in milliseconds. The valid range is from 0 to 60000.

The following is an example of how to configure the maximum computing time:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#max-comp-time 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.
min-cp-duration	Specifies the minimum crypto period.

Command	Description
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

max-ofdm-spectrum

To specify the maximum spectrum used by all the OFDM channels on the given port, use the **max-ofdm-spectrum** command in controller configuration mode. To undo the maximum spectrum assignment, use **no** form of this command.

max-ofdm-spectrum *value*

no max-ofdm-spectrum

Syntax Description

value	Maximum OFDM spectrum value (Hz), in 1 MHz increments. Valid range is from 24000000 to 1170000000.

Command Default

None.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the maximum spectrum used by all the OFDM channels on the given port.

Examples

The following example shows how to specify the maximum spectrum used by all the OFDM channels on the given port:

```
Router# configure terminal
Router(config)# controller integrated-cable 3/0/0
Router(config-controller)# max-ofdm-spectrum 24000000
```

max-streams

To configure the maximum number of simultaneous open streams supported by the ECMG on a channel, use the **max-streams** command in the DVB scrambling ECMG overrule configuration mode. To void the maximum number configuration, use the **no** form of this command.

max-streams *number*
no max-streams

max-streams *number*	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the maximum number of simultaneous open streams supported by the ECMG on a channel. The valid range is from 0 to 30000.

The following is an example of how to configure the maximum number of simultaneous open streams supported by the ECMG on a channel:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#max-streams 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
min-cp-duration	Specifies the minimum crypto period.

Command	Description
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

member slot

To add a line card as a primary or secondary card in a redundancy group, use the **member slot** command in line card redundancy configuration sub-mode. To remove the configuration, use the **no** form of this command.

member slot *slot* { **primary** | **secondary** }
no member slot *slot* { **primary** | **secondary** }

Syntax Description

slot	Slot number of the line card. The range is from 0 to 3 and 6 to 9 on the Cisco cBR-8 router.
primary	Specifies the primary slot of the line card group.
secondary	Specifies the secondary slot of the line card group.

Command Default

None.

Command Modes

Line card redundancy configuration (config-red-lc)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

We can only add the secondary card (protect card) after which there should be at least one primary member in the group. You can add a single secondary card for multiple primary cards.

Note You cannot remove the last primary member if there is secondary member in redundancy group. You should remove the secondary member first in such case. If the primary card is in Standby role, you must revert back to it before removing.

When a line card is added as secondary card, the line card will be reloaded automatically. On the Cisco cBR-8 router, slot 3 and 6 cannot be configured as secondary card. Only the line card with CBR-RF-PROT-PIC installed could be set as secondary card. In addition, only the line card with CBR-RF-PIC installed could be set as primary card.

The CBR-RF-PROT-PIC can only send RF signals to lower slot (with larger slot number). So the slot number of the secondary card must be the smallest one in the line card redundancy group.

It is recommended to install the PROT-PIC in slot 0 and make line card 0 as secondary. The RF signal can only be relayed from upper slot to lower slot by CBR-RF-PIC. So, do not install any RF blank PICs between the secondary and primary cards.

Examples

The following example shows how to add the line card as a primary card in the redundancy group:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# redundancy
Router(config-red)#  linecard-group 0 internal-switch
```

```
Router(config-red-lc)# member slot 1 primary
```

The following example shows how to add the line card as a primary card in the redundancy group:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# redundancy
Router(config-red)#  linecard-group 0 internal-switch
Router(config-red-lc)# member slot 0 secondary
```

Related Commands

Command	Description
class	Configures redundancy class on the line card.
description	Adds a description to the line card group.
linecard-group internal-switch	Creates a line card group for the line card.
redundancy	Configures line card redundancy.
show redundancy linecard	Displays information about a redundant line card or a line card group.

method

To select the method the CMTS uses to determine the load, use the **method** command in the config-lb-group configuration mode. To reset the method, use the **no** form of this command.

Cisco uBR Series Router
method {**modems** | **service-flows** | **utilization**}**us-method** {**modems** | **service-flows** | **utilization**}
no method

Cisco cBR Series Router
method {**modems** | **service-flows** | **utilization**}**us-method** {**modems** | **utilization**}
no method

Syntax Description

modems	Specifies the load balancing method for the number of modems on the CMTS.
service-flows	Specifies the load balancing method for the number of service flows on the CMTS.
utilization	Specifies the load balancing method for the interface utilization on the CMTS.
us-method {modems | service-flows | utilization}	Specifies the load balancing method for upstream (US) channels on modems, service-flows, or utilization. **Note** **service-flows** method is not supported in Cisco cBR-8 router.

Command Default

No default behavior or values.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **service-flows** keyword was removed.

Usage Guidelines

The upstream channel uses the same method as the downstream channel. Change the method of the upstream channel using the **method** command.

Examples

The following example shows how to select the method the CMTS uses to determine the load, using the **method** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
```

```
Router(config-lb-group)# method modems us-method service-flows
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

mgmt-ip

To define the local management IP address for a logical edge device, use the **mgmt-ip** command in the logical edge device protocol configuration mode. To reset to default configuration, use the **no** form of this command.

Note The **mgmt-ip** address should be in the same subnet as the IP address of interface VirtualPortGroup.

mgmt-ip *ip-address*
no mgmt-ip *ip-address*

Syntax Description

ip-address	Specifies the local management IP address.

Command Default

None

Command Modes

Logical edge device protocol configuration (config-video-led-protocol)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines the local management IP address for a logical edge device.

Examples

The following example shows how to define the local management IP address for a logical edge device:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)#logical-edge-device vod id 1
Router#(config-video-led)protocol gqi
Router#(config-video-led-protocol)mgmt-ip 172.16.0.1
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
mac-address	Defines the MAC address for a logical edge device.
server	Defines the server IP address of the session resource manager.
vcg	Specifies the virtual carrier group assigned to the logical edge device.
virtual-edge-input-ip	Defines a virtual edge input.

Command	Description
show cable video logical-edge-device	Displays the logical edge device information.
show cable video gqi connections	Displays the GQI connection information of the logical edge device with the Session Resource Manager.
show diag all eeprom detail | include MAC	Displays the chassis MAC address information.

mgmt-ip (DVB)

To configure the manangement IP for EIS/Broadcast ECMG, use the **mgmt-ip** command in the DVB scrambling configuration mode. To void the manangement IP configuration, use the **no** form of this command.

mgmt-ip *ip_address*
no mgmt-ip

ip_address	Specifies the management IP for EIS and Broadcast ECMG Connection.

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the manangement IP for EIS/Broadcast ECMG:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#mgmt-ip 1.24.2.10
```

Related Commands

Command	Description
dvb	Enters DVB scrambling configuration mode.
strong-pairing-enforce	Switches on the NDS strong pairing enforcement
check-scg-at-prov	Enables Check SCG at provision time.
scramble-video-audio	Scrambles only video and audio pids.
route-ecmg	Configures the route to the ECMG server.
ca-interface	Configures the conditional access interface.
tier-based	Enters the tier-based scrambling configuration mode.
ecmg	Enters the ECM Generator configuration mode.
eis	Enters the Event Information Scheduler configuration mode.

microcode (uBR10012)

To reload the microcode software images on a Parallel eXpress Forwarding (PXF) processor or on all line cards that support downloadable microcode, use the **microcode** command in global configuration mode.

microcode {**pxf** *filename* | **reload**}

Syntax Description

pxf	Reloads the microcode for the PXF processors on the Performance Routing Engine (PRE1) module.
filename	Specifies the microcode software image for the PXF processors by device name and filename.
reload	Reloads the microcode for all PRE1 modules and other line cards that support downloadable microcode software images.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(1)XF1	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, the Cisco uBR10012 router automatically loads all required microcode on to the PXF processors and other line cards when it loads the Cisco IOS software image. Also, the PRE1 module automatically reloads the microcode on a card when certain faults occur, allowing the card to recover from the fault.

You can reload the microcode on the PRE1 module or on all line cards that support downloadable microcode by using the **microcode** command. Typically, this is not needed and should be done only upon the advice of Cisco TAC or field service engineers.

Tip You can also reload the microcode on the PXF processors or on all cards using the **microcode reload** command in privileged EXEC mode. In particular, use the **microcode reload** command to reload the PXF processors with the default microcode that was loaded along with the Cisco IOS software image.

Examples

The following example shows how to reload the microcode on all PRE processors and line cards that support downloadable microcode:

```
Router# configure terminal

Router(config)# microcode reload
Reload microcode? [confirm] yes

00:49:41: Downloading Microcode: file=system:pxf/ubr10k-ucode.1.2.3,
version=1.1.0, description=Release Software created Wed 17-Jul-02 16:58
<<list of interfaces going down or coming up>>
```

```
00:49:42: !!pxf clients started, forwarding code operational!!
Router(config)#
```

The following example shows how to reload the microcode on the PXF processors on the PRE1 module, using a specific image that is stored in the Flash memory:

```
Router# configure terminal

Router(config)# microcode pxf flash:pxf/ubr10k-ucode.122.1.2.3

Reload microcode? [confirm] yes

1d04h: Downloading Microcode: file=flash:pxf/ubr10k-ucode.122.1.2.3, version=122.1.2.3,
description=Release Software created Thu 17-Oct-02 11:33
<<list of interfaces going down or coming up>>
1d04h: !!pxf clients started, forwarding code operational!!
Router(config)#
```

Related Commands

Command	Description
hw-module reset	Resets a particular PRE1 module or a particular line card.
microcode reload	Reloads the microcode software images on one or all line cards that support downloadable microcode.
show pxf microcode	Displays display identifying information for the microcode being used on the PXF processors.

microcode reload (uBR10012)

To reload the microcode software images on one or all line cards that support downloadable microcode, use the **microcode reload** command in privileged EXEC mode.

microcode reload {**all** | **pxf**} *device:* [*filename*]

Syntax Description

all	Reloads the microcode for all Performance Routing Engine (PRE1) modules and other line cards that support downloadable microcode software images.
pxf	Reloads the microcode for the Parallel eXpress Forwarding (PXF) processors on the PRE1 module.
device: [*filename*]	(Optional) Loads the PXF processors with the microcode software image that has the specific filename on the specific device. If no filename is specified, the first image found on the device is loaded by default.

Command Default

For **microcode reload pxf**, defaults to loading the microcode image that was originally loaded when the Cisco IOS software image was loaded.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(1)XF1	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, the Cisco uBR10012 router automatically loads all required microcode on to the PXF processors and other line cards when it loads the Cisco IOS software image. Also, the PRE1 module automatically reloads the microcode on a card when certain faults occur, allowing the card to recover from the fault.

You can reload the microcode on the PRE1 module or on all line cards that support downloadable microcode by using the **microcode reload** command. Typically, this is not needed and should be done only upon the advice of Cisco TAC or field service engineers.

Tip You can also reload the microcode on the PXF processors or on all cards using the **microcode** command in global configuration mode.

Examples

The following example shows how to reload the microcode on all PRE processors and line cards that support downloadable microcode:

```
Router# microcode reload all
Reload microcode? [confirm] yes

00:49:41: Downloading Microcode: file=system:pxf/ubr10k-1-ucode.122.1.0, version=122.1.0,
```

```
description=Release Software created Wed 17-Jul-02 16:58
<<list of interfaces going down or coming up>>
00:49:42: !!pxf clients started, forwarding code operational!!
Router#
```

The following example shows a typical list of devices that you can use when loading microcode for the PXF processors. This list might vary, depending on whether a standby PRE1 module is installed and depending on the version of Cisco IOS software being used.

```
Router# microcode reload pxf ?

   bootflash:      location of microcode
   disk0:          location of microcode
   disk1:          location of microcode
   flash:          location of microcode
   ftp:            location of microcode
   null:           location of microcode
   nvram:          location of microcode
   rcp:            location of microcode
   scp:            location of microcode
   sec-bootflash:  location of microcode
   sec-disk0:      location of microcode
   sec-disk1:      location of microcode
   sec-nvram:      location of microcode
   sec-slot0:      location of microcode
   sec-slot1:      location of microcode
   slot0:          location of microcode
   slot1:          location of microcode
   system:         location of microcode
   tftp:           location of microcode
   <cr>
Router#
```

The following example shows how to reload the microcode on the PXF processors on the PRE1 module, using a specific image that is stored in the Flash memory:

```
Router# microcode reload pxf flash:pxf/ubr10k-1-ucode.122.1.0.4

Reload microcode? [confirm] yes

3d00h: Downloading Microcode: file=flash:pxf/ubr10k-1-ucode.122.1.0.4, version=122.1.0.4,
description=Release Software created Thu 27-Jun-02 16:05
<<list of interfaces going down or coming up>>
3d00h: !!pxf clients started, forwarding code operational!!
Router#
```

Related Commands

Command	Description
hw-module reset	Resets a particular PRE1 module or a particular line card.
microcode	Reloads the microcode software images on one or all line cards that support downloadable microcode.
show pxf microcode	Displays display identifying information for the microcode being used on the PXF processors.

min-cp-duration

To configure the minimum crypto period, use the **min-cp-duration** command in the DVB scrambling ECMG overrule configuration mode. To void the minimum crypto period configuration, use the **no** form of this command.

min-cp-duration *time*
no min-cp-duration

min-cp-duration *time*	Specifies the minimum crypto period in milliseconds.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the minimum crypto period in milliseconds. The valid range is from 1000 to 3600000.

The following is an example of how to configure the minimum crypto period in milliseconds:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#min-cp-duration 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.

Command	Description
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

mode

To configure the application mode of ECMG, use the **mode** command in the DVB scrambling ECMG configuration mode. To void the ECMG application mode configuration, use the **no** form of this command.

mode {**broadcast** | **tier-based** | **vod linecard** *slot/bay*}
no mode

broadcast	Specifies the ECM application mode broadcast.
tier-based	Specifies the ECM application mode tier-based.
vod	Specifies the ECM application mode VOD.
slot/bay	Specifies the slot and bay of the linecard.

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the application mode of ECMG:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#mode vod linecard 7/0
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
auto-channel-id	Enables automatic channel ID selection.
connection	Configures the ECMG connection.
ecm-pid-source	Configures the source of ECM PID.
ca-system-id	Configures the CA system ID.
type	Configures the ECMG type.
desc-rule	Configures the descriptor rule.

Command	Description
overrule	Overrules the default settings.

modular-host subslot

To specify the modular-host line card that will be used foe DOCSIS 3.0 downstream or downstream channel bonding operations, use the **modular-host subslot** command in controller configuration mode. To remove the modular-host line card used for DOCSIS 3.0 downstream or downstream channel bonding operations, use the **no** form of this command.

modular-host subslot *slot/subslot*
no modular-host subslot *slot/subslot*

Syntax Description

slot/subslot	The location of the modular-host line card.

Command Default

No modular-host line card is configured for DOCSIS 3.0 downstream or downstream channel bonding operations.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the modular-host line card for DOCSIS 3.0 downstream or downstream channel bonding operations. This applies to the cable interface line card (for example, the Cisco uBR10-MC5X20S-D line card) that is used for these operations. The Wideband SPA itself does not support DOCSIS 3.0 downstream channel bonding operations.

Note A maximum of 3 SPA controllers can be hosted on a single cable interface line card.

Examples

The following example shows how to configure the modular-host line card for DOCSIS 3.0 downstream channel bonding operations for the Wideband SPA located in slot/subslot/bay 1/0/0:

```
Router(config)# controller modular-cable 1/0/0

Router(config-controller)# modular-host subslot 7/0
```

Related Commands

Command	Description
annex modulation	Sets the annex and modulation for the Wideband SPA.

Command	Description
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
ip-address (controller)	Sets the IP address of the Wideband SPA FPGA.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.
rf-channel network delay	Specifies the CIN delay for each RF channel.
rf-channel description	Specifies the description for each RF channel.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.

modulation

To set the QAM modulation format for a specific QAM profile, use the **annex** command in QAM profile configuration mode.

modulation {**256** | **64**}

Syntax Description

modulation {**256**| **64**}	Specifies the QAM modulation format: • **256**– 256-QAM modulation. • **64**– 64-QAM modulation.

Command Default

None

Command Modes

QAM profile configuration (config-qam-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the QAM modulation format for a specific QAM profile.

Examples

The following example shows how to set the QAM modulation format for a specific QAM profile:

```
Router# configure terminal
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)# modulation 256
```

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.
interleaver-depth	Set the interleaver-depth.
annex	Set the MPEG framing format.
spectrum-inversion	Set the spectrum-inversion on or off.
symbol-rate	Set the symbol rate.

monitoring-basics

To specify the type of monitoring for subscriber traffic management on a Cisco CMTS router, use the **monitoring-basics** command in enforce-rule configuration mode. To disable the selected monitoring, use the **no** form of this command.

monitoring-basics {**legacy** | **peak-offpeak**} {**docsis10** | **docsis11**}
no monitoring-basics {**legacy** | **peak-offpeak**} {**docsis10** | **docsis11**}

Syntax Description

legacy	Provides only one threshold and one monitoring duration.
peak-offpeak	Allows the selection of two peak durations within a day.
docsis10	Specifies application of the enforce-rule to DOCSIS 1.0 cable modems.
docsis11	Specifies application of the enforce-rule to DOCSIS 1.1 cable modems.

Command Default

The default for this command is **legacy** and **docsis10**.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(9a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Legacy monitoring (using the **legacy** keyword) occurs 24 hours a day, with no distinction between peak and offpeak hours. The available monitoring duration is between 10 minutes and 31 days.

Use the **peak-offpeak** keyword to set up monitoring duration and threshold for first peak, second peak, and offpeak monitoring. Each one can be different. After setting up first peak and second peak durations, the remaining hours are treated as offpeak. Monitoring happens during offpeak hours if the offpeak duration and threshold are defined. Monitoring duration is between 60 minutes and 23 hours.

Examples

The following example shows configuration of peak-offpeak monitoring for DOCSIS 1.1 cable modems:

```
Router(enforce-rule)# monitoring-basics peak-offpeak docsis11
```

The following example shows configuration of legacy monitoring for DOCSIS 1.1 on a Cisco cBR Series Converged Broadband Router:

```
Router(enforce-rule)#monitoring-basics legacy docsis11
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
debug cable subscriber-monitoring	Displays enforce-rule debug messages for subscriber traffic management on the Cisco CMTS routers.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
peak-time1	Specifies peak and offpeak monitoring times.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate the registered QoS profiles.
service-class (enforce-rule)	Identifies a particular service class for cable modem monitoring in an enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

monitoring-duration



Note Effective with Cisco IOS Release 12.3(9a)BC, the **monitoring-duration** command is replaced by the **duration** command.

To specify the time period and sample rate to be used for monitoring subscribers, use the **monitoring-duration** command in enforce-rule configuration mode. To reset an enforce-rule to its default values, use the **no** form of this command.

monitoring-duration *minutes* [**sample-rate** *minutes*]
no monitoring-duration

Syntax Description

minutes	Specifies the time (in minutes). The valid range is 10 to 10080, with a default of 360 (6 hours).
sample-rate minutes	(Optional) Rate of sampling, in minutes. The valid range is 1 to 30, with a default value of 15.

Command Default

The **monitoring-duration** value defaults to 360 minutes (6 hours), and the **sample-rate** value defaults to 15 minutes.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.2(15)BC2	The minimum **sample-rate** was reduced to 1 minute. Also, the **sample-rate** is not allowed to be set to a value greater than the **monitoring-duration** period. If you attempt to do so, the command is ignored and both parameters remain set to their current values.
12.3(9a)BC	This command was replaced by the **duration** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **sample-rate** *minutes* must be less than or equal to the **monitoring-duration** *minutes* period.

When you enable an enforce-rule, the Cisco CMTS router periodically checks the bandwidth being used by subscribers, to determine whether any subscribers are consuming more bandwidth than that specified by their registered QoS profile. The Cisco CMTS router keeps track of the subscribers using a sliding window that begins at each sample-rate interval and continues for the monitoring-duration period.

For example, with the default sample-rate interval of 15 minutes and the default monitoring-duration window of 360 minutes, the Cisco CMTS router samples the bandwidth usage every 15 minutes and determines the total bytes transmitted at the end of each 360-minute period. Each sample-rate interval begins a new sliding window period for which the Cisco CMTS router keeps track of the total bytes transmitted.

Note The **sample-rate** interval must be less than or equal to the **monitoring-duration** period. If you attempt to set the sample-rate interval to a value greater than the monitor-duration period, the command is ignored and the parameters are unchanged.

When you change the configuration of a currently active enforce-rule, that rule begins using the new configuration immediately to manage the cable modems tracked by this enforce-rule.

For more information about the Subscriber Traffic Management feature and to see an illustration of a sample monitoring window, refer to the Subscriber Traffic Management for the Cisco CMTS Routers feature document on Cisco.com.

Examples

The following example shows an enforce-rule being configured for a monitoring-duration period that is 20 minutes in length, with a sampling rate of every 10 minutes:

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential

Router(enforce-rule)# monitoring-duration 20 sample-interval 10
```

The following example shows the error message that is displayed when the **sample-rate** interval is configured to be greater than the **monitoring-duration** period. In this situation, the command is ignored and the parameters remain unchanged.

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential

Router(enforce-rule)# monitoring-duration 20 sample-interval 30

Monitoring duration cannot be less than the Sampling interval -- so the values
would remain unchanged
```

Related Commands

Command	Description
activate-rule at-byte-count	Specifies the number of bytes that a subscriber can transmit during the monitoring period on a Cisco CMTS router.
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers that violate their registered QoS profiles.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.

Command	Description
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

mute

To mute the port, use the **mute** command in the controller sub configuration mode. Use the **no** form of the command to unmute the port.

[**no**] **mute**

This command has no keywords or arguments.

Command Default

Default is no mute.

Command Modes

Controller sub configuration mode (config-controller).

Command History

Release	Modification
Cisco IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to mute the RF channel without changing any channel configuration.

The following example shows how to mute the RF channel:

```
router#configure terminal
router (config)#controller Integrated-Cable 3/0/1
router (config-controller)#rf-chan 15
router (config-rf-chan)#mute
router (config-rf-chan)#exit
router (config-controller)#exit
router (config)#exit
```

Related Commands

Command	Description
shutdown	Disables or enables the interface on a line card.

multicast-label

To create a multicast label used for table-based session configuration when more than one multicast source [S, G] is used as backup for the sessions, use the **multicast-label** command in cable video configuration mode.

multicast-label *label* **group** *group-ip* **source** *source-ip* **source2** *source-ip* **source3** *source-ip* **source4** *source-ip*

Syntax Description

label	Specifies the multicast label name.
group *group-ip*	Identifies the multicast group for the label.
source *source-ip* **source2** *source-ip* **source3** *source-ip* **source4** *source-ip*	Specifies the multicast sources for the label.

Command Default

None

Command Modes

Cable video configuration mode (config-video)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure a multicast label:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#table-based
Router(config-video-tb)#multicast-label mlabel1 group 236.0.1.1 source 175.10.5.2 source2
175.10.6.20 source3 175.10.7.2
```

Related Commands

Command	Description
cable video	Enters cable video configuration mode.
table-based	Enables table-based session configuration.

multicast-pool

To specify the multicast pool for the downstream controller profile, use the **multicast-pool** command in controller profile configuration mode. To void the multicast pool configuration, use the **no** form of this command.

multicast-pool *id*

no multicast-pool

Syntax Description

Syntax Description

id	Specifies the multicast pool ID.

Command Default

None

Command Modes

Controller profile configuration (config-controller-profile)

Command History

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the multicast pool for the downstream controller profile.

Examples

The following example shows how to specify the multicast pool for the downstream controller profile:

```
Router# configure terminal
Router(config)# cable downstream controller-profile 1
Router(config-controller-profile)# multicast-pool 1
```

Related Commands

Command	Description
cable downstream controller-profile	Configures the downstream controller profile.

multicast-uplink

To set a TenGigabit Ethernet port for multicast traffic, use the **multicast-uplink** command in cable video configuration mode.

multicast-uplink *interface-name* [**access-list** *access-list-name*]

interface-name	Specifies the interface for multicast traffic.
access-list *access-list-name*	Specifies the access list for the multicast uplink.

Command Default

None

Command Modes

Cable video configuration mode (config-video)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure a multicast uplink:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#multicast-uplink TenGigabitEthernet4/1/2
```

The following example shows how to configure a multicast uplink with an access list:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#multicast-uplink Port-channel23 access-list all-multicasts
```

Related Commands

Command	Description
cable video	Enters cable video configuration mode.

name

To specify the name of the CMTS tag, use the **name** command in the cmts-tag configuration mode. To remove the name, use the **no** form of this command.

name *tag-name*
no name *tag-name*

Syntax Description

tag-name	Name of the CMTS tag. The configured name is added to the DOCSIS load balancing group and policies.

Command Default

No default behavior or values.

Command Modes

CMTS tag mode (cmts-tag)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to give name to a CMTS tag using the **name** command:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(cmts-tag)# name cisco
```

Related Commands

Command	Description
cable load-balance docsis-group	To configure a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	To display real-time configuration, statistical and operational information for load balancing operations on the router.
cable tag	To configure a tag for a DOCSIS load balancing group on the CMTS.

nc

To configure the network controller for virtual ARPD, use the **nc** command in OOB virtual ARPD configuration mode. To void the network controller configuration, use the **no** form of this command.

nc *ip* **udp-port** *port_number*

no nc *ip* **udp-port** *port_number*

Syntax Description

ip	Specifies the IP address of the network controller.
port_number	Specifies the destination UDP port number.

Command Default

None

Command Modes

OOB Virtual ARPD configuration (config-oob-varpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the network controller for virtual ARPD.

Examples

The following example shows how to configure the network controller for virtual ARPD:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)# virtual-arpd 1
Router(config-oob-varpd)# nc 225.225.225.225 udp-port 23411
```

Related Commands

Command	Description
virtual-arpd	Defines a virtual ARPD configuration.
ip	Configures the virtual ARPD source IP address.
source-id	Configures the source ID for virtual ARPD.

network

To configure the DHCP address pool with the specified *network-number* and subnet *mask*, which are the DHCP *yiaddr* field and Subnet Mask (DHCP option 1) field, use the **network** command in global configuration mode. To remove this configuration, use the **no** form of this command.

network *network-number* [*mask*]
no network *network-number* [*mask*]

Syntax Description

network-number	The DHCP *yiaddr* field.
mask	Subnet Mask (DHCP option 1). If you do not specify the *mask* value, it is supported to 255.255.255.255.

Command Default

DHCP settings are not configured by default.

Command Modes

DHCP configuration

Command History

Release	Modification
Release 12.2(4)BC1	Supoported on the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command requires that you first use the **dhcp ip dhcp pool name** command in global configuration mode to enter DHCP configuration mode.

Note To create an address pool with a single IP address, use the **host** command instead of **network**.

For additional information about DHCP support on the Cisco CMTS, refer to the following document on Cisco.com:

- *DHCP and ToD Servers on the Cisco CMTS*

Examples

The following example illustrates use of the **network** command with the **ip dhcp pool name** command.

```
Router# configure terminal
Router(config)# ip dhcp pool name platinum
Router(dhcp-config)# network 10.10.10.0 255.255.0.0

Router(dhcp-config)#
```

Related Commands

Command	Description
ip dhcp pool name	Creates a DHCP address pool and enters DHCP pool configuration file mode.

network-delay

To configure the DEPI latency measurement, use the **network-delay dlm** command in core-interface configuration mode. To void the DEPI latency measurement configuration, use the **no** form of this command.

network-delay dlm *interval_in_seconds* **[measure-only]**

no network-delay dlm

Syntax Description

interval_in_seconds	Specifies the sampling interval in seconds.

Command Default

None

Command Modes

Core-interface configuration (config-rpd-core)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the DEPI latency measurement.

The following example shows how to configure the DEPI latency measurement:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/0/1
Router(config-rpd-core)# network-delay dlm 100
```

Related Commands

Command	Description
core-interface	Configures the core-interface of the RPD.

nls

To enable Network Layer signaliing (NLS) functionality, use the **nls** command in global configuration mode. To disable NLS functionality, use the **no** form of this command.

nls [**authentication**]
no nls [**authentication**]

Syntax Description

authentication	(Optional) Enables NLS protocol security authentication.

Command Default

Disabled.

Command Modes

Global configuaration

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

It is recommended that NLS message authentication is enabled all the time.

Examples

The following example shows nls enabled on a router:

```
router (config)# nls
```

Related Commands

Command	Description
cpd	Enables the CPD feature.
nls ag-id auth-key	Configures an Authorization Group Identifier (AG ID) for CMTS.
nls resp-timeout	Configures NLS response timeout.

nls ag-id auth-key

To configure an Authorization Group Identifier (AG ID) for CMTS, use the **nls ag-id auth-key** command in global configuration mode. To disable the AG ID, use the **no** form of this command.

nls ag-id *ag-id number* **auth-key** *auth-key char*
no nls ag-id auth-key

Syntax Description

ag-id number	Authorization Group Identifier. The valid range is 1- 4294967295.
auth-key char	Authentication key provisioned on CMTS. The valid range is 20-64 characters.

Command Default

Disabled

Command Modes

Global configuaration

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows configuring the AG ID:

```
Router(config) #  nls ag-id 345 auth-key aabbccddeeeeddccbbaa
```

Related Commands

Command	Description
cpd	Enables CPD.
nls	Enables Network Layer signaliing (NLS) functionality.
nls resp-timeout	Configures NLS response timeout.

nls resp-timeout

To configure the NLS response timeout, use the **nls resp-timeout** command in global configuration mode. To disable CPD, use the **no** form of this command.

nls resp-timeout *timeout number*
no nls resp-timeout *timeout number*

Syntax Description

timeout number	Controls the time CTMS will wait before getting a response for an NLS information request. The valid range is 1-60 seconds. Upon a response timeout, the CPD message is dropped.

Command Default

The default timeout is 1 second.

Command Modes

Global configuration

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows configuring the NLS response timeout:

```
Router(config)#nls rssp-timeout 35
```

Related Commands

Command	Description
cpd	Enables CPD.
nls	Enables Network Layer signalling (NLS) functionality.
nls ag-id auth-key	Configures an Authorization Group Identifier (AG ID) for CMTS.

ofdm-freq-excl-band

To specify the range of frequencies on this port that are excluded from all OFDM channels, use the **ofdm-freq-excl-band** command in controller configuration mode. To undo the frequency range assignment, use **no** form of this command.

ofdm-freq-excl-band start-frequency *frequency* **width** *value*

no ofdm-freq-excl-band start-frequency *frequency* **width** *value*

Syntax Description

frequency	Frequency of the left edge of the exclusion band in Hz.
value	Width of the exclusion band in Hz. Valid range is from 1000000 to 1110000000.

Command Default

None.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the range of frequencies on this port that are excluded from all OFDM channels.

Examples

The following example shows how to specify the range of frequencies on this port that are excluded from all OFDM channels:

```
Router# configure terminal
Router(config)# controller integrated-cable 3/0/0
Router(config-controller)# ofdm-freq-excl-band start-frequency 108000000 width 1000000
```

ofdm channel-profile

To configure the OFDM RF channel, use the **ofdm channel-profile** command in RF-channel configuration mode. To undo the configuration, use **no** form of this command.

ofdm channel-profile *id***start-frequency** *frequency***[width** *value***] [plc** *plc-spectrum-start-freq***]**

no ofdm channel-profile *id***start-frequency** *frequency***[width** *value***] [plc** *plc-spectrum-start-freq***]**

Syntax Description

ofdm channel-profile *id*	OFDM RF channel profile.
start-frequency *frequency*	OFDM RF channel start frequency in Hz.
width *value*	Channel width in Hz.
plc *plc-spectrum-start-freq*	PLC spectrum start frequency in Hz.

Command Default

None.

Command Modes

RF-channel configuration (config-rf-chan)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the OFDM RF channel.

Examples

The following example shows how to configure the OFDM RF channel:

```
Router# configure terminal
Router(config)# controller integrated-cable 3/0/0
Router(config-controller)# rf-chan 158
Router(config-rf-chan)# ofdm channel-profile 0 start-frequency 627000000 width 192000000
plc 720000000
```

onid

To override the default ONID, use the **onid** command in the service distribution group configuration mode. To revert back to the default ONID, use the **no** form of the command.

onid *number*

Syntax Description

number	Defines the new ONID value. By default, the system ONID is 0, which is commonly used in North America.

Command Default

None.

Command Modes

Service distribution group configuration mode (config-video-sdg)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to override the default ONID value. If you perform this configuration, all channels associated with the configured SDG will have the new ONID value.

The following example shows how to override the default ONID value:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-distribution-group sdg id 1
router(config-video-sdg)#onid 100
```

Related Commands

Command	Description
service-distribution-group	Defines a service distribution group.
rf-port integrated-cable	Defines the physical slot/bay/port to be used in a video service.
psi-interval	Override the default PSI value.
show cable video service-distribution-group	Displays the SDG configuration.

oui

To configure the Organizational Unique Identifier (OUI) of the CM for the CMTS tag, use the **oui** command in the cmts-tag configuration mode. To remove the configured OUI from the CMTS tag, use the **no** form of this command.

[**exclude**] **oui** *oui-of-CM*
no oui *oui-of-CM*

Syntax Description

exclude	(Optional) Configures the tag to exclude the specified OUI.
oui-of-CM	MAC address prefix of the vendor.

Command Default

None

Command Modes

CMTS tag mode (cmts-tag)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the OUI for the CMTS tag using the **oui** command:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(cmts-tag)# oui 00.1a.c3
```

Related Commands

Command	Description
cable load-balance docsis-group	To configure a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	To display real-time configuration, statistical and operational information for load balancing operations on the router.
cable tag	To configure a tag for a DOCSIS load balancing group on the CMTS.

output-rate

Note Starting with Cisco IOS Release 12.2(33)SCG, the **output-rate** command is not supported on the Cisco uBR10012 router.

To specify a custom-defined output line rate to a WAN interface instead of the default output line rate, use the **output-rate** command in interface configuration mode. Use the **no** form of this command to use the default output line rate.

output-rate *rate*
no output-rate

Syntax Description

rate	Output rate to the WAN interface, in kilobits per second. Valid values range from 1 to 1,000,000.

Command Default

Gigabit Ethernet output line rate is 1,000,000 kbps.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCG	Support for this command was removed for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies a custom-defined output line rate for the WAN interface.

Starting with Cisco IOS Release 12.2(33)SCG, the **output-rate** command is not supported and the value 10,000 is used for the output line rate on a Cisco uBR10012 router.

Examples

The following example shows how to specify a custom-defined output line rate for the WAN interface:

```
Router# configure terminal
Router(config
)# interface gigabitethernet 1/0/0
Router(config-if
)# output-rate 100
```

Related Commands

Command	Description
show running-config interface gigabitethernet	Displays the configuration settings for the specified Gigabit Ethernet interface.

Command	Description
show interfaces gigabitethernet	Displays the status and configuration settings for Gigabit Ethernet interfaces.

override

To override the Type/Length/Value (TLV) or SNMP when assigning a restricted load balancing group (RLBG) to CM, use the **override** command in the cmts-tag configuration mode. To reenable the TLV or SNMP when assigning a RLBG to CM, use the **no** form of this command.

override
no override

Command Default

TLV or SNMP are effective when assigning a RLBG to CM.

Command Modes

CMTS tag mode (cmts-tag)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to override the TLV or SNMP when assigning a RLBG using the **override** command:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(cmts-tag)# override
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.
cable tag	Configures a tag for a DOCSIS load balancing group on the CMTS.

overrule

To overrule the default settings, use the **overrule** command in the DVB scrambling ECMG configuration mode. To void the overrule configuration, use the **no** form of this command.

overrule
no overrule

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to overrule the default settings:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.
min-cp-duration	Specifies the minimum crypto period.
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.

Command	Description
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

overwrite-scg

To enable Scrambling Control Group (SCG) overwrite, use the **overwrite-scg** command in the DVB scrambling EIS configuration mode. To disable the SCG overwrite, use the **no** form of this command.

overwrite-scg
no overwrite-scg

Command Default

None

Command Modes

DVB scrambling EIS configuration mode (config-video-encrypt-dvb-eis)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to enable Scrambling Control Group (SCG) overwrite:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#eis EIS-1 id 1
Router(config-video-encrypt-dvb-eis)#overwrite-scg
```

Related Commands

Command	Description
eis	Enters the Event Information Scheduler configuration mode.
listening-port	Configures the listening TCP port.
cp-overrule	Overrules and specifies the crypto period duration.

packetcable

To enable PacketCable operations on the Cisco CMTS, use the **packetcable** command in global configuration mode. To disable PacketCable operations, use the **no** form of this command.

packetcable
no packetcable

Syntax Description

This command has no keywords or arguments.

Command Default

PacketCable operation is disabled.

Command Modes

Global Configuration (config)

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(11)BC1	Support was added for automatically creating a random Element ID when PacketCable operations are enabled.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables PacketCable operations on all cable interfaces and takes effect immediately. If you do not need to change any parameters from their default values, this is the only command needed to enable PacketCable operations.

In Cisco IOS Release 12.2(11)BC1 and later releases, this command also automatically creates a random Element ID for the CMTS that is in the range of 0 and 99,999. To ensure that this Element ID is unique across the entire PacketCable domain, you should use the **packetcable element-id** command.



Note PacketCable operations can be configured together with HCCP N+1 redundancy, but the PacketCable states are not synchronized between the Working and Protect interfaces. If a switchover occurs, existing voice calls continue, but when the user hangs up, PacketCable event messages are not generated because the Protect interface is not aware of the previous call states. However, new voice calls can be made and proceed in the normal fashion.

Channel Width Limitations

The 200,000 Hz channel width cannot be used on upstreams that support PacketCable voice calls, or on any upstreams that use Unsolicited Grant Service (UGS) or UGS with Activity Detection (UGS-AD) service flows. Using this small a channel width with voice and other UGS/UGS-AD service flows results in calls being rejected because of “DSA MULTIPLE ERRORS”.

Examples

The following example shows PacketCable operation being enabled:

```
Router# configure terminal
Router(config)# packetcable
Router(config)#
```

The following example shows PacketCable operation being disabled (default):

```
Router# configure terminal
Router(config)# no packetcable
Router(config)#
```

Related Commands

Command	Description
clear packetcable gate counter commit	Resets the counters that track the total number of committed gates.
packetcable authorize vanilla-docsis-mta	Allows Unsolicited Grant Service (UGS) service flows without a proper PacketCable gate ID when PacketCable operations are enabled on the Cisco CMTS.
packetcable element-id	Configures the PacketCable Event Message Element ID.
packetcable gate maxcount	Changes the maximum number of PacketCable gate IDs in the gate database on the Cisco CMTS.
packetcable timer	Changes the value of the different PacketCable DQoS timers.
show packetcable gate	Displays information about one or more gates in the gate database.
show packetcable gate counter commit	Displays the total number of committed gates since system reset or since the counter was last cleared.
show packetcable global	Displays the current PacketCable configuration.

packetcable authorize vanilla-docsis-mta

To allow Unsolicited Grant Service (UGS) service flows without a proper PacketCable gate ID when PacketCable operations are enabled on the Cisco CMTS, use the **packetcable authorize vanilla-docsis-mta** command in global configuration mode. To prevent CMs from requesting non-PacketCable UGS service flows when PacketCable operations are enabled, use the **no** form of this command.

packetcable authorize vanilla-docsis-mta
no packetcable authorize vanilla-docsis-mta

Syntax Description

This command has no keywords or arguments.

Command Default

Non-PacketCable UGS service flows are not allowed when PacketCable operations are enabled.

Command Modes

Global Configuration (config)

Command History

Release	Modification
12.2(11)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

By default, when PacketCable operations are enabled (using the **packetcable** ccommand), CMs must follow the PacketCable protocol when requesting UGS service flows. This prevents DOCSIS CMs that do not support PacketCable operations from using DOCSIS-style UGS service flows.

If you have a mixed network that contains both PacketCable and non-PacketCable DOCSIS CMs, you can allow DOCSIS CMs to request UGS service flows by using the **packetcable authorize vanilla-docsis-mta** command. If, however, your CMTS is providing PacketCable services, use the **no packetcable authorize vanilla-docsis-mta** command to disable DOCSIS-style service flows. This is the default configuration when PacketCable operations are enabled, and it requires that CMs must provide a validly authorized gate ID before being granted a UGS service flow.

Examples

The following example shows PacketCable operation being enabled, while still allowing DOCSIS-style UGS service flows:

```
Router# configure terminal
Router(config)# packetcable
Router(config)# packetcable authorize vanilla-docsis-mta
```

The **show packetcable global** command has also been enhanced to display whether non-PacketCable DOCSIS-style UGS service flows are allowed.

The following is a sample output on the Cisco uBR10012 router:

```
Router# show packetcable global
Packet Cable Global configuration:
```

```
Enabled   : Yes
Element ID: 12456
Max Gates : 1048576
Allow non-PacketCable UGS
Default Timer value -
  T0      : 30000 msec
  T1      : 300000 msec
  T2      : 2000 msec
  T5      : 500 msec
Router#
```

The following is a sample output on a Cisco cBR series router:

```
Router# show packetcable global
Packet Cable Global configuration:
Packetcable DQOS Enabled   : Yes
Packetcable Multimedia Enabled   : No
Element ID: 88330
Max Gates : 512000
Allow non-PacketCable UGS
Default Multimedia Timer value -
  T1              : 200000 msec
  Persistent gate : 0 hour
  Volume Limit    : STOPPED
Default DQoS Timer value -
  T0      : 30000 msec
  T1      : 300000 msec
Client Accept Timer: Disabled
Client Accept Timer Expired: 0
Packetcable DQOS Gate Send SubscriberID Enabled:  No

Router#
```

Related Commands

Command	Description
clear packetcable gate counter commit	Resets the counters that track the total number of committed gates.
packetcable	Enables PacketCable operations on the Cisco CMTS.
packetcable element-id	Configures the PacketCable Event Message Element ID.
packetcable gate maxcount	Changes the maximum number of PacketCable gate IDs in the gate database on the Cisco CMTS.
packetcable timer	Changes the value of the different PacketCable DQoS timers.
show packetcable gate	Displays information about one or more gates in the gate database.
show packetcable gate counter commit	Displays the total number of committed gates since system reset or since the counter was last cleared.
show packetcable global	Displays the current PacketCable configuration.

packetcable element-id

To configure the PacketCable Event Message Element ID on the Cisco CMTS, use the **packetcable element-id** command in global configuration mode. To reset the counter to its default value, use the **no** form of this command.

packetcable element-id *n*
no packetcable element-id

Syntax Description

n	PacketCable Event Message Element ID for the Cisco CMTS. The valid range is 0 through 99999, with a default that is a random number in that range.

Command Default

A random value between 0 and 99,999.

Command Modes

Global Configuration (config)

Command History

Release	Modification
12.2(11)BC1	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The PacketCable Event Message specification (PKT-SP-EM-I03-011221) requires that each trusted PacketCable network element that generates an Event Message MUST identify itself with a static Element ID that is unique across an entire PacketCable domain. This command allows you to configure the CMTS with an Element ID that is unique for your particular network. If you do not manually configure this parameter with the **packetcable element-id** command, it defaults to a random value between 0 and 99,999 when PacketCable operations is enabled.

The CMTS includes the Element ID in its Event Messages, along with its timezone information. You can display the current value using the **show packetcable global** command.

Examples

The following example shows the Event Message Element ID for this particular CMTS being set to 12456:

```
Router# configure terminal
Router(config)# packetcable element-id 12456
Pktcbl: Configured element ID 12456
Router(config)#
```

Related Commands

Command	Description
packetcable	Enables PacketCable operations on the Cisco CMTS.

Command	Description
packetcable authorize vanilla-docsis-mta	Allows Unsolicited Grant Service (UGS) service flows without a proper PacketCable gate ID when PacketCable operations are enabled on the Cisco CMTS.
packetcable gate maxcount	Changes the maximum number of PacketCable gate IDs in the gate database on the Cisco CMTS.
packetcable timer	Changes the value of the different PacketCable DQoS timers.
show packetcable global	Displays the current PacketCable configuration, including the Element ID.

packetcable gate maxcount

To change the maximum number of PacketCable gate IDs in the gate database on the Cisco CMTS, use the **packetcable gate maxcount** command in global configuration mode. To reset the counter to its default value, use the **no** form of this command.

packetcable gate maxcount *n*
no packetcable gate maxcount

Syntax Description

n	Maximum number of gate IDs to be allocated in the gate database on the CMTS. The valid range on the Cisco uBR10012 and Cisco uBR7200 series routers is 512 through 2097152, with a default value of 2097152 (8 * 512 * 512), which is sufficient to support 8 cable interface line cards. The valid range on the Cisco cBR series routers is 1 to 512000 and the default is 512000.

Command Default

2097152 gate IDs on the Cisco uBR10012 and Cisco uBR7200 series routers.

512000 gate IDs on the Cisco cBR series routers.

Command Modes

Global Configuration (config)

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(11)BC2	The maximum number of possible gates and the default number of gates were doubled from 1,048,576 to 2,097,152 to accommodate a maximum of eight cable interface line cards (where each cable interface line card can use a maximum of 512*512, or 262,144, gates).
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command configures the number of gate IDs that the Cisco CMTS can store in its gate database. Because each PacketCable gate ID typically refers to both an upstream gate and a downstream gate, multiply this number by 2 to get the maximum number of gates that can be created on the Cisco CMTS.



Note Each cable interface line card on the Cisco uBR10012 and Cisco uBR7200 series routers supports a maximum of 512*512 (262,144) PacketCable gates, so ensure that you set the maximum number of gates to accommodate all installed cable interface line cards.

Examples

The following example shows the maximum number of gate IDs being set to 524288 on the Cisco uBR10012 router, which is sufficient for two cable interface line cards:

```
Router# configure terminal
Router(config)# packetcable gate maxcount 524288
```

The following example shows the maximum number of gate IDs being set to 10 on a Cisco cBR series router:

```
Router# configure terminal
Router(config)# packetcable gate maxcount 10
```

Related Commands

Command	Description
packetcable	Enables PacketCable operations on the Cisco CMTS.
packetcable authorize vanilla-docsis-mta	Allows Unsolicited Grant Service (UGS) service flows without a proper PacketCable gate ID when PacketCable operations are enabled on the Cisco CMTS.
packetcable element-id	Configures the PacketCable Event Message Element ID.
packetcable timer	Changes the value of the different PacketCable DQoS timers.
show packetcable global	Displays the current PacketCable configuration.

packetcable gate send-subscriberID

To include subscriber identification in GATE-OPEN and GATE-CLOSE gate control messages, use the **packetcable gate send-subscriberID** command in global configuration mode. To remove subscriber identification information from the gate control messages, use the **no** form of this command.

packetcable gate send-subscriberID
no packetcable gate send-subscriberID

Syntax Description

This command has no arguments or keywords.

Command Default

No subscriber identification information is provided in the GATE-OPEN and GATE-CLOSE gate control messages.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.3(23)BC1	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example enables gate control subscriber identification information using the **packetcable gate send-subscriberID** command:

```
Router(config)# packetcable gate send-subscriberID
```

Related Commands

Command	Description
packetcable	Enables PacketCable operation.
show packetcable gate	Displays information about one or more gates in the gate database.
show packetcable global	Displays the current PacketCable configuration.

packetcable multimedia

To enable the Cisco CMTS router to start or stop responding to PCMM COPS messages received from the PCMM Policy Server, use the **packetcable multimedia** command in the Global Configuration (config) mode.

packetcable multimedia

no packet cable multimedia

To configure the SessionClassID that the Cisco CMTS router applies to high priority PCMM calls, use the **packetcable multimedia high-priority** command in the Global Configuration (config) mode.

packetcable multimedia high-priority *priority*

Syntax Description

high-priority	To configure the SessionClassID for high priority calls.
priority	SessionClassID of the high priority (911) calls.

Command Default

The default SessionClassID of high priority (911) calls is 15.

Command Modes

Global Configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	The **packetcable multimedia** command was implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Amsterdam 17.3.1x	The **packetcable multimedia high-priority** command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Enable packetcable multimedia before you use **packetcable multimedia high-priority** *priority*.

packetcable timer

To change the value of the different PacketCable Dynamic Quality of Service (DQoS) timers, use the **packetcable timer** command in global configuration mode. To reset a timer to its default value, use the **no** form of this command.

packetcable timer {**T0** *timer-value* | **T1** *timer-value* | **multimedia T1** *timer-value*}
no packetcable timer {**T0** *timer-value* | **T1** *timer-value* | **multimedia T1** *timer-value*}

Syntax Description

T0 *timer-value*	Sets the T0 timer in milliseconds. The valid range is from 1 to 1,000,000,000 milliseconds, with a default value of 30000 milliseconds (30 seconds).
T1 *timer-value*	Sets the T1 timer in milliseconds. The valid range is from1 to 1,000,000,000 milliseconds, with a default value of 200000 milliseconds (200 seconds).
multimedia T1 *timer-value*	Sets the PacketCable multimedia T1 timer in milliseconds. The valid range is 1 to 1,000,000,000 milliseconds, with a default value of 200000 milliseconds (200 seconds).

Command Default

None

Command Modes

Global Configuration (config)

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(11)BC2	The T2 and T5 timers were removed to conform to the requirements of the PacketCable DQoS Engineering Change Notice (ECN) 02148.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the following timers, which are defined in the *PacketCable™ Dynamic Quality-of-Service Specification* (PKT-SP-DQOS-I03-020116):

- T0 specifies the amount of time that a gate ID can remain allocated without any specified gate parameters. The timer begins counting when a gate is allocated with a Gate-Alloc command. The timer stops when a Gate-Set command marks the gate as Authorized. If the timer expires without a Gate-Set command being received, the gate is deleted.
- T1 specifies the amount of time that an authorization for a gate can remain valid. It begins counting when the CMTS creates a gate with a Gate-Set command and puts the gate in the Authorized state. The timer stops when the gate is put into the committed state. If the timer expires without the gate being committed, the CMTS must close the gate and release all associated resources.



Note The new timer values apply to all gates that are created after giving the command. Existing gates are not affected.

Examples

The following example shows the T0 timer being set to 20 seconds (20,000 milliseconds):

```
Router# configure terminal
Router(config)# packetcable timer T0 20000
```

Related Commands

Command	Description
packetcable	Enables PacketCable operations on the Cisco CMTS.
packetcable authorize vanilla-docsis-mta	Allows Unsolicited Grant Service (UGS) service flows without a proper PacketCable gate ID when PacketCable operations are enabled on the Cisco CMTS.
packetcable element-id	Configures the PacketCable Event Message Element ID.
packetcable gate maxcount	Changes the maximum number of PacketCable gate IDs in the gate database on the Cisco CMTS.
show packetcable global	Displays the current PacketCable configuration.show packetcable global

pcr-based-source-switch

To configure source switching of multicast SPTS streams to be based on PCR PID bitrate instead of stream bitrate, use the **pcr-based-source-switch** command in video configuration mode. To disable the PCR PID based source switch, use the **no** form of this command.

pcr-based-source-switch

no pcr-based-source-switch

Command Default

None

Command Modes

Video configuration (config-video)

Command History

Release	Modification
Cisco IOS XE 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to enable PCR PID based source switch:

```
Router(config)#cable video
Router(config-video)#pcr-based-source-switch
```

peak-time1

To specify peak and offpeak monitoring times on a Cisco CMTS router, use the **peak-time1** command in enforce-rule configuration mode. To disable configuration of peak monitoring times, use the **no** form of this command.

peak-time1 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
peak-time2 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
duration *offpeak-minutes* **avg-rate** *offpeak-minutes*
sample-interval minutes]*minutes* [**penalty** *minutes*] {**downstream** | **upstream**}[**enforce**]
no peak-time1 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
peak-time2 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
duration *offpeak-minutes* **avg-rate** *offpeak-minutes*
sample-interval minutes]*minutes* [**penalty** *minutes*] {**downstream** | **upstream**}[**enforce**]

Cisco cBR Series Converged Broadband Routers
peak-time1 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
peak-time2 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
duration *offpeak-minutes* **avg-rate** *offpeak-minutes*
sample-interval minutes*minutes* [**penalty-period** *minutes*] {**downstream** | **upstream**}[**enforce**]
no peak-time1 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
peak-time2 {*hourhour:minutes*} **duration** *minutes* **avg-rate** *rate*
duration *offpeak-minutes* **avg-rate** *offpeak-minutes*
sample-interval minutes*minutes* [**penalty-period** *minutes*] {**downstream** | **upstream**}[**enforce**]

Syntax Description

hour | *hour:minutes*	Specifies the time of day, in either hh or hh:mm format, during which monitoring occurs for the peak time. If the time is specified in hour (hh), the valid range is 1 to 23 using a 24-hour clock. If the time is specified in hour:minutes (hh:mm), the valid range for hour is 1 to 23 using a 24-hour clock, and the valid range for minutes is 0 to 59.
duration *minutes*	Specifies the size of the sliding window (in minutes) during which the subscriber usage is monitored for the first peak time, and optionally for a second peak time when used with the **peak-time2** keyword. The valid range is 60 to 1440. For Cisco cBR Series Converged Broadband Routers, the valid range is 6 to 1440.
avg-rate *rate*	Specifies the average sampling rate in kilobits per second for the specified duration. The valid range is 1 to 400000 kilobits with no default.
duration *offpeak-minutes*	(Optional) Specifies the size of the sliding window (in minutes) during which the subscriber usage is monitored for the remaining offpeak time (time not specified for peak monitoring). The valid range is 60 to 1440. For Cisco cBR Series Converged Broadband Routers, the valid range is 6 to 1440.
avg-rate *offpeak-rate*	Specifies the average sampling rate in kilobits per second for the specified offpeak duration. The valid range is 1 to 400000 kilobits with no default.

peak-time2 hour | hour:minutes	(Optional) Specifies the time of day during which monitoring occurs for a second peak time. The time can be specified either in hour or hour:minutes format. The valid range for hour is 1 to 23 using a 24-hour clock, and the valid range for minutes is 0 to 59.
sample-interval *minutes*	Specifies how often (in minutes) the CMTS router should sample a service flow to get an estimate of subscriber usage. The valid range is 1 to 30, with a default value of 15.
penalty *minutes*	(Optional) Specifies the period (in minutes) during which a cable modem can be under penalty. The valid range is 1 to 10080.
penalty-period *minutes*	(Optional) Specifies the period during which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile.
downstream	Specifies monitoring of traffic in the downstream direction.
upstream	Specifies monitoring of traffic in the upstream direction.
enforce	(Optional) Specifies that the enforce-rule QoS profile should be applied automatically if a user violates their registered QoS profile.

Command Default

Peak and offpeak monitoring is disabled. The only default value for the **peak-time1** command is the 15-minute sample interval.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(9a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD2	The **minute-level granularity (hh:mm) for peak-time1and peak-time2 duration, and the penalty** keyword option were added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **penalty** keyword option was removed. The **penalty-period** option was added.

Usage Guidelines

Note This command is applicable only after the **monitoring-basics** command is configured with the keyword **peak-offpeak**.

You can monitor two peak monitoring periods using the initial **peak-time1** command and its options, followed by the **peak-time2** keyword and the corresponding options. The remaining hours are considered offpeak and can be monitored by configuring the optional **duration** keyword and the corresponding options.

The **penalty** duration, which is configured using the **peak-time1** command, is unique to weekdays, and takes precedence over the global penalty duration configured using the **penalty-period** command.

When you use the **show running-configuration** command to display the configuration, the keyword options for the **peak-time1** command are truncated. In the following example, "d" represents **duration** (a single peak and offpeak duration are configured), "avg" represents **avg-rate**, "sa" represents **sample-interval**, "pen" represents penalty, "do" represents **downstream**, and "enf" represents **enforce**:

```
Router# show running-configuration
.
.
.
peak-time1 1 d 60 avg 2 d 60 avg 40 sa 10 pen 11 do enf
```

Examples

The following example shows an enforce-rule that defines two peak monitoring periods for upstream traffic:

```
Router(enforce-rule)# peak-time1 10:30 duration 120 avg-rate 10 peak-time2 23 duration 60
avg-rate 10 sample-interval 10 penalty 11 upstream enforce
```

The following example shows an enforce-rulebeing configured on a Cisco cBR Series Converged Broadband Router:

```
Router(enforce-rule)# peak-time1 1 duration 6 avg-rate 1 sample-interval 1 penalty-period
1 downstream enforce
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
debug cable subscriber-monitoring	Displays enforce-rule debug messages for subscriber traffic management on the Cisco CMTS routers.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
monitoring-basics	Specifies the type of monitoring for subscriber traffic management on a Cisco CMTS router.
penalty-period	Specifies the period during which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles. This command is applicable for DOCSIS 1.0 cable modems
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule. This command is applicable for DOCSIS 1.0 cable modems

Command	Description
service-class (enforce-rule)	Identifies a particular service class for cable modem monitoring in an enforce-rule. This command is applicable for DOCSIS 1.1 or later cable modems.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.
weekend peak-time1	Configures peak and offpeak subscriber monitoring over weekends on a Cisco CMTS router.

penalty-period

To specify the time period that an enforced quality of service (QoS) profile should be in force for subscribers that violate their registered QoS profile, use the **penalty-period** command in enforce-rule configuration mode. To reset an enforce-rule to its default penalty period, use the **no** form of this command.

penalty-period *minutes* [**time-of-day** *hour*]
no penalty-period *minutes* [**time-of-day** *hour*]

Cisco cBR Series Converged Broadband Routers
penalty-period *minutes* [**time-of-day** {*hourhour:minutes*}**monitoring-on**]
no penalty-period *minutes* [**time-of-day** {*hourhour:minutes*}**monitoring-on**]

Syntax Description

minutes	Specifies a time period (in minutes) during which a cable modem (CM) can be under penalty. The range is 1 to 10080, with a default value of 10080 (7 days).
time-of-day *{hour | hour:minutes}*	(Optional) Specifies the time of day (in hh or hh:mm format) when: • A CM that is under penalty is released from the penalty period. • A CM that is not under penalty has its subscriber monitoring counters reset. If the time of day is specified in hour (hh), the valid range is 1 to 23 using a 24-hour clock. If the time of day is specified in hour:minutes (hh:mm), the valid range for hour is 1 to 23 using a 24-hour clock, and the valid range for minutes is 0 to 59.
monitoring-on	(Optional) Specifies that monitoring should be turned on after the penalty release time. If this keyword is not specified, by default, monitoring is turned off after the release time, until the end of the day, that is 00:00 hrs.

Command Default

The default time period is 10080 minutes (7 days).

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(9a)BC	This command was integrated into Cisco IOS Release 12.3(9a)BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.3(23)BC2	The **time-of-day** keyword option was added.
12.2(33)SCB	The **time-of-day** keyword option was integrated into Cisco IOS Release 12.2(33)SCB.
12.3(23)SCD2	The **minute-level granuality for the time-of-day** duration, and the **monitoring-on** keyword option were added.

Release	Modification
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When a subscriber overconsumes the maximum bandwidth that is specified in the enforce-rule, the Cisco CMTS router can automatically switch the subscriber to an enforced QoS profile for the time duration configured with the **penalty-period** command. When the penalty period expires, the Cisco CMTS router restores the subscriber to their registered QoS profile.

The penalty duration specified in the **penalty-period** command is a global configuration. This penalty duration is overridden if the individual penalty duration is already configured using the **duration**, **weekend duration, peaktime1** or **weekend peaktime1** commands. Similarly, if the individual penalty duration is not configured, the global penalty duration is used. The table below explains in detail the criteria for choosing the penalty duration:

Table 33: Criteria for Choosing Penalty Duration

Global Penalty-Period Configured	Weekday Penalty-Period Configuration (CLI: duration or peaktime1)	Weekend Penalty-Period Configuration (CLI: weekend duration, or weekend peaktime1)	Applied Penalty Duration for Weekdays	Applied Penalty Duration for Weekends
Yes	Yes	Yes	Weekday Penalty Configuration	Weekend Penalty Configuration
Yes	Yes	No	Weekday Penalty Configuration	Global Penalty Configuration
Yes	No	Yes	Global Penalty Configuration	Weekend Penalty Configuration
Yes	No	No	Global Penalty Configuration	Global Penalty Configuration

If the keyword monitoring-on is specified, monitoring starts immediately after the cable modems are released from penalty. However if this keyword is not specified, by default, all the cable modems using the enforce-rule are not monitored until the end of day, that is, 00:00 hrs.

The penalty period continues across reboots of the cable modem, so a user cannot avoid the enforced QoS profile by trying to reset their modem and reregister on the cable network. This allows service providers to set an appropriate penalty for users who consistently exceed the allocated maximum bandwidth.

Note To manually move a DOCSIS 1.0 cable modem back to its registered profile before the end of the penalty period, use the **cable modem qos profile** command. To manually move a DOCSIS 1.1(or later) cable modem back to its registered profile before the end of the penalty period, use the **cable modem** {**ip-address** | **mac-address**} **service-class-name** command.

When you change the configuration of a currently active enforce-rule, that rule begins using the new configuration immediately to manage the cable modems tracked by this enforce-rule.



Note Before making any changes to an active enforce-rule, we recommend that you first disable the enforce rule using the no enabled command.

A cable modem consists of two service flows, Primary upstream and Primary downstream. If a DOCSIS 1.0 cable modem enters the penalty period because one of its service flows has exceeded its allowed bandwidth, the QoS profile of the entire modem is changed. However, if a DOCSIS 1.1 or later cable modem enters the penalty period because its upstream or downstream service flow has exceeded the allowed bandwidth threshold, the service class name is changed only for the upstream or downstream service flow.

Examples

The following example shows an enforce-rule named “test”, which is configured with a penalty period of 1440 minutes (1 day):

```
Router# configure terminal

Router(config)# cable qos enforce-rule test

Router(enforce-rule)# penalty-period 1440
```

The following example shows an enforce-rule named “test”, which is configured with a penalty period of 1440 minutes (1 day), but allowing the removal of the cable modems in penalty at 23:00. Monitoring will be turned off by default at 23:00, to 00:00 (1 hour):

```
Router# configure terminal

Router(config)# cable qos enforce-rule test

Router(enforce-rule)# penalty-period 1440 time-of-day 23
```

The following example shows an enforce-rule named “test”, which is configured with a penalty period of 1440 minutes (1 day), allowing the removal of the cable modems in penalty at 23:00. However, after the cable modems are released from penalty, fresh monitoring starts, with all the subscriber monitoring counters reset to 0:

```
Router# configure terminal

Router(config)# cable qos enforce-rule test

Router(enforce-rule)# penalty-period 1440 time-of-day 23 monitoring-on
```

The following example shows an enforce-rule being configured with a penalty period on a Cisco cBR Series Converged Broadband Router:

```
Router(enforce-rule)# penalty-period 1 time-of-day 1 monitoring-on
```

Related Commands

Command	Description
activate-rule at-byte-count	Specifies the number of bytes that a subscriber can transmit during the monitoring period on a Cisco CMTS router.

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic monitoring, and enters the enforce-rule configuration mode.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles. This command is applicable for only DOCSIS 1.0 cable modems.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule. This command is applicable for only DOCSIS 1.0 cable modems.
service-class (enforce-rule)	Specifies a service class (enforced or registered) that should be used for the cable modem monitoring in an enforce-rule. This command is applicable for DOCSIS 1.1 or later cable modems.
show cable qos enforce-rule	Displays the QoS enforce-rules that are defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

periodic-rel-pxf enable

To enable the Reload PXF in the Standby PRE Support feature, use the **periodic-rel-pxf enable** command in redundancy configuration mode. To disable the Reload PXF in the Standby PRE feature, use the **no** form of this command.

periodic-rel-pxf enable
no periodic-rel-pxf enable

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Redundancy configuration (config-red)

Command History

Release	Modification
12.2(33)SCG2	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **periodic-rel-pxf enable** command is used to enable the Reload PXF on Standby PRE Support feature.

The **periodic-rel-pxf enable** command is supported on Cisco uBR10012 router only.

Examples

The following example shows how to enable the Reload PXF on Standby PRE feature on the Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# redundancy
Router(config-red
)# periodic-rel-pxf enable
Router(config-red
)# end
```

Related Commands

Command	Description
redundancy	Enters redundancy configuration mode.

ping docsis

To determine whether a specific cable modem (CM) is reachable from the CMTS at the DOCSIS MAC layer, use the **ping docsis** command in privileged EXEC mode.

ping docsis {*mac-addr ip-addr* | **name** *fqdn*} [*count*] [**repeat** *queue-intervals*] [**verbose**]

Cisco cBR Series Converged Broadband Routers
ping docsis {*mac-addr ip-addr* } [*count*] [**repeat** *queue-intervals*] [**verbose**]

Syntax Description

mac-addr	The 48-bit hardware (MAC) address of the CM. If you specify the MAC address of a CPE device, the command will resolve it to the MAC address of the CM servicing that CPE device and send the DOCSIS ping to the CM.
ip-addr	IPv4 or IPv6 address of the CM. If you specify the IP address of a CPE device, the command will resolve it to the IP address of the CM servicing that CPE device and send the DOCSIS ping to the CM.
name *fqdn*	Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.
repeat *queue-intervals*	(Optional) Specifies the number of maintenance intervals for a queue. Valid values are from 1 to 2147483647.
verbose	(Optional) Specifies verbose mode for the output, giving additional details about the packets transmitted and received.

Command Default

If no count is specified, five DOCSIS ping packets are sent.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced for the Cisco uBR7200 series router.
12.0(4)XI1	Support was added for the Cisco uBR924 cable access router.
12.1(3)XL	Support was added for the Cisco uBR905 cable access router.
12.1(5)XU1	Support was added for the Cisco CVA122 Cable Voice Adapter.
12.1(1a)T1	The command output was enhanced.
12.1(3)XQ1	Support was added for wireless radio modems.
12.1(5)EC	Support was added for the Cisco uBR7100 series routers.
12.2(2)XA	Support was added for the Cisco uBR925 cable access router.

Release	Modification
12.2(1)XF1	Support was added for the Cisco uBR10012 router.
12.2(4)BC1	This command was integrated into Cisco IOS Release 12.2(4)BC1.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCC	The **repeat** keyword was added to specify maintenance intervals for queues.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **name** keyword and *fqdn* variable were removed.

Usage Guidelines

The DOCSIS ping is a unique Cisco patented technology that allows a cable operator to quickly diagnose the health of a channel between the CMTS router and any particular DOCSIS cable CPE device. The DOCSIS ping is similar in concept to the IP ping but uses the lower MAC layer instead of the datalink or transport layers. Using the MAC layer has two major advantages:

- A DOCSIS ping uses only 1/64 of the bandwidth of an IP ping.
- A DOCSIS ping can be used with CMs that have not yet acquired an IP address. This allows cable operators to ping CMs that were not able to complete registration or that were improperly configured at the IP layer.

In addition to providing connectivity information, the **ping docsis** command provides a real-time view and plot of requested power adjustments, frequency, timing offset adjustments, and a measure of optimal headend reception power.

If a CM responds to the **ping docsis** command, but does not respond to an IP ping, the problem could be one of the following:

- The CM is still in the registration process and has not yet come completely online. In particular, the CM could be waiting for the DHCP server to assign it an IP address.
- Severe interference or other faults on the physical layer (either the upstream or downstream).
- Significant upstream signal error, distortion, or amplitude errors, often resulting in frequent power adjustments (which are shown in the cable flap list).
- A non-DOCSIS compliant upstream carrier-to-noise power ratio (C/N) that is between 14 and 21 dB, along with a mixed modulation profile, such as ranging request/response messages being sent in QPSK mode and short and long data grants in 16-QAM mode.



Note The **ping docsis** command is a DOCSIS-compliant process that can be used with any two-way DOCSIS-compliant CM; the CM does not require any special features or code. The **ping docsis** command cannot be used with telco-return CMs.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

The table below explains the different characters that can appear in the output for the **ping docsis** command:

Table 34: ping docsis Command Output Characters

Output Character	Description
!	Indicates that a successful response was received from the ping request. This indicates that the CM is reachable from the CMTS and can respond to CMTS requests at the DOCSIS MAC layer.
.	Indicates that a DOCSIS ping request was sent out but that the ping request timed out without receiving a response. This indicates that the CM is having difficulties maintaining DOCSIS MAC layer connectivity to the CMTS. **Note** If the **ping docsis** command displays a number of periods (.) along with exclamation points (!), it strongly indicates the presence of RF noise or physical cable and plant issues that is causing a loss of MAC layer connectivity.
a	Indicates that a response was received but that an adjustment of frequency, power, or timing was also made in the response. This indicates that, although the upstream channel is functional, some sort of problem is forcing power averaging and other misreads of the upstream received power signals.
f	Indicates that the CMTS failed to send the DOCSIS ping request because the CM is offline, and therefore MAC-layer communication is not possible. This indicates that the CM had previously registered with the CMTS, but that at some point it stopped responding to the DOCSIS station maintenance messages and that the CMTS eventually marked the CM as offline. The CM might have lost power or might have been disconnected from the coaxial cable. **Tip** Use the **show cable modem** command with the same MAC or IP address as you used with the **ping docsis** command to show the current status of this CM.

Note If a CM is already in the flap list, the **ping docsis** command increments the hit, miss, and power-adjustment fields for it in the cable flap list.

Examples

Note The following example shows a default **ping docsis** command that sends five packets to the CM with the MAC address of 00d0.ba77.7595, with a response being received for each:

```
Router# ping docsis 00d0.ba77.7595

Queueing 5 MAC-layer station maintenance intervals, timeout is 25 msec:
!!!!!
Success rate is 100 percent (5/5)
Router#
```

The following example shows the verbose output for the same command:

```
Router# ping docsis 00d0.ba77.7595 verbose

Queueing 5 MAC-layer station maintenance intervals, timeout is 25 msec:
Reply from 00d0.ba77.7595: 2 ms, tadj=-1, padj=0.50, fadj=0
Reply from 00d0.ba77.7595: 2 ms, tadj=-1, padj=0.50, fadj=0
Reply from 00d0.ba77.7595: 2 ms, tadj=-1, padj=0.50, fadj=0
Reply from 00d0.ba77.7595: 98 ms, tadj=-1, padj=0.25, fadj=0
Reply from 00d0.ba77.7595: 2 ms, tadj=-1, padj=0.25, fadj=0
Success rate is 100 percent (5/5)
Router#
```

The following example shows that the CM at 192.168.100.10 is connected to the network and is operational, but that one ping packet was lost and that several power adjustments were made during the ping process:

```
router# ping docsis 192.168.100.10

Queueing 100 MAC-layer station maintenance intervals, timeout is 25 msec:
!!!!!a!!!!!!!a!a!!!!!!!!!!!!!!!!!!!!aa!!!!!!!!!!a!!!a!a!!!aa!!!!!!.!!a!!!a!
a!a!!!!!!!!aa!!!!!!!aa!a
Success rate is 99 percent (99/100)
```

A CM that displays output such as that above (a higher percentage of successful pings but with a number of power-adjustment readings) is most likely experiencing a problem that is not bad enough to force the modem offline but that should be addressed.

If this problem is consistent for just a small number of CMs on an upstream receiver (such as a fiber node within a combining group), then the problem is likely related to in-home wiring at those modem locations. It could also be due to a cable TV network element that is on the same HFC segment.

If the problem occurs for all CMs on a single fiber node, then changing the upstream frequency or reducing the number of homes passed per combining group might improve conditions. If this does not help the situation, the problem could be due to a faulty cable drop, dirty optical connector on the node, or other physical plant problem.

The **ping docsis** command cannot be used with a CM that has not yet registered with the CMTS. The following example shows the responses for a CM that has not yet registered with the CMTS.

```
Router# ping docsis 192.168.100.111

Cable modem with IP address 192.168.100.111 not registered.
Please try using MAC address instead.
Router# ping docsis 0123.4567.89ab

Cable modem with MAC address 0123.4567.89ab not registered.
router#
The following example shows the output of the ping docsis
command with the repeat
 keyword:
Router# ping docsis 192.168.100.10 repeat 22
```

```
Queueing 22 MAC-layer station maintenance intervals, timeout is 25 msec:
!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (22/22)
```

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a CM in the flap-list table before aging it out of the table.
cable flap-list insertion-time	Sets the insertion time interval that determines whether a CM is placed in the flap list.
cable flap-list miss-threshold	Specifies miss threshold for recording a flap-list event.
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a CM flap-list event.
cable flap-list size	Specifies the maximum number of CMs that can be listed in the flap-list table.
clear cable flap-list	Clears all the entries in the flap-list table.
ping	Outputs one or more IP ping requests to a particular IP address.
show cable flap-list	Displays the current contents of the flap list.

ping docsis pnm

To send RxMER probes on OFDMA channel assigned to the modem, use the **ping docsis pnm** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Routers
ping docsis pnm *mac-address* **[ignore | upstream** *us-channel* **[ignore]]**

Syntax Description

mac-address	MAC address of a specific CM to be displayed.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1c	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The usage for each of the commands are listed below:

- **ping docsis pnm** *mac-address* : sends RxMER probes on each OFDMA channel assigned to the modem. If enabled, auto profile management will analyze the results and potentially change the active profile.
- **ping docsis pnm** *mac-address* **upstream** *us-channel* : sends RxMER probes on a specified OFDMA channel assigned to the modem. If enabled, auto profile management will analyze the results and potentially change the active profile.
- **ping docsis pnm** *mac-address* **ignore**: sends RxMER probes on each OFDMA channel assigned to the modem. Auto profile management will always **ignore** the results of the probe.
- **ping docsis pnm** *mac-address* **upstream** *us-channel* **ignore**: sends RxMER probes on a specified OFDMA channel assigned to the modem. Auto profile management will always **ignore** the results of the probe.

Examples

The following example shows how to configure the system to send RxMER probes on OFDMA channel assigned to the modem:

```
Router# ping docsis pnm 34bd.fa0c.b480
```

Related Commands

Command	Description
show cable modem prof-mgmt upstream	Displays the results of RxMER probes.

platform power protection

To configure voltage thresholds to switch between different modes when power budget provided by AC PSMs is not sufficient to power Field Replaceable Units (FRUs), use the **platform power protection** command in global configuration mode. To use the default voltage thresholds, use the**no** form of the command.

By default, power protection action is disabled to avoid service outage. If protection action is disabled, any online FRU is not powered down in the event of insufficient power budget, but any newly installed line card is not powered up. To enable power protection action, use the **platform power protection action shutdown linecard** command.

platform power protection ac220v *voff von*

no platform power protection ac220v

platform power protection action shutdown linecard

Syntax Description

voff	Specifies the hytersis threshold value value. The hystersis thresholds define when the PSM should switch modes. For example, if the *voff* value is configured as 180V, the PSM switches to the 120V mode with 1300W capacity when input voltage drops below 180V.
von	Specifies the hytersis threshold value value. The hystersis thresholds define when the PSM should switch modes. For example, if the *von* value is configured as 200V, the PSM switches to the 220V mode when input voltage increases to more than 200V.

Command Default

The default value of *voff* is 190V while the default value of *von* is 197V.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows a sample configuration:

```
Router# configure terminal
Router(config)# platform power protection ac220v 180 200
Router(config)#
```

The following example shows how to enable power protection action.

```
Router# configure terminal
Router(config)# platform power protection action shutdown linecard
```

The following example shows how to verify the voltage threshold configuration.

```
Router# configure terminal
Router(config)# sh run | i protection
platform power protection ac220v 180 200
```

platform punt-policer

To rate-limit the aggregate punt-rate on a per-punt-cause basis, use the **platform punt-policer** command in global configuration mode. Using the **no** form of the command returns the rate to the default value.

platform punt-policer { **cable-snmp** | *punt-cause_value* } *rate_value* **[high]**

no platform punt-policer

Syntax Description

punt-policer *punt-cause_value*	Specifies the punt cause value. *punt-cause_value* can be obtained from **show platform software punt-policer** command.
cable-snmp	This is the punt-cause assigned to SNMP packets destined to the CMTS.
rate_value	Specifies the rate in packets/second. The range is from 10 to 300000.

Command Default

The default rate is 512 packets/second.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
IOS XE 16.12.1z1	Thiscommand was updated. **cable-snmp** was added as a new punt cause to rate-limit SNMP packets destined to cBR-8.

Usage Guidelines

In most cases, cable-snmp punts are normal priority.

Examples

The following example shows a sample configuration:

```
Router# configure terminal
Router(config)# platform punt-policer cable-snmp 1000
Router(config)#
```

Related Commands

Command	Description
show platform software punt-policer	Displays configuration and statistics for the per-cause punt-policer.
show platform hardware qfp active infrastructure punt-policer summary	Displays detailed configuration data and statistics for the per-cause punt-policer.
show platform hardware qfp active infrastructure punt summary	Displays the punt summary statistics which includes a summary of punted packets and aggregate drop-counts from CoPP, SBRL, the punt-policer and the global policer.
show platform hardware qfp active infrastructure punt sbrl	Displays the SBRL statistics.

Command	Description
platform punt-sbrl	Rate-limit packet streams identified by the Source-Based Rate-Limit (SBRL).
show policy-map control-plane	Displays configuration and statistics for the control-plane service-policy.
clear control-plane	Clears the control-plane service-policy statistics.
show platform hardware qfp active infrastructure punt statistics type global-drop	Displays the global punt-policer statistics.

platform punt-sbrl

To rate-limit packet streams identified by the Source-Based Rate-Limit (SBRL), use the **platform punt-sbrl** command in global configuration mode. To disable the rate-limiting, use the **no** form of the command.

Subscriber-side configuration before Cisco IOS XE Fuji 16.8.x

platform punt-sbrl subscriber rate { *rate_value* | **no-drop** }

platform punt-sbrl subscriber punt-cause *punt-cause_value* **rate** *rate_value*

Subscriber-side configuration in Cisco IOS XE Fuji 16.8.x

platform punt-sbrl subscriber punt-cause *punt-cause_value* **rate-per-4-sec** { **no-drop** | *rate_value* [**quarantine-time** *q_time* **burst-factor** *b_value*] }

Subscriber-side configuration in Cisco IOS XE Fuji 16.9.x and later

platform punt-sbrl subscriber punt-cause *punt-cause_value* **rate-per-4-sec** { **no-drop** | *rate_value* [**bucket-size** *b_size*] [**quarantine-time** *q_time* **burst-factor** *b_value*] }

WAN-side configuration before Cisco IOS XE Fuji 16.8.x

platform punt-sbrl wan punt-cause *punt-cause_value* **rate** *rate_value* [**quarantine-time** *q_time* **burst-factor** *b_value*]

WAN-side configuration in Cisco IOS XE Fuji 16.8.x and later

platform punt-sbrl wan punt-cause *punt-cause_value* **rate-per-1-sec** *rate_value* [**quarantine-time** *q_time* **burst-factor** *b_value*]

no platform punt-sbrl

Syntax Description

punt-cause *punt-cause_value*	Specifies the punt-cause value in number 1 to 107 or string.
rate *rate_value*	Specifies the rate in packet per seconds. The range is from 1 to 256, specified in powers-of-2.
no-drop	Disables the rate-limiting.
rate-per-4-sec *rate_value*	Specifies the rate in packet per 4 seconds. The range is from 1 to 255.
rate-per-1-sec *rate_value*	Specifies the rate in packet per seconds. The range is from 1 to 256, specified in powers-of-2.
quarantine-time *q_time*	Specifies the quarantine time in minutes. The range is from 1 to 60.
bucket-size *b_size*	Specifies the bucket size in packets. The range is from 1 to 255.
burst-factor *b_value*	Specifies the quarantine burst factor in packets. The range is from 50 to 1000 .

Command Default

The WAN-side default rate is zero, which means that rate-limiting does not occur. Using the **no** configuration returns the rate to the default value.

The default subscriber-side global rate is zero. The default subscriber-side per-cause rate for CABLE_L3_MOBILITY is 4 packets per second. Using the **no** configuration returns the rate to the default value.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. The **platform punt-sbrl wan** command replaces **service divert-rate-limit ip** and **service divert-rate-limit ipv6** commands. The **platform punt-sbrl subscriber** command replaces **service divert-limit** and **cable divert-rate-limit** commands.
IOS XE Fuji 16.8.1	The command **platform punt-sbrl subscriber rate** *rate_value* was deprecated.
IOS XE Fuji 16.9.1	The keyword **bucket-size** was added in the command.

Usage Guidelines

WAN-side configuration

WAN configuration consists of two parts:

1) Configure CoPP to specify which WAN-side packet streams are subject to SBRL. The policy-map action **set qos-group 99** specifies that packets matching that class are subject to SBRL.

2) Configure WAN-side SBRL to specify which punt-causes are rate-limited. Trusted sites are specified by adding classes to the CoPP policy-map. ACLs are used to finely identify trusted streams. It is important to understand the CoPP applies to all punted packets, so it may be necessary to ensure that subscriber-side packets do not match the trusted-site ACLs. Quarantine can optionally be configured. When a packet-stream enters quarantine, all punts from the stream are dropped for the configured period of time. When (*burst-factor* x *rate*) packets arrive at a rate faster than *rate*, quarantine is activated for that stream.

For more information, see the WAN-side configuration example.

Subscriber-side configuration

The subscriber-side configuration is global. There is also a per-cause configuration which currently only applies to the CABLE_L3_MOBILITY punt-cause. All subscriber-side packets go to SBRL, regardless of the CoPP configuration.

Examples

The following example shows the subscriber-side configuration:

```
Router# configure terminal
Router(config)# platform punt-sbrl subscriber punt-cause 99 rate 8
Router(config)#

Router# configure terminal
Router(config)# platform punt-sbrl subscriber rate 64
Router(config)#
```

The following example shows a simple CoPP configuration which sends all WAN-side punts to SBRL:

```
Router# configure terminal
Router(config)# policy-map copp_policy
Router(config-pmap)# class class-default
Router(config-pmap-c)# set qos-group 99
Router(config-pmap-c)# exit
Router(config-pmap)# exit
Router(config)# control-plane
Router(config-cp)# service-policy input copp_policy
Router(config-cp)# exit
Router(config)# platform punt-sbrl wan punt-cause 11 rate 64 quarantine 5 burst-factor 500
```

Related Commands

Command	Description
show platform hardware qfp active infrastructure punt summary	Displays the punt summary statistics which includes a summary of punted packets and aggregate drop-counts from CoPP, SBRL, the punt-policer and the global policer.
show platform hardware qfp active infrastructure punt sbrl	Displays the SBRL statistics.
platform punt-policer	Configures the per-cause punt-policer.
show platform software punt-policer	Displays configuration and statistics for the per-cause punt-policer.
show platform hardware active qfp infrastructure punt-policer summary	Displays detailed configuration data and statistics for the per-cause punt-policer.
show policy-map control-plane	Displays configuration and statistics for the control-plane service-policy.
clear control-plane	Clears the control-plane service-policy statistics.
show platform hardware qfp active infrastructure punt statistics type global-drop	Displays the global punt-policer statistics.

platform aom pending-thresh

To configure a threshold value in seconds to notify that an AOM download is stuck, use the **platform aom pending-threshold** command in the global configuration mode.

If you configure the **no** form of the command, the *seconds-to-error* and *seconds-to-warning*, revert to their default values.

platform aom pending-thresh { *seconds-to-error* } { *seconds-to-warning* }

no platform aom pending-thresh { *seconds-to-error* } { *seconds-to-warning* }

Syntax Description

seconds-to-error	Allows you to configure a threshold value in seconds to notify that an AOM download is stuck. The *seconds-to-error* specifies the threshold value in seconds to log an error on the console. The valid range is 60 to 3600 seconds and the default value is 1800 seconds
seconds-to-warning	Specifies the threshold value in seconds to log a warning in the trace log when the AOM download is stuck. The valid range is 60 to 3600 seconds and the default value is 900 seconds

Command Default

The default value for *seconds-to-error* is 1800 seconds and the default value for *seconds-to-warning* is 900 seconds.

If you configure the **no** form of the command, the *seconds-to-error* and *seconds-to-warning*, revert to their default values.

Command Modes

Global configuration (config)

Command History

Release	Modification
17.6.1z	This command is introduced.

Usage Guidelines

The **platform aom pending-thresh** command allows you to configure a threshold value, in seconds, to notify that an AOM download is stuck. When the specified threshold time is reached, an error and warning notification is sent to the console and trace log, respectively. The valid range is 60–3600 seconds. Use the **no** form of the command to remove the threshold value.

Examples

The following example shows a sample configuration:

```
Router# configure terminal
Router(config)# platform aom pending-thresh 300 180
Router(config)#
```

In this example, 300 indicates the threshold value in seconds to log an error on the console and 180 specifies the threshold value in seconds to log an warning on the console.

pilot-scaling

To specify the value to calculate the number of continuous pilots, use the **pilot-scaling** command in OFDM channel profile configuration mode. To undo the pilot-scaling value assignment, use **no** form of this command.

pilot-scaling *value*

no pilot-scaling

Syntax Description

value	Value to scale the number of continuous pilots. Valid range is from 48 to 120.

Command Default

The default value is 48.

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the value to calculate the number of continuous pilots.

Examples

The following example shows how to specify the value to calculate the number of continuous pilots:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# pilot-scaling 50
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
interleaver-depth	Specify the channel interleaver-depth.
profile-control	Specify default modulation or profile as the channel control profile.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

pme cem

To define parameters for the Cisco Edge QAM Manager server, use the **pme cem** command in the encryption configuration mode. To reset the parameters to default value, use the **no** form of this command.



Note There can be only one entry for VODS-ID, CEM IP, CEM Port, and Management Interface IP. Defining any configuration with newer values clears the previous configuration. The individual configurations can be cleared with the **no** form of the command.

pme cem *ip-address tcp-port*
no pme cem *ip-address tcp-port*

Syntax Description

ip-address	Specifies the IP address of the Cisco Edge QAM Manager server.
tcp-port	Specifies the TCP port number of the Cisco Edge QAM Manager server. The valid range is from 1024 to 65534.

Command Default

None

Command Modes

Encryption configuration (config-video-encrypt)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines the parameters for the Cisco Edge QAM Manager server during privacy mode encryption configuration.

Examples

The following example shows how to define parameters for the Cisco Edge QAM Manager server:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# encryption
Router(config-video-encrypt)# pme cem 172.16.1.163 1024
```

Related Commands

Command	Description
encrypt	Encrypts the virtual carrier group.
pme vodsid	Configures the VODSID of Cisco Edge QAM Manager server.
pme mgmt-ip	Configures the privacy mode encryption management IP to establish Cisco Edge QAM Manager server connection.
show cable video encryption pme	Displays the privacy mode encryption information.

Command	Description
show cable video encryption linecard	Displays the encryption configuration information of the line card.

pme mgmt-ip

To define the privacy mode encryption management IP address for establishing Cisco Edge QAM Manager server connection, use the **pme mgmt-ip** command in the encryption configuration mode. To reset to default configuration, use the **no** form of this command.

pme mgmt-ip *ip-address*
no pme mgmt-ip *ip-address*

Syntax Description

ip-address	Specifies the management IP address.

Command Default

None

Command Modes

Encryption configuration (config-video-encrypt)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines the privacy mode encryption management IP address.

Examples

The following example shows how to define the privacy mode encryption management IP address:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)#encryption
Router#(config-video-encrypt)pme mgmt-ip 172.16.1.164
```

Related Commands

Command	Description
encrypt	Encrypts the virtual carrier group.
pme vodsid	Configures the VODSID of Cisco Edge QAM Manager server.
pme cem	Configures the parameters for the Cisco Edge QAM Manager server.
show cable video encryption pme	Displays the privacy mode encryption information.
show cable video encryption linecard	Displays the encryption configuration information of the line card.

pme vodsid

To define VODSID of the Cisco Edge QAM Manager server, use the **pme vodsid** command in the encryption configuration mode. To reset to default configuration, use the **no** form of this command.

pme vodsid *id*
no pme vodsid *id*

Syntax Description

id	Specifies the VODSID ID of the Cisco Edge QAM Manager server. The valid range is from 2 to 2147483647.

Command Default

None

Command Modes

Encryption configuration (config-video-encrypt)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines the VODSID for the Cisco Edge QAM Manager server.

Examples

The following example shows how to define VODSID for the Cisco Edge QAM Manager server:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# encryption
Router(config-video-encrypt)# pme vodsid 111
```

Related Commands

Command	Description
encrypt	Encrypts the virtual carrier group.
pme cem	Configures the parameters for the Cisco Edge QAM Manager server.
pme mgmt-ip	Configures the privacy mode encryption management IP to establish CEM connection.
show cable video encryption pme	Displays the privacy mode encryption information.
show cable video encryption linecard	Displays the encryption configuration information of the line card.

policy

To select modems based on the type of service flow that is balanced, use the **policy** command in the config-lb-group configuration mode. To reset the selection, use the **no** form of this command.

policy {**pcmm** | **ugs** | **us-across-ds** | **pure-ds-load**}
no policy {**pcmm** | **ugs** | **us-across-ds** | **pure-ds-load**}

Syntax Description

pcmm	Enables balancing of modems with active PCMM service flows.
ugs	Enables balancing of modems with active UGS service flows.
us-across-ds	Sets load balancing on upstream (US) groups across downstream (DS) and DS group methods are ignored.
pure-ds-load	Considers DS load and not US load when calculating DS utilization.

Command Default

None

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to select the modems on the CMTS based on the type of service flow that is balanced using the **policy** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# policy
 pure-ds-load
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

power-adjust

To adjust the channel's power level, use the **power-adjust** command in the RF channel sub configuration mode.

power-adjust *value*

Syntax Description

value	Value for the power level. Valid range is -6.0 to 2.0 dBmV.

Command Default

None.

Command Modes

RF channel sub configuration mode (config-rf-chan)

Usage Guidelines

This command is used to adjust the channel's power levels.

The following example shows how to change the channel's power level:

```
router#configure terminal
router(config)#controller integrated-cable 3/0/0
router(config-controller)#rf-chan 5 10
router(config-rf-chan)#type video
router(config-rf-chan)#frequency 723000000
router(config-rf-chan)#rf-output alt
router(config-rf-chan)#power-adjust 0
router(config-rf-chan)#exit
router(config-controller)#exit
router(config)#exit
router#show controller integrated-Cable 3/0/0 rf-channel 5 10
Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output
 5   TEST   UP   723000000  VIDEO  B    256   5361  I32-J4       164  34     ALT
 10  TEST   UP   753000000  VIDEO  B    256   5361  I32-J4       169  34     ALT
```

Related Commands

Command	Description
controller integrated-cable	Enters the controller configuration mode.
frequency	Defines the RF channel frequency.
qam-profile	Defines the QAM profile number.
rf-chan	Enters the RF channel sub configuration mode.
rf-output	Defines the QAM output mode.
power-adjust	Defines the channel power level.

power-tilt

To configure downstream power tilt for a controller port, use the **power-tilt** command in the controller sub configuration mode.

power-tilt {cable-loss-approx | linear}*tilt* **max-frequency** *frequency*

Syntax Description

tile	Measured cable loss at *frequency*, specified in 1/10 dB.
frequency	The maximum frequency for the RF channel.

Command Default

None

Command Modes

Controller sub configuration mode (config-controller).

Command History

Release	Modification
IOS XE Fuji 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to configure downstream power tilt for a controller port.

The following example shows how to define the base channel power level:

```
router#configure terminal
router(config)#controller Integrated-Cable 3/0/0
router(config-controller)#max-ofdm-spectrum 192000000
router(config-controller)#max-carrier 32
router(config-controller)#base-channel-power 34
router(config-controller)#power-tilt linear 4.0 max-frequency 696000000
router(config-controller)#rf-chan 0 31
router(config-rf-chan)#type DOCSIS
router(config-rf-chan)#frequency 261000000
router(config-rf-chan)#rf-output NORMAL
router(config-rf-chan)#power-adjust -2.0
router(config-rf-chan)#qam-profile 1
router(config-rf-chan)#docsis-channel-id 1
router(config-rf-chan)#exit
router(config-controller)#rf-chan 158
router(config-rf-chan)#power-adjust 0
router(config-rf-chan)#docsis-channel-id 159
router(config-rf-chan)#ofdm channel-profile 20 start-frequency 600000000 width 96000000 plc
 645000000
```

Related Commands

Command	Description
base-channel-power	Sets the base channel power level.
power-adjust	Adjusts the power levels of the RF channel.

prefix

To configure an IPv4 or IPv6 prefix in a source address verification (SAV) group, use the **prefix** command in SAV configuration mode. To disable the use of a configured prefix in a SAV group, use the **no** form of this command.

prefix {*ipv4_prefix/ipv4_prefix_lengthipv6_prefix/ipv6_prefix_length*}
no prefix {*ipv4_prefix/ipv4_prefix_lengthipv6_prefix/ipv6_prefix_length*}

Syntax Description

ipv4_prefix	IPv4 prefix associated with a particular SAV group, specified in the X.X.X.X/X format.
ipv4_prefix_length	Length of the IPv4 prefix. The valid range is from 0 to 32.
ipv6_prefix	IPv6 prefix associated with a particular SAV group, specified in the X:X:X:X::/X format.
ipv6_prefix_length	Length of the IPv6 prefix. The valid range is from 0 to 128.

Command Default

None

Command Modes

SAV Configuration (config-sav)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **prefix** command is used to configure IPv4 or IPv6 prefixes within a particular SAV groups. The Cisco CMTS uses these prefixes to authenticate a cable modem (CM). A CM may be configured with an IPv4 or IPv6 prefix belonging to a particular SAV group. The time, length, value (TLV) 43.7.2 specifies the prefix associated with the CM. The Cisco CMTS considers a packet from a CM authorized if that packet is sourced with an IP address that belongs to the configured prefix in a SAV group.

A maximum of four prefixes are supported on one SAV group. These prefixes can be either IPv4s, IPv6s, or a combination of both prefixes (maximum up to four)

Examples

The following example shows how to configure a SAV group with one IPv4 prefixes and one IPv6 prefixes:

```
Router(config)# cable source-verify group sav1
Router(config-sav)# prefix 10.16.0.0/12
Router(config-sav)# prefix 10::/12
Router(config-sav)# exit
```

Related Commands

Command	Description
cable source-verify enable-sav-static	Enables SAV prefix processing.

Command	Description
cable source-verify group	Configures SAV groups.

principal

To specify the principal core of the RPD, use the **principal** command in RPD core-interface configuration mode. To void the principal core configuration, use the **no** form of this command.

principal

no principal

Command Default

None

Command Modes

RPD conre-interface configuration (config-rpd-core)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the principal core of the RPD.

The following example shows how to specify the principal core of the RPD:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/1/0
Router(config-rpd-core)# principal
```

Related Commands

Command	Description
core-interface	Configures the core-interface of the RPD.

privacy

To create a DOCSIS configuration file that enables and configures the DOCSIS Baseline Privacy Interface (BPI) option, use the **privacy** command in cable config-file configuration mode. To disable BPI for the CM, use the **no** form of this command.

privacy grace-time {**authorization** *value* | **tek** *value*}
privacy timeout {**authorize** *value* | **operational** *value* | **re-authorize** *value* | **rekey** *value*}
no privacy grace-time {**authorization** | **tek**}
no privacy timeout {**authorize** | **operational** | **re-authorize** | **reject** | **rekey**}

Syntax Description

authorization *value*	Authorization grace time in seconds. Valid values are 1 to 1800 seconds. Default value is 600 seconds.
tek *value*	TEK grace time in seconds. Valid range is 1 to 1800 seconds. Default is 600 seconds.
authorize *value*	Authorize wait timeout in seconds. Valid range is 1 to 30 seconds. Default value is 10 seconds.
operational *value*	Operational Wait timeout in seconds. Valid range is 1 to 10 seconds. Default is 1 second.
re-authorize *value*	Re-authorize wait timeout in seconds. Valid range is 1 to 20 seconds.
reject *value*	Authorize reject wait timeout in seconds. Valid range is 1 to 600 seconds. Default is 60 seconds.
rekey *value*	Rekey wait timeout in seconds. Valid range is 1 to 10 seconds. Default is 1 second.

Command Default

None

Command Modes

Cable config-file configuration

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(11)BC2	This command was supported on the Release 12.2 BC train.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Specifying the **privacy** command without any of the keywords and arguments enables BPI encryption and decryption for the CM. In addition to this command, you must also specify the **service-class privacy** command to enable BPI operations on the cable modem.



Note The **privacy** command appears and is supported only in images with support for BPI or BPI+ encryption. This option configures the CM for BPI or BPI+ encryption. To use BPI encryption, the Cisco CMTS must also be configured for BPI or BPI+ encryption, using the **cable privacy** command.

Examples

The following example shows how to set the CM privacy TEK gracetime to 1200 seconds and enables BPI operations for the cable modem.

```
router(config)# cable config-file bpi.cm
router(config-file)# privacy grace-time tek 1200
router(config-file)# service-class 1 privacy

router(config-file)# exit

router(config)#
```

Related Commands

Command	Description
access-denied	Disables access to the network.
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
cable privacy	Enables BPI or BPI+ encryption on the Cisco CMTS.
channel-id	Specifies upstream channel ID.
cpe max	Specifies CPE information.
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.
option	Provides config-file options.
service-class	Specifies service class definitions for the configuration file.
snmp manager	Specifies Simple Network Management Protocol (SNMP) options.
timestamp	Enables time-stamp generation.

profile

To bind the profile to the controller, use the **profile** command in controller configuration mode. To undo the bind, use **no** form of this command.

profile *id*

no profile

Syntax Description

id	The ID of the configured controller profile.

Command Default

None.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
Cisco IOS XE Fuji 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to bind the profile to the controller.

Examples

The following example shows how to bind the profile to the controller:

```
Router#configure terminal
Router(config)#controller integrated-cable 1/0/1
Router(config-controller)#profile 1
```

Related Commands

Command	Description
cable downstream controller-profile	Configures the downstream controller profile.
cable upstream controller-profile	Configures the upstream controller profile.

profile-control

To specify the control-plane profile used for MAC management and other control messages, use the **profile-control** command in OFDM channel profile configuration mode. To undo the control-plane profile assignment, use **no** form of this command.

profile-control {**modulation-default** *value* | **modulation-profile** *id*}

no profile-control

Syntax Description

modulation-default *value*	The default modulation. Valid values are 16-QAM, 64-QAM, 128-QAM, 256-QAM, 512-QAM, 1024-QAM, 2048-QAM, and 4096-QAM.
modulation-profile *id*	Global modulation profile ID.

Command Default

1024-QAM

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the control-plane profile used for MAC management and other control messages.

Examples

The following example shows how to specify the control-plane profile used for MAC management and other control messages:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# profile-control modulation-default 1024-qam
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
interleaver-depth	Specify the channel interleaver-depth.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.

Command	Description
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

profile-data

To specify the data-plane profiles used for data packets, use the **profile-data** command in OFDM channel profile configuration mode. To undo the data-plane profile assignment, use **no** form of this command.

profile-data *id* {**modulation-default** *value* | **modulation-profile** *id*}

no profile-data *id*

Syntax Description

profile-data *id*	Channel data profile ID. Valid range is from 1 to 5.
modulation-default *value*	The default modulation. Valid values are 16-QAM, 64-QAM, 128-QAM, 256-QAM, 512-QAM, 1024-QAM, 2048-QAM, and 4096-QAM.
modulation-profile *id*	Global modulation profile ID.

Command Default

None.

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the data-plane profiles used for data packets.

Examples

The following example shows how to specify the data-plane profiles used for data packets:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# profile-data 3 modulation-default 1024-qam
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
interleaver-depth	Specify the channel interleaver-depth.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-control	Specify default modulation or profile as the channel control profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.

Command	Description
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

profile-description

To provide a profile description for each profile in the selected cable multicast authorization profile, use the **profile-description** command in multicast authorization profile configuration mode. To remove the profile description, use the **no** form of this command.

profile-description *profile-description*
no profile-description *profile-description*

Syntax Description

profile-description	Specifies profile description for the selected profile. You can use up to 128 characters to describe the profile.

Command Default

Profile description is empty.

Command Modes

Multicast authorization configuration—(config-mauth)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is available only from the cable multicast authorization profile mode.

Examples

The following example shows how to enter a profile description for a multicast authorization profile name:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable multicast auth profile-name
Router(config)# cable multicast auth profile-name gold
Router(config-mauth)# profile-description gold-configured-may
```

Related Commands

Command	Description
cable multicast authorization enable default-action	Enables the cable multicast authorization features.
cable multicast authorization profile-name	Defines the cable multicast authorization profile.
show cable multicast authorization	Displays the list of defined multicast authorization profiles and all CMs associated with corresponding profiles.
show running-config interface cable	Displays the running configuration for each of the cable interfaces.

profile-ncp

To specify the ncp profile, use the **profile-ncp** command in OFDM channel profile configuration mode. To undo the ncp profile assignment, use **no** form of this command.

profile-ncp {**modulation-default** *value* | **modulation-profile** *id*}

no profile-ncp

Syntax Description

modulation-default *value*	The default modulation. Valid values are QPSK, 16-QAM, and 64-QAM.
modulation-profile *id*	Global modulation profile ID.

Command Default

None.

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the ncp profile.

Examples

The following example shows how to specify the ncp profile:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# profile-ncp modulation-default qpsk
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
interleaver-depth	Specify the channel interleaver-depth.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-control	Specify default modulation or profile as the channel control profile.
profile-data	Specify default modulation or profile as the channel data profile.
roll-off	Specify the channel roll-off value.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

protect-tunnel

To configure a Downstream External PHY Interface (DEPI) tunnel for the protect cable interface line card on a Cisco CMTS router, use the **protect-tunnel** command in global configuration mode. To disable this configuration, use the **no** form of this command.

protect-tunnel *protect-depi-tunnel-name*
no protect-tunnel *protect-depi-tunnel-name*

Syntax Description

protect-tunnel-name	DEPI tunnel name for the protect cable interface line card.

Command Default

The N+1 DEPI redundancy feature is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The protect tunnel must be explicitly configured. The working tunnel and the protect tunnel are configured using the same **depi-tunnel** command. The protect tunnel inherits L2TP class and DEPI class parameters from the working tunnel. When you configure the protect tunnel and specify the destination IP address for the protect tunnel, the protect tunnel inherits the QAM channel parameters specified for the working tunnel.

Examples

The following example shows how to configure a DEPI tunnel for the protect cable interface line card on the Cisco uBR10012 router:

```
Router> enable
Router# configure terminal
Router(config)# depi-tunnel protect1
Router(config-depi-tunnel)# dest-ip 192.0.2.103
Router(config-depi-tunnel)# exit
Router(config)# depi-tunnel depi-tunnel working1
Router(config-depi-tunnel)# protect-tunnel protect1
Router(config-depi-tunnel)# end
```

Related Commands

Command	Description
depi-tunnel	Specifies a template for DEPI tunnel configuration settings.

protocol

To specify the protocol used in the logical edge device, use the **protocol** command in logical edge device configuration mode. To undo the protocol assignment, use the **no** form of this command.

protocol {**GQI** | **table-based**}
no protocol {**GQI** | **table-based**}

Command Default

None.

Command Modes

Logical edge device configuration mode (config-video-led)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the protocol.

Examples

The following example shows how to specify the protocol:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# logical-edge-device vod id 1
Router(config-video-led)# protocol table-based
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.
show cable video logical-edge-device	Displays the logical edge device information.

provider-name

To specify the provider name as part of the service descriptor, use the **provider-name** command in the service descriptor configuration mode. To revoke the configuration, use the **no** form of the command.

provider-name *string*

Syntax Description

string	Specifies the provider name.

Command Default

None.

Command Modes

Service descriptor configuration mode (config-video-serv-desc)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1c	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to specify the provider name:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-descriptor-default
router(config-video-serv-desc)#provider-name test
```

Related Commands

Command	Description
serving-area	Configures the serving area which enables the set tops to discover VOD content.
service-descriptor-default	Enables the operator to specify the default values for the service descriptor.

psi-interval

To override the default PSI value, use the **psi-interval** command in the service distribution group configuration mode. To revert back to the default psi-interval value, use the **no** form of the command.

psi-interval *number*

Syntax Description

number	Defines the new psi-interval value.

Command Default

None.

Command Modes

Service distribution group configuration mode (config-video-sdg)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to override the default psi-interval value.

The following example shows how to override the default psi-interval:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-distribution-group sdg id 1
router(config-video-sdg)#psi-interval 250
```

Related Commands

Command	Description
service-distribution-group	Defines a service distribution group.
rf-port integrated-cable	Defines the physical slot/bay/port to be used in a video service.
onid	Override the default ONID.
show cable video service-distribution-group	Displays the SDG configuration.

show ptp clock running

To display the PTP clock, use the **show ptp clock running** command.

show ptp clock running

Command Default

Command Modes

Command History

Release	Modification
Cisco IOS XE 16.8.x	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display the running PTP clock.

The following example shows how to display the PTP clock.

```
router# show ptp clock running
PTP Ordinary Clock [Domain 55]
State Ports Pkts sent Pkts rcvd Redundancy
Mode
PHASE_ALIGNED 1 68938 138822 Hot standby
PORT SUMMARY
PTP Master
Name Tx Mode Role Transport State Sessions
Port Addr
slave-from-903 unicast slave Lo1588 Slave 1
10.90.3.93
```

pxf-fail-switchover-trap enable

To enable the sending of ciscoRFSwactNotif trap which is encoded with extended switchover, that indicates the Toaster SEU error triggered PRE switchover, use the **pxf-fail-switchover-trap enable** command in the redundancy configuration mode.



Note This command is a hidden command.

pxf-fail-switchover-trap enable

Syntax Description

This command has no keywords or arguments.

Command Default

None.

Command Modes

Redundancy configuration mode (config-red)

Command History

Release	Modification
12.2(33)SCJ1	This command was introduced in Cisco uBR10012 router.

Usage Guidelines

Before configuring ciscoRFSwactNotif trap, use **snmp-server enable traps rf** to enable the sending of ciscoRFSwactNotf trap for cable related events.

The following example shows how to enable to send the extended switchover reason (uses private switchover reason 100) of ciscoRFSwactNotif trap:

```
router#configure terminal
router(config)#redundancy
router(config-red)#pxf-fail-switchover-trap enable
```

You need to notice the extended switchover reason is a private value (100), which is not ciscoRFSwactNotif trap standard value, the trap receive utility in customer side may need to be updated in order to understand the private switchover reason(100). The extended switchover reason will be sent out after PRE switchover when old active PRE boots up.

Related Commands

Command	Description
snmp-server enable traps rf	Enables the sending of SNMP traps for cable related events.
show redundancy switchover history	Displays the redundancy switchover information.



Cable Commands: q through sg

- qos-profile enforced, on page 1432
- qos-profile registered, on page 1435
- qam-profile, on page 1437
- r-dti, on page 1438
- rcp-id, on page 1439
- receive-channel, on page 1440
- receive-module, on page 1442
- redundancy, on page 1444
- redundancy force-failover main-cpu, on page 1445
- redundancy force-switchover main-cpu, on page 1447
- redundancy linecard-group, on page 1449
- redundancy reload, on page 1454
- redundancy switch-activity, on page 1457
- registered qos-profile, on page 1459
- remap pid vcg, on page 1461
- rep-period, on page 1462
- report-stream-error cc-error, on page 1464
- report-stream-error input-stream-failure report-interval syslog, on page 1465
- request platform hardware diagnostic load, on page 1466
- request platform hardware diagnostic unload, on page 1467
- request platform software package expand, on page 1468
- request platform software package install node, on page 1469
- request platform software package install rp, on page 1471
- request platform software process restart , on page 1472
- reserve-pid-range, on page 1474
- reset-interval, on page 1475
- restart-retry, on page 1476
- restricted, on page 1477
- revertive, on page 1478
- rf-chan, on page 1479
- rf-channel, on page 1480
- rf-channel (Virtual Carrier Group), on page 1481
- rf-channel (table-based vcg), on page 1482

- rf-channel cable downstream channel-id, on page 1483
- rf-channel depi-tunnel, on page 1486
- rf-channel description, on page 1487
- rf-channel frequency, on page 1489
- rf-channel group-address, on page 1492
- rf-channel ip-address mac-address udp-port, on page 1493
- rf-channel network-delay, on page 1496
- rf-channel rf-power, on page 1498
- rf-channel rf-shutdown, on page 1501
- rf-channel stacking, on page 1503
- rf-output, on page 1504
- rf-port integrated-cable, on page 1505
- rf-switch auxport enable, on page 1506
- roll-off, on page 1507
- route-ecmg, on page 1508
- **routing-interface-ip**, on page 1510
- **routing-interface-vrf**, on page 1511
- rpd-ds downstream-cable, on page 1512
- rpd-ds downstream-oob-vom, on page 1513
- rpd-event, on page 1514
- rpd-us upstream-cable, on page 1515
- rpd-us upstream-oob-varpd, on page 1516
- rpd downstream-cable, on page 1517
- sbfd, on page 1518
- scramble-video-audio, on page 1519
- secondary aux, on page 1520
- server, on page 1521
- service divert-limit, on page 1523
- service divert-rate-limit, on page 1524
- service divert-rate-limit ip, on page 1526
- service divert-rate-limit ipv6, on page 1528
- service divert-rate-limit ip trusted-site, on page 1531
- service divert-rate-limit max-rate us-cable, on page 1533
- service divert-rate-limit max-rate wan, on page 1535
- service divert-rate-limit non-ip, on page 1537
- service divert-rate-limit trusted-site, on page 1538
- service divert-rate-limit trusted-site-ipv6, on page 1540
- service instance, on page 1542
- service udp-small-servers max-servers no-limit, on page 1543
- service-class, on page 1545
- service-class (cmts-tag), on page 1547
- service-class (enforce-rule), on page 1548
- service-descriptor-default, on page 1550
- service-distribution-group, on page 1551
- service-id, on page 1552
- service-name, on page 1553

- service-type (service descriptor), on page 1554
- service-type (virtual carrier group), on page 1555
- service-type-id (load-balance), on page 1556
- service-type-id (cmts-tag), on page 1557
- serving-area, on page 1558
- session, on page 1559
- session name multicast-label , on page 1562
- session-range, on page 1564
- set clock, on page 1565

qos-profile enforced

To specify a quality-of-service (QoS) profile that should be enforced when users violate their registered QoS profiles, use the **qos-profile enforced** command in enforce-rule configuration mode. To delete the enforced QoS profile from the enforce-rule, use the **no** form of this command.

qos-profile enforced *profile-id* [**no-persistence**]
no qos-profile enforced *profile-id* [**no-persistence**]

Syntax Description

profile-id	Specifies the QoS profile to be enforced. The valid range is 0 to 16383, with a default of 0.
no-persistence	(Optional) Specifies that the enforced QoS profile should not remain in force when a cable modem reboots. Instead, when a cable modem that is in the penalty period reboots, it is automatically removed from the penalty period and assigned the QoS profile that is specified in its DOCSIS configuration file. The default behavior is that enforced QoS profiles remain in force for cable modems across reboots.

Command Default

The value of *profile-id* defaults to 0, and enforced QoS profiles are persistent across cable modem reboots.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(9a)BC	This command was introduced. This command replaces the **enforced qos-profile** command.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Both the originally provisioned QoS profile and the enforced QoS profile must be created on the Cisco CMTS router. The *profile-id* does not support QoS profiles that are created by the cable modem.

An enforce-rule can specify an enforced QoS profile, which is automatically applied to subscribers who transmit more traffic than allowed by their registered QoS profile. The enforced QoS profile remains in effect during the penalty time period (see the **penalty-period** command). At the end of the penalty period, the subscriber returns to the registered QoS profile.

If a cable modem reboots while it is in its penalty time period, it continues using the enforced QoS profile, unless the service provider has manually changed the cable modem's registered QoS profile using the **cable modem qos profile** command.

When you change the enforced QoS profile for a currently active enforce-rule, any cable modems using this rule that are currently in the penalty period continue using the previously configured enforced QoS profile. Any cable modems that enter the penalty period after this configuration change, however, use the new enforced QoS profile.

An enforced QoS profile must already have been created on the Cisco CMTS router before you can assign it to an enforce-rule. If the rule does not exist, the system displays an error message.

When the **no-persistence** option is specified, the enforced QoS profile is still automatically applied to subscribers who violate their bandwidth requirements. However, when the cable modem reboots, the Cisco CMTS router allows the cable modem to use the QoS profile that is specified in its DOCSIS configuration file.

The **no-persistence** option can be used when initially using the Subscriber Traffic Management feature to identify potential problem applications and users. When repeat offenders are identified, they can then be assigned enforce-rules that do not use the **no-persistence** option, so that they remain in the penalty period even if they reboot their cable modems.



Note The system automatically applies the enforced QoS profile to violators only if the **enforce** keyword has been used with the **activate-rule-at-byte-count** command.

Examples

The following example shows profile 12 being assigned as the enforced QoS profile to an enforce-rule:

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential

Router(enforce-rule)# qos-profile enforced 12
```

The following example shows profile 12 being assigned as the enforced QoS profile to an enforce-rule, but with the **no-persistence** option specified, so that the enforced QoS profile does not remain in force if the cable modem reboots:

```
Router# configure terminal

Router(config)# cable qos enforce-rule residential

Router(enforce-rule)# qos-profile enforced 12 no-persistence
```

The following example shows the error message that is displayed when the specified QoS profile does not exist on the CMTS:

```
Router# configure terminal

Router(config)# cable qos enforce-rule test

Router(enforce-rule)# qos-profile enforced 98

The qos profile 98 doesn't exist or it's a cm created QoS profile
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.

Command	Description
debug cable subscriber-monitoring	Displays enforce-rule debug messages for subscriber traffic management on the Cisco CMTS routers.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
monitoring-basics	Specifies the type of monitoring for subscriber traffic management on a Cisco CMTS router.
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.
service-class (enforce-rule)	Identifies a particular service class for cable modem monitoring in an enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

qos-profile registered

To specify the registered quality of service (QoS) profile that should be used for this enforce-rule, use the **qos-profile registered** command in enforce-rule configuration mode. To remove the registered QoS profile from the enforce-rule, use the **no** form of this command.

qos-profile registered *profile-id*
no qos-profile registered *profile-id*

Syntax Description

profile-id	Specifies the QoS profile to be monitored. This profile must be created on the Cisco CMTS router. If you want to manage a cable modem that uses a modem-created QoS profile, you must first create that exact QoS profile on the CMTS router before using this command. The valid range is 0 to 16383, with a default of 0.

Command Default

The default profile ID is 0.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(9a)BC	This command was introduced. This command replaces the **registered qos-profile** command.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must specify a registered QoS profile for each enforce-rule. The Cisco CMTS router then uses the registered profile ID to match subscribers' service flows to the proper enforce-rules.

When you change the registered QoS profile for an active rule, the cable modems that had been using the previous registered QoS profile are no longer managed by the Subscriber Traffic Management feature. Instead, the rule begins managing those cable modems that use the new registered QoS profile.



Note The registered QoS profile must be created on the Cisco CMTS router before you can assign it to an enforce-rule. If the rule does not exist, the system displays an error message. If you want to manage a cable modem that is currently using a modem-created QoS profile, you must first manually create a new QoS profile on the CMTS router that has the same QoS parameters as the modem-created profile. Then allow the modem to come online using the manually created profile, before using the **qos-profile registered** command.

Examples

The following example shows profile 50 being assigned as the registered QoS profile to an enforce-rule:

```
Router# configure terminal

Router(config)# cable qos enforce-rule enforce-rule
Router(enforce-rule)# qos-profile registered 50
```

The following example shows the error message that is displayed when the specified QoS profile does not exist on the CMTS:

```
Router# configure terminal

Router(config)# cable qos enforce-rule test

Router(enforce-rule)# qos-profile registered 99

The qos profile 99 doesn't exist or it's a cm created QoS profile
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
debug cable subscriber-monitoring	Displays enforce-rule debug messages for subscriber traffic management on the Cisco CMTS routers.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
monitoring-basics	Specifies the type of monitoring for subscriber traffic management on a Cisco CMTS router.
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles.
service-class (enforce-rule)	Enables the enforcing of QOS profiles according to service class.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

qam-profile

To define the QAM profile number, use the **qam-profile** command in the RF channel sub configuration mode.

qam-profile *value*

Syntax Description

value Value for the QAM profile. The QAM profiles are defined before they are associated with rf-channels. Valid range is 0 to 31.

- QAM profile ID 0 to 5
- System defined 6 to 31

Once defined, the rf-channel associated with that profile must match the correct qam-profile type. For instance, qam-profile 4 is defined for video, and may be used with rf-channels of type VIDEO.

Command Default

None.

Command Modes

RF channel sub configuration mode (config-rf-chan)

Usage Guidelines

This command is used to define the QAM profile number.

The following example shows how to define the QAM profile number:

```
router#configure terminal
router(config)#controller integrated-cable 3/0/0
router(config-controller)#rf-chan 5 10
router(config-rf-chan)#type video
router(config-rf-chan)#frequency 723000000
router(config-rf-chan)#rf-output alt
router(config-rf-chan)#power-adjust 0
router(config-rf-chan)#qam-profile 4
router(config-rf-chan)#exit
router(config-controller)#exit
router(config)#exit
router#show controller integrated-Cable 3/0/0 rf-channel 5 10
Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output
 5   TEST   UP   723000000  VIDEO  B    256   5361  I32-J4       164  34     ALT
 10  TEST   UP   753000000  VIDEO  B    256   5361  I32-J4       169  34     ALT
```

Related Commands

Command	Description
controller integrated-cable	Enters the controller configuration mode.
frequency	Defines the RF channel frequency.
qam-profile	Defines the QAM profile number.
rf-chan	Enters the RF channel sub configuration mode.
rf-output	Defines the QAM output mode.
power-adjust	Defines the channel power level.

r-dti

To specify the Remote DOCSIS Timing Interface (R-DTI) configuration ID to use in RPD, use the **r-dti** command in RPD configuration mode. To void the R-DTI configuration specification, use the **no** form of this command.

r-dti *configuration_id*

no r-dti

Syntax Description

configuration_id	Specifies the ID of the R-DTI configuration previously created.

Command Default

None

Command Modes

RPD configuration (config-rpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the R-DTI configuration ID.

The following example shows how to specify the R-DTI configuration ID:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# r-dti 1
```

rcp-id

To assign a receive channel profile (RCP) ID to a receive channel configuration (RCC) template, use the **rcp-id** command in RCC template configuration mode. To remove the RCP ID, use the **no** form of this command.

rcp-id *rcp-id*
no rcp-id *rcp-id*

Syntax Description

rcp-id	Specifies an RCP ID for the RCC template. The valid range is from 00 00 00 00 00 to FF FF FF FF FF.

Command Default

By default the RCP ID is set to 00 00 00 00 00. However, you must change the default value to a non-zero RCP ID.

Command Modes

RCC template configuration (config-rcc-template)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.

Usage Guidelines

A valid RCC template consists of a configured RCP ID, a receive module (RM) entry, and a receive channel (RC) entry.

First, you define an RCC template for an RCP, and then assign the template to a cable interface to generate RCCs based on the actual DS channel configuration.

Examples

The following example shows how to assign an RCP ID to an RCC template:

```
Router# configure terminal
Router(config)# cable rcc-template
 1
Router(config-rcc-template)# rcp-id 00 10 00 00 03
```

Related Commands

Command	Description
rcp-id	Specifies an ID for the receive channel profile.
receive-module	Specifies a receive module entry in the form of a numeric value.
receive-channel	Specifies a receive channel entry in the form of a numeric value.

receive-channel

To associate a receive channel to a receive module (RC), use the **receive-channel** command in RCC template configuration mode. To restore the default value, use the **no** form of this command.

receive-channel *index* **center-frequency** *Hz* **connected-receive-module** *index* [**primary**]
no receive-channel *index* **center-frequency** *Hz* **connected-receive-module** *index*

Syntax Description

index	Specifies the index value for the receive channel. The valid range is 1 to 10.
center-frequency	Specifies the center frequency for the receive channel.
Hz	Specifies the center frequency value in Hz. The valid range is 55000000-858000000.
connected-receive-module	Specifies a nested receive module in the RCC template. Generally, only one receive module is configured for an RCC template.
index	Specifies the index value for the connected receive module. The valid range is 1 to 10.
primary	(Optional) Indicates that it is a CM primary channel and an RCC can be derived from this channel.

Command Default

None

Command Modes

RCC template configuration (config-rcc-template)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A valid RCC template consists of a configured RCP ID, a receive module (RM) entry, and a receive channel (RC) entry. First, you define an RCC template for an RCP, and then assign the template to a cable interface to generate RCCs based on the actual DS channel configuration.

An RCC template configures the physical layer components described by an RCP, including receive modules and receive channels to specific downstream frequencies, and specifies the interconnections among receive modules or between receive modules and receive channels.

A receive module can include multiple receive channels. So we need to specify which receive channel belongs to which receive module.

Examples

The following example shows how to associate a receive channel to a receive module:

```
Router# configure terminal
```

```
Router(config)# cable rcc-template
 1
Router(config-rcc-template)# rcp-id 00 10 00 00 03
Router(config-rcc-template)# receive-module 1 first-channel-center-frequency 555000000
Router(config-rcc-template)# receive-channel 1 center-frequency 555000000
connected-receive-module 1 primary
Router(config-rcc-template)# receive-channel 2 center-frequency 561000000
connected-receive-module 1
```

Related Commands

Command	Description
cable rcc-template	Defines a receive channel configuration (RCC) template for an RCP.
rcp-id	Specifies an ID for the receive channel profile.
receive-module	Specifies a receive module entry in the form of a numeric value.

receive-module

To associate a receive module (RC) to a Receive Channel Configuration (RCC) template, use the **receive-module** command in RCC template configuration mode. To restore the default value, use the **no** form of this command.

receive-module *index* **first-channel-center-frequency** *Hz* [**connected-receive-module** *index*]
no receive-module *index* **first-channel-center-frequency** *Hz* [**connected-receive-module** *index*]

Syntax Description

index	Specifies the index value for the receive module. The valid index range is 1 to 10.
first-channel-center-frequency	Specifies the center frequency of the first channel of the receive module channel block.
Hz	Specifies the center frequency value in Hz. The valid range is 55000000 to 858000000.
connected-receive-module	(Optional) Specifies a nested receive module in the RCC template. Generally, only one receive module is configured for an RCC template.
index	(Optional) Specifies the index value for the connected receive module. The valid range is 1 to 10.

Command Default

None

Command Modes

RCC template configuration (config-rcc-template)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A valid RCC template consists of a configured RCP ID, a receive module (RM) entry, and a receive channel (RC) entry. First, you define an RCC template for an RCP, and then assign the template to a cable interface to generate RCCs based on the actual DS channel configuration.

An RCC template configures the physical layer components described by an RCP, including receive modules and receive channels to specific downstream frequencies, and specifies the interconnections among receive modules or between receive modules and receive channels.

A receive module can include multiple receive channels. So we need to specify which receive channel belongs to which receive module.

Examples

The following example shows how to associate a receive module to an RCC template:

```
Router# configure terminal
```

```
Router(config)# cable rcc-template
 1
Router(config-rcc-template)# rcp-id 00 10 00 00 03
Router(config-rcc-template)# receive-module 1 first-channel-center-frequency 555000000
Router(config-rcc-template)# receive-channel 1 center-frequency 555000000
connected-receive-module 1 primary
Router(config-rcc-template)# receive-channel 2 center-frequency 561000000
connected-receive-module 1
```

Related Commands

Command	Description
cable rcc-template	Defines a receive channel configuration (RCC) template for an RCP.
rcp-id	Specifies an ID for the receive channel profile.
receive-channel	Specifies a receive channel entry in the form of a numeric value.

redundancy

To configure line card redundancy, use the **redundancy** command in global configuration mode.

redundancy

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **redundancy** command to enter the redundancy configuration mode.

Examples

The following example shows how to configure line card redundancy:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# redundancy
Router(config-red)# linecard-group 0 internal-switch
Router(config-red-lc)# description RedundancyGroup0
Router(config-red-lc)# class 1:N
Router(config-red-lc)# revertive 60
Router(config-red-lc)# member slot 1 primary
Router(config-red-lc)# member slot 0 secondary
```

Related Commands

Command	Description
linecard-group internal-switch	Creates a line card group for the line card.
description	Adds a description to the line card group.
class	Configures redundancy class on the line card.

redundancy force-failover main-cpu

To force a switchover, so that the standby Performance Routing Engine (PRE1) module becomes the active PRE1 module, use the**redundancy force-failover main-cpu** command in privileged EXEC mode.

redundancy force-failover main-cpu

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(4)XF1	This command was introduced for the Cisco uBR10012 router.
12.2(11)BC3	The active PRE1 module checks to see if a switchover is currently in progress before implementing this command.
12.3(21)BC	This command is replaced by the **redundancy switch-activity** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **redundancy force-failover main-cpu** command initiates a manual switchover, so that the standby PRE1 module becomes the active PRE1 module and assumes full responsibilities for router operations. This command requires that both PRE1 modules are running a Cisco IOS software image that supports the Route Processor Redundancy (RPR) feature.



Note The terms failover and switchover are interchangeable, but switchover is the term used across all Cisco platforms capable of high-availability operation.

A manual switchover is typically done for one of the following reasons:

- You want to upgrade or replace the active PRE1 module.
- You have upgraded the Cisco IOS software on the standby PRE1 module and want the standby PRE1 module to begin using the new software image. This also allows you to upgrade the software on the former active PRE1 module without interrupting systems operations.
- You want to test switchover operation on the system.

A switchover can also be manually initiated by removing the active PRE1 module from the chassis, but using the **redundancy force-failover main-cpu** command provides a more graceful switchover, without generating hardware alarms.

Tip Do not perform a switchover immediately after you change the configuration and save it to the NVRAM. Instead, wait a few minutes to allow the two PRE1 modules to synchronize the new configuration, and then perform the switchover.

Tip Wait two to three minutes after a switchover before switching the system back to the original PRE1 module, so as to allow the system to stabilize and so that both PRE1 modules are ready for the switch. In Cisco IOS Release 12.2(11)BC3 and later releases, the active PRE1 module will not initiate a new switchover until a current switchover is complete and the system has stabilized.

Examples

The following example shows a switchover being manually initiated:

```
Router# redundancy force-failover main-cpu

Proceed with switchover to standby PRE? [confirm] y
```

Note Pressing **enter** or **y** confirms the action and begins the switchover. Pressing any other key cancels the switchover and returns control to the current active PRE1 module.

The following example shows a switchover being attempted but failing because the standby PRE1 module is either not ready, not available, or not installed:

```
Router# redundancy force-failover main-cpu

Proceed with switchover to standby PRE? [confirm]
Standby PRE not ready, switchover aborted.
Router#
```

Note In some versions of Cisco IOS software, a failed software switchover will show the following message:

```
Unable to communicate with standby PRE, switchover aborted.
```

Related Commands

Command	Description
associate	Associates two line cards for Automatic Protection Switching (APS) redundancy protection.
redundancy	Enters redundancy configuration mode so that the synchronization parameters can be configured.
redundancy reload	Resets the standby PRE1 module, or to reset both the active and standby PRE1 modules.
redundancy switch-activity	Forces a switchover to the standby PRE module.

redundancy force-switchover main-cpu

To force a standby Performance Routing Engine (PRE) to assume the role of an active PRE, use the **redundancy force-switchovermain-cpu** command in privileged EXEC mode.

redundancy force-switchovermain-cpu

Syntax Description

None

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Before using this command, install the Cisco IOS software image (to ensure high availability), and configure the Route Processor Redundancy (RPR) mode on both the PRE modules.

Note The terms failover and switchover are interchangeable, but switchover is the term used across all Cisco platforms capable of high-availability operation.

Note We recommend you use the **redundancy force-switchover main-cpu** command only on the active PRE module. The active PRE crashes used on the standby PRE.

Examples

The following example shows a manual switchover:

```
Router# redundancy force-switchover main-cpu

Proceed with switchover to standby PRE? [confirm] y

Preparing to Switch Activity
```

Note Pressing **enter** or **y** confirms the action and begins the switchover. Pressing any other key cancels the switchover and returns control to the currently active PRE module.

The following example shows a switchover being attempted but failing because the standby PRE module is either not ready, not available, or not installed:

```
Router# redundancy force-switchover main-cpu

Proceed with switchover to standby PRE? [confirm] n

Standby PRE not ready, switchover aborted.

Router#
```

Related Commands

Command	Description
redundancy	Enters the redundancy configuration mode so that the synchronization parameters could be configured.
redundancy reload	Resets the standby PRE module or resets both the active and standby PRE modules.
redundancy switch-activity	Forces a switchover to the standby PRE module.
show redundancy	Displays the current active and standby Supervisor card redundancy status.

redundancy linecard-group

To trigger a switchover from the working line card to the protect line card, or to revert from the protect line card to the working line card on the Cisco uBR10012 and Cisco cBR series routers, use the **redundancy linecard-group** command in privileged EXEC mode.

redundancy linecard-group {**lockout** | **resync** | **revertback** | **switchover from** | **unlockout**} **slot**/**subslot**
Cisco cBR Series Converged Broadband Routers
redundancy linecard-group switchover from *slot*

Syntax Description

lockout	Locks a line card switchover from the specified working slot and subslot.
resync	Specifies static synchronization from the working line card to the protect line card.
revertback	Reverts from the protect line card to the working line card.
switchover from	Triggers a switchover from the working line card to the protect line card.
slot	(Cisco cBR series routers) Slot number of the interface card. The range is from 0 to 3 and 6 to 9 on the Cisco cBR-8 router.
unlockout	Removes the switchover lockout from the specified working slot and subslot.
slot /*subslot*	(Cisco uBR10012 router) Specifies the cable interface line card. • *slot*—Chassis slot number of the cable interface line card. The valid range is from 5 to 8. • *subslot*—(Cisco uBR10012 router only) Secondary slot number of the cable interface line card. Valid subslots are 0 and 1.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(13a)BC	This command was introduced.
12.2(33)SCE	This command was modified. A new keyword, **resync**, was added to enable the Cisco uBR10012 router to perform a manual synchronization from the working line card to the protect line card.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **lockout**, **resync**, **revertback**, and **unlockout** keywords were removed.

Usage Guidelines

The **redundancy linecard-group** command is supported only on the Cisco uBR10012 and Cisco cBR series routers.

When the normal (system initiated) static line card synchronization fails, use the **redundancy linecard-group** command with the **resync** keyword to enable the Cisco uBR10012 router to perform a manual synchronization from the working line card to the protect line card.

Examples

The following example shows how to lock a line card switchover from slot 5 and subslot 0 on the Cisco uBR10012 router using the **redundancy linecard-group** command with the **lockout** keyword:

```
Router# redundancy linecard-group lockout 5/0
HCCP LC: 5/0 Working will be locked out, this operation will prevent all kinds of switchover.
```

The following example shows how to remove the switchover lockout from slot 5 and subslot 0 on the Cisco uBR10012 router using the **redundancy linecard-group** command with the **unlockout** keyword:

```
Router# redundancy linecard-group unlockout 5/0
```

The following example shows how to enable the Cisco uBR10012 router to perform a manual synchronization from the working line card to the protect line card using the **redundancy linecard-group** command with the **resync** keyword:

```
Router# redundancy linecard-group resync 5/0
*Nov  9 23:09:09.049: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state to
administratively down
*Nov  9 23:09:09.049: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U1, changed state to
administratively down
*Nov  9 23:09:09.049: %SNMP-5-LINK_DOWN: LinkDown:Interface Cable5/1/1-upstream2 changed
state to down
*Nov  9 23:09:09.049: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U0, changed state to
administratively down
*Nov  9 23:09:09.057: %SNMP-5-LINK_DOWN: LinkDown:Interface Cable5/1/1-upstream1 changed
state to down
*Nov  9 23:09:09.057: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U0, changed state to up
*Nov  9 23:09:09.057: %SNMP-5-LINK_DOWN: LinkDown:Interface Cable5/1/1-upstream0 changed
state to down
*Nov  9 23:09:09.061: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U1, changed state to up
*Nov  9 23:09:09.061: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state to up
*Nov  9 23:09:09.173: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/1/1-upstream0 changed state
 to up
SLOT 5/1: Nov  9 23:09:09.057: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state
to administratively down
SLOT 5/1: Nov  9 23:09:09.057: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U1, changed state
to administratively down
SLOT 5/1: Nov  9 23:09:09.057: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U0, changed state
to administratively down
SLOT 5/1: Nov  9 23:09:09.173: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U0, changed state
to up
SLOT 5/1: Nov  9 23:09:09.177: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U1, changed state
to up
SLOT 5/1: Nov  9 23:09:09.177: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state
to up
*Nov  9 23:09:19.457: %HCCP-5-SWITCHOVERREADY: HCCP card 5/1 Mbr 50 Protect: ready to
switchover.
*Nov  9 23:09:19.457: %HCCP-5-SWITCHOVERREADY: HCCP card 5/0 Mbr 50 Working: ready to
switchover.
```

The following example shows how **to enable the** Cisco uBR10012 router **to perform a switchover** from the working line card to the protect line card using the **redundancy linecard-group** command with the **switchover from** keyword:

The following example shows how to enable the Cisco uBR10012 router to perform a switchover from the working line card to the protect line card using the**redundancy linecard-group** command with the **switchover** from keyword:

```
Router# redundancy linecard-group switchover from 5/0
*Nov  9 23:17:27.489: %HCCP-5-LC_ACTIVE: HCCP card 5/1 Mbr 50 Protect: change state to
active due to: CLI Switch.
*Nov  9 23:17:27.525: %HCCP-5-LC_STANDBY: HCCP card 5/0 Mbr 50 Working: change state to
standby due to: CLI Switch.
*Nov  9 23:17:27.525: %HCCP-5-CHANON: HCCP card 5/1 Mbr 50 Protect: turning on channel.
*Nov  9 23:17:27.525: %HCCP-6-HCCP_CHAN_RFSW_SNMP_INFO: HCCP_LC_CHAN: waits forsnmp response
 asynchronously.
*Nov  9 23:17:27.541: %SNMP-5-LINK_UP: LinkUp:Interface Wideband-Cable5/1/1:0 changed state
 to up
*Nov  9 23:17:27.541: %LINEPROTO-5-UPDOWN: Line protocol on Interface Wideband-Cable5/1/1:0,
 changed state to up
*Nov  9 23:17:27.541: %SNMP-5-LINK_UP: LinkUp:Interface Wideband-Cable5/1/1:2 changed state
 to up
*Nov  9 23:17:27.541: %LINEPROTO-5-UPDOWN: Line protocol on Interface Wideband-Cable5/1/1:2,
 changed state to up
*Nov  9 23:17:27.541: %SNMP-5-LINK_UP: LinkUp:Interface Wideband-Cable5/1/1:4 changed state
 to up
*Nov  9 23:17:27.541: %LINEPROTO-5-UPDOWN: Line protocol on Interface Wideband-Cable5/1/1:4,
 changed state to up
*Nov  9 23:17:27.905: %HCCP-6-HCCP_CHAN_RFSW_SNMP_INFO: HCCP_LC_CHAN: snmp set to rf switch
 is successful.
SLOT 5/1: Nov  9 23:17:27.597: %HCCP-6-LC_RPLC_CFGSYNC_CONFIG_RECOVER: HCCP 14 50 Protect:
 LC critical rplc_cfgsync configuration recover is succeed.
SLOT 5/1: Nov  9 23:17:27.601: %HCCP-6-LC_RPLC_CFGSYNC_CONFIG_RECOVER: HCCP 15 50 Protect:
 LC critical rplc_cfgsync configuration recover is succeed.
*Nov  9 23:17:28.121: %HCCP-3-DATA_PLANE_READY: HCCP data plane for card 5/1 member 50 is
ready.
*Nov  9 23:17:28.493: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/1/0, changed
state to up
*Nov  9 23:17:28.493: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/1/0 changed state to up
*Nov  9 23:17:28.497: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/1/1, changed
state to up
*Nov  9 23:17:28.497: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/1/1 changed state to up
*Nov  9 23:17:28.497: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/1/2, changed
state to up
*Nov  9 23:17:28.497: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/1/2 changed state to up
*Nov  9 23:17:37.801: %LINK-3-UPDOWN: Interface Modular-Cable5/1/1:0, changed state to up
*Nov  9 23:17:38.513: %HCCP-6-STATICSYNC_COMPLETED: HCCP static sync for card 5/1 member
50 is completed in 56 ms.
*Nov  9 23:17:38.801: %LINEPROTO-5-UPDOWN: Line protocol on Interface Modular-Cable5/1/1:0,
 changed state to up
*Nov  9 23:17:48.513: %HCCP-5-SWITCHOVERREADY: HCCP card 5/0 Mbr 50 Working: ready to
switchover.
*Nov  9 23:17:48.513: %HCCP-5-SWITCHOVERREADY: HCCP card 5/1 Mbr 50 Protect: ready to
switchover.
```

The following example shows how to revert from the protect line card to the working line card using the **redundancy linecard-group** command with the **revertback** keyword on the Cisco uBR10012 router:

```
Router# redundancy linecard-group revertback 5/0
```

```
*Nov  9 23:21:33.277: %HCCP-5-LC_ACTIVE: HCCP card 5/0 Mbr 50 Working: change state to
active due to: CLI Switch.
*Nov  9 23:21:33.285: %HCCP-5-LC_STANDBY: HCCP card 5/1 Mbr 50 Protect: change state to
standby due to: CLI Switch.
*Nov  9 23:21:33.297: %HCCP-5-CHANON: HCCP card 5/0 Mbr 50 Working: turning on channel.
*Nov  9 23:21:33.301: %HCCP-5-CHANOFF: HCCP card 5/1 Mbr 50 Protect: turning off channel.
*Nov  9 23:21:33.301: %HCCP-6-HCCP_CHAN_RFSW_SNMP_INFO: HCCP_LC_CHAN: waits for snmp response
 asynchronously.
*Nov  9 23:21:33.433: %UBR10000-5-UPDOWN: Interface Cable5/1/0 U2, changed state to
administratively down
*Nov  9 23:21:33.437: %UBR10000-5-UPDOWN: Interface Cable5/1/0 U1, changed state to
administratively down
*Nov  9 23:21:33.441: %UBR10000-5-UPDOWN: Interface Cable5/1/0 U0, changed state to
administratively down
*Nov  9 23:21:33.481: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state to
administratively down
*Nov  9 23:21:33.481: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state to
administratively down
Nov  9 23:21:33.585: %interface Cable5/1/0 U0 Docsis mode set to DOCSIS 1.x-only Nov  9
23:21:33.585: %Modulation profile set to 21
*Nov  9 23:21:34.277: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/0/0, changed
state to up
*Nov  9 23:21:34.277: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/0/0 changed state to up
*Nov  9 23:21:34.277: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/0/1, changed
state to up
*Nov  9 23:21:34.277: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/0/1 changed state to up
*Nov  9 23:21:34.277: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/0/2, changed
state to up
*Nov  9 23:21:34.277: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/0/2 changed state to up
*Nov  9 23:21:34.309: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/0/3, changed
state to up
*Nov  9 23:21:34.309: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/0/3 changed state to up
*Nov  9 23:21:34.309: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cable5/0/4, changed
state to up
*Nov  9 23:21:34.309: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/0/4 changed state to up
*Nov  9 23:21:35.513: %LINK-3-UPDOWN: Interface Modular-Cable5/1/1:0, changed state to down
*Nov  9 23:21:36.513: %LINEPROTO-5-UPDOWN: Line protocol on Interface Modular-Cable5/1/1:0,
 changed state to down
*Nov  9 23:21:46.537: %UBR10000-5-USFREQCHG: Interface Cable5/1/0 U0, changed to Freq 10.000
 MHz
*Nov  9 23:21:46.545: %UBR10000-5-USFREQCHG: Interface Cable5/1/0 U1, changed to Freq 30.000
 MHz
*Nov  9 23:21:46.549: %UBR10000-5-USFREQCHG: Interface Cable5/1/0 U2, changed to Freq 20.000
 MHz
*Nov  9 23:21:46.581: %UBR10000-5-USFREQCHG: Interface Cable5/1/1 U0, changed to Freq 25.000
 MHz
*Nov  9 23:21:46.585: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U0, changed state to up
*Nov  9 23:21:46.585: %UBR10000-5-USFREQCHG: Interface Cable5/1/1 U1, changed to Freq 15.000
 MHz
*Nov  9 23:21:46.585: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U1, changed state to up
*Nov  9 23:21:46.589: %UBR10000-5-USFREQCHG: Interface Cable5/1/1 U2, changed to Freq 35.000
 MHz
*Nov  9 23:21:46.589: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state to up
*Nov  9 23:21:46.657: %SNMP-5-LINK_UP: LinkUp:Interface Cable5/1/1-upstream0 changed state
 to up
Nov  9 23:21:46.669: %interface Cable5/1/0 U0 Docsis mode set to ATDMA-only (1.x CMs will
go offline)
Nov  9 23:21:46.669: %Modulation profile set to 221
SLOT 5/1: Nov  9 23:21:46.689: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U0, changed state
to up
SLOT 5/1: Nov  9 23:21:46.693: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U1, changed state
to up
SLOT 5/1: Nov  9 23:21:46.693: %UBR10000-5-UPDOWN: Interface Cable5/1/1 U2, changed state
to up
```

```
*Nov  9 23:21:57.033: %HCCP-5-SWITCHOVERREADY: HCCP card 5/1 Mbr 50 Protect: ready to
switchover.
*Nov  9 23:21:57.033: %HCCP-5-SWITCHOVERREADY: HCCP card 5/0 Mbr 50 Working: ready to
switchover.
```

The following example shows how to trigger a switchover from working card to protect card on a Cisco cBR-8 router:

```
Router# redundancy linecard-group switchover from slot 3
```

Related Commands

Command	Description
show hccp	(Not for Cisco cBR Series Routers) Displays Hot Standby Connection-to-Connection Protocol (HCCP) group information for a specific cable interface.
show hccp interface	(Not for Cisco cBR Series Routers) Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.
show hccp linecard	(Not for Cisco cBR Series Routers) Displays information about HCCP groups associated with a line card.

redundancy reload

To manually reload a standby Route Processor (RP) module, use the **redundancy reload** command in privileged EXEC mode.

redundancy reload {**peer** | **shelf**}

Syntax Description

peer	Reloads only the standby PRE1 module or Supervisor card.
shelf	Reloads both the active and standby PRE1 module or Supervisor card.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(4)XF1	This command was introduced for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was removed from Cisco IOS Release 12.2(33)SCA. It is replaced by the **hw-module standby-cpu reset** command.
12.2(44)SQ	This command was integrated into Cisco IOS Release 12.2(44)SQ. Support for the Cisco RF Gateway 10 was added.
15.2(4)M	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **redundancy reload peer** command is used to reset the standby RP module when there are any failures, tracebacks, or functionality and behavior mismatches on either one or both active and standby RP modules.

This command does not have an impact on active device operations, assuming a switchover is not required while the standby module is resetting.

The **redundancy reload shelf** command reloads the Cisco IOS software on both the active and standby RP modules. This command interrupts services on the router until all the RP modules and the line cards initialize and come back online.

Examples

The following example shows how to manually reload the standby RP module:

```
Router# redundancy reload peer
Reload peer? [confirm] y

Preparing to reload peer
```

Note Pressing **enter** or **y** begins the reload. Pressing any other key cancels the reload and returns control to the active RP module.

The following is sample output when a standby RP module is not installed on a router:

```
Router# redundancy reload peer
System is running in SIMPLEX mode, reload anyway? [confirm] n

Peer reload not performed.
```

The following example shows how to reload all RP modules:

```
Router# redundancy reload shelf
Reload the entire shelf [confirm] y

Preparing to reload entire shelf
```

Note Pressing **enter** or **y** begins the reload. Pressing any other key cancels the reload and returns control to the current active PRE1 module.

Cisco RF Gateway 10

The following example shows the system response when a standby Supervisor card is not installed in the Cisco RFGW-10:

```
Switch# redundancy reload peer
System is running in SIMPLEX mode, reload anyway? [confirm] n
```

Peer reload not performed.

The following example shows how to reload both Supervisor cards on the Cisco RFGW-10:

```
Switch# redundancy reload shelf
Reload the entire shelf [confirm] y

Preparing to reload entire shelf
```

Note Pressing **Enter** or **y** confirms the action and begins the reload of both cards. Pressing any other key cancels the reload and returns control to the current active Supervisor card.

Related Commands

Command	Description
associate slot	Associates slots for APS processor redundancy.
redundancy	Enters redundancy configuration mode so that the synchronization parameters can be configured.

Command	Description
redundancy force-failover main-cpu	Forces a switchover, so that the standby RP module becomes the active RP module.
redundancy switch-activity	Forces a switchover to the standby RP module.

redundancy switch-activity

To force a switchover to the standby PRE module, use the **redundancy switch-activity** command in privileged EXEC mode.



Note The terms failover and switchover are interchangeable, but switchover is the term used across all Cisco platforms capable of high-availability operation.

redundancy switch-activity [**force**]

Syntax Description

force	(Optional) Forces a switchover immediately, overriding any checks in the code or configuration that might prevent or delay a switchover.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(4)XF1	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **redundancy switch-activity** command is similar to the **redundancy force-failover main-cpu** command, except that it includes an option to force the switchover, overriding any configuration checks or other checks in the software that could prevent the switchover. In all cases, this command verifies that the standby PRE module is available and capable of performing the switchover before it transfers control to that PRE module. This command also synchronizes the current running-config and client data before initiating the switchover.

Examples

The following example shows a switchover being manually initiated, overriding any checks that might prevent or delay the switchover:

```
Router# redundancy switch-activity force
Proceed with switchover to standby PRE? [confirm] y
```



Note Pressing **enter** or **y** confirms the action and begins the switchover. Pressing any other key cancels the switchover and returns control to the current active PRE1 module.

Related Commands

Command	Description
associate	Associates two line cards for Automatic Protection Switching (APS) redundancy protection.

Command	Description
redundancy	Enters redundancy configuration mode so that the synchronization parameters can be configured.
redundancy reload	Resets the standby PRE1 module or to reset both the active and standby PRE1 modules.
redundancy force-failover main-cpu	Forces a switchover, so that the standby Performance Routing Engine (PRE1) module becomes the active PRE1 module.

registered qos-profile

Note Effective with Cisco IOS Release 12.3(9a)BC, the **registered qos-profile** command is replaced by the **qos-profile registered** command.

To specify the registered quality of service (QoS) profile that should be used for this enforce-rule, use the **registered qos-profile** command in enforce-rule configuration mode. To remove the registered QoS profile from the enforce-rule, use the **no** form of this command.

registered qos-profile *profile-id*
no registered qos-profile *profile-id*

Syntax Description

profile-id	Specifies the QoS profile to be monitored. This profile must be created on the Cisco CMTS router. If you want to manage a cable modem that uses a modem-created QoS profile, you must first create that exact QoS profile on the CMTS router before using this command. The range is 0 to 16383. The default of 0.

Command Default

The default profile ID is 0.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(9a)BC	This command was replaced by the **qos-profile registered** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must specify a registered QoS profile for each enforce-rule. The Cisco CMTS router then uses the registered profile ID to match subscribers' service flows to the proper enforce-rules.

When you change the registered QoS profile for an active rule, the cable modems that had been using the previous registered QoS profile are no longer managed by the Subscriber Traffic Management feature. Instead, the rule begins managing those cable modems that use the new registered QoS profile.

Note The registered QoS profile must be created on the Cisco CMTS router before you can assign it to an enforce-rule. If the rule does not exist, the system displays an error message. If you want to manage a CM that is using a CM-created QoS profile, you must first create a QoS profile on the Cisco CMTS router that matches the CM-created profile exactly. Then use the **registered qos-profile** command to assign that profile to this enforce-rule.

Examples

The following example shows profile 50 being assigned as the registered QoS profile to an enforce-rule:

```
Router# configure terminal

Router(config)# cable qos enforce-rule enforce-rule
Router(enforce-rule)# registered qos-profile 50
```

The following example shows the error message that is displayed when the specified QoS profile does not exist on the CMTS:

```
Router# configure terminal

Router(config)# cable qos enforce-rule test

Router(enforce-rule)# registered qos-profile 99

The qos profile 99 doesn't exist or it's a cm created QoS profile
```

Related Commands

Command	Description
activate-rule at-byte-count	Specifies the number of bytes that a subscriber can transmit during the monitoring period on a Cisco CMTS router.
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers that violate their registered QoS profiles.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

remap pid vcg

To configure custom PID remapping, use the **remap pid vcg** command in video configuration mode. PID remapping enables you to specify remap rules for all four types of processing types—data, pass-through, remap, and remux sessions.

remap pid vcg *vcg*

Syntax Description

vcg	Specifies the virtual carrier group.

Command Default

None.

Command Modes

Video configuration (config)

Command History

Release	Modification
IOS-XE 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a PID remap rule for a table-based unicast session on input port number 1 with vei-ip 198.51.100.1

```
logical-edge-device led1 id 1
        protocol table-based
              virtual-edge-input-ip 198.51.100.1 input-port-number 1
              vcg vcg1
              active
table-based
       vcg vcg1
             rf-channel 20
                 session unicast input-port 1 start-udp-port 49152 processing-type passthru
```

The corresponding remap rule is shown below:

```
remap pid vcg vcg1
      rf-channel 20
  vei-ip 198.51.100.1 udp-port 49152
    pid 100-200 101-201
    pid 102-130 202-230
    pid 131 240
```

rep-period

To configure the time between two ECM packets at the output, use the **rep-period** command in the DVB scrambling ECMG overrule configuration mode. To void the ECM repetition period configuration, use the **no** form of this command.

rep-period *time*
no rep-period

rep-period *time*	Specifies the ECM repetition period in milliseconds.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the time between two ECM packets at the output in milliseconds. The valid range is from 0 to 30000.

The following is an example of how to configure the ECM repetition period in milliseconds:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#rep-period 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.

Command	Description
min-cp-duration	Specifies the minimum crypto period.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

report-stream-error cc-error

To enable Continuity Counter (CC) error reporting on the chassis level, use the **report-stream-error cc-error** command in video configuration mode.

report-stream-error cc-error [[report-interval *value* **] threshold** *value*

Syntax Description

report-interval *value*	Specifies the event report interval in minutes.
threshold *value*	specifies the threshold value to report the event.

Command Default

None

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE Fuji 16.8.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

This example shows how to enable CC error reporting on the chassis level:

```
Router#configure terminal
Router(config)#cable video
Router(config-video)# report-stream-error cc-error report-interval 10 threshold value 5
```

report-stream-error input-stream-failure report-interval syslog

To configure a timeout value and syslog message for input stream failure trap for multicast sources, use the **report-stream-error input-stream-failure report-interval syslog** command in video configuration mode.

report-stream-error input-stream-failure report-interval *timeout value* **syslog** {**enable** | **disable**}

Syntax Description

timeout value	The interval after which input stream failure trap is sent if the input source down exceeds the configured timeout value. The timeout value range is 5–1800 seconds.
syslog	Enable or disable logging for for input stream stream failure trap.

Command Default

None

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE Fuji 16.8.1d	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

This example shows how to configure a timeout value and syslog message:

```
Router#configure terminal
Router(config)#cable video
Router(config-video)# report-stream-error input-stream-failure report-interval 10 syslog
enable
```

Related Commands

Command	Description
showcable video snmp-alarms	Display the active alarms in the system.
show cable video snmp-alarm-config	Display the alarm configuration in the system.
snmp-trap input-stream-failure multicast	Disable input stream failure trap for EAS stream.
snmp-server enable traps video-cable	Enable alarm event traps for cable related events.

request platform hardware diagnostic load

To load the field diagnostic image and start field diagnostic test, use the **request platform hardware diagnostic load slot** *slot-id image-path* **[autostart]** command in Privileged EXEC mode.

request platform hardware diagnostic load slot *slot-id image-path* [**autostart**]

Syntax Description

slot *slot-id*	Specifies the slot to perform field diagnostic test.
image-path	Specifies the path of the field diagnostic image, the image can be copied to hard disk, bootflash, or USB disk.
autostart	Automatically performs the default diagnostic test after loading the field diagnostic image.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **request platform hardware diagnostic load slot** *slot-id image-path* **[autostart]** command loads the field diagnostic image and starts field diagnostic test.

Examples

The following example shows how to load the field diagnostic image and start field diagnostic test:

```
Router# request platform hardware diagnostic load slot 0 harddisk:field_diag autostart
Mar 2 16:00:51.933 CST: %IOSXE_OIR-6-REMCARD: Card (cc) removed from slot 0
Mar 2 16:00:51.934 CST: %CABLE_CLC-5-LOGGER_LC_REMOVED: Carrier Card 0 removed
```

Related Commands

Command	Description
request platform hardware diagnostic unload	Removes the field diagnostic image from the line card.
show platform hardware diagnostic status	Displays the field diagnostic tests status.

request platform hardware diagnostic unload

To unload the field diagnostic image from the line card and reload the run-time image, use the **request platform hardware diagnostic unload slot** *slot-id* command in Privileged EXEC mode.

request platform hardware diagnostic unload slot *slot-id*

Syntax Description

slot *slot-id*	Specifies the slot to unload the field diagnostic image.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **request platform hardware diagnostic unload slot** *slot-id* command unloads the field diagnostic image from the line card and reloads the run-time image.

Examples

The following example shows how to unload the field diagnostic image:

```
Router# request platform hardware diagnostic unload slot 0
Mar 2 16:04:51.860 CST: %IOSXE_OIR-6-INSCARD: Card (cc) inserted in slot 0
```

Related Commands

Command	Description
request platform hardware diagnostic load	Loads the field diagnostic image and starts field diagnostic test.
show platform hardware diagnostic status	Displays the field diagnostic tests status.

request platform software package expand

To expand the package to bootflash, use the **request platform software package expand** command in Privileged EXEC mode.

request platform software package expand file bootflash:[**force** | **to bootflash:**[**force** | **wipe** | [**force**]] | **wipe** | [**force**]]

Syntax Description

bootflash:	Expand the package to bootflash. Cisco cBR-8 router only boot from bootflash.
force	Proceed despite warnings.
wipe	Wipe destination media content first.
to	Location for contained files.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.16.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **request platform software package expand** command in Privileged EXEC mode to expand the package to bootflash.

Examples

The following example shows hwo to expand the package to bootflash:

```
 router# request platform software package expand file
bootflash:subpkg_3_16/cbrsup-universalk9.03.16.00.S.155-3.S-std.SPA.bin
```

Related Commands

Command	Description
request platform software package install	Perform singe command ISSU install.

request platform software package install node

To install the package for upgrade process, use the **request platform software package install node** command in Privileged EXEC mode.

request platform software package install node {**abort** | **attach** | **file bootflash:**[**linecard-delay** *delay* | [**switchback**] | **noreload** | [**linecard**]] | **linecard-only** {**all** | **slot** *slot-number*} | **rollback**}

Syntax Description

abort	Cancel the ISSU process.
attach	Enables the users to view the last run log that contains the reports of all the stages of the one-shot upgrade.
file	Consolidated package file on active bootflash.
linecard-delay *delay*	By default, all the line cards will be reloaded with 240s interval during the upgrade procedure. Use **linecard-delay** *delay* option to specify the linecard reload interval.
switchback	By default, the active SUP will change to standby SUP after the upgrade procedure is complete. Use the **switchback** option to switchover the active and standby SUP at the end of upgrade procedure, so that the active SUP remains to be the active SUP after ISSU.
noreload	With **noreload** option, both the SUP and linecard will not be reloaded during the upgrade procedure. Upgrade will take effect by the next system reboot. With **noreload linecard** option, only the linecard will not be reloaded during the upgrade procedure.
linecard-only	Upgrade linecard only.
rollback	Roll back the chassis to the previous image.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.16.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on Cisco cBR Series Converged Broadband Routers. The **abort**, **linecard-only** and **rollback** keywords were added.

Usage Guidelines

Use the **request platform software package install node** command in Privileged EXEC mode to install the package for upgrade process, cancel the upgrade process, or rollback the chassis.

Examples

The following example shows how to install the package file:

```
router# request platform software package install node file
bootflash:subpkg_3_16/cbrsup-universalk9.03.16.00.S.155-3.S-std.SPA.bin
```

Related Commands

Command	Description
request platform software package expand	Expand the package to bootflash.

request platform software package install rp

To rollback to old package or implement ISSU subpackages upgrade on single SUP, use the **request platform software package instal rp** *rp-slot* **rollback** command in Privileged EXEC mode.

request platform software package install rp *rp-slot* {**file bootflash:**[**interface-module-delay** *delay-seconds*] | **rollback**[**as-booted**]}

Syntax Description

interface-module-delay *delay-second*	Specify the interface module restart timeout delay.
rollback	Un-do a previous install.
as-booted	Return to software provisioned at boot.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.16.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **request platform software package instal rp** *rp-slot* **rollback** command in Privileged EXEC mode to rollback to old package.

Examples

The following example shows how to rollback the upgrade:

```
router# request platform software package install rp 0 rollback
```

Related Commands

Command	Description
request platform software package install node	Install the package for upgrade process.

request platform software process restart

To restart processes in software platform, use the **request platform software process restart** command in Privileged EXEC mode.

request platform software process restart [**interval** *secs* | **slot** *slot-number*]

Syntax Description

interval *secs*	The interval between line card reload in seconds. Valid range is from 0 to 500.
slot *slot-number*	The line card slot number. The valid range is from 0 to 9.

Command Default

This command takes effect if the new iosd and iosdb, and the us-scheduler sub-packages have been previously installed on the Supervisor. Only line cards which are both active and primary will be affected.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.16.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **request platform software process restart** command only after installing new iosd, iosdb, and us-scheduler sub-packages on the Supervisor. This command will install the new sub-packages on the line cards and restarts the affected processes.

Examples

This example shows how to restart an isod process with an interval of 10 seconds:

```
Router# request platform software process restart interval 10
    Restarting the process ubrclc_k9lc_ms
    SUCCESS: Finished Restarting the process ubrclc_k9lc_ms
    Will automatically restart process iosdb
```

This example shows how to restart a us-scheduler process:

```
Router#request platform software process restart slot 6
    Restarting the process us-scheduler on slot 6
    SUCCESS: Finished Restarting the process us-scheduler on slot 6

Router#
*Jan 23 16:51:36.160 PDT: %CMCC_CBR-4-PROC_DOWN: CLC6: cmcc:  Process us-sched (cdman) is
down
*Jan 23 16:51:36.506 PDT: %CMCC_CBR-4-PROC_RESTART: CLC6: cmcc:  Process us-sched (cdman)
restarted. Please redo any config changes
made during process restart
*Jan 23 16:51:39.737 PDT: lcpr_enqueue_reco_event: lc_slot=6 peer=6
*Jan 23 16:51:39.881 PDT: %CBR-4-RECONCL_CM_FINISH: Reconciliation (clc->sup) for slot 6
finished: total 31, success 31, failed 0,
clc-only 0, sup-only 0, mismatch 0, offline 0
```

Related Commands

Command	Description
request platform software package install	Upgrades a consolidated package or an individual sub-package.

reserve-pid-range

To configure reserved output PID range, use the **reserve-pid-range** command in video configuration mode. To delete the reserved output PID range, use the **no** form of this command.

reserve-pid-range *start-pid–end-pid*
no reserve-pid-range *start-pid–end-pid*

Syntax Description

reserve-pid-range *start-pid–end-pid*	Specifies a range of PIDs that will not be used as output for remapped sessions.

Command Default

None.

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command configures reserved output PID range.

Examples

The following example shows how to configure reserved output PID range:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# reserve-pid-range 1-10
```

Related Commands

Command	Description
show cable video logical-edge-device	Displays the logical edge device information.

reset-interval

To set the default ONID number, use the **default-onid** command in the video configuration mode.

default-onid *number*

Syntax Description

number	The ONID number. By default, the system ONID is 0, which is commonly used in North America. If the default value of the ONID is used, the TSID must be unique. If you change the ONID, the TSID-ONID pair must be unique. The ONID must be in the range of 0 to 65535.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the deault system ONID.

The following example shows how to change the default ONID number:

```
configure terminal
cable video
default-onid 1580
```

restart-retry

To set the retry times for cable line card process restart, use the **restart-retry** *times* command in the process restart configuration mode.

`restart-retry` *times*

Syntax Description

times	Cable line card process restart retry times.

Command Default

None

Command Modes

Process restart configuration (config-process-restart)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command sets the retry times for cable line card process restart.

The following example shows how to set the retry times for cable line card process restart.

```
Router# configure terminal
Router(config)# process-restart
Router(config-process-restart)# restart-retry 3
```

Related Commands

Command	Description
lc-control-plane-timeout	Sets the interval of monitoring cable line card control plane process restart.
lc-us-scheduler-timeout	Sets the interval of monitoring cable line card upstream scheduler process restart.

restricted

To convert a general load balancing group (GLBG) to a restricted load balancing group (RLBG) for DOCSIS load balancing, use the **restricted** command in the config-lb-group configuration mode. To revert to the general group type for DOCSIS load balancing, use the **no** form of this command.

restricted
no restricted

Command Default

By default, the general group type is selected for load balancing.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to convert a GLBG to a RLBG using the **restricted** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# restricted
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

revertive

To enable the revert operation on a protect card, use the **revertive** command in line card redundancy group mode. To disable the revert operation, use the **no** form of the command.

revertive *time*
no revertive *time*

Syntax Description

time	Specifies the revert operation time in seconds. The valid values are 1 to 35791. The valid values on the Cisco cBR series routers are 10 to 86400 seconds.

Command Default

None

Command Modes

Line card redundancy group (config-red-lc)

Command History

Release	Modification
12.2(33)SCA	This command was introduced in Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to specify the revert operation time for a protect card on a uBR10012 router:

```
Router# configure terminal
Router(config)# redundancy
Router(config-red)# linecard-group 1 cable
Router(config-red-lc)# revertive 30
```

The following example shows how to specify the revert operation time on a Cisco cBR series router:

```
Router# configure terminal
Router(config)# redundancy
Router(config-red)# linecard-group 0 internal-switch
Router(config-red-lc)# revertive 30
```

Related Commands

Command	Description
linecard-group	Creates a line card group for one-to-one line card redundancy.
redundancy	Enters redundancy mode.
member subslot	Enables the redundancy role of a line card.

rf-chan

To enter the RF channel sub configuration mode to configure an individual channel or a block of channels, use the **rf-chan** command in the controller sub configuration mode.

rf-chan *starting QAM id ending QAM id*

Syntax Description

starting QAM id	The starting QAM ID. The valid range is 0 to 127.
ending QAM id	The ending QAM ID. The valid range is 0 to 127.

Command Default

None.

Command Modes

Controller sub configuration mode (config-controller)

Command History

Release	Modification
IOS-XE 3.15.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to enter the RF channel configuration sub-mode. If an individual channel is specified, only that channel's configuration is changed. If a block of channels is specified, the configuration change is applied to all the channels in the block.

The following example shows how to enter into the RF channel configuration sub-mode:

```
router#configure terminal
router(config)#controller integrated-cable 3/0/0
router(config-controller)#rf-chan 0 2
router(config-rf-chan)#frequency 93000000
router(config-rf-chan)#exit
router(config-controller)#exit
router#show controller integrated-Cable 3/0/0 rf-channel 0-2

Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output
0     UP   UP   93000000   DOCSIS  B    256   5361  I32-J4       1    34     NORMAL
1     UP   UP   99000000   DOCSIS  B    256   5361  I32-J4       2    34     NORMAL
2     UP   UP   105000000  DOCSIS  B    256   5361  I32-J4       3    34     NORMAL
```

Related Commands

Command	Description
controller integrated-cable	Enters the controller configuration mode.
frequency	Defines the RF channel frequency.
qam-profile	Defines the QAM profile number.
rf-output	Defines the QAM output mode.
type	Defines the QAM data type.
power-adjust	Defines the channel power level.

rf-channel

To enter the RF channel sub configuration mode to configure an individual channel, use the **rf-channel** command in the controller sub configuration mode.

rf-channel *number*

number	Identifies an RF channel and enters the RF channel sub configuration mode. The valid values are

Command Default

None

Command Modes

Controller sub configuration mode (config-controller)

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to enter the RF channel sub configuration mode:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#table-based
Router(config-video-tb)#vcg vcg1
Router(config-video-tb-vcg)#rf-channel 20
```

Related Commands

Command	Description
cable video	Enters cable video configuration mode.
table-based	Enables table-based session configuration.
vcg *name*	Specifies the virtual carrier group assigned to a logical edge device.

rf-channel (Virtual Carrier Group)

To specify the virtual RF channels in a virtual carrier group, use the **rf-channel** command in virtual carrier group configuration mode. To delete the virtual RF channels, use the **no** form of this command.

rf-channel *start-channel−end-channel* **tsid** *start-tsid−end-tsid* **output-port-number** *start-port−end-port*
no rf-channel *start-channel−end-channel* **tsid** *start-tsid−end-tsid* **output-port-number** *start-port−end-port*

Syntax Description

rf-channel *start-channel−end-channel*	Specifies the RF channel range.
tsid *start-tsid−end-tsid*	Specifies the tsid range.
output-port-number *start-port−end-port*	Specifies the output port range.

Command Default

None.

Command Modes

Virtual carrier group configuration (config-video-vcg)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the virtual RF channels.

Examples

The following example shows how to specify the virtual RF channels:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# virtual-carrier-group vod id 1
Router(config-video-vcg)# rf-channel 1-11 tsid 1-11 output-port-number 1-11
```

Related Commands

Command	Description
virtual-carrier-group	Defines a virtual carrier group.
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
encrypt	Encrypts the virtual carrier group.
service-type	Specifies the service type of the virtual carrier group.
show cable video virtual-carrier-group	Displays the virtual carrier group information.

rf-channel (table-based vcg)

To configure the rf channel in the table-based session, use the **rf-channel** command in the table-based VCG configuration mode. To delete the configuration, use the **no** form of this command.

rf-channel *start_channel* [*–end_channel*]

start_channel–end_channel	Specifies the range of rf channels for the table-based session.

Command Default

None

Command Modes

Table-based VCG configuration mode (config-video-tb-vcg)

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the rf channel in the table-based session:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#table-based
Router(config-video-tb)#vcg vcg1
Router(config-video-tb-vcg)#rf-channel 0-7
```

Related Commands

Command	Description
vcg (table-based)	Specifies the virtual carrier group associated with the table-based session.

rf-channel cable downstream channel-id

To assign a downstream channel ID to an RF channel, use the **rf-channel cable downstream channel-id** command in controller configuration mode. To remove a downstream channel ID for an RF channel, use the **no** form of this command.

rf-channel *rf-port* **cable downstream channel-id** *channel-id*
no rf-channel *rf-port* **cable downstream channel-id** *channel-id*

Syntax Description

rf-port	Specifies the RF channel physical port on the Wideband SPA FPGA. Valid values for *rf-port* depend on the configuration set with the **annex modulation** command.
channel-id	A unique channel ID. Valid values for releases prior to Cisco IOS Release 12.2(33)SCB are from 0 to 255 and the valid values for Cisco IOS Release 12.2(33)SCB and later are from 1 to 255 as 0 is reserved for network management.

Command Default

If the **rf-channel cable downstream channel-id** command is not issued, Cisco IOS software assigns a unique downstream channel ID to the RF channel.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB1	The downstream channel ID scheme was changed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For the wideband channel to work correctly, each RF channel on the fiber node that the wideband channel uses must have a unique downstream channel ID. By default, Cisco IOS software assigns a unique downstream channel ID to the RF channel. Use the **rf-channel cable downstream channel-id** command to change the default channel ID.

The downstream channel ID that is assigned to the RF channel must be unique on the fiber node.

- The ID cannot be the same ID as is used for another RF channel on the fiber node.
- The ID cannot be the same ID as is used for a primary downstream channel on the fiber node.

You can check downstream channel IDs that are being used by examining the CMTS router configuration file.

Refer to **cable downstream channel-id** *id command for the updated downstream channel ID scheme table.*

Note If you assign a downstream channel ID that is not unique on the fiber node, the **rf-channel cable downstream channel-id** command displays an error message. The command does assign the channel ID, but the status of the fiber node becomes invalid.

The Cisco uBR10012 router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command.

- For annex A and 256 QAM, each Wideband SPA supports 18 RF channels. In this case, valid values for the *rf-port* argument are 0 to 17.
- For all other cases, the SPA supports 24 RF channels. In these cases, valid values for the *rf-port* argument are 0 to 23.

Note Effective with Cisco IOS Release 12.3(23)BC, the **annex modulation** command is obsolete and **annex** and **modulation** are included as keyword options in the **rf-channel frequency** command. Also, for annex A and 256 QAM, each Wideband SPA supports up to 18 RF channels at full rate or up to 24 RF channels at less than full rate.

Examples

The following example shows how to assign a downstream channel ID of 123 to RF channel 3 on the Wideband SPA located in slot/subslot/bay 1/0/1.

```
Router# configure terminal

Router(config)# controller modular-cable 1/0/1
Router(config-controller)# rf-channel 3 cable downstream channel-id 123
```

Related Commands

Command	Description
annex modulation	Sets the annex and modulation for the Wideband SPA.
cable primary	Specifies that a wideband channel is a primary wideband channel.
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
ip-address (controller)	Sets the IP address of the Wideband SPA FPGA.
modular-host subslot	Specifies the modular-host line card.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.
rf-channel network delay	Specifies the CIN delay for each RF channel.

Command	Description
rf-channel description	Specifies the description for each RF channel.

rf-channel depi-tunnel

To bind the depi-tunnel, which inherits the configuration of the specified l2tp-class and depi-class, to an rf-channel on a shared port adapter (SPA), use the **rf-channel depi-tunnel** command in controller configuration mode. The **tsid** keyword is used to associate the logical rf-channel of the SPA to a physical quadrature amplitude modulation (QAM) on the radio frequency gateway (RFGW-10). To unbind the depi-tunnel, use the **no** form of this command.

rf-channel *rf-channel* **depi-tunnel** *depi-tunnel-name* **tsid** *id*
no rf-channel *rf-channel* **depi-tunnel** *depi-tunnel-name* **tsid** *id*

Syntax Description

rf-channel	RF channel physical port on the Wideband SPA. The allowed range is from 0 to 3.
depi-tunnel-name	Name of the DEPI tunnel.
tsid id	TS ID value.

Command Default

None

Command Modes

Global configuration (config)

Subinterface configuration (config-subif)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To configure DEPI on the M-CMTS, bind the depi-tunnel to an rf-channel on a SPA using the **rf-channel depi-tunnel** command in controller configuration mode. To associate the logical rf-channel on the SPA to a QAM on the RFGW, use the **tsid** keyword.

Examples

The following example shows how to bind the depi-tunnel SPA0 to rf-channel 0 on a SPA and associate tsid 100 to the QAM:

```
Router# configure terminal
Router(config)# controller modular-cable 1/0/0
Router(config-controller)# rf-channel 0 depi-tunnel SPA0 tsid 100
```

Related Commands

Command	Description
controller modular-cable	Specifies the slot, bay, and port to be configured.
show interface modular-cable	Displays the DEPI information for the modular cable.

rf-channel description

To configure the description of an RF channel on a Wideband SPA, use the **rf-channel description** command in controller configuration mode. To remove an RF channel configuration, use the **no** form of this command.

rf-channel *rf-port* **description** *description*
no rf-channel *rf-port* **description** *description*

Syntax Description

rf-port	Specifies the RF channel physical port on the Wideband SPA FPGA. Allowed range is 0 to 23. Valid values for *rf-port* depend on the configuration set with the **annex modulation** command (see the Usage Guidelines section).
description *description*	Specifies a description for the RF channel.

Command Default

No default RF channel configuration values are set for the description.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco uBR10012 router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command. For annex A and 256 QAM, each Wideband SPA supports up to 18 RF channels at full rate and up to 24 RF channels at less than full rate. For all other cases, the SPA supports 24 RF channels.

Note In Cisco IOS Release 12.3(21)BC, annex and modulation parameters were set globally for each SPA using the **annex modulation** command. Beginning in Cisco IOS Release 12.3(23)BC, annex and modulation values are set for each RF channel using the **rf-channel frequency** command. The **annex modulation** command is obsolete.

Examples

The following example shows how to configure the description of the RF channel characteristics for RF port 0:

```
Router# configure terminal

Router(config)# controller modular-cable 1/0/0
Router(config-controller)# rf-channel 0 description Primary downstream channel
```

Related Commands

Command	Description
cable primary	Specifies that a wideband channel is a primary wideband channel.
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
ip-address (controller)	Sets the IP address of the Wideband SPA FPGA.
modular-host subslot	Specifies the modular-host line card for Wideband protocol operations.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.
rf-channel network delay	Configures the network delay for an RF channel.

rf-channel frequency

To configure the frequency of an RF channel on a wideband interface, use the **rf-channel frequency** command in controller configuration mode. To remove the frequency of an RF channel configuration, use the **no** form of this command.

Cisco IOS Releases 12.3(21)BC and 12.2(33)SCA

rf-channel *rf-port* **frequency** *freq*
no rf-channel *rf-port* **frequency**

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCB

rf-channel *rf-port* **frequency** *freq* [**annex** {**A** | **B**} **modulation** {**64** | **256**} [**interleave-depth** {**8** | **12** | **16** | **32** | **64** | **128**}]]
no rf-channel *rf-port* **frequency**

Syntax Description

rf-port	Specifies the RF channel physical port on the Wideband SPA FPGA. Allowed range is 0 to 23. Valid values for *rf-port* depend on the configuration set with the **annex modulation** command (see the Usage Guidelines section).
freq	Sets the center frequency for the RF channel. Allowed range is 55000000 to 1050000000 MHz.
annex {**A**|**B**}	Specifies the MPEG framing format for each RF channel: • **A**–Annex A. The downstream is compatible with the European MPEG framing format specified in ITU-TJ.83 Annex A. • **B**–Annex B. The downstream is compatible with the North American MPEG framing format specified in ITU-TJ.83 Annex B.
modulation {**64**|**256**}	Specifies the modulation rate for each RF channel: • **64**–64-QAM • **256**–256-QAM
interleave-depth{**8** | **12** | **16** | **32** | **64**| **128**}	Indicates the downstream interleave depth. The default value is 32.

Command Default

No default RF channel configuration values are set for frequency, annex, and modulation.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.3(23)BC	The following keyword options were added: • **annex** • **modulation** • **interleave-depth**
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. The **annex**, **modulation**, and **interleave-depth** keyword options are not supported.
12.2(33)SCB	The **annex**, **modulation**, and **interleave-depth** keyword options are supported.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Cisco IOS Release 12.3(21)BC and Cisco IOS Release 12.2(33)SCA

This command configures the frequency for an RF channel on a Wideband SPA.

The Cisco uBR10012 router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command. For annex A and 256 QAM, each Wideband SPA supports up to 18 RF channels. For all other cases, the SPA supports up to 24 RF channels.

Note In Cisco IOS 12.3(21)BC and 12.3(21a)BC3 releases, **annex** and **modulation** parameters were set globally for each SPA using the **annex modulation** command. Beginning in Cisco IOS Release 12.3(23)BC, annex and modulation values are set for each RF channel using the **rf-channel frequency** command. The **annex modulation** command is obsolete.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCB

This command configures the frequency for an RF channel on a Wideband SPA. The Cisco uBR10012 router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels. For annex A and 256 QAM, each Wideband SPA supports up to 18 RF channels at full rate. For all other cases, the SPA supports up to 24 RF channels.

For each RF channel, use the **rf-channel frequency** command in controller configuration mode to configure RF-channel characteristics. For Cisco IOS Release 12.3(21)BC, for each RF channel (*rf-port*), the frequency option *must be configured* with the **rf-channel frequency** command**.**

Uniqueness of frequency is required for all cable downstream channels on all cable interfaces and all Wideband SPAs on the CMTS.

Note Be certain to verify that the RF channel values set with **rf-channel frequency** match the values configured for the QAM outputs on the edge QAM device.The frequency value must match. If the value does not match, the Wideband SPA will not successfully communicate with the edge QAM device.

Cisco IOS Release 12.2(33)SCE

In Cisco IOS Release 12.2(33)SCE and later, changing the frequency of a single RF channel in a controller will change the frequency of all RF channels in that controller. In the event of the frequency change, all DOCSIS 3.0 cable modems will start re-registering in downstream partial service mode (p-online).

Examples

The following example shows how to configure RF channel frequency for RF port 0:

```
Router# configure terminal

Router(config)# controller modular-cable 1/0/0
Router(config-controller)# rf-channel 0 frequency 699000000 annex A modulation 256
interleave-depth 64
```

Related Commands

Command	Description
cable primary	Specifies that a wideband channel is a primary wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
rf-channel description	Specifies the description for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.
rf-channel network-delay	Configure the network delay for an RF channel.

rf-channel group-address

To configure the DEPI multicast group address for the RF channel, use the **rf-channel group-address** command in controller configuration mode. To disable the configuration, use the **no** form of the command.

rf-channel *rf-number* **group-address** *ip-address*

no rf-channel *rf-number* **group-address**

Syntax Description

rf-number	RF channel number. The range is from 0 to 23.
ip-address	DEPI multicast group IP address.

Command Default

The DEPI multicast group address is not configured for the RF channel.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **rf-channel group-address** command provides upstream and downstream mapping information for a specific channel group.

The following example shows how to configure the DEPI multicast group address for RF channel 0:

```
Router# configure terminal
Router# controller Modular-Cable 8/1/0
Router(config-controller)# rf-channel 0 group-address 224.0.0.1
```

Related Commands

Command	Description
controller modular-cable	Configures the DEPI controller.

rf-channel ip-address mac-address udp-port

To configure the IP address, MAC address, UDP port and DEPI remote ID of an RF channel on a Wideband SPA, use the **rf-channel ip-address mac-address udp-port** command in controller configuration mode. To remove the IP address, MAC address, UDP port and DEPI remote ID configuration of an RF channel, use the **no** form of this command.

Cisco IOS Releases 12.3(21)BC and 12.2(33)SCA

rf-channel *rf-port* **ip-address** *ip-address* **mac-address** *mac-address* **udp-port** *portnum*
no rf-channel *rf-port* **ip-address** *ip-address* **mac-address** *mac-address* **udp-port** *portnum*

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCB

rf-channel *rf-port* **ip-address** *ip-address* **mac-address** *mac-address* {**udp-port** *portnum* | **depi-remote-id session-id**}
no rf-channel *rf-port* **ip-address** *ip-address* **mac-address** *mac-address* {**udp-port** *portnum* | **depi-remote-id session-id**}

Syntax Description

rf-port	Specifies the RF channel physical port on the Wideband SPA FPGA. Allowed range is 0 to 23. Valid values for *rf-port* depend on the configuration set with the **annex modulation** command (see the Usage Guidelines section).
ip-address	Specifies the IP address of the Gigabit Ethernet interface on the edge QAM device for this RF channel.
mac-address	Specifies the MAC address of the next-hop interface or of the edge QAM device for this RF channel.
portnum	Specifies the UDP port number for the edge QAM device that will be used for this RF channel. Allowed range is 0 to 65535.
session-id	Specifies the DEPI remote session ID to be used for encapsulation of frames in DOCSIS-MPT mode.

Command Default

None

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.3(23)BC	The **depi-remote-id** keyword option was added.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. The **depi-remote-id** keyword option is not supported.
12.2(33)SCB	The **depi-remote-id** keyword option is supported.

Release	Modification
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For each RF channel, use the **rf-channel ip-address mac-address udp-port** command in controller configuration mode to configure RF-channel characteristics.

The Cisco uBR10012 router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command. For annex A and 256 QAM, each Wideband SPA supports up to18 RF channels. For all other cases, the SPA supports up to 24 RF channels.

Note In the Cisco IOS Release 12.3(21)BC and 12.3(21a)BC3 releases, **annex** and **modulation** options were set globally for each SPA using the **annex modulation** command. Beginning in Cisco IOS Release 12.3(23)BC, annex and modulation values are set for each RF channel using the **rf-channel frequency** command. The **annex modulation** command is obsolete.

For each RF channel (*rf-port*), the following items *must be configured* with **rf-channel ip-address mac-address udp-port** command:

Cisco IOS Release 12.3(21)BC and Cisco IOS Release 12.2(33)SCA

- IP address
- MAC address
- UDP port
- Associated wideband channel (see the **cable rf-channel** command)

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCB

- IP address
- MAC address
- UDP port or DEPI remote ID
- Associated wideband channel (see the **cable rf-channel** command)

The value used for *mac-address* in the *mac-address* argument is as follows:

- If a Gigabit Ethernet router or Layer 3 switch is used between the Wideband SPA and the edge QAM device, the value specified for *mac-address* is the MAC address for the next-hop interface on the router or Layer 3 switch.
- If a Gigabit Ethernet router or Layer 3 switch is not used, the value specified for *mac-address* is the MAC address for the Gigabit Ethernet interface on the edge QAM device.

The UDP port number set for the RF channel allows mapping an input UDP session to a specific QAM output port. Wideband traffic from different Wideband SPAs cannot be mixed on the same QAM output ports.

Note Be certain to verify that the RF channel values set with **rf-channel frequency** match the values configured for the QAM outputs on the edge QAM device. IP address, MAC address, UDP port, and DEPI remote ID must match. If any of these values do not match, the Wideband SPA will not successfully communicate with the edge QAM device.

Examples

The following example shows how to configure the RF channel IP address, MAC address UDP port and DEPI remote ID characteristics for RF port 0:

```
Router# configure terminal

Router(config)# controller modular-cable 1/0/0
Router(config-controller)# rf-channel 0 ip-address 192.168.200.30 mac-address
0011-920e-a9ff udp-port 49152
```

Related Commands

Command	Description
cable primary	Specifies that a wideband channel is a primary wideband channel.
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
ip-address (controller)	Sets the IP address of the Wideband SPA FPGA.
modular-host sub-slot	Specifies the modular-host line card for Wideband protocol operations.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.
rf-channel description	Specifies the description for each RF channel.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel network delay	Configures the network delay for an RF channel.

rf-channel network-delay

To configure the network delay for an RF channel on a Wideband SPA, use the **rf-channel network delay** command in controller configuration mode. To remove the network delay configuration for an RF channel, use the **no** form of this command.

rf-channel *rf-port* **network-delay** *delay* [**sampling-rate** *rate*]
no rf-channel *rf-port* **network-delay** *delay* [**sampling-rate** *rate*]

Syntax Description

rf-port	RF channel physical port on the Wideband SPA FPGA. The allowed range is from 0 to 23. The valid values for *rf-port* depend on the configuration set with the **annex modulation** command (see the Usage Guidelines section).
delay	Converged Interconnect Network (CIN) delay. The default value is 550 us. The allowed range is from 0 to 3000 us. The delay value auto determines the delay through DEPI Latency Measurement (DLM) packets.
sampling-rate *rate*	(Optional) Specifies how often the DLM is sent. The range is from 1 to 500 sec. The default value is 10 sec. This option is available only when the delay value is set to auto.

Command Default

None

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 universal broadband router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.
12.2(33)SCC	This command was modified to include **sampling-rate** *rate* to specify how often the DLM is sent.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The Cisco uBR10012 universal broadband router supports two Wideband SPAs. Each Wideband SPA supports up to 24 RF channels depending on how the SPA is configured with the **annex modulation** command. For annex A and 256 QAM, each Wideband SPA supports up to18 RF channels. For all other cases, the SPA supports up to 24 RF channels.

Note In Cisco IOS releases 12.3(21) BC and 12.3(21a)BC3, **annex** and **modulation** parameters were set globally for each SPA using the **annex modulation** command. From Cisco IOS Release 12.3(23)BC onwards, annex and modulation values are set for each RF channel using the **rf-channel frequency** command. The **annex modulation** command is obsolete.

Examples

The following example shows how to configure the RF channel network delay characteristics for RF port 0:

```
Router# configure terminal

Router(config)# controller modular-cable 1/0/0
Router(config-controller)# rf-channel 0 network-delay 1000
```

The following example shows how to configure the RF channel network delay characteristics for RF port 0 with a sampling-rate of 1sec:

```
Router# configure terminal

Router(config)# controller modular-cable 1/0/0
Router(config-controller)# rf-channel 0 network-delay auto sampling-rate 1
```

Related Commands

Command	Description
cable primary	Specifies that a wideband channel is a primary wideband channel.
cable rf-channel	Associates an RF channel on a Wideband SPA with a wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
ip-address (controller)	Sets the IP address of the Wideband SPA FPGA.
modular-host subslot	Specifies the modular-host line card for Wideband protocol operations.
rf-channel cable downstream channel-id	Assigns a downstream channel ID to an RF channel.
rf-channel description	Specifies the description for each RF channel.
rf-channel frequency	Sets the frequency for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address, and UDP port for each RF channel.

rf-channel rf-power

To set the RF power output level on Cisco UBR-MC20X20V and Cisco uBR-MC88V cable interface line cards, use the **rf-channel rf-power** command in controller configuration mode. To reset the RF output power level to its default value, use the **no** form of this command.

rf-channel *rf-port* **rf-power** *power-level*
no rf-channel *rf-port* **rf-power** *power-level*

Syntax Description

rf-port	RF channel physical port on the Wideband SPA FPGA. The range is from 0 to 3. The values for *rf-port* depend on the configuration set with the **annex modulation** command.
power-level	Desired RF output power level in dBmV. The range is dependent on the cable interface line card. The format is XY.Z. By default, .Z is added as .0.

Command Default

None

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCD	This command was modified. Added support for the controller interface configuration on Cisco uBR7246VXR and Cisco uBR7225VXR universal broadband routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For the Cisco UBR-MC20X20V cable interface line card, all the channels within a controller must have the same RF power value. When the RF power value is changed on any one channel, the same value is applied to all the channels within the controller. The recommended RF power range depends on the mode of the upconverter. The mode of the upconverter is decided by the highest numbered channel that is enabled.

Note RF power value outside the recommended RF power range is accepted but is automatically adjusted. If the input value exceeds the recommended RF power range, it is adjusted to a value lower than the upper limit of the range and if it is less than the recommended range, it is adjusted to a value higher than the lower limit of the range. The RF power level can be configured in decimals too.

Table below lists the recommended RF power range for different channel settings on the Cisco UBR-MC20X20V line card.

Table 35: RF Power Range on the Cisco UBR-MC20X20V Line Card

Upconverter Mode	Channel Setting	Recommended RF Power Range
Single	Only channel 0 is enabled	60.0 to 52.0 dBmV

Upconverter Mode	Channel Setting	Recommended RF Power Range
Dual	Channel 0 is either enabled or disabled. Channel 1 is enabled. Channel 2 and channel 3 are disabled.	56.0 to 48.0 dBmV
Triple	Channel 0, and channel 1 are either enabled or disabled. Channel 2 is enabled and channel 3 is disabled.	54.0 to 46.0 dBmV
Quad	Channels 0, 1, and 2 are either enabled or disabled. Channel 3 is enabled.	52.0 to 44.0 dBmV

Table below lists the recommended RF power range for different channel settings on the Cisco uBR-MC88V line card.

Table 36: RF Power Range on the Cisco uBR-MC88V Line Card

Upconverter Mode	Channel Setting	Recommended RF Power Range
Single	The RF channel stacking number equals to 1 in this mode. Channel 0 is enabled while the other channels are disabled.	45 to 63 dBmV
Dual	The RF channel stacking number equals to 2 in this mode. Channels 0 and 1 are enabled; channels 2 and 3 are disabled.	48 to 56 dBmV
Triple	The RF channel stacking number equals to 3 in this mode. Channels 0, 1, and 2 are enabled; channel 3 is disabled.	46 to 54 dBmV
Quad	The RF channel stacking number equals to 4. Channels 0, 1, 2, and 3 are enabled.	44 to 52 dBmV

Examples

The following example shows how to configure RF power for RF port 0 in modular-cable controller mode:

```
Router# configure terminal

Router(config)# controller modular-cable 1/0/0
Router(config-controller)# rf-channel 0 rf-power 50.6
```

The following example shows how to configure RF power for RF port 0 in integrated-cable controller mode:

```
Router# configure terminal

Router(config)# controller integrated-cable 1/0/0
Router(config-controller)# rf-channel 0 rf-power 50.6
```

Related Commands

Command	Description
cable primary	Specifies that a wideband channel is a primary wideband channel.
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
controller integrated-cable	Enters integrated-cable controller configuration mode.
rf-channel description	Specifies the description for each RF channel.
rf-channel ip-address mac-address udp-port	Sets the IP address, MAC address and UDP port for each RF channel.
rf-channel frequency	Configures the frequency for the RF channel.
rf-channel network-delay	Configure the network delay for an RF channel.
rf-channel rf-shutdown	Enables or disables RF output on a Wideband SPA.

rf-channel rf-shutdown

To disable the RF output on a wideband interface, use the **rf-channel rf-shutdown** command in controller configuration mode. To enable the RF output, use the **no** form of this command.

rf-channel *rf-port* **rf-shutdown**
no rf-channel *rf-port* **rf-shutdown**

Syntax Description

rf-port	Specifies the RF channel physical port. The range is from 0 to 3. The valid values for *rf-port* depend on the configuration set with the **annex modulation** command.

Command Default

RF output is disabled.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Starting with Cisco IOS Release 12.2(33)SCE, when you use the **rf-channel rf-shutdown** command, all DOCSIS 3.0 cable modems associated with the RF channel on a particular wideband interface will go offline and start re-registering in downstream partial service mode (p-online). In Cisco IOS Release 12.2(33)SCD and earlier, cable modems do not go offline while using the **rf-channel rf-shutdown** command.

For muting and unmuting the QAM on the Cisco RFGW-10, use the **rf-channel rf-shutdown** command in the M-CMTS.



Note This command cannot be executed on a Cisco 1 Gbps Wideband Shared Port Adapter (SPA) configured with manual DEPI.

Examples

The following example enables RF output on the Cisco wideband SPA:

```
Router# enable

Router# configure terminal
Router(config)# controller integrated-cable 7/1/0
Router(config-controller)# no rf-channel 0 rf-shutdown
```

Related Commands

Command	Description
controller modular-cable	Enters controller configuration mode to configure the Wideband SPA controller.
controller integrated-cable	Enters integrated-cable controller configuration mode.

Command	Description
rf-channel network-delay	Configure the network delay for an RF channel.
rf-channel rf-power	Sets the RF power output level on the Cisco UBR-MC20X20V cable interface line card.

rf-channel stacking

To suppress a carrier or mute a radio frequency (RF) channel on the Cisco uBR-MC88V cable interface line card, use the **rf-channel stacking command in** controller configuration mode. To remove the configuration, use the **no** form of this command.

rf-channel stacking *stacking-number*
no rf-channel stacking *stacking-number*

Syntax Description

stacking-number	RF channel stacking number. The range is from 1 to 4. The default value is 4.

Command Default

The RF channel stacking number is set to 4.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.2(33)SCD	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If you change the default stacking number configuration, traffic loss may occur on the active channels. For example, if you change the stacking number from 4 to 2, traffic is interrupted on the RF channels 0 and 1. However, traffic loss does not occur if you do not change the stacking number configuration when shutting down an RF channel using the **rf-channel rf-shutdownrf-channel rf-shutdown** command.



Note We recommend that you do not change the default stacking number configuration. You can change the default configuration when you want RF diagnostics performed on a particular channel. For example, if you want to perform RF diagnostics on RF channel 2, you need to change the default stacking number configuration to 2 to completely mute this channel.

Examples

The following example shows how to configure the RF channel stacking number for the Cisco uBR-MC88V cable interface line card:

```
Router# configure terminal

Router(config)# controller integrated-cable 5/1
Router(config-controller)# rf-channel stacking 3
```

Related Commands

Command	Description
rf-channel rf-shutdown	Disables the RF output on a Cisco Wideband SPA, or a cable interface line card.

rf-output

To define the output mode for the RF channel, use the **rf-output** command in the RF channel sub configuration mode.

rf-output {**normal** | **alt** | **cw** | **prbs**}

Syntax Description

normal	Normal mode for production operation.
alt	Alternating symbol (two-tone). Diagnostic mode for hardware testing.
cw	Continuous Wave. Diagnostic mode for hardware testing.
prbs	Pseudo Random Binary Sequence. Diagnostic mode for hardware testing.

Command Default

None.

Command Modes

RF channel sub configuration mode (config-rf-chan)

Usage Guidelines

This command is used to define the output mode for the RF channel.

The following example shows how to change the output mode:

```
router#configure terminal
router(config)#controller integrated-cable 3/0/0
router(config-controller)#rf-chan 5 10
router(config-rf-chan)#frequency 723000000
router(config-rf-chan)#rf-output alt
router(config-rf-chan)#exit
router(config-controller)#exit
router(config)#exit
router#show controller integrated-Cable 3/0/0 rf-channel 5 10
Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output
 5   TEST   UP   723000000  DOCSIS  B    256   5361  I32-J4       164  34     ALT
 10  TEST   UP   753000000  DOCSIS  B    256   5361  I32-J4       169  34     ALT
```

Related Commands

Command	Description
controller integrated-cable	Enters the controller configuration mode.
frequency	Defines the RF channel frequency.
qam-profile	Defines the QAM profile number.
rf-chan	Enters the RF channel sub configuration mode.
type	Defines the QAM data type.
power-adjust	Defines the channel power level.

rf-port integrated-cable

To define the physical slot/bay/port to be used in a video service, to define the Service Distribution Group (SDG) use the **rf-port integrated-cable** command in the service distribution group configuration mode. To delete the physical slot/bay/port, use the **no** form of the command.

rf-port integrated-cable *slot/bay/port*

Syntax Description

slot	The line card slot number. Slot can be configured from 0-3 or 6-9. Slots 4 and 5 are the supervisor slots.
bay	The Cisco cBR-8 chassis number. This is always configured as 0.
port	The RF port number. This can be configured from 1-8.

Command Default

None.

Command Modes

Service distribution group configuration mode (config-video-sdg)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to define the physical slot/bay/port to be used in a video service, to define the SDG. To configure QAM replication for service group size alignment between the DOCSIS and video services to one or more ports, you can add more ports into the service distribution group configuration. Make sure that the controller type is video for the slot/bay/port that you would use for the SDG. For more information, see the Video QAM Carriers section here: http://www.cisco.com/c/en/us/td/docs/cable/cbr/configuration/guide/b_cbr_basic_config_prov_construct/video_qam_carriers.html.

The following example shows how to define the physical slot/bay/port :

```
router#configure terminal
router(config)#cable video
router(config-video)#service-distribution-group sdgid 1
router(config-video-sdg)#rf-port integrated-cable 7/0/0
router(config-video-sdg)#rf-port integrated-cable 7/0/1
```

Related Commands

Command	Description
service-distribution-group	Defines a service distribution group.
onid	Override the default ONID.
psi-interval	Override the default PSI value.
show cable video service-distribution-group	Displays the SDG configuration.

rf-switch auxport enable

To enable the AUX port of the RF switch, use the **rf-switch auxport enable** command in redundancy mode. To disable the AUX port, use the **no** form of this command.

rf-switch auxport enable
no rf-switch auxport

Syntax Description

enable	Enables the Cisco NGRFSW-ADV. In the default configuration, the Cisco NGRFSW-ADV is disabled. When the Cisco NGRFSW-ADV is enabled, the Cisco CMTS router starts polling the Cisco NGRFSW-ADV at a set interval to check its status.

Command Default

The AUX port of the Cisco NGRFSW-ADV is disabled by default.

Command Modes

Redundancy mode (config-red)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable the AUX port of the Cisco NGRFSW-ADV:

```
Router> enable
Router# configure terminal
Router(config)# redundancy
Router(config-red)# linecard-group 1 cable
Router(config-red-lc)# rf-switch auxport enable
```

Command History

The **rf-switch auxport enable** command is used to configure the Cisco uBR Advanced RF Switch (NGRFSW-ADV). See Cisco uBR Advanced RF Switch Software Configuration Guide .

Related Commands

Command	Description
linecard-group id cable	Assigns the Hot Standby Connection-to-Connection Protocol (HCCP) group to all interfaces on the cable interface line card, or Cisco Broadband Processing Engine.
show redundancy linecard	Displays information about a redundant line card or line card group.

roll-off

To specify the channel roll-off value, use the **roll-off** command in OFDM channel profile configuration mode. To undo the channel roll-off value assignment, use **no** form of this command.

roll-off *value*

no profile-control

Syntax Description

value	The channel roll-off value. Valid values are 64, 128, 192, and 256.

Command Default

128

Command Modes

OFDM channel profile configuration (config-ofdm-chan-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the channel roll-off value.

Examples

The following example shows how to specify the channel roll-off value:

```
Router# configure terminal
Router(config)# cable downstream ofdm-chan-profile 21
Router(config-ofdm-chan-prof)# roll-off 128
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.
cyclic-prefix	Specify the channel cyclic-prefix.
description (OFDM channel profile)	Specify a user defined description for the profile.
interleaver-depth	Specify the channel interleaver-depth.
pilot-scaling	Specify the value used to calculate the number of continuous pilots.
profile-data	Specify default modulation or profile as the channel data profile.
profile-ncp	Specify default modulation or profile as the channel ncp profile.
profile-control	Specify default modulation or profile as the channel control profile.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.

route-ecmg

To configure the route to the ECMG server for session based scrambling, use the **route-ecmg** command in the DVB scrambling configuration mode. To void the route configuration, use the **no** form of this command.

route-ecmg *ip_address netmask interface forwarding_router_ip*
no route-ecmg *ip_address netmask interface forwarding_router_ip*

ip_address	Specifies the IP address of the ECMG server.
netmask	Specifies the netmask of the connection.
interface	Specifies the interface of the connection.
forwarding_router_ip	Specifies the IP address of the forwarding router.

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the route to the ECMG server:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#route-ecmg 1.200.1.0 255.255.255.0 TenGigabitEthernet 4/1/2
 1.200.1.1
```

Related Commands

Command	Description
dvb	Enters DVB scrambling configuration mode.
strong-pairing-enforce	Switches on the NDS strong pairing enforcement
check-scg-at-prov	Enables Check SCG at provision time.
scramble-video-audio	Scrambles only video and audio pids.
mgmt-ip	Configures the manangement IP for EIS/Broadcast ECMG.
ca-interface	Configures the conditional access interface.
tier-based	Enters the tier-based scrambling configuration mode.

Command	Description
ecmg	Enters the ECM Generator configuration mode.
eis	Enters the Event Information Scheduler configuration mode.

routing-interface-ip

To automatically configure IP addresses of line card video interfaces from a pool of IP addresses that you provide, use the **routing-interface-ip** command.

routing-interface-ip *ip-address* *ip-mask* { **secondary** *ip-address* *ip-mask* }

Syntax Description

ip-address	Specifies the starting IP address of the line card video interfaces.
ip-mask	Specifies the IP mask IP address.
secondary	Specifies the secondary interface of the line card video interfaces.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Do not change the video interface IP configuration unless there are conflicts with customer subnets.

Video interface IP configuration is optional. By default, the Cisco cBR-8 uses 10.100.x.x subnets for primary IP addresses and 10.101.x.x subnets for secondary IP addresses of video interfaces. By default, all video interfaces are in the VRF *Mgmt-MPEG-video-intf.*

Configure the video interface IP before configuring any other video-specific configurations like logical edge device and virtual service group configurations. Use the **routing-interface-ip** only when the default configuration conflicts with the existing subnets in the network.

routing-interface-vrf

To configure user-specific VRF to line card video interfaces, use the **routing-interface-vrf** command in video configuration mode. To remove the user-specific VRF configuration, use the **no** form of this command.

routing-interface-vrf slot *slot* **vrf-name** *vrf-name*

Syntax Description

slot	Slot where the line card resides. The valid range is 0–3 and 6–9.
vrf-name	Name of the user-specific VRF

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1x	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Virtual routing and forwarding configuration is optional. Use the **routing-interface-vrf** only when the video interface participates in NX-MVPN profile 12 or profile 14.

Do not use the **routing-interface-vrf** command for legacy L3VPN.

By default, all video interfaces are in the VRF *Mgmt-MPEG-video-intf*.

Configure VRF separately for each line card that is participating in NX-MVPN.

Configure virtual routing and forwarding before configuring any other video-specific configurations like logical edge device, virtual carrier group, or service distribution group configurations.

rpd-ds downstream-cable

To configure the downstream controller in the RPD, use the **rpd-ds downstream-cable** command in RPD core-interface configuration mode. To void the downstream controller configuration in the RPD, use the **no** form of this command.

rpd-ds 0 downsteam-cable *slot/subslot/port* **profile** *id*

no rpd-ds 0 downsteam-cable *slot/subslot/port*

Syntax Description

slot/subslot/port	Specifies the slot, subslot and port of the downstream controller.

Command Default

None

Command Modes

RPD conre-interface configuration (config-rpd-core)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the downstream controller in the RPD.

The following example shows how to configure the downstream controller in the RPD:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/1/0
Router(config-rpd-core)# rpd-ds 0 downstream-cable 9/0/0 profile 0
```

Related Commands

Command	Description
core-interface	Configures the core-interface of the RPD.
rpd-us upstream-cable	Configures the upstream controller in the RPD.

rpd-ds downstream-oob-vom

To specify the downstream virtual OM and OOB profile, use the **rpd-ds downstream-oob-vom** command in RPD core-interface configuration mode. To void the downstream virtual OM and OOB profile assignment, use the **no** form of this command.

rpd-ds 0 downstream-oob-vom *o-id* **profile** *dp-id*

no rpd-ds 0 downstream-oob-vom

Syntax Description

o-id	Specifies the ID of the virtual OM previously configured.
dp-id	Specifies the ID of the downstream OOB profile previously configured.

Command Default

None

Command Modes

RPD conre-interface configuration (config-rpd-core)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the downstream virtual OM and OOB profile.

The following example shows how to specify the downstream virtual OM and OOB profile:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/1/0
Router(config-rpd-core)# rpd-ds 0 downstream-oob-vom 1 profile 3
```

Related Commands

Command	Description
virtual-om	Defines a virtual OOB modulator configuration.
controller downstream-oob 55d1-profile	Configures the OOB downstream controller profile.

rpd-event

To specify the RPD event reporting profile to use in RPD, use the **rpd-event** command in RPD configuration mode. To void the RPD event reporting profile specification, use the **no** form of this command.

rpd-event profile *id*

no rpd-event profile

Syntax Description

id	Specifies the ID of the RPD event reporting profile previously created.

Command Default

None

Command Modes

RPD configuration (config-rpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the RPD event reporting profile.

The following example shows how to specify the RPD event reporting profile:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# rpd-event profile 1
```

rpd-us upstream-cable

To configure the upstream controller in the RPD, use the **rpd-us upstream-cable** command in RPD core-interface configuration mode. To void the upstream controller configuration in the RPD, use the **no** form of this command.

rpd-us *port* **upsteam-cable** *slot/subslot/port* **profile** *id*

no rpd-us *port* **upsteam-cable** *slot/subslot/port*

Syntax Description

slot/port/interface	Specifies the slot, subslot and port of the upstream controller.

Command Default

None

Command Modes

RPD conre-interface configuration (config-rpd-core)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Description

Specifies a description for the upstream controller profile. The maximum length is 20 characters. This field is set to NULL by default. Different upstream controller profiles on the RPD ports can be easily distinguished if a description is specified.

Usage Guidelines

Use this command to configure the upstream controller in the RPD.

The following example shows how to configure the upstream controller in the RPD:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/1/0
Router(config-rpd-core)# rpd-us 0 upstream-cable 9/0/0 profile 122
```

Related Commands

Command	Description
core-interface	Configures the core-interface of the RPD.
rpd-ds downstream-cable	Configures the downstream controller in the RPD.

rpd-us upstream-oob-varpd

To specify the upstream virtual ARPD and OOB profile, use the **rpd-us upstream-oob-varpd** command in RPD core-interface configuration mode. To void the upstream virtual ARPD and OOB profile assignment, use the **no** form of this command.

rpd-us *port* **upstream-oob-varpd***a-id* **profile** *up-id*

no rpd-us *port* **upstream-oob-varpd**

Syntax Description

a-id	Specifies the ID of the virtual ARPD previously configured.
up-id	Specifies the ID of the upstream OOB profile previously configured.

Command Default

None

Command Modes

RPD conre-interface configuration (config-rpd-core)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the upstream virtual ARPD and OOB profile.

The following example shows how to specify the upstream virtual ARPD and OOB profile:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/1/0
Router(config-rpd-core)# rpd-us 0 upstream-oob-varpd 1 profile 3
```

Related Commands

Command	Description
virtual-arpd	Defines a virtual ARPD configuration.
controller upstream-oob 55d1-profile	Configures the OOB upstream controller profile.

rpd downstream-cable

To specify the RPD in the SDG, use the **rpd downstream-cable** command in SDG configuration mode. To void the RPD assignment in the SDG, use the **no** form of this command.

rpd downsteam-cable *slot/bay/port*

no rpd downsteam-cable *slot/bay/port*

Syntax Description

slot/bay/port	Specifies the slot, bay and port of the downstream cable interface.

Command Default

None

Command Modes

service distribution group configuration (config-video-sdg)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the downstream controller in the RPD.

The following example shows how to configure the downstream controller in the RPD:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# core-interface tengigabitethernet 3/1/0
Router(config-rpd-core)# rpd-ds 0 downstream-cable 9/0/0 profile 0
```

Related Commands

Command	Description
core-interface	Configures the core-interface of the RPD.
rpd-us upstream-cable	Configures the upstream controller in the RPD.

sbfd

To configure the SBFD, use the **sbfd** command in RPD configuration mode. To void the SBFD configuration, use the **no** form of this command.

sbfd {sbfd | inteval *milliseconds* **multiplier** *value***}**

no sbfd {enable | interval}

Syntax Description

milliseconds	Specifies interval in milliseconds.
value	Specifies the value to multiply the interval.

Command Default

None

Command Modes

RPD configuration (config-rpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure SBFD.

The following example shows how to configure SBFD:

```
Router# configure terminal
Router(config)# cable rpd 1
Router(config-rpd)# no sbfd enable
```

scramble-video-audio

To scramble only video and audio pids, use the **scramble-video-audio** command in the DVB scrambling configuration mode. To scramble all elementary streams, use the **no** form of this command.

scramble-video-audio
no scramble-video-audio

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When **scramble-video-audio** is configured, the elementary streams other than video and audio are not scrambled.

The following is an example of how to scramble only video and audio pids:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#scramble-video-audio
```

Related Commands

Command	Description
dvb	Enters DVB scrambling configuration mode.
strong-pairing-enforce	Switches on the NDS strong pairing enforcement
check-scg-at-prov	Enables Check SCG at provision time.
route-ecmg	Configures the route to the ECMG server.
mgmt-ip	Configures the manangement IP for EIS/Broadcast ECMG.
ca-interface	Configures the conditional access interface.
tier-based	Enters the tier-based scrambling configuration mode.
ecmg	Enters the ECM Generator configuration mode.
eis	Enters the Event Information Scheduler configuration mode.

secondary aux

To enable the auxiliary port on the standby PRE1 module, use the **secondary aux** command in redundancy configuration (main-cpu) mode. To disable the auxiliary port, use the **no** form of this command.

secondary aux
no secondary aux

Syntax Description

This command has no keywords or arguments.

Command Default

The auxiliary port on the standby PRE1 module is disabled.

Command Modes

Redundancy configuration, main-cpu mode

Command History

Release	Modification
12.2(11)BC3	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable the auxiliary port on the standby PRE1 module.

```
Router# config t

Router(config)# redundancy

Router(config-r)# main-cpu

Router(config-r-mc)# secondary aux
Router(config-r-mc)# exit

Router(config-f)# exit

Router(config)#
```

Related Commands

Command	Description
main-cpu	Enters main-CPU redundancy configuration mode, so that you can configure the synchronization of the active and standby Performance Routing Engine (PRE1) modules.
redundancy	Configures the synchronization of system files between the active and standby PRE1 modules.
redundancy force-failover main-cpu	Forces a manual switchover between the active and standby PRE1 modules.

server

To define the server IP address of the session resource manager, use the **server** command in the logical edge device protocol configuration mode. To reset to default configuration, use the **no** form of this command.

server *ip-address*
no server *ip-address*

Syntax Description

ip-address	Specifies the server IP address of the session resource manager.

Command Default

None

Command Modes

Logical edge device protocol configuration (config-video-led-protocol)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines the server IP address of the session resource manager.

Examples

The following example shows how to define the server IP address of the session resource manager:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)#logical-edge-device vod id 1
Router#(config-video-led)protocol gqi
Router#(config-video-led-protocol)server 172.16.3.75
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
mgmt-ip	Defines the local management IP address for a logical edge device.
mac-address	Defines the MAC address for a logical edge device.
vcg	Specifies the virtual carrier group assigned to the logical edge device.
virtual-edge-input-ip	Defines a virtual edge input.
show cable video logical-edge-device	Displays the logical edge device information.
show cable video gqi connections	Displays the GQI connection information of the logical edge device with the Session Resource Manager.

Command	Description
show diag all eeprom detail | include MAC	Displays the chassis MAC address information.

service divert-limit

To set the layer 3 mobility threshold limit, use the **service divert-limit** command in global configuration mode. To set the default value, use the **no** form of this command.

service divert-limit {**l3-mobility-counter** *limit* | **l3-mobility-timeslot** *timeslot* }
no service divert-limit {**l3-mobility-counter** *limit* | **l3-mobility-timeslot** *timeslot* }

Syntax Description

l3-mobility-counter	Sets the layer 3 CPE mobility counter threshold.
limit	Specifies the mobility counter threshold limit in packets. The range is from 1 to 127. The default is 16.
l3-mobility-timeslot	Sets the layer 3 CPE mobility time slot configuration.
timeslot	Specifies the mobility time slot in milliseconds. The range is from 1 to 4095. The default is 300.

Command Default

This **divert-limit l3-mobility-counter** default value is 16 packets and **divert-limit l3-mobility-timeslot** default value is 300 ms.

Command Modes

Global configuration (config)

Command History

12.2(33)SCH2	The command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **platform punt-sbrl subscriber** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If the **cable l3-mobility** command is enabled, the **service divert-limit** command is also enabled by default. This command is usually used to modify the default value.

Note This command does not work if **cable l3-mobility** command is disabled.

Examples

The following example shows how to set the CPE mobility threshold and time slot:

```
Router # enable
Router # configure terminal
Router (config) # service divert-limit l3-mobility-counter 127
Router (config) # service divert-limit l3-mobility-timeslot 4095
```

Related Commands

Command	Description
cable l3-mobility	Enables mobility for a particular IPv4 or IPv6 subnet.

service divert-rate-limit



Note Effective with Cisco IOS Release 12.2(33)SCB, the **service divert-rate-limit** *fib-rp-glean* command is replaced on the WAN-side by the **service divert-rate-limit ip** *fib-rp-glean* command. See the **service divert-rate-limit ip** command for more information. The **service divert-rate-limit** *fib-rp-glean* command is replaced on the WAN-side non-IP by **service divert-rate-limit non-ip** *fib-rpf-glean* command. See the **service divert-rate-limit non-ip** command for more information. For cable-side DRL configuration, see the **cable divert-rate-limit** command.

To configure PXF Divert-Rate-Limit, use the **service divert-rate-limit** command in global configuration mode. To reset this feature to the default parameters, use the no form of this command.

service divert-rate-limit *divert-code rate* [**limit** *limit*]
no service divert-rate-limit *divert-code*

Syntax Description

divert-code rate	Configures the PXF Divert-Rate-Limit for the any of the following packets: • fwd-glean—Packets that hit a glean adjacency in the FIB. • rpf-glean—Packets that hit a glean adjacency during the RPF check. The range is from 1 to 255 packet-per-second. The default rate is 20 packets-per-second.
limit *limit*	(Optional) Sets the limit for the number of packets that will be diverted in an initial burst of packets. The range is from 4 to 255 packets. The default limit is 5 packets. **Note** Setting the limit has a limited effect on the behavior of the algorithm, so this part of the CLI is hidden.

Command Default

Divert-Rate-Limit contains the following default behavior and values:

- Divert-Rate-Limit is always active.
- The default rate is 20 packets-per-second.
- The default limit is 5 packets.

Command Modes

Global configuration (config)

Command History

12.3(17a)BC	The command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

12.2(33)SCB	This command was replaced by the **service divert-rate-limit ip** *fib-rp-glean* command and **service divert-rate-limit non-ip** *fib-rpf-glean* command.
IOS-XE 3.15.0S	This command was replaced by the **platform punt-sbrl subscriber** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The**service divert-rate-limit** command is used to configure the PXF Divert-Rate-Limit for fwd-glean and rpf-glean packets in order to identify packet streams that will cause congestion of the FP-to-RP interface.

Examples

The following example shows how to configure rate-limiting for fib-rp-glean, with a rate of 10 packets-per-second and a limit of 20 packets:

```
Router(config-if)# service divert-rate-limit fib-rp-glean 10 limit 20
```

The following example shows how to return rate-limiting for fib-rp-glean to the default values:

```
Router(config-if)# no service divert-rate-limit fib-rp-glean
```

Pass and fail counters are kept for fwd-glean, rpf-glean, and cable-ARP packets. To show the statistics for the pass and fail counter, use the **show pxf cpu statistics drl** command:

```
Router(config-if)# show pxf cpu statistics drl
 Divert-Rate-Limit statistics
    code          total                diverted             dropped
  fib_rpf_glean   500                  59                   441
  fib_rp_glean    500                  54                   446
  arp_filter      0                    0                    0
```

Note The arp_filter stats shown above are global stats for PXF ARP Filtering. These stats cannot be cleared by the CLI. However, they will reset to zero upon reload.

Packets dropped by Divert-Rate-Limit and the ARP Filter will be recorded in the regular PXF drop statistics:

```
Router(config-if)# show pxf cpu statistics drop c5/0/0

 FP drop statistics for Cable5/0/0
                           packets            bytes
    vcci undefined         0                  0
  vcci C
    ...
    divert_rate_limit      441                28224
    arp_filter_reply       0                  0
    arp_filter_request     0                  0
```

Related Commands

Command	Description
show cable arp-filter	Displays the total number of Address Resolution Protocol (ARP) offenders.

service divert-rate-limit ip

To set DRL rate and limit for WAN-side IP packet streams, use the **service divert-rate-limit ip** command in global configuration mode. To reset the *rate* and *limit* to the default values for all IP divert-codes, use the **no** form of this command. Using **no service divert-rate-limit ip** *divert-code* will reset rate and limit to the default values for the specified divert code.

service divert-rate-limit ip *divert-code* **rate** *rate* **limit** *limit*
no service divert-rate-limit ip

Syntax Description

divert code	Specifies the applicable divert code.
rate	Specifies the divert rate in packets per second. Minimum rate is 1 packet per second. Maximum rate is 65535 packets per second. For WAN-side IP packets, the default rate is 4000 packets per second
limit	Specifies the number of packets to be diverted in an initial burst of packets. Minimum limit is 4 packets. Maximum limit is 4194 packets. For WAN-side IP packets, the default limit is 4000 packets.

Command Default

For WAN-side IP packet streams, the default rate is 4000 packets per second and default limit is 4000 packets. These defaults apply to each uniquely identified IP packet stream.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced. The **service divert-rate-limit ip** *fib-rp-glean* command is the WAN-side replacement for the **service divert-rate limit** *fib-rp-glean* command.
IOS-XE 3.15.0S	This command was replaced by the **platform punt-sbrl wan** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can configure a rate and limit for a particular IP divert-code for WAN-side IP packets. However, each IP packet-stream is uniquely identified (using a hash of the VRF, the IP source address, and the divert-code), and then packets in that stream are sent through a rate-limiter with the configured rate and limit.

Examples

The following example shows how to set the rate and limit for the specified divert code:

```
Router(config)# service divert-rate-limit ip fib-rp-glean rate 1 limit 4
```

Related Commands

Command	Description
service divert-rate-limit non-ip	This command configures DRL for WAN-side non-IP packet streams.

Command	Description
service divert-rate-limit trusted-site	This command adds entries to the trusted site list.

service divert-rate-limit ipv6

To set the divert rate limit (DRL) rate and limit for WAN-side IPv6 packet streams, use the **service divert-rate-limit ipv6** command in global configuration mode.

service divert-rate-limit ipv6 *divert-code* **rate** *rate* **limit** *limit*
no service divert-rate-limit ipv6

Syntax Description

divert-code	Specifies the applicable divert code.
rate	Specifies the divert rate in packets per second. Minimum rate is 1 packet per second. Maximum rate is 65535 packets per second. For WAN-side IPv6 packets, the default rate is 4000 packets per second.
limit	Specifies the number of packets to be diverted in an initial burst of packets. Minimum limit is 4 packets. Maximum limit is 4194 packets. For WAN-side IPv6 packets, the default limit is 4000 packets.

Command Default

For WAN-side IPv6 packet streams, the default rate is 4000 packets per second and default limit is 4000 packets.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **platform punt-sbrl wan** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can configure rate and limit for a particular IPv6 divert-code for WAN-side IP packets. However, each IP packet-stream is uniquely identified (using a hash of the VRF, the IP source address, and the divert-code), and then packets in that stream are sent through a rate-limiter with the configured rate and limit.

This command is supported only on PRE4.

Use the **diversion** option of the **show pxf cpu statistics** command to troubleshoot the divert code, before configuring the DRL.

To configure the correct divert code, refer to the list of divert codes.

Table 37: List of divert codes

Divert Code	Description
6pe_dst_linklocal	6PE dst linklocal
6pe_dst_mcast	6PE dst multicast

Divert Code	Description
6pe_ttl	6PE ttl
icmpv6	IPv6 ICMP
ipv6_cable_filter_ds	ipv6 cable filter ds
ipv6_dhcp_ucast	IPv6 unicast DHCP
ipv6_hopopts	IPv6 HopOpts
ipv6_lng_ext_hdr	IPv6 long extension hdr
ipv6_mcast_rsvd	IPv6 multicast
ipv6_nd_na_mcast	IPv6 ND NA (multicast)
ipv6_nd_na_ucast	IPv6 ND NA (unicast)
ipv6_nd_ns_mcast	IPv6 ND NS (multicast)
ipv6_nd_ns_ucast	IPv6 ND NS (unicast)
ipv6_nd_rs_mcast	IPv6 ND RS (multicast)
ipv6_rp_dest	IPv6 receive adjacency
ipv6_rp_glean	IPv6 glean adjacency
ipv6_rp_pbr	IPv6 RP PBR
ipv6_rp_punt	IPv6 punt adjacency
ipv6_src_linklocal	IPv6 SRC LinkLocal
ipv6_src_ver_lq_req	IPv6 src ver leasequery request
ipv6_src_ver_mac_req	IPv6 src ver MAC request

Note To reset the *rate* and *limit* to the default values for all IPv6 divert-codes, use the no form of this command. Using **no service divert-rate-limit ipv6** *divert-code* will reset *rate* and *limit* to the default values for the specified divert code.

Examples

The following example shows how to set the rate and limit for the specified divert code:

```
Router(config)# service divert-rate-limit ipv6 ipv6_rp_glean rate 20 limit 10
Router(config)#
```

Related Commands

Command	Description
service divert-rate-limit trusted-site	Adds IPv4-specific entries to the trusted site list.
service divert-rate-limit non-ip	Configures DRL for WAN-side non-IP packet streams.
service divert-rate-limit trusted-site-ipv6	Adds IPv6-specific entries to the trusted site list.
show pxf cpu statistics	Displays Parallel eXpress Forwarding (PXF) CPU statistics.

service divert-rate-limit ip trusted-site

To add entries to the trusted site list, use the **service divert-rate-limit ip trusted-site** command in the global configuration mode. To remove all entries from the trusted site list, use the **no** form of this command.

service divert-rate-limit ip trusted-site *ip-address* **mask** *ip-address* **tos** *tos-value* **mask** *tos-mask* **vrf** *vrf-name*
no service divert-rate-limit ip trusted-site *ip-address* **mask** *ip-address* **tos** *tos-value* **mask** *tos-mask* **vrf** *vrf-name*

Syntax Description

ip-address	Specifies the source IP address that should be matched.
mask *ip-address*	The mask to apply to the source IP address of the packet before testing if it matches. There are no restrictions on the mask value.
tos *tos-value*	The ToS value of the trusted site. There are no restrictions on the tos_value. Example: 0xD0
mask *tos-mask*	The mask to apply to the IP ToS value and the trusted-site tos_value before testing if it matches. There are no restrictions on the tos_mask value. Example: 0xF3 **Note** The ToS value can be wild-carded by setting the tos_mask to 0x00
vrf *vrf-name*	The VRF that this trusted site applies to. For the global VRF, use the **global** keyword. To apply the trusted-site to all VRFs (including the global VRF), hit enter after specifying the *tos-mask*. If a non-existent VRF is specified, the table entry is filled, but the information is not written to toaster memory. If the specified VRF is subsequently created, the information is written to toaster at that time.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **service divert-rate-limit ip trusted-site** command is used to configure trusted site list that contains a source IP address and mask, IP ToS value and mask, and a VRF. If no IP address is specified, the entire trusted site list is cleared. The trusted site list contains a source IP address and mask, IP ToS value and mask, and a VRF. The trusted site list applies only to WAN-IP IPv4 packets. There is a limitation of four trusted sites.

Examples

The following example shows how to configure trusted site list:

```
Router(config
)# service divert-rate-limit trusted-site 192.0.13.2 255.255.255.0
  tos 0xD0 mask 0xF3 vrf name1
```

Related Commands

Command	Description
service divert-rate-limit non-ip	This command sets and limit default values for the specified divert code.

service divert-rate-limit max-rate us-cable

To set per-divert-code rate limit on the upstream cable interface, use the **service divert-rate-limit max-rate us-cable** command in global configuration mode. To reset the divert-rate-limit parameters to the default values for all divert-codes, use the no form of this command.

service divert-rate-limit max-rate us-cable *divert-code* **rate** *rate* **limit** *limit*

Syntax Description

divert-code Configures the divert-rate-limit for any of the following packets:

- mfib_224_0_0_x—The Packet whose destination IP is 224.0.0.x.
- icmpv6—IPv6 ICMP
- mfib_igmp—IGMP protocol packet
- ipv6_nd_na_mcast—IPv6 ND NA (multicast)
- ipv6_nd_na_ucast—IPv6 ND NA (unicast)
- ipv6_nd_ns_mcast—IPv6 ND NS (multicast)
- ipv6_nd_ns_ucast—IPv6 ND NS (unicast)
- fib_rp_dest— IPv4 packets targeting to CMTS.
- fib_rp_dest_precedence—The packet whose destination is RP and has non-zero precedence value in IP header.
- fib_rp_glean—FIB glean adjacency used for IPv4 adjacency resolving.
- fib_rp_punt—FIB punt adjacency used for IPv4 adjacency resolving.
- src_ver_leasequery_req—Divert to RP due to zero MD and sid value and need to send lease query to DHCP server for those packets.
- src_ver_unknown_ip_addr—Divert to RP due to zero MD and sid value and no adjacency information for source IP address of those packets.
- ipv6_rp_dest—IPv4 packets targeting to CMTS.
- ipv6_rp_dest_precedence—The packet whose destination is RP and has non-zero precedence value in IPV6 header.
- ipv6_rp_glean—IPv6 receive adjacency used for IPv4 adjacency resolving.
- ipv6_rp_punt—IPv6 punt adjacency used for IPv4 adjacency resolving.
- ipv6_src_linklocal—IPv6 SRC LinkLocal
- ipv6_src_ver_mac_req—Divert to RP due to zero MD and sid value.

rate Specifies the divert rate in packets/sec. The range is from 1 to 65535. The default value is 4194.

limit Specifies the limit for the number of packets that will be diverted in an initial burst of packets. The range is from 4 to 4194.The default value is 4194.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCJ	This command was introduced.

Usage Guidelines

The **service divert-rate-limit max-rate us-cable** command can be configured when the DDos occurs and the flooding packets have one of the support divert codes.

Note Before you configure the service divert-rate-limit max-rate command, it is recommended to configure the source based DRL first.

Example

The following example shows how to set the rate and limit for the specified divert code:

```
Router(config)# service divert-rate-limit max-rate us-cable fib_rp_glean rate 5000 limit
100
```

Related Commands

Command	Description
show pxf cpu statistics drlmax-rate us-cable	Verifies the drop counters for the DRL max-rate on the upstream cable interface.

service divert-rate-limit max-rate wan

To set per-divert-code rate limit on the WAN interface, use the **service divert-rate-limit max-rate wan** command in global configuration mode. To reset the divert-rate-limit parameters to the default values for all divert-codes, use the no form of this command.

service divert-rate-limit max-rate wan *divert-code* **rate** *rate* **limit** *limit*

Syntax Description

divert-code Configures the divert-rate-limit for any of the following packets:

- fib_rp_dest— IPv4 packets targeting to CMTS.
- fib_rp_glean—FIB glean adjacency used for IPv4 adjacency resolving.
- fib_rp_punt—FIB punt adjacency used for IPv4 adjacency resolving.
- ipv6_rp_dest—IPv4 packets targeting to CMTS.
- ipv6_rp_glean—IPv6 receive adjacency used for IPv4 adjacency resolving.
- ipv6_rp_punt—IPv6 punt adjacency used for IPv4 adjacency resolving.
- mfib_224_0_0_x—The Packet whose destination IP is 224.0.0.x.
- icmpv6—IPv6 ICMP
- mfib_igmp—IGMP protocol packet
- ipv6_nd_na_mcast—IPv6 ND NA (multicast)
- ipv6_nd_na_ucast—IPv6 ND NA (unicast)
- ipv6_nd_ns_mcast—IPv6 ND NS (multicast)
- ipv6_nd_ns_ucast—IPv6 ND NS (unicast)
- ipv6_rp_dest_precedence—The packet whose destination is RP and has non-zero precedence value in IPV6 header.
- ipv6_src_linklocal—IPv6 SRC LinkLocal
- fib_rp_dest_precedence—The packet whose destination is RP and has non-zero precedence value in IP header.

rate	Specifies the divert rate in packets/sec. The range is from 1 to 65535. The default value is 4194.
limit	Specifies the limit for the number of packets that will be diverted in an initial burst of packets. The range is from 4 to 4194.The default value is 4194.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCH3	This command was introduced.

Release	Modification
12.2(33)SCJ	This command was updated to include more divert codes.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **service divert-rate-limit max-rate wan** command can be configured when the DDos occurs and the flooding packets have one of the support divert codes.



Note Before you configure the service divert-rate-limit max-rate command, it is recommended to configure the source based DRL first.

Example

The following example shows how to set the rate and limit for the specified divert code:

```
Router(config)# service divert-rate-limit max-rate wan fib_rp_glean rate 5000 limit 100
```

Related Commands

Command	Description
show pxf cpu statistics drlmax-rate wan	Verifies the drop counters for the DRL max-rate on the WAN interface.
clear pxf statistics drl max-rate	Clears the DRL max-rate statistics on the WAN interface.

service divert-rate-limit non-ip

To set DRL for WAN-side non-IP packet streams, use the **service divert-rate-limit non-ip** command in global configuration mode. To reset the *rate* and *limit* to the default values for all non-IP divert-codes, use the **no** form of this command. Using **no service divert-rate-limit non-ip** *divert-code* will reset rate and limit to the default values for the specified divert-code.

service divert-rate-limit non-ip *divert-code* **rate** *rate* **limit** *limit*
no service divert-rate-limit non-ip

Syntax Description

divert-code	Specifies the applicable divert code.
rate	Specifies the rate in packets per second. Minimum rate is one packet per second. Maximum rate is 65535 packets per second. For WAN-side non-IP packets, the default rate is 2000 packets per second.
limit	Specifies the number of packets to be diverted in an initial burst of packets. Minimum limit is 4 packets. Maximum limit is 4194 packets. For WAN-non-IP packets, the default limit is 2000 packets.

Command Default

For WAN-side non-IP packets, the default rate is 2000 packets per second and default limit is 2000 packets.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced. The **service divert-rate-limit non-ip** *fib-rpf-glean* command is the WAN-side non-IP replacement for the **service divert-rate-limit** *fib-rpf-glean* command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can configure a rate and limit for a particular non-IP divert-code, and all packets arriving with that divert-code are sent through a single rate-limiter with the configured rate and limit. but the explanation is fairly straightforward: there is a single rate-limiter for each non-IP divert-code. No attempt is made to uniquely identify the source of the attacking packet stream.

Examples

The following example shows how to set and limit default values for the specified divert code:

```
Router(config)# service divert-rate-limit non-ip fib-rp-glean 10 rate 1 limit 4
```

Related Commands

Command	Description
service divert-rate-limit ip	This command configures DRL rate and limit for WAN-side IP packet streams.

service divert-rate-limit trusted-site

To add entries to the trusted site list, use the **service divert-rate-limit trusted-site** command in the global configuration mode. To remove all entries from the trusted site list, use the **no** form of this command.

service divert-rate-limit trusted-site *ip-address mask-ip-address* **tos** *tos-value* **mask** *tos-mask* [**global** | **vrf vrf-name**]
no service divert-rate-limit trusted-site

Syntax Description

ip-address	Specifies the source IP address that should be matched.
mask *ip-address*	The mask to apply to the source IP address of the packet before testing if it matches. There are no restrictions on the mask value.
tos *tos-value*	The ToS value of the trusted site. There are no restrictions on the tos_value. Example: 0xD0
mask *tos-mask*	The mask to apply to the IP ToS value and the trusted-site tos_value before testing if it matches. There are no restrictions on the tos_mask value. Example: 0xF3 **Note** The ToS value can be wild-carded by setting the tos_mask to 0x00
vrf *vrf-name*	The VRF that this trusted site applies to. For the global VRF, use the **global** keyword. To apply the trusted-site to all VRFs (including the global VRF), hit enter after specifying the *tos-mask*. If a non-existent VRF is specified, the table entry is filled, but the information is not written to toaster memory. If the specified VRF is subsequently created, the information is written to toaster at that time.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **service divert-rate-limit ip trusted-site** command is used to configure trusted site list that contains a source IP address and mask, IP ToS value and mask, and a VRF. The trusted site list contains a source IP address and mask, IP ToS value and mask, and a VRF. The trusted site list applies only to WAN-IP IPv4 packets. There is a limitation of four trusted sites.

To remove specified entry from the trusted site list, use **no service divert-rate-limit trusted-site** *ip-address* **mask** *ip-address* **tos** *tos-value* **mask** *tos-mask* [**global** | **vrf** *vrf-name*]. If no IP address is specified, the entire trusted site list is cleared.

Examples

The following example shows how to configure trusted site list:

```
Router(config
)# service divert-rate-limit trusted-site 192.0.13.0 255.255.255.0
  tos 0xD0 mask 0xF3 vrf name1
```

Related Commands

Command	Description
service divert-rate-limit non-ip	This command sets and limit default values for the specified divert code.

service divert-rate-limit trusted-site-ipv6

To add IPv6-specific entries to the trusted site list, use the **service divert-rate-limit trusted-site-ipv6** command in the global configuration mode. To remove all entries from the trusted site list, use the **no** form of this command.

service divert-rate-limit trusted-site-ipv6 *ip-address* **traffic-class** *tc_value* **mask** *tc-mask* [**global** | **vrf** *vrf-name*]
no service divert-rate-limit trusted-site-ipv6

Syntax Description

ip-address	The source IPv6 address that should be matched.
traffic-class*tc_value*	The 8-bit traffic-class of the trusted site. There are no restrictions on the tc_value. Example: 0xD0
mask *tc-mask*	The mask to apply to the packet traffic-class and the trusted-site *tc_value* before testing if it matches. There are no restrictions on the *tc-mask* value. Example: 0xF3
vrf *vrf-name*	The virtual route forwarding (VRF) instance to which this trusted site is being applied. For the global VRF, use the global keyword. To apply the trusted-site to all VRFs (including the global VRF), hit enter after specifying the *tc-mask*.

Command Default

Disabled

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to configure trusted site list that contains an IPv6 source-address/prefix-length, a traffic-class value and mask, and a VRF. There is a limitation of four trusted sites.



Note The **no** form of the command is used to remove all entries from the trusted site list. To remove a specific entry you should specify the matching source IP address. For example: **no service divert-rate-limit trusted-site-ipv6** *ip-address* **traffic-class** *tc_value* **mask***tc-mask* [**global** | **vrf** *vrf-name*].

Examples

The following example shows how to configure IPv6 trusted site list:

```
Router(config)# service divert-rate-limit trusted-site-ipv6 2001:420:3800:800:21F:29FF::1/128
 2001:420:3800:800:21F:29FF::1/128 traffic-class 0x3 mask 0xFF global
Router(config)#
```

Related Commands

Command	Description
show pxf cpu statistics drl us-cable	Displays the number of upstream cable packets that are dropped from the CMTS.
show pxf cpu statistics drl ipv6	Verifies the drop counters for WAN-IPv6 packets.
show pxf cpu statistics drl ipv4	Verifies the drop counters for WAN-IPv4 packets.

service instance

To configure an Ethernet service instance, use the **service instance** command in Layer 2 VPN configuration mode. To disable this configuration, use the **no** form of this command.

service instance *id service-type*
no service instance *id service-type*

Syntax Description

id	Service instance ID.
service-type	Service type for the instance.

Command Default

None

Command Modes

Layer 2 VPN configuration (config-l2vpn)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You must provision a Multiprotocol Label Switching (MPLS) pseudowire before configuring an Ethernet service instance in Layer 2 VPN configuration mode.

Examples

The following example shows how to configure an Ethernet service instance on a Cisco uBR10012 router:

```
Router # configure terminal
Router(config) # cable l2vpn 001e.6bfb.0f9e customer2
Router(config-l2vpn) # service instance 7000 ethernet
```

Related Commands

Command	Description
cable l2-vpn-service xconnect	Enables the use of Layer 2 tunnels based on an MPLS pseudowire.

service udp-small-servers max-servers no-limit

To enable use of minor servers that use the UDP protocol (such as ToD, echo, chargen, and discard), use the **service udp-small-servers max-servers no-limit** command in global configuration mode. To remove this configuration, use the **no** form of this command.

service udp-small-servers max-servers no-limit
no service udp-small-servers max-servers no-limit

Command Default

DHCP or ToD servers are not configured by default.

Command Modes

Global configuration

Command History

Release	Modification
12.1 EC	Command support introduced on the Cisco CMTS.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Disabling the ping option can speed up address assignment when a large number of modems are trying to connect at the same time. However, disabling the ping option can also result in duplicate IP addresses being assigned if users assign unauthorized static IP addresses to their CPE devices.

Examples

The following example illustrates configuration of this command:

```
Router# configure terminal
Router(config)# service udp-small-servers max-servers no-limit
Router(config)#
```

The following example shows a typical ToD server configuration:

```
service udp-small-servers max-servers no-limit
cable time-server
```

These are the only commands required to enable the ToD server.

Usage Guidelines

The **max-servers no-limit** option allows a large number of cable modems to obtain the ToD server at one time, in the event that a cable or power failure forces many cable modems offline. When the problem has been resolved, the cable modems can quickly reconnect.

Note Do not disable the minor UDP servers if you are also enabling the other DHCP or TFTP servers.

For additional information about DHCP configuration on the Cisco CMTS, refer to the following documents on Cisco.com:

- *Filtering Cable DHCP Lease Queries on the Cisco CMTS*
- *DHCP and Time-of-Day Services on the Cisco CMTS*

Related Commands

Command	Description
cable dhcp-giaddr policy	Sets the DHCP *giaddr* field of DHCP request packets to the primary address for cable modems and the secondary address for CPE devices, allowing the use of separate address pools for the different clients.
cable dhcp-parse option (for uBR series router)	Enables the parsing of certain DHCP options.
cable helper-address	Enables load-balancing of DHCP requests from cable modems and CPE devices by specifying different DHCP servers according to the cable interface or subinterface.
ip dhcp ping packet 0	Instructs the DHCP server to assign an IP address from its pool without first sending an ICMP ping to test whether a client is already currently using that IP address.
ip dhcp relay information option	Configures the DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages.
ip dhcp smart-relay	Enables the DHCP relay agent on the CMTS to automatically switch a cable modem or CPE device to a secondary DHCP server or address pool if the primary DHCP server does not respond to three successive requests.

service-class

To create a DOCSIS configuration file that specifies the quality-of-service (QoS) service-class options for the CM configuration file, use the **service-class** command in cable config-file configuration mode. To disable the specification, use the **no** form of this command.

service-class {**guaranteed-upstream** *us-bandwidth* | **max-burst** *burst-size* | **max-downstream** *max-dsbandwidth* | **max-upstream** *max-usbandwidth* | **priority** *priority-num* | **privacy**}
no service-class

Syntax Description

class	Specifies service class number. The range is 1 to 16. Default value is 1.
guaranteed-upstream *us-bandwidth*	Specifies the guaranteed upstream bandwidth in kbps. Valid range for *us-bandwidth* is 0 to 100000 kbps. Default value is 0.
max-burst	Specifies the maximum upstream burst size in bytes. Valid range for *burst-size is 0 to 65535. Default value is 0, unlimited burst* length. Recommended value range is 1600 to 1800 bytes. Using a value of 0 or greater than 1800 bytes can cause latency issues for Voice-over-IP. A value of less than 1500 bytes prevents upstream transmission of large Ethernet frames for any modem or CMTS not implementing fragmentation (an optional feature in DOCSIS 1.0).
*burst-size***max-downstream** *max-dsbandwidth*	Specifies the downstream bandwidth in kbps. Valid range for *max-dsbandwidth* is 0 to 100000 kbps. Default value is 0.
max-upstream *max-usbandwidth*	Specifies the upstream bandwidth in kbps. Valid range for *max-usbandwidth* is 0 to 100000 kbps. Default value is 0.
priority *priority-num*	Specifies the service class priority. Valid range for *priority-num* is 0 to 7, where 7 is the highest-priority service-class setting.
privacy	Enables baseline privacy interface (BPI).

Command Default

Service-class is not set by default. A CM cannot register on a Cisco CMTS unless at least one parameter in a service class is specified.

Command Modes

Cable config-file (config-file)

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(4)BC1	This command was integrated into Cisco IOS Release 12.2(4)BC1.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Default values can be used only if **service-class** class is specified. A single configuration file should not contain multiple service-class ID numbers. Thus, all parameters should be set using a single service-class ID. However, different configuration files can reuse the same service-class ID.



Note To enable Baseline Privacy Interface (BPI) operations on the cable command, you must specify both the **service-class privacy** and **privacy** commands for the cable modem's DOCSIS configuration file.

Examples

The following example shows how to specify the **service-class** command for a DOCSIS configuration file:

```
router(config)# cable config-file upgrade.cm
router(config-file)# service-class 1 priority 0
router(config-file)#service-class 1 max-upstream 3247
router(config-file)# service-class 1 max-downstream 10000
router(config-file)# service-class 1 max-burst 1600
router(config-file)# service-class 1 privacy
router(config-file)# privacy

router(config-file)# exit
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
access-denied	Disables access to the network.
channel-id	Specifies upstream channel ID.
cpe max	Specifies CPE information.
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.
option	Specifies vendor-specific information fields and other config-file options.
privacy	Specifies privacy options for baseline privacy images.
snmp manager	Specifies SNMP options.
timestamp	Enables time-stamp generation.

service-class (cmts-tag)

To configure the specified service class name for the CMTS tag, use the **service-class** command in the cmts-tag configuration mode. To remove the configured service class name from the CMTS tag, use the **no** form of this command.

[**exclude**] **service-class** *service-class-name*
no service-class *service-class-name*

Syntax Description

exclude	(Optional) Configures the CMTS tag to exclude the specified service class name.
service-class-name	Service class name with matching rule

Command Default

None

Command Modes

CMTS tag mode (cmts-tag)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the specified service class name for the CMTS tag using the **service-class** command:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(cmts-tag)# service-class uBR
```

Related Commands

Command	Description
cable load-balance docsis-group	To configure a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	To display real-time configuration, statistical and operational information for load balancing operations on the router.
cable tag	To configure a tag for a DOCSIS load balancing group on the CMTS.

service-class (enforce-rule)

To identify a particular service class for cable modem monitoring in an enforce-rule, use the **service-class (enforce-rule)** command in enforce-rule configuration mode. To remove the service class from the enforce-rule, use the **no** form of this command.

service-class {**enforced** | **registered**} *name*
no service-class {**enforced** | **registered**} *name*

Cisco cBR Series Converged Broadband Routers
service-class { {**enforced** *name* [**no-persistence**] | {**registered** *name* } }
no service-class { {**enforced** *name* [**no-persistence**] | {**registered** *name* } }

Syntax Description

enforced	Specifies an enforced service class.
registered	Specifies enforcing of QoS profiles for the registered service class.
name	Specifies the name of the service class.
no-persistence	(Optional) Specifies that the enforced QoS profile should not remain in force when a cable modem reboots.

Command Default

None

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(9a)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **service-class (enforce-rule)** command allows operators to identify the name of the initial registered service class for a CM in an enforce-rule, and also the name of a new service class to be enforced if the CM violates its registered service parameters.

Examples

The following example shows specification of the enforced service class called “test” in an enforce-rule:

```
Router(enforce-rule)# service-class enforced test
```

The following example shows service class being enforced with **no-persistence** option on a Cisco cBR Series Converged Broadband Routers:

```
Router(enforce-rule)# service-class enforced test1 no-persistence
```

Related Commands

Command	Description
cable qos enforce-rule (for uBR series router)	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
debug cable subscriber-monitoring	Displays enforce-rule debug messages for subscriber traffic management on the Cisco CMTS routers.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
monitoring-basics	Specifies the type of monitoring desired for subscriber traffic management on a Cisco CMTS router.
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

service-descriptor-default

To enable the operator to specify the default values for the service descriptor that will be encoded as part of the serving area table at chassis level, use the **service-descriptor-default** command in the video configuration mode. To disable the feature, use the **no** form of the command.

service-descriptor-default

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1c	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to enable the feature:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-descriptor-default
router(config-video-serv-desc)#
```

Related Commands

Command	Description
serving-area	Configures the serving area which enables the set tops to discover VOD content.
cable video	Enters the video configuration mode.

service-distribution-group

To define a service distribution group, use the **service-distribution-group** command in video configuration mode. To delete a service distribution group, use the **no** form of this command.

service-distribution-group *name*
id *id*
no service-distribution-group *name*
id *id*

Syntax Description

service-distribution-group *name*	Specifies the service distribution group name.
id *id*	Specifies the service distribution group identifier.

Command Default

None.

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines a service distribution group.

Examples

The following example shows how to define a service distribution group:

```
Router#configure terminal
Router(config)#cable video
Router(config-video)#service-distribution-group west-region id 1
```

Related Commands

Command	Description
rf-port integrated-cable	Specifies the RF port in a service distribution group.
onid	Specifies the original network identifier in a service distribution group.
psi-interval	Specifies the program specific information interval in a service distribution group.
show cable video service-distribution-group all	Displays the service distribution group information.

service-id

To specify the service ID as part of the service descriptor, use the **service-id** command in the service descriptor configuration mode. To revoke the configuration, use the **no** form of the command.

service-id *value*

Syntax Description

value	Specifies the service ID.

Command Default

None.

Command Modes

Service descriptor configuration mode (config-video-serv-desc)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1c	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to specify the service ID:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-descriptor-default
router(config-video-serv-desc)#service-id 1
```

Related Commands

Command	Description
serving-area	Configures the serving area which enables the set tops to discover VOD content.
service-descriptor-default	Enables the operator to specify the default values for the service descriptor.

service-name

To specify the service name as part of the service descriptor, use the **service-name** command in the service descriptor configuration mode. To revoke the configuration, use the **no** form of the command.

service-name *string*

Syntax Description

string	Specifies the service name.

Command Default

None.

Command Modes

Service descriptor configuration mode (config-video-serv-desc)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1c	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to specify the service name:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-descriptor-default
router(config-video-serv-desc)#service-name test
```

Related Commands

Command	Description
serving-area	Configures the serving area which enables the set tops to discover VOD content.
service-descriptor-default	Enables the operator to specify the default values for the service descriptor.

service-type (service descriptor)

To specify the service type as part of the service descriptor, use the **service-type** command in the service descriptor configuration mode. To revoke the configuration, use the **no** form of the command.

service-type *value*

Syntax Description

value	Specifies the service type.

Command Default

None.

Command Modes

Service descriptor configuration mode (config-video-serv-desc)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1c	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to specify the service type:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-descriptor-default
router(config-video-serv-desc)#service-type 2
```

Related Commands

Command	Description
serving-area	Configures the serving area which enables the set tops to discover VOD content.
service-descriptor-default	Enables the operator to specify the default values for the service descriptor.

service-type (virtual carrier group)

To specify the service type of a virtual carrier group, use the **service-type** command in virtual carrier group configuration mode. To undo the service type assignment, use the **no** form of this command.

service-type {**narrowcast** | **broadcast**}
no service-type {**narrowcast** | **broadcast**}

narrowcast	Specifies video on demand and/or switched digital video service type. These narrowcast service types can share the same virtual carrier group.
broadcast	Specifies the broadcast service type.

Command Default

Narrowcast service type

Command Modes

Virtual carrier group configuration (config-video-vcg)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the service type of a virtual carrier group to be enabled on the linecard.

Examples

The following example shows how to specify the service type of a virtual carrier group:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# virtual-carrier-group vod id 1
Router(config-video-vcg)# service-type broadcast
```

Related Commands

Command	Description
virtual-carrier-group	Defines a virtual carrier group.
virtual-edge-input-ip	Defines a virtual edge input.
encrypt	Enables encryption on the virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
show cable video virtual-carrier-group	Displays the virtual carrier group information.

service-type-id (load-balance)

To add a service type ID that is compared against the cable modem provisioned service type ID, to determine an appropriate restricted load balancing group (RLBG), use the **service-type-id** command in the config-lb-group configuration mode. To remove the service type ID, use the **no** form of this command.

service-type-id *string*
no service-type-id *string*

Syntax Description

string	Identifier of the service type that gets added to the load balancing group.

Command Default

No default behavior or values.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can use the **service-type-id** command to add a service type ID only to a RLBG.

Examples

The following example shows how to add a service type ID on the CMTS, using the **service-type-id** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# restricted
Router(config-lb-group)# service-type-id commercial
Router(config-lb-group)# no service-type-id commercial
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

service-type-id (cmts-tag)

To configure the specified service type ID for the CMTS tag, use the **service-type-id** command in the cmts-tag configuration mode. To remove the service type ID, use the **no** form of this command.

[**exclude**] **service-type-id** *service-type-id*
no service-type-id *service-type-id*

Syntax Description

exclude	(Optional) Configures the CMTS tag to exclude the specified service type ID.
service-type-id	Sets a matching rule with the specified service type ID.

Command Default

None

Command Modes

CMTS tag mode (cmts-tag)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the specified service type ID for the CMTS tag using the **service-type-id** command:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable tag 1
Router(cmts-tag)# service-type-id commercial
```

Related Commands

Command	Description
cable load-balance docsis-group	To configure a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	To display real-time configuration, statistical and operational information for load balancing operations on the router.
cable tag	To configure a tag for a DOCSIS load balancing group on the CMTS.

serving-area

To configure the serving area which enables the set tops to discover VOD content, use the **serving-area** command in the service distribution group configuration mode. To revoke the configuration, use the **no** form of the command.

serving-area *value*

Syntax Description

value	Specifies the serving-area at SDG level.

Command Default

None.

Command Modes

Service distribution group configuration mode (config-video-sdg)

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.10.1c	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows how to configure the serving area:

```
router#configure terminal
router(config)#cable video
router(config-video)#service-distribution-group sdg id 1
router(config-video-sdg)#serving-area 100
```

Related Commands

Command	Description
service-distribution-group	Defines a service distribution group.
show cable video service-distribution-group	Displays the SDG configuration.

session

To configure a table based video session, use the **session** command in session configuration mode. To disable the configuration, use the **no** form of this command.



Note Before configuring the table-based video sessions, you must configure the physical and virtual constructs for Cisco cBR-8. You must also configure the Logical Edge Device (LED), Service Distribution Group (SDG), binding and Virtual Carrier Group (VCG).

session *sess-name* {**input-port** *number* | **bundle-id** *number* }**start-udp-port** *number* **num-sessions-per-qam** *number* **processing-type** {*programdata*}**start-program** *program-num* [**repeat**]**jitter** *ms* [**cbr** | **vbr**]
no session *sess-name* {**input-port** *number* | **bundle-id** *number* }**start-udp-port** *number* **num-sessions-per-qam** *number* **processing-type** {*programdata*}**start-program** *program-num* [**repeat**] **jitter** *ms* [**cbr** | **vbr**]

Cisco cBR Series Converged Broadband Routers
session *sess-name* **multicast-label** *multicast label* **input-port** *vei-number* **group** *group_ip* **source** *source_ip* **processing-type** {*remappassthrudataremux*}**start-program** *program-num* [**bit-rate** *bit-rate_number*][**jitter** *ms*][**cbr** | **vbr**] **input-program-num** *num* **output-program-num** *num*
no session *sess-name* **multicast-label** *multicast label* **input port** *vei-number* **group** *group_ip* **source** *source_ip* **processing-type** {*remappassthrudataremux*}**start-program** *program-num* [**bit-rate** *bit-rate_number*][**jitter** *ms*][**cbr** | **vbr**] **input-program-num** *num* **output-program-num** *num*

Syntax Description

sess-name	Specifies the session name for the table-based session.
multicast label	Specifies the multicast label name.
input-port *vei-number*	Specifies the virtual edge input port number.
group *group-ip*	Specifies the group name for the table-based session.
input-port *number*	Specifies the input port number for the table-based session.
bundle-id *number*	Specifies the virtual edge input bundle ID.
start-udp-port *number*	Specifies the UDP port number.
num-sessions-per-qam *number*	Specifies the number of sessions per QAM. The valid range is from 1 to 80.

processing-type	Specifies the processing type of session. **program**—Configures video session as program. **data**—Configures video streams that are not dejittered, and remapped. **remap**—Configures video streams that are remapped. **passthru**—Configures video streams that are passthrough. **remux**—Configures video streams that are remultiplexed. This processing type allows you to specify a program in a multi-program transport stream (MPTS) input session, renumber it, and send it to an output session.
start-program *program-num*	Specifies the starting program number. The valid range is from 1 to 65535.
bit-rate *bit-rate-number*	Specified the bits per second.
jitter *ms*	Specifies the jitter value in milliseconds. The valid range is from 10 to 200.
input-program-num *num*	Specifies the input program number. This is applicable only for remux sessions. The allowed range of program numbers is 1–65535.
output-program-num *num*	Specifies the output program number. This is applicable for remap and remux sessions. The allowed range of program numbers is 1–65535.

Command Default

None

Command Modes

Session configuration (config-video-tb-vcg-sess)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0SP	This command was modified on the Cisco cBR Series Converged Broadband Routers. .
IOS-XE 16.8.1	The **remux** and the **input-program-num** keywords were added.

Usage Guidelines

This command configures a table based video session.

Examples

The following example shows how to configure the virtual carrier group and service distribution group for replication:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# table-based
Router(config-video-tb)# vcg pme_tbv
Router(config-video-tb-vcg)# rf-channel 20-22
Router(config-video-tb-vcg-sess)# session bago_tbv input-port 10 start-udp-port 1
num-sessions-per-qam 2 processing-type remap start-program 1 jitter 100 cbr
```

The following example shows how to configure the virtual carrier group with passthru processing type:

```
Router#configure terminal
Router(config)#cable video
Router(config-video)#table-based
Router(config-video-tb)# multicast-label a2 group 232.5.6.7 source 175.2.5.6
Router(config-video-tb)#multicast-label exampleLabel group 232.2.1.6 source 175.6.1.13
source2 175.6.1.12 source3 180.1.1.1 source4 175.6.1.14
Router(config-video-tb)#vcg VCG_PME4
Router(config-video-tb-VCG_PME4)#rf-channel 24
Router(config-video-tb-VCG_PME4-sess)#session SESS_PME4 group 232.5.6.15 source 175.2.6.7
processing-type passthru
```

The following example shows how to configure a session with remux processing type:

```
Router# session remux1 group 209.165.200.225 source 192.0.2.1 processing-type remux
input-program-num 1 output-program-num 1
```

The following example shows how to see the remux sessions with input and output program numbers:

```
Router#sh cable video session log id 31
Total Sessions = 80

Session  Output Frequency  Streaming Sess Session Source       UDP  Input   Output  Input
     Output Input    Output   Encrypt  Encrypt Low PMV Session
Id       Port   Hz         Type      Type Ucast Dest IP        Port Program Program State
     State  Bitrate  Bitrate  Type     Status  Lat NUM Name
                                  /Mcast IP (S,G)

------------------------------------------------------------------------------------------------------------
32505897 54     825000000  Remux     SSM  192.0.2.1,234.1.1.1  0    1       1       ACTIVE-PSI
 ON     65088810 65684765 CLEAR    -       N   -   remux1.9.5015
32505898 54     825000000  Remux     SSM  192.0.2.1,234.1.1.1  0    2       2       ACTIVE-PSI
 ON     65088810 65684765 CLEAR    -       N   -   remux2.9.5015
32505899 54     825000000  Remux     SSM  192.0.2.1,234.1.1.1  0    3       3       ACTIVE-PSI
 ON     65088810 65684765 CLEAR    -       N   -   remux3.9.5015
32505900 54     825000000  Remux     SSM  192.0.2.1,234.1.1.1  0    4       4       ACTIVE-PSI
 ON     65088810 65684765 CLEAR    -       N   -   remux4.9.5015
32505901 54     825000000  Remux     SSM  192.0.2.1,234.1.1.1  0    5       5       ACTIVE-PSI
 ON     65088810 65684765 CLEAR    -       N   -   remux5.9.5015
```

Related Commands

Command	Description
virtual-carrier-group	Defines a virtual carrier group.
service-distribution-group	Defines a service distribution group.
rf-port integrated-cable	Specifies the RF ports in a service distribution group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
bind-vcg	Binds a set of virtual RF-channels defined in the virtual carrier group to the physical port in the service distribution group.

session name multicast-label

The Cisco cBR Series Converged Broadband Routers supported two clock recovery modes: VBR and CBR. Both VBR and CBR modes use one phase-locked loop (PLL) to recover the program clock, using all the PCR packet identifiers (PIDs) found in content. Hence, for MPTS sessions with a large number of programs, the PCRs may have different clock frequencies and be of poor quality. This lead to excessive overdue drops and bad output video quality.

The *Clock Recovery Mechanism* is a new third clock recovery mode, supported from Cisco IOS XE Gibraltar 17.3.1x, and can handle this type of content with better results. The Clock Recovery Mechanism uses one phase-locked loop (PLL) to recover the program clock, using only one PCR PID as the primary. All the other PCR PIDs are subordinates and are re-timed using the clock recovered from the primary PCR PID. The output will be good if the primary PCR is of good quality.

session *name* **multicast-label** *label* **processing-type** *type* **primary-subordinate** [**pcr-pid <pid>**]

Syntax Description

Parameter	Description
name	Specifies the session name
label	Specifies the multicast label name
type	Specifies the processing type of session.
pcr-pid <pid>	This is an optional parameter, and allows you to select a desired PCR-pid to be used for the primary PCR PID

Command Default

None

Command Modes

Service distribution group configuration mode (config-video-sdg)

Command History

Release	Modification
Cisco IOS XE Gibraltar 17.3.1x	The Clock Recovery Mechanism command was introduced on the Cisco cBR Series Converged Broadband Routers.

The keyword *primary-subordinate* selects primary-subordinate Clock Recovery Mechanism for the session. One of the PCR PIDs is selected to serve as the primary PID. The selected PID is the first PCR PID found in the content, or first one found after a buffer overflow or underflow handling. The Clock Recovery Mechanism is available for both unicast and multicast sessions, for session of processing types remap, passthru and remux. They are not available for data-piping sessions.

Note If the primary PCR PID is not configured, or is absent in the content, one of the PCR PIDs is selected to serve as the primary PID. The selected PID is the first PCR PID found in the content, or first one found after a buffer overflow or underflow handling.

Usage Guidelines

To recover the overdue drops, you can configure the Clock Recovery Mechanism.

Examples

The following example shows how to configure the Clock Recovery Mechanism under cable video configuration:

```
Router# conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable video
Router(config-video)# table-based
Router(config-video-tb)# $source3 175.10.3.2 source4 175.10.4.2
Router(config-video-tb)#    vcg v2
Router(config-video-tb-vcg)#      rf-channel 68
Router(config-video-tb-vcg-sess)#$ session check input-port 1 start-udp-port 1523
processing-type remux input-program-num 1 output-program-num 1 primary-subordinate pcr-pid
 50
Router(config-video-tb-vcg-sess)# exit
Router(config-video-tb-vcg)# exit
Router(config-video-tb)# exit
Router(config-video)# exit
Router(config)#
```

session-range

To identify the multicast QoS group session range, use the **session-range** command in multicast QoS configuration mode. To disable the QoS group session range, use the **no** form of this command.

session-range *ip-address ip-mask*
no session-range *ip-address ip-mask*

Syntax Description

ip-address	Specifies the IP address of the multicast QoS group.
ip-mask	Specifies the IP mask of the multicast QoS group.

Command Default

A session range IP address and IP mask are not defined for a specific multicast QoS group.

Command Modes

Multicast QoS configuration (config-mqos)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **session-range** command to configure the session range to specify the number of multicast sessions to be admitted on a particular service flow. CMTS does not admit new sessions (no forwarding) if the current number of sessions has reached the defined limit, and waits until a session ends to free up a slot for new sessions. You can configure multiple session ranges.

Examples

The following example defines a session range IP address and IP mask using the **session-range** command:

```
Router(config)# cable multicast qos group 20 priority 55 global
Router(config-mqos)# session-range 224.10.10.01 255.255.255.254
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface bundle multicast-sessions	Displays multicast session information for a specific virtual cable bundle.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

set clock

To set the system clock on the Cisco CMTS, use the **set clock** command in global configuration mode.

set clock *time-date*

Syntax Description

time-date	Time and date for which to set the clock on the Cisco CMTS.

Command Default

Time-of-Day, DHCP, and TFTP server configuration not defined on the Cisco CMTS by default.

Command Modes

Global configuration

Command History

Release	Modification
12.0(4)XI	This feature was introduced for the Cisco uBR7200 series routers.
12.1(5)EC	This feature was supported on the Cisco uBR7100 series routers.
12.2(4)BC1	This feature was supported on the Release 12.2 BC train for all Cisco CMTS platforms.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

To supply an accurate clock, the system clock on the Cisco CMTS should be configured for the correct time, either by using the **set clock** command or by configuring the Cisco CMTS to act as a Network Time Protocol (NTP) or Simple Network Time Protocol (SNTP) client.

For proper operation of the DOCSIS network, especially a DOCSIS 1.1 network using BPI+ encryption and authentication, the system clock on the Cisco CMTS must be set accurately. You can achieve this by manually using the **set clock** command, or by configuring the CMTS to use either the Network Time Protocol (NTP) or the Simple Network Time Protocol (SNTP).

For additional information about the **set clock** command, refer to the following documents on Cisco.com:

- http://www.cisco.com/en/US/docs/ios/cable/configuration/guide/cmts_services.html#wp1051747 Time-of-Day Server for the Cisco CMTS
- http://www.cisco.com/en/US/docs/ios/cable/configuration/guide/cmts_services.html DHCP, ToD, and TFTP Services for the Cisco Cable Modem Termination System

Related Commands

Command	Description
cable dhcp-giaddr policy	Sets the DHCP *giaddr* field of DHCP request packets to the primary address for cable modems and the secondary address for CPE devices, allowing the use of separate address pools for the different clients.
cable dhcp-parse option	Enables the parsing of certain DHCP options.
cable helper-address	Enables load-balancing of DHCP requests from cable modems and CPE devices by specifying different DHCP servers according to the cable interface or subinterface.

Command	Description
ip dhcp ping packet 0	Instructs the DHCP server to assign an IP address from its pool without first sending an ICMP ping to test whether a client is already currently using that IP address.
ip dhcp relay information option	Configures the DHCP server to validate the relay agent information option in forwarded BOOTREPLY messages.
ip dhcp smart-relay	Enables the DHCP relay agent on the CMTS to automatically switch a cable modem or CPE device to a secondary DHCP server or address pool if the primary DHCP server does not respond to three successive requests.



Cable Commands: show a through show cable l

- show application-buckets, on page 1569
- show bridge cable-modem, on page 1571
- show cable acfe controller, on page 1573
- show cable acfe interface, on page 1576
- show cable acfe summary, on page 1579
- show cable active-reman, on page 1581
- show cable admission-control, on page 1584
- show cable admission-control fiber-node , on page 1592
- show cable arp-filter, on page 1593
- show cable asf-qos-profile, on page 1601
- show cable bgsync, on page 1603
- show cable bgsync sync-info cable, on page 1607
- show cable bundle, on page 1611
- show cable bundle multicast, on page 1614
- show cable burst-profile, on page 1616
- show cable calls, on page 1618
- show cable card , on page 1620
- show cable cgd-associations, on page 1623
- show cable channel-group, on page 1625
- show cable clock, on page 1628
- show cable clock dti counters, on page 1634
- show cable clock dti status, on page 1635
- show cable cmc, on page 1636
- show cable cmts-id, on page 1646
- show cable depi multicast, on page 1647
- show cable device access-group, on page 1649
- show cable downstream controller-profile, on page 1652
- show cable dp aqm, on page 1653
- show cable dp pfg, on page 1655
- show cable dp queue, on page 1656
- show cable dsg, on page 1658
- show cable dsg cfr, on page 1662
- show cable dsg host, on page 1667

- show cable dsg static-group bundle, on page 1669
- show cable dsg tg, on page 1671
- show cable dsg tunnel, on page 1674
- show cable dynamic-qos trace, on page 1681
- show cable dynamic-bonding-group, on page 1683
- show cable entropy status, on page 1690
- show cable fiber-node, on page 1691
- show cable filter, on page 1697
- show cable flap-list, on page 1702
- show cable flap-list reset-cm-list, on page 1713
- show cable flap-list wb-rf, on page 1714
- show cable freq-profile, on page 1717
- show cable hop, on page 1720
- show cable host access-group, on page 1725
- show cable ib-ipc, on page 1727
- show cable ipc-stats, on page 1728
- show cable ipv6 leasequery-filter, on page 1732
- show cable ipv6 leasequery-stats, on page 1733
- show cable l2-vpn dot1q-nsi-redundancy, on page 1734
- show cable l2-vpn dot1q-vc-map, on page 1736
- show cable l2-vpn vc-map, on page 1741
- show cable l2-vpn xconnect, on page 1743
- show cable leasequery-filter, on page 1748
- show cable leasequery-stats, on page 1752
- show cable licenses all, on page 1753
- show cable licenses cpb, on page 1756
- show cable license wan, on page 1758
- show cable load-balance, on page 1759
- show cable load-balance docsis-group, on page 1771
- show cable logging, on page 1804

show application-buckets

To displays rules for any or all buckets supporting Service Flow Admission Control on the Cisco CMTS, use the **show application-buckets** command in privileged EXEC mode. The configured rules for any given bucket are displayed in order of precedence in the Rule field.

show application-buckets [**bucket-no** *n*]

Syntax Description

bucket-no *n*	You may specify a specific bucket number on the Cisco CMTS to display parameters for that bucket and no others. Valid range is 1 to 8, or all buckets if no specific bucket is designated.

Command Default

No default behavior or values for this command. However, Cisco IOS Release 12.3(21)BC supports default operation and non-default configuration for feature on the Cisco CMTS.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router and the Cisco uBR7246VXR router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For additional information for Service Flow Admission Control, commencing in Cisco IOS Release 12.3(21)BC, refer to the following document on Cisco.com:

- Service Flow Admission Control for the Cisco Cable Modem Termination System

Examples

The following example illustrates sample output of the show application-buckets command.

```
Router# show cable application-type

For bucket 1, Name PktCable
     Packetcable normal priority gates
     Packetcable high priority gates
For bucket 2, Name PCMM-Vid
     PCMM gate app-id = 30
For bucket 3, Name Gaming
     PCMM gate app-id = 40
For bucket 4, Name
For bucket 5, Name
For bucket 6, Name
For bucket 7, Name
For bucket 8, Name HSD
     Best-effort (CIR) flows
```

Related Commands

Command	Description
cable admission-control ds-bandwidth	Sets minor, major and exclusive thresholds for downstream voice or data bandwidth for each or all interfaces on the Cisco CMTS
cable admission-control preempt priority-voice	Changes the default PacketCable Emergency 911 call preemption functions on the Cisco CMTS, supporting throughput and bandwidth requirements for Emergency 911 calls above all other buckets on the Cisco CMTS.
cable admission-control us-bandwidth	Configures global or interface-level upstream bandwidth thresholds and exclusive or non-exclusive resources on the Cisco CMTS.
cable application-type include	Associates an application type with a specific and prioritized bucket on the Cisco CMTS.
cable application-type name	Assigns an alpha-numeric name for the specified bucket.
debug cable admission-control flow-categorization	Displays service flow categorization results, enabled when a service flow is classified.
show application-buckets	Displays rules for any or all buckets supporting Service Flow Admission Control on the Cisco CMTS.
show interface cable admission-control reservation	Displays service flows, categorizations, and bandwidth consumption on the Cisco CMTS, for the specified interface, and the specified service flow direction.

show bridge cable-modem

To display bridging information for the router's cable interface, use the **show bridge cable-modem** command in privileged EXEC mode.

Cisco uBR904, uBR905, uBR924, uBR925 cable access routers, Cisco CVA122 Cable Voice Adapter

show bridge cable-modem *number*

Syntax Description

number	Identifies the cable interface (always **0**).

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3(4)NA	This command was introduced for the Cisco uBR904 cable access router.
12.0(4)XI1	Support was added for the Cisco uBR924 cable access router.
12.1(3)XL	Support was added for the Cisco uBR905 cable access router.
12.1(5)XU1	Support was added for the Cisco CVA122 Cable Voice Adapter.
12.2(2)XA	Support was added for the Cisco uBR925 cable access router.

Examples

The following example shows sample output for this **show bridge cable-modem** command:

```
Router#
show bridge cable-modem 0

Total of 300 station blocks, 298 free
Codes: P - permanent, S - self
Bridge Group 59:
```

Table 38: show bridge cable-modem Field Descriptions

Field	Description
Total of 300 station blocks	Total number of forwarding database elements in the system. The memory to hold bridge entries is allocated in blocks of memory sufficient to hold 300 individual entries. When the number of free entries falls below 25, another block of memory sufficient to hold another 300 entries is allocated. Thus, the total number of forwarding elements in the system is expanded dynamically, as needed, limited by the amount of free memory in the router.
Bridge Group	The number of the bridge group to which this interface is assigned.



Tip In Cisco IOS Release 12.2(8)T and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show dhcp	Displays the current DHCP settings on point-to-point interfaces.
show interfaces cable-modem	Displays information about the cable interface.

show cable acfe controller

To display fairness across DOCSIS interfaces controller statistics, use the **show cable acfe controller** command in privileged EXEC mode.

show cable acfe controller modular-cable *slot/subslot/unit* [**cluster** *cluster-index*]

Cisco cBR Series Converged Broadband Routers
show cable acfe controller Integrated-Cable *slot/subslot/unit* [**cluster** *cluster-index*]

Syntax Description

modular-cable *slot/subslot/unit*	Displays information for all controllers on the specified modular cable interface on a Cisco uBR10012 router, where: • *slot*—Controller slot number. The range is from 0 to 8. • *subslot*—Controller subslot number. The range is from 0 to 3. • *unit*—Controller unit number. The valid value is 0.
Integrated-Cable *slot/subslot/port*	Displays information for all controllers on the specified integrated cable interface on a Cisco cBR series router, where: • *slot*—Controller slot number. The range is from 0 to 3 and 6 to 9 on the Cisco cBR-8 router. • *subslot*—Controller subslot number. The valid value is 0 on the Cisco cBR-8 router. • *port*—Controller port number. The range is from 0 to 7 on the Cisco cBR-8 router.
cluster *cluster-index*	Displays information at the cluster level. • *cluster-index*—Cluster index. The range is from 0 to 253 on a Cisco uBR10012 router, and 0 to 1021 on a Cisco cBR series router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **Integrated-Cable** keyword was added and **modular-cable** keyword was removed.

Usage Guidelines

Use the **show cable acfe controller** command to show fairness across DOCSIS interfaces status and statistics for each controller interface.

Examples

The following example shows a sample output of the **show cable acfe controller** command on a Cisco uBR10012 router:

```
Router# show cable acfe controller modular-Cable 1/0/0
```

```
EIR Rebalance invoked: 76476
Adaptive CIR granted:  0
Adaptive CIR rejected: 0
Total clusters:        2
RF      FlexBW
0       28687
1       28687
RF      FlexBW
2       28687
3       28687
```

The following example shows a sample output of the **show cable acfe controller** command with the **cluster** keyword on a Cisco uBR10012 router:

```
Router# show cable acfe controller modular-Cable 1/0/0 cluster 1
EIR Rebalance invoked: 1810
Adaptive CIR granted:  0
Adaptive CIR rejected: 0
Total clusters:        2
RF      FlexBW
2       28687
3       28687
```

The following example shows a sample output of the **show cable acfe controller** command on a Cisco cBR-8 router:

```
Router# show cable acfe  controller integrated-Cable 1/0/0
EIR Rebalance invoked: 450963
Adaptive CIR granted:  20
Adaptive CIR rejected: 1
Total clusters:        9
RF      FlexBW
8       36376
9       36376
10      32625
```

The following example shows a sample output of the **show cable acfe controller** command with the **cluster** keyword on a Cisco cBR-8 router:

```
Router# show controllers integrated-Cable 1/0/0 acfe cluster 0
Integrated-Cable 1/0/0 status:
Topology changed: No
========Cluster 0========
Number of RF: 2
RF   FlexBW   WB    ExcessBW    Quanta
0    35625    -     35438       35438
0    187      187
1    35250    0     35250       35250
Number of BG: 2
Intf  Demand  CIR   Max     CstrMin  Alloc  NBonus  Ratio
WB0   1000    0     70875   35250    35437  35438   14855190400
IC0   1000    0     35625   0        35438  187     14855609600
```

Table 39: show cable acfe controller Field Descriptions

Field	Description
EIR Rebalance invoked	Number of EIR rebalance invoked.

Field	Description
Adaptive CIR granted	Number of CIRs granted.
Adaptive CIR rejected	Number of CIRs rejected.
Total Clusters	Cluster numbers.
RF	RF channel number.
FlexBW	Flexible bandwidth.
Intf	Interface number.
Demand	EIR demand.
CIR	CIR.
Max	Maximum bonus bandwidth allocation.
CstrMin	Minimum bonus bandwidth considering CIR.
Alloc	Allocated bandwidth.
NBonus	Non-guaranteed bonus bandwidth.
Ratio	Ratio between allocated bandwidth and demand.

Related Commands

Command	Description
show cable acfe interface	Displays fairness across DOCSIS interfaces statistics of a specific interface.
show cable acfe summary	Displays fairness across DOCSIS interfaces status and statistics.

show cable acfe interface

To display the fairness across DOCSIS interfaces statistics of a specific interface, use the **show cable acfe interface** command in privileged EXEC mode.

Cisco uBR Series Router

show cable acfe interface {**modular-cable** | **wideband-cable** | **integrated-cable**}*slot/subslot/port:interface-num* [**verbose**]

Cisco cBR Series Router

show cable acfe interface {**wideband-cable** | **integrated-cable**}*slot/subslot/port:interface-num* [**verbose**]

Syntax Description

interface	Specifies the cable interface.
	• modular-cable—Specifies the modular cable interface.
	• wideband-cable—Specifies the wideband cable interface.
	• integrated-cable—Specifies the integrated cable interface.
	• slot—Slot number of the cable interface. The valid range is from 5 to 8 for uBR series router, 0 to 9 for cBR series router.
	• subslot—Subslot number of the cable interface. The valid values are 0 or 1 for uBR series router, 0 for cBR series router.
	• port—Port number. The valid values are 0 or 1 for uBR series router, 0 to 7 for cBR series router.
	• interface-num—Interface number.
	  • For uBR series router, the valid range is from 0 to 23 for modular interface, 0 to 31 for the wideband interface, and 0 to 3 for the integrated interface.
	  • For cBR series router, the valid range is from 0 to 63 for the wideband interface, and 0 to 157 for the integrated interface.

verbose	(Optional) Enables verbose mode for the output, giving additional details about the modular, wideband or integrated interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **modular-cable** was removed.

Usage Guidelines

Use the **show cable acfe interface** command to display the fairness across DOCSIS interfaces statistics on a specific interface. For uBR series router, the command output also displays the route processor Service Flow Admission Control (SFAC) shadow with thresholds and reservations.

For uBR series router, the **integrated-cable** option works only on the Cisco UBR-MC20X20V cable interface line cards.

Examples

The following examples show sample outputs of the **show cable acfe interface** command in uBR series router:

```
Router# show cable acfe interface modular-Cable 1/0/0:1
Adaptive CIR granted:      0
Adaptive CIR rejected:     0
EIR Demand (raw/scale):    0/1
EIR Per-Flow BW (kbps):    18991
Guar Bonus BW (kbps):      18991
Non-guar Bonus BW (kbps):  9696
Reserved Bonus BW (kbps):  0
Router# show cable acfe interface wideband-Cable 1/0/0:1
Adaptive CIR granted:      0
Adaptive CIR rejected:     0
EIR Demand (raw/scale):    0/1
EIR Per-Flow BW (kbps):    18991
Guar Bonus BW (kbps):      19391
Non-guar Bonus BW (kbps):  37983
Reserved Bonus BW (kbps):  400
Router# show cable acfe interface integrated-Cable 6/1/0:0
Adaptive CIR granted:      0
Adaptive CIR rejected:     0
EIR Demand (raw/scale):    0/1
EIR Per-Flow BW (kbps):    20028
Guar Bonus BW (kbps):      20028
Non-guar Bonus BW (kbps):  10009
Reserved Bonus BW (kbps):  0
```

The following examples show sample outputs of the **show cable acfe interface** command in cBR series router:

```
Router# show cable acfe interface integrated-Cable 1/0/0:16
EIR Demand (raw/scale): 1/1000
Per-Flow EIR BW (kbps): 7200
Guar Bonus BW (kbps): 7200
Non-guar Bonus BW (kbps): 0
Reserved Bonus BW (kbps): 0
Cir total (kbps): 0
Cir unicast (kbps): 0
Cir multicast (kbps): 0
Router# show cable acfe interface wideband-Cable 1/0/0:1
EIR Demand (raw/scale): 1/1000
Per-Flow EIR BW (kbps): 94800
Guar Bonus BW (kbps): 94800
Non-guar Bonus BW (kbps): 60302
Reserved Bonus BW (kbps): 0
Cir total (kbps): 224
Cir unicast (kbps): 224
Cir multicast (kbps): 0
```

This table describes the significant fields shown in the display.

Table 40: show cable acfe interface Field Descriptions

Field	Description
Adaptive CIR granted	For uBR series router, number of adaptive CIRs granted.
Adaptive CIR rejected	For uBR series router, number of adaptive CIRs rejected.
EIR Demand (raw/scale)	Total EIR demand.
EIR Per-Flow BW (kbps)	Expected saturated throughput of a priority 0 BE flow on this interface.
Guar Bonus BW (kbps)	Guaranteed bonus bandwidth, in kilobytes per second.
Non-guar Bonus BW (kbps)	Non-guaranteed bonus bandwidth, in kilobytes per second.
Reserved Bonus BW (kbps)	Reserved bonus bandwidth, in kilobytes per second.

Related Commands

Command	Description
show cable acfe controller	Displays fairness across DOCSIS interfaces controller statistics.
show cable acfe summary	Displays fairness across DOCSIS interfaces status and statistics.

show cable acfe summary

To display the fairness across DOCSIS interfaces status and statistics, use the **show cable acfe summary** command in privileged EXEC mode.

show cable acfe summary

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **CIR Oversubscriptions** item was added in the command output.

Usage Guidelines

The **show cable acfe summary** command displays the global fairness across DOCSIS interfaces status and statistics.

Examples

The following example shows a sample output of the **show cable acfe summary** command for uBR series router:

```
Router# show cable acfe summary

ACFE state: Enabled
EIR Rebalance period (secs): 5
EIR Rebalance invocations:   32416
CIR Acquire invocations:     1
CIR Acquire rate/limit:      100/100
CIR Acquire throttled:       0
Maximal EIR ratio:           16
```

The following example shows a sample output of the **show cable acfe summary** command for cBR series router:

```
Router# show cable acfe summary

ACFE state: Enabled
EIR Rebalance period (secs): 5
EIR Rebalance invocations:   153243
CIR Acquire rate/limit:      100/100
CIR Acquire invocations:     0
CIR Acquire throttled:       0
CIR Oversubscriptions:       8
Maximal EIR ratio:           10
```

This table describes the significant fields shown in the display.

Table 41: show cable acfe summary Field Descriptions

Field	Description
ACFE state	Fairness across DOCSIS interfaces state, enabled or disabled.
EIR Rebalance period (secs)	EIR rebalance period, in seconds.
EIR Rebalance invocations	Number of EIR rebalance invocations.
CIR Acquire invocations	Number of CIR acquire invocations.
CIR Acquire rate/limit	CIR acquire rate and limit.
CIR Acquire throttled	Number of CIR acquisitions that failed because they reached the rate limit.
Maximal EIR ratio	Maximum EIR ratio.
CIR Oversubscriptions	For cBR series router, number of CIR oversubscription times.

Related Commands

Command	Description
cable acfe enable	Enables Fairness Across DOCSIS Interfaces feature on the CMTS router.

show cable active-reman

To display the line card high availability information, use the show cable active-reman command in privileged EXEC mode.

show cable active-reman {**all***slot/subslot*}

Syntax Description

all	Displays high availability information for all line card interfaces.
slot	Cable interface line card slot. The valid range is from 5 to 8.
subslot	Cable interface line card subslot. The valid range is 0 and 1.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced in Cisco IOS Release 12.2(33)SCF.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the show cable active-reman command that shows high availability information for all cable interfaces on the Cisco uBR10012 router:

```
Router# show cable active-reman all
------------------------------------------------------------
Active Reman info on LC 5/0:
[slot_index 0]:  work_slot:1/0,  active_slot:1/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 1]:  work_slot:3/0,  active_slot:3/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 2]:  work_slot:5/0,  active_slot:5/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 3]:  work_slot:5/1,  active_slot:5/1,  is_protect:TRUE ,  is_standby
:TRUE
[slot_index 4]:  work_slot:6/0,  active_slot:6/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 5]:  work_slot:6/1,  active_slot:6/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 6]:  work_slot:7/0,  active_slot:7/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 7]:  work_slot:7/1,  active_slot:7/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 8]:  work_slot:8/0,  active_slot:8/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 9]:  work_slot:8/1,  active_slot:8/1,  is_protect:FALSE,  is_standby
:FALSE
------------------------------------------------------------
Active Reman info on LC 5/1:
[slot_index 0]:  work_slot:1/0,  active_slot:1/0,  is_protect:FALSE,  is_standby
```

```
:FALSE
[slot_index 1]:  work_slot:3/0,  active_slot:3/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 2]:  work_slot:5/0,  active_slot:5/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 3]:  work_slot:5/1,  active_slot:5/1,  is_protect:TRUE ,  is_standby
:TRUE
[slot_index 4]:  work_slot:6/0,  active_slot:6/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 5]:  work_slot:6/1,  active_slot:6/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 6]:  work_slot:7/0,  active_slot:7/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 7]:  work_slot:7/1,  active_slot:7/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 8]:  work_slot:8/0,  active_slot:8/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 9]:  work_slot:8/1,  active_slot:8/1,  is_protect:FALSE,  is_standby
:FALSE
------------------------------------------------------------
Active Reman info on LC 6/0:
[slot_index 0]:  work_slot:1/0,  active_slot:1/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 1]:  work_slot:3/0,  active_slot:3/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 2]:  work_slot:5/0,  active_slot:5/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 3]:  work_slot:5/1,  active_slot:5/1,  is_protect:TRUE ,  is_standby
:TRUE
[slot_index 4]:  work_slot:6/0,  active_slot:6/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 5]:  work_slot:6/1,  active_slot:6/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 6]:  work_slot:7/0,  active_slot:7/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 7]:  work_slot:7/1,  active_slot:7/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 8]:  work_slot:8/0,  active_slot:8/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 9]:  work_slot:8/1,  active_slot:8/1,  is_protect:FALSE,  is_standby
:FALSE
------------------------------------------------------------
Active Reman info on LC 7/0:
[slot_index 0]:  work_slot:1/0,  active_slot:1/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 1]:  work_slot:3/0,  active_slot:3/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 2]:  work_slot:5/0,  active_slot:5/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 3]:  work_slot:5/1,  active_slot:5/1,  is_protect:TRUE ,  is_standby
:TRUE
[slot_index 4]:  work_slot:6/0,  active_slot:6/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 5]:  work_slot:6/1,  active_slot:6/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 6]:  work_slot:7/0,  active_slot:7/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 7]:  work_slot:7/1,  active_slot:7/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 8]:  work_slot:8/0,  active_slot:8/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 9]:  work_slot:8/1,  active_slot:8/1,  is_protect:FALSE,  is_standby
:FALSE
------------------------------------------------------------
```

```
Active Reman info on LC 8/0:
[slot_index 0]:  work_slot:1/0,  active_slot:1/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 1]:  work_slot:3/0,  active_slot:3/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 2]:  work_slot:5/0,  active_slot:5/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 3]:  work_slot:5/1,  active_slot:5/1,  is_protect:TRUE ,  is_standby
:TRUE
[slot_index 4]:  work_slot:6/0,  active_slot:6/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 5]:  work_slot:6/1,  active_slot:6/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 6]:  work_slot:7/0,  active_slot:7/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 7]:  work_slot:7/1,  active_slot:7/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 8]:  work_slot:8/0,  active_slot:8/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 9]:  work_slot:8/1,  active_slot:8/1,  is_protect:FALSE,  is_standby
```

The following is a sample output of the show cable active-reman command that shows high availability information for slot 5 and subslot 0 on the Cisco uBR10012 router:

```
Router# show cable active-reman 5/0
------------------------------------------------------------
Active Reman info on LC 5/0:
[slot_index 0]:  work_slot:1/0,  active_slot:1/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 1]:  work_slot:3/0,  active_slot:3/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 2]:  work_slot:5/0,  active_slot:5/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 3]:  work_slot:5/1,  active_slot:5/1,  is_protect:TRUE ,  is_standby
:TRUE
[slot_index 4]:  work_slot:6/0,  active_slot:6/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 5]:  work_slot:6/1,  active_slot:6/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 6]:  work_slot:7/0,  active_slot:7/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 7]:  work_slot:7/1,  active_slot:7/1,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 8]:  work_slot:8/0,  active_slot:8/0,  is_protect:FALSE,  is_standby
:FALSE
[slot_index 9]:  work_slot:8/1,  active_slot:8/1,  is_protect:FALSE,  is_standby
:FALSE
```

show cable admission-control

To display the current admission control (AC) configuration and status on a Cisco CMTS router, or on a specified interface, use the **show cable admission-control** command in privileged EXEC mode.

show cable admission-control [**global** | **interface** | {*slot/port slot/subslot/port* }] [**all** | **verbose**]

Cisco IOS Release 12.2(33)SCE and later

show cable admission-control {**global** | **interface** | {**cable** *slot/subslot/cable-interface-index* | {**integrated-cable** | **modular-cable** | **wideband-cable**}}}*slot/subslot/port:interface-num* [**all** | **verbose**]

Cisco cBR Series Router

show cable admission-control interface {**cable** *slot/subslot/cable-interface-index* | {**integrated-cable** | **wideband-cable**}}*slot/subslot/port:interface-num* **all**

Syntax Description

global	For uBR series router, displays the following information: • Parameters configured for AC. • Number of requests that crossed minor, major, and critical levels for each resource.

interface *slot/port* | *slot/subslot/port*	Displays admission control information for the specified interface. For uBR series router, this includes the following:
	• slot—Slot on the interface. The valid range is from 5 to 8 for the Cisco uBR10012 router and from 3 to 6 for the Cisco uBR7200 series routers.
	• subslot—Subslot on the interface. The valid values are 0 or 1.
	• port—Port on the interface. The valid range is from 0 to 4 for the Cisco uBR10012 router and 0 or 1 for the Cisco uBR7200 series routers.
	• cable-interface-index
	  • Cisco uBR7200 series routers—The valid values are 0 or 1.
	  • Cisco uBR10012 router—The valid range is from 0 to 4 for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards, and 0 to 14 for the Cisco uBR-MC3GX60V line card.
	• interface-num—Interface number. The valid range is from 0 to 23 for the modular interface, 0 to 31 for the wideband interface, and 0 to 3 for the integrated interface.

all	(Optional) Displays information for all interfaces configured for AC on the Cisco CMTS.
verbose	(Optional) For uBR series router, displays detailed information for the wideband interface configured for AC on the Cisco CMTS.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(13a)BC	This command was introduced on the Cisco uBR10012 router and the Cisco uBR7246VXR router.
12.3(23)BC	This command was modified; new fields were added to the output.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC	This command was modified to display DS threshold values and reservations per bucket on a modular cable, interface cable, or DS channel bonding.
12.2(33)SCE	This command was modified. The port parameter was changed to *cable-interface-index* to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
12.2(33)SCF	This command was modified to display guaranteed and non-guaranteed bonus bandwidth from the ACFE functionality.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **global**, **modular-cable** and **verbose** keywords are removed.

Usage Guidelines

The **show cable admission-control** command offers flexible syntax that enables display of the AC as specifically configured on the Cisco CMTS. See the examples for additional information.

Examples

The following example displays upstream and downstream AC information for the specified cable interface:

```
Router# show cable admission-control interface cable 7/0/0

Interface  Cable7/0/0


 Resource - Upstream Bandwidth
 -----------------------------
Thresholds applicable to upstream ports with no interface level
 configurations in place
Bucket                  Minor          Major         Exclusive         Non-Excls
No                      Level          Level         Level             Level
1                         0              0             0                 0
2                         0              0             0                 0
3                         0              0             0                 0
4                         0              0             0                 0
5                         0              0             0                 0
6                         0              0             0                 0
7                         0              0             0                 0
8                         0              0             0                 0

Downstream Bit Rate (bits per second) = 24273316

 Resource - Downstream Bandwidth
 -------------------------------
Bkt    Name   Minor # of  Major # of  Excls # of  Non-Ex Curr. Curr. Conf  # of
No            Level Times Level Times Level Times Level  Resv  Ovrsb Level Rej
1             0     0     0     0     0     0     100*    0.0   0.0  G       0
2             0     0     0     0     0     0     100*    0.0   0.0  G       0
```

```
3              0     0     0     0     0     0     100*    0.0   0.0  G       0
4              0     0     0     0     0     0     100*    0.0   0.0  G       0
5              0     0     0     0     0     0     100*    0.0   0.0  G       0
6              0     0     0     0     0     0     100*    0.0   0.0  G       0
7              0     0     0     0     0     0     100*    0.0   0.0  G       0
8              0     0     0     0     0     0     100*   12.3   0.0  G       0
 Note: * indicates that the thresholds are implicit

 Resource - Modular Downstream Bandwidth
 -------------------------------
Interface       Total(Kbps)       Reservable(Kbps)       Allocated(Kbps)
Mo1/0/0:0            19405                  12424                  3100
```

Effective from Cisco IOS Release 12.2(33)SCF, the **show cable admission-control** command output for wideband cable interface was modified.

The following example displays the upstream and downstream AC information for the wideband-cable interface:

```
Router# show cable admission-control interface wideband-Cable 1/0/0:1

Interface Wideband-Cable1/0/0:1
Configured AC Max Reservable Bandwidth = 600000 bps
 Resource - Downstream Bandwidth
 -------------------------------
Bkt    Name   Minor # of  Major # of  Excls # of  Non-Ex Curr. Curr. Conf  # of
No            Level Times Level Times Level Times Level  Resv  Ovrsb Level Rej
1             0     0     0     0     0     0     0  *    0.0   0.0  G       0
2             0     0     0     0     0     0     0  *    0.0   0.0  G       0
3             0     0     0     0     0     0     0  *    0.0   0.0  G       0
4             0     0     0     0     0     0     0  *    0.0   0.0  G       0
5             0     0     0     0     0     0     0  *    0.0   0.0  G       0
6             0     0     0     0     0     0     0  *    0.0   0.0  G       0
7             0     0     0     0     0     0     0  *    0.0   0.0  G       0
8             0     0     0     0     0     0     100* 1333.31233.3  G       0
 Note: * indicates that the thresholds are implicit
```

The following example displays the modified detailed upstream and downstream AC information for the wideband-cable interface with the verbose keyword:

```
Router# show cable admission-control interface wideband-Cable 1/0/0:1 verbose
Interface Wideband-Cable1/0/0:0
Configured AC Max Reservable Bandwidth = 72000000 bps
 Resource - Downstream Bandwidth
 -------------------------------
Bkt    Name   Minor # of  Major # of  Excls # of  Non-Ex Curr. Curr. Conf  # of
No            Level Times Level Times Level Times Level  Resv  Ovrsb Level Rej
1   DEF_MULTI 10    0     20    0     25    0     0        0.0   0.0  I       0
2   PKTCBL_N  2     0     3     0     5     0     0        0.0   0.0  I       0
3   PCMM_1    1     0     2     0     3     0     0        0.0   0.0  I       0
4             0     0     0     0     0     0     0  *     0.0   0.0  I       0
5             0     0     0     0     0     0     0  *     0.0   0.0  I       0
6             0     0     0     0     0     0     0  *     0.0   0.0  I       0
7             0     0     0     0     0     0     0  *     0.0   0.0  I       0
8             0     0     0     0     0     0     67 *    27.7   0.0  I       0
 Note: * indicates that the thresholds are implicit
WB-NB CIR for Wideband-Cable1/0/0:0
CIR Values for Cable6/1/0
Bkt SFAC BW    Rsvd CIR   Reject #
1   4499750    0          0
```

```
2   1800000    0          0
3   540000     0          0
4   0          0          0
5   0          0          0
6   0          0          0
7   0          0          0
8   34120000   20000000   0
Available Guaranteed Bonus BW (bps): 2531250
Available Non-guaranteed Bonus BW (bps): 10125000
CIR Values for Cable6/1/1
Bkt SFAC BW    Rsvd CIR   Reject #
1   4499750    0          0
2   1800000    0          0
3   540000     0          0
4   0          0          0
5   0          0          0
6   0          0          0
7   0          0          0
8   14120000   0          0
Available Guaranteed Bonus BW (bps): 2531250
Available Non-guaranteed Bonus BW (bps): 10125000
WB Multicast CIR Utilization
Bkt SFAC BW    Rsvd CIR   Reject #
1   9000500    1000       0
2   0          0          0
3   1080000    0          0
4   0          0          0
5   0          0          0
6   0          0          0
7   0          0          0
8   0          0          0
Available Guaranteed Bonus BW (bps):
5062500 Available Non-guaranteed Bonus BW (bps): 10125000
```

The **verbose** keyword is not applicable to integrated-cable and modular-cable interfaces.

Effective from Cisco IOS Release 12.2(33)SCF, the **show cable admission-control** command output for modular cable interface was modified.

The following example displays upstream and downstream AC information for the specified modular cable interface:

```
Router# show cable admission-control interface modular-Cable 1/0/0:1
Interface Mo1/0/0:1
Configured AC Max Reservable Bandwidth = 3000000 bps
 Resource - Downstream Bandwidth
 -------------------------------
Bkt    Name   Minor # of  Major # of  Excls # of  Non-Ex Curr. Curr. Conf  # of
No            Level Times Level Times Level Times Level  Resv  Ovrsb Level Rej
1             0     0     0     0     0     0     100*   0.0   0.0   G     0
2             0     0     0     0     0     0     100*   0.0   0.0   G     0
3             0     0     0     0     0     0     100*   0.0   0.0   G     0
4             0     0     0     0     0     0     100*   0.0   0.0   G     0
5             0     0     0     0     0     0     100*   0.0   0.0   G     0
6             0     0     0     0     0     0     100*   0.0   0.0   G     0
7             0     0     0     0     0     0     100*   0.0   0.0   G     0
8             0     0     0     0     0     0     100*   0.0   0.0   G     0
 Note: * indicates that the thresholds are implicit
 Total Current Reservation = 0 bps
 Guaranteed Bonus available/total = 13657000/13657000 bps
 Non-guaranteed Bonus available/total = 13658000/13658000 bps
```

Effective from Cisco IOS Release 12.2(33)SCF, the **show cable admission-control** command output for integrated cable interface was modified.

The following example displays upstream and downstream AC information for the specified integrated cable interface:

```
Router# show cable admission-control interface integrated-Cable 6/1/0:0
Interface In6/1/0:0
Configured AC Max Reservable Bandwidth = 300000 bps
 Resource - Downstream Bandwidth
 -------------------------------
Bkt    Name   Minor # of  Major # of  Excls # of  Non-Ex Curr. Curr. Conf  # of
No            Level Times Level Times Level Times Level  Resv  Ovrsb Level Rej
1             0     0     0     0     0     0     100*    0.0   0.0  G       0
2             0     0     0     0     0     0     100*    0.0   0.0  G       0
3             0     0     0     0     0     0     100*    0.0   0.0  G       0
4             0     0     0     0     0     0     100*    0.0   0.0  G       0
5   ACFE      0     0     0     0     0     0     100*    0.0   0.0  G       0
6             0     0     0     0     0     0     100*    0.0   0.0  G       0
7             0     0     0     0     0     0     100*    0.0   0.0  G       0
8             0     0     0     0     0     0     100*    0.0   0.0  G       0
 Note: * indicates that the thresholds are implicit
 Total Current Reservation = 0 bps
 Guaranteed Bonus available/total = 20028000/20028000 bps
 Non-guaranteed Bonus available/total = 10009000/10009000 bps
```

The following example displays upstream and downstream AC information for the specified cable interface:

```
Router# show cable admission-control interface cable 6/1/0
Interface  Cable6/1/0
Resource - Upstream Bandwidth
 ----------------------------
Thresholds applicable to upstream ports with no interface level configurations in place
Bucket       Name    Minor       Major      Exclusive      Non-Excls      Config
No                   Level       Level      Level          Level          Level
1       DEF_MULTI     15          20          25             10             I
2             UGS     15          20          25             10             I
3          PCMM_1      0           0           0              0*            I
4                      0           0           0              0*            I
5                      0           0           0              0*            I
6                      0           0           0              0*            I
7                      0           0           0              0*            I
8                     10          15          20             15             I
Downstream Bit Rate (bits per second) = 34307436
 Resource - Downstream Bandwidth
 -------------------------------
Bkt    Name   Minor # of  Major # of  Excls # of  Non-Ex Curr. Curr. Conf  # of
No            Level Times Level Times Level Times Level  Resv  Ovrsb Level Rej
1   DEF_MULTI 1     0     3     0     10    0     0       0.0   0.0  I       0
2   UGS      10    0     15    0     20    0     5       0.2   0.0  I       0
3   PCMM_1    0     0     0     0     0     0     70 *    0.0   0.0  I       0
4             0     0     0     0     0     0     70 *    0.0   0.0  I       0
5             0     0     0     0     0     0     70 *    0.0   0.0  I       0
6             0     0     0     0     0     0     70 *    0.0   0.0  I       0
7             0     0     0     0     0     0     70 *    0.0   0.0  I       0
8             0     0     0     0     0     0     70 *   58.7   0.0  I       0
```

The following example displays upstream and downstream AC information with the global keyword:

```
Router# show cable admission-control global
CM registration event enabled
Dynamic service event enabled
Call preemption due to priority call enabled
Resource  Minor #times Major #times Critical #times Current
cpu-5sec    50%      7   70%      0      99%      0       2
proc-mem    50%      0   80%      0      90%      0      11
io-mem      50%      1   60%      1      90%      0      75
total-mem   50%      0   80%      0      90%      0      36
Number of Packetcable voice calls = 80/100 (maximum)
Number of times voice count exceeded = 1
 Resource - Upstream Bandwidth
 ----------------------------
Thresholds applicable to upstream ports with no interface or port level configurations in
place
Bucket    Name          Minor          Major         Exclusive         Non-Excls
No                      Level          Level         Level             Level
1       DEF_MULTI         5              8             20                10
2             UGS         5             10             15                 5
3          PCMM_1         0              0              0                 0
4                         0              0              0                 0
5                         0              0              0                 0
6                        40             45             50                 5
7                         0              0              0                 0
8                         0              0              0                 0
 Resource - Downstream Bandwidth
 ------------------------------
Thresholds applicable to interfaces with no interface level configurations in place
Bucket    Name          Minor          Major         Exclusive         Non-Excls
No                      Level          Level         Level             Level
1       DEF_MULTI         0              0             0                 0
2             UGS         0              0             0                 0
3          PCMM_1         0              0             0                 0
4                         0              0             0                 0
5                         0              0             0                 0
6                         0              0             0                 0
7                         0              0             0                 0
8                         0              0             0                 0
```

This table describes the significant fields for the show cable admission-control command for upstream and downstream throughput.

Table 42: show cable admission-control Field Descriptions

Field	Description
Bucket No	Specific bucket number.
Names	Bucket name.
Minor Level	Minor threshold as currently defined in a percentage on the Cisco CMTS.
# of Times	Number of times traffic has crossed this threshold since the counters on the Cisco CMTS were last cleared.
Major Level	Major threshold as currently defined in a percentage on the Cisco CMTS.
Excls Level	Percentage of exclusive throughput that is reserved for the corresponding traffic type on the Cisco CMTS. Applies to downstream or upstream traffic.

Field	Description
Non-Ex Level	Percentage of non-exclusive throughput configured on the Cisco CMTS. Commonly used with Best Effort (lowest priority) traffic.
Curr Resv	Percentage of throughput reserved exclusively for the corresponding flow type.
Conf Level	Configuration level that indicates the scope of configuration is actually applied for that US/ DS (whether the global, interface, or the upstream level is applied). The values in this field can be as follows: • U—Upstream • I—Interface • G—Global
# of Rejec	Number of rejections.
Sched Type	Available for upstream only. This field displays the following information: • UGS—UGS thresholds configured and traffic rates. • RTPS—RTPS thresholds configured and traffic rates. • BE—Best Effort thresholds configured and traffic rates.
Flow Type	Available for Downstream only. This field displays voice and data information: • voice—Voice thresholds configured and traffic rates. • data—Data thresholds configured and traffic rates.
Class Name	Available for upstream only.
CM-Registration event	Counter increments once for every cable modem that crosses a threshold during its registration. For example, if the minor, major, and critical thresholds on the Cisco CMTS are 60%, 70%, and 80% respectively, and a cable modem tries to register when the current value is 80%, then the cable modem is allowed to register, but the counters for minor, major and critical thresholds are each incremented by one.
Voice-Call event	Counter increments if the resource check fails when a voice-call is made. For example, assume both the MTAs are on the same Cisco CMTS, and minor, major, and critical thresholds for I/O memory are 50%, 60%, and 70%, respectively. Then assume the current I/O memory value is 75%. In this scenario, before the gate creation, AC performs an I/O memory check. This results in the counters for minor, major, and critical thresholds each being incremented by one, and the voice call fails. No packetcable gates are created because the voice calls fail.

The following example displays the upstream and downstream AC information for the wideband-cable interface:

```
Router# show cable admission-control interface wideband-Cable 8/0/0:0

Interface Wideband-Cable8/0/0:0

Resource - Downstream Bandwidth
-------------------------------
Max Reserved BW = 18000000 bps
Total Current Reservation = 1000000 bps
```

```
Guaranteed Bonus BW = 0 bps
Non-guaranteed Bonus BW = 0 bps
```

The following example displays the reserved and reservable bandwidth for a particular interface:

```
Router#show cable admission-control interface wideband-Cable 2/0/0:1

Interface Wi2/0/0:1
BGID: 8194

Resource - Downstream Bandwidth
-------------------------------
App-type    Name       Reservation/bps    Maximum        Rejected
1                      4000               90%            0
2                      0                  N/A            0
3                      0                  90%            0
4                      0                  N/A            0
5                      0                  N/A            0
6                      0                  90%            0
7                      0                  N/A            0
8                      0                  87%            0
Max Reserved BW = 11424000 bps
Total Current Reservation = 4000 bps
Guaranteed Bonus BW = 884352000 bps
Non-guaranteed Bonus BW = 225904000 bps
Capacity BW = 1428000000 bps
Subset BGs: In2/0/0:0 In2/0/0:1 In2/0/0:2 In2/0/0:3 In2/0/0:4 In2/0/0:5 In2/0/0:6 In2/0/0:7
 In2/0/0:158 Wi2/0/0:0
Superset BGs: N/A
```



Note Effective with Cisco IOS-XE Release 3.18.0SP, if an OFDM channel has both Control Profile (profile A) and Data Profiles (profile B, C, and so on) configured, the lowest Data Profile rate is used for admission control calculation. Otherwise, the Control Profile rate is used.

Related Commands

Command	Description
cable admission-control	Configures the CPU and memory thresholds for the Cisco CMTS and supporting broadband processing engines.
cable admission-control event	Configures and enables AC event types.
cable admission-control ds-bandwidth	Configures AC downstream bandwidth thresholds.
cable admission-control max-reserved-bandwidth	Defines the maximum reserved bandwidth per bonding group for all service flows that are allowed by the Cisco CMTS.
cable admission-control us-bandwidth	Configures AC upstream bandwidth thresholds.
clear cable admission control counters	Clears all AC resource counters.
debug cable admission-control	Enables automatic AC troubleshooting processes.

show cable admission-control fiber-node

To display Service Group Admission Control (SGAC) configuration information for a fiber-node, use **show cable admission-control fiber-node** command in privileged EXEC mode.

show cable admission-control fiber-node *node-id*

Syntax Description

node-id	The cable fiber-node id. Valid range is from 1 to 512.

Command Default

None.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
IOS-XE 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable admission-control fiber-node** command to verify admission-control configuration.

Examples

The following example displays SGAC configuration information for an fiber-node:

```
Router# show cable admission-control fiber-node 2
Constraint      Name       Limit
1                          15%

Router#
```

Related Commands

Command	Description
show cable admission-control interface	Displays current reservation and other AC related information for a specific interface.

show cable arp-filter

To display the total number of Address Resolution Protocol (ARP) replies and requests that have been sent and received, including the number of requests that have been filtered, use the **show cable arp-filter** command in privileged EXEC mode.

Cisco uBR7246VXR Router

show cable arp-filter cable *slot/port*[**ip-requests-filtered** *number*] [**requests-filtered** *number* | **replies-filtered** *number*]

Cisco uBR10012 Router

show cable arp-filter cable *slot/subslot/port* [**ip-requests-filtered** *number*] [**requests-filtered** *number* | **replies-filtered** *number*]

Cisco cBR-8 Router

show cable arp-filter {**cable** *slot/subslot/port* | **bundle** *number*} [**ip-requests-filtered** *number*] [**requests-filtered** *number* | **replies-filtered** *number*]

Syntax Description

cable *slot/port*	Displays information for all CMs on the specified cable interface and downstream port on the Cisco uBR7246VXR router. On the Cisco uBR7246VXR router, *slot* can range from 3 to 6, and *port* can be 0 or 1, depending on the cable interface.
cable *slot/subslot/port*	Displays information for all CMs on the specified cable interface on the router. The following are the valid values: • *slot* = 5 to 8 for uBR10012 router, 0 to 9 for cBR-8 router • *subslot* = 0 or 1 for uBR10012 router, 0 for cBR-8 router • *port* = 0 to 4 for uBR10012 router, 0 to 15 for cBR-8 router (depending on the cable interface)
bundle *number*	Bundle interface number. The value range for *number* is 1 to 255.
[**ip-requests-filtered** *number*]	(Optional) Displays the Service IDs (SIDs) that are generating or forwarding more filtered ARP requests for IP packets than the specified minimum *number* of packets. The valid range for *number* is 1 to 65535, with no default. **Note** This field shows the modems that are forwarding IP traffic that could be an part of an attack, such as TCP SYN floods, ping scans, and so forth.
[**requests-filtered** *number*]	(Optional) Displays the Service IDs (SIDs) that are generating or forwarding more filtered ARP requests than the specified minimum *number* of packets. The valid range for *number* is 1 to 65535, with no default.

[**replies-filtered** *number*]	(Optional) Displays the Service IDs (SIDs) that are generating or filtering more filtered ARP replies than the specified minimum *number* of packets. The valid range for *number* is 1 to 65535, with no default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers.
12.2(15)BC2b	The **ip-requests-filtered** option was added to display the specific Service IDs (SIDs) that are generating or forwarding a minimum number of ARP packets.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value ranges for the *slot/subslot/port* variables were changed.

Usage Guidelines

The **cable arp filter** command enables the filtering of ARP request and reply packets on a cable interface. ARP packets might need to be filtered when a user on the cable network generates a large volume of ARP traffic as part of a theft-of-service or denial-of-service attack, or when a virus is using ARP requests to find other computers that it might infect.

The **show cable arp-filter** command displays the total number of ARP reply packets that have been received and the number of ARP request packets that have been sent on the cable interface, as well as the number of such packets that have been filtered.

Tip To clear the counters on all interfaces, use the **clear counters** command. To clear the counters on a specific interface, use the **clear counters cable** *interface* command.

Examples

The following example shows the typical output from the **show cable arp-filter** command on a Cisco uBR10012 router. The displays for other Cisco CMTS platforms are similar.

```
Router# show cable arp-filter Cable6/0/0

ARP Filter statistics for Cable6/0/0:
  Replies Rcvd: 177387 total, 1869 unfiltered, 8824 filtered
  Requests Sent For IP: 68625 total, 964 unfiltered, 36062 filtered
  Requests Forwarded: 7969175 total, 7213 unfiltered, 366167 filtered
Router#
```

Table 43: show cable arp-filter Field Descriptions in Cisco uBR10012 Router

Field	Description
Replies Rcvd	
Total	Total number of ARP reply packets received on the cable interface since power-on.

Field	Description
Unfiltered	Number of ARP reply packets that the cable interface received and accepted while filtering was enabled using the **cable arp filter reply-accept** command.
Filtered	Number of ARP reply packets that the cable interface dropped while filtering was enabled, because they would have otherwise exceeded the allowable threshold value that was configured for the interface using the **cable arp filter reply-accept** command.
Requests Sent For IP	Total number of ARP request packets that the cable interface was asked to forward since power-on.
Total	
Unfiltered	Number of ARP request packets that the cable interface sent while filtering was enabled using the **cable arp filter request-send** command.
Filtered	Number of ARP request packets that the cable interface dropped, because they would have otherwise exceeded the allowable threshold value that was configured for the interface using the **cable arp filter request-send** command.
Requests Forwarded	Total number of ARP request packets that the cable interface was asked to forward to the ARP proxy since power-on.
Total	
Unfiltered	Number of ARP request packets that the cable interface sent to the ARP proxy while filtering was enabled using the **cable arp filter request-send** command.
Filtered	Number of ARP request packets for the ARP proxy that the cable interface dropped, because they would have otherwise exceeded the allowable threshold value that was configured for the interface using the **cable arp filter request-send** command.
Note All counters are 16-bit counters, with a maximum value of 65,535 packets. If the number of packets exceeds this amount, the counter wraps back to zero and begins incrementing again.	



Note The Total counts in the **show cable arp-filter** command continue to increment, regardless of whether ARP filtering has been enabled. The Unfiltered and Filtered counts increment only when ARP filtering has been enabled using the **cable arp filter** command. When cable ARP filtering is disabled, these counters retain their current values until manually reset, using the **clear counters** command.

The following example shows how to display the devices that are generating or filtering more than 100 ARP requests per reporting period. Repeat the command to see how quickly the device is generating ARP packets.

```
Router# show cable arp-filter c6/0/0 requests-filtered 100

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
1    0006.2854.72d7 50.3.81.4       12407          0                    0
Router# show cable arp-filter c6/0/0 requests-filtered 100

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
1    0006.2854.72d7 50.3.81.4       14597          0                    0
Router#
```

The following example shows how to display the devices that are generating or filtering more than 200 ARP replies per reporting period. Repeat the command to see how quickly the device is generating ARP packets.

```
Router# show cable arp-filter c6/0/0 replies-filtered 200

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
2    0006.53b6.562f 50.3.81.6       0              0                    2358
Router# show cable arp-filter c6/0/0 replies-filtered 200

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
2    0006.53b6.562f 50.3.81.6       0              0                    4016
Router#
```

The following example shows how to display the devices that are generating or filtering more than 10 ARP requests for IP packets per reporting period. Repeat the command to see how quickly the device is generating ARP packets.

```
Router# show cable arp-filter c6/0/0 ip-requests-filtered 10

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
2    0006.2854.71e7 50.3.72.4       0              1926                 0
Router#
```

Table 44: show cable arp-filter Detail Field Descriptions in Cisco uBR10012 Router

Field	Description
SID	Service ID (SID) of the device.
MAC Address	Hardware (MAC-layer) address of the cable modem or CPE device.
IP Address	IP address of the cable modem or CPE device.
Req-Filtered	Total number of ARP requests that the device has generated or forwarded.
Req-For-IP-Filtered	Total number of ARP requests that the device has generated or forwarded for IP packets.
Rep-Filtered	Total number of ARP replies that the device has generated or forwarded.

Field	Description
Note The Req-Filter and Rep-Filtered counters are 16-bit counters, with a maximum value of 65,535 packets. If the number of packets exceeds this amount, the counter wraps back to zero and begins incrementing again.	

The following example shows the typical output from the **show cable arp-filter** command on a Cisco cBR-8 router.

```
Router# show cable arp-filter c9/0/0 requests-filtered 100

May  8 16:28:17.252 CST: %IP-4-ZERO_ADDR: Zero MAC address for 30.140.2.1 in ARP cache
Interface Cable9/0/0
SID  CPE Mac        CPE IP          Modem Mac      Modem IP        M/S Rate Pro REQ
6    0000.af0e.26e4 30.141.0.2      c8fb.26a5.5954 30.140.1.3      MAC -    RP  10849
6    0000.af0e.26e4 30.141.0.2      c8fb.26a5.5954 30.140.1.3      MAC -    PXF 59705
```

The following example shows how to display the devices that are generating or filtering more than 200 ARP replies per reporting period. Repeat the command to see how quickly the device is generating ARP packets.

```
Router# show cable arp-filter c9/0/0 requests-filtered 200

Interface Cable9/0/0
SID  CPE Mac        CPE IP          Modem Mac      Modem IP        M/S Rate Pro REQ
6    0000.af0e.26e4 30.141.0.2      c8fb.26a5.5954 30.140.1.3      MAC -    RP  10849
6    0000.af0e.26e4 30.141.0.2      c8fb.26a5.5954 30.140.1.3      MAC 934  PXF 352036
```

The following example shows how to display the devices that are generating or filtering more than 10 ARP requests for IP packets per reporting period. Repeat the command to see how quickly the device is generating ARP packets.

```
Router# show cable arp-filter c9/0/0 ip-requests-filtered 100

Interface Cable9/0/0
SID  CPE Mac        CPE IP          Modem Mac      Modem IP        M/S Rate Pro  IP
1    0000.af0e.26e4 30.141.0.2      c8fb.26a5.5954 30.140.1.3      MAC -    RP  1203
```

Table 45: show cable arp-filter Field Descriptions in Cisco cBR-8 Router

Field	Description
SID	Service ID (SID) of the device.
CPE MAC	Hardware (MAC-layer) address of the cable CPE device.
CPE IP	IP address of the CPE device.
Modem MAC	Hardware (MAC-layer) address of the cable modem.

Field	Description
Modem IP	IP address of the Cable Modem
M/S	Type of filtering, M means per MAC filtering, S means per Sid filtering.
Rate	The rate of filtered packets, olny hardware assist filtering has the value.
Pro	Where is the filtering performed, with options RP and PXF(FP).
[REQ|REP|REQIP]	REQ means arp request packets, REP means arp reply, REQIP means arp request for IP.

Clearing the ARP Packet Counters

The following example shows the cable ARP counters being cleared by the **clear counters cable** *interface* command. This can be useful because the ARP counters are 16-bit counters that can wrap around to zero relatively quickly when large amounts of ARP traffic is being generated. Also, the ARP packet counters could include SIDs that had forwarded large amounts of ARP traffic in the past, but that are not currently forwarding such traffic. Clearing the counters allows you to clearly see the SIDS that are currently forwarding the ARP traffic that is triggering the ARP filters.

For uBR series router:

```
Router# show cable arp cable 6/0/0

ARP Filter statistics for Cable6/0/0:
  Replies Rcvd: 3278 total. 84 unfiltered, 3194 filtered
  Requests Sent For IP: 941 total. 30 unfiltered, 911 filtered
  Requests Forwarded: 941 total. 37 unfiltered, 904 filtered
Router# show cable arp-filter cable 6/0/0 requests-filtered 10

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
1    0006.2854.72d7 10.3.81.4       8              0                    0
23   0007.0e02.b747 10.3.81.31      32             0                    0
57   0007.0e03.2c51 10.3.81.31      12407          0                    0
...
81   00C0.c726.6b14 10.3.81.31      23             0                    0
Router# clear counter cable 6/0/0

Clear "show interface" counters on this interface [confirm] y

08:17:53.968: %CLEAR-5-COUNTERS: Clear counter on interface Cable6/0/0 by console
Router# show cable arp cable 6/0/0

ARP Filter statistics for Cable6/0/0:
  Replies Rcvd: 0 total. 0 unfiltered, 0 filtered
  Requests Sent For IP: 0 total. 0 unfiltered, 0 filtered
  Requests Forwarded: 0 total. 0 unfiltered, 0 filtered
Router# show cable arp-filter cable 6/0/0 requests-filtered 10

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
Router# show cable arp-filter cable 6/0/0 requests-filtered 10

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
57   0007.0e03.2c51 10.3.81.31      20             0                    0
81   00C0.c726.6b14 10.3.81.31      12             0                    0
```

```
Router# show cable arp-filter cable 6/0/0 requests-filtered 10

Sid  MAC Address    IP Address      Req-Filtered   Req-For-IP-Filtered  Rep-Filtered
57   0007.0e03.2c51 10.3.81.31      31             0                    0
81   00C0.c726.6b14 10.3.81.31      18             0                    0
Router#
```

For cBR series router:

```
Router# show cable arp-filter c9/0/0

ARP Filter statistics for Cable9/0/0:
  Replies Rcvd: 3868865 total. 0 unfiltered, 0 filtered
  Requests Forwarded: 82364 total. 2707 unfiltered, 70878 filtered
  Requests Sent For IP: 0 total. 0 unfiltered, 0 filtered

Router# show cable arp-filter c9/0/0 requests-filtered 1

Interface Cable9/0/0
SID  CPE Mac        CPE IP          Modem Mac      Modem IP        M/S Rate Pro REQ
6    0000.af0e.26e4 30.141.0.2      c8fb.26a5.5954 30.140.1.3      MAC -    RP  7480
6    0000.af0e.26e4 30.141.0.2      c8fb.26a5.5954 30.140.1.3      MAC -    PXF 6987

Router# clear counter cable 9/0/0

Clear "show interface" counters on this interface [confirm]

Router# show cable arp-filter c9/0/0 requests-filtered 1

May  8 17:53:14.557 CST: %CLEAR-5-COUNTERS: Clear counter on interface Cable9/0/0 by console

Router# show cable arp-filter c9/0/0

ARP Filter statistics for Cable9/0/0:
  Replies Rcvd: 6288 total. 0 unfiltered, 0 filtered
  Requests Forwarded: 0 total. 0 unfiltered, 0 filtered
  Requests Sent For IP: 0 total. 0 unfiltered, 0 filtered

Router# show cable arp-filter c9/0/0 requests-filtered 1

Interface Cable9/0/0 - none

Router# show cable arp-filter c9/0/0 requests-filtered 1

Interface Cable9/0/0 - none
```

Note The **clear counters** command clears all of the packet counters on an interface, not just the ARP packet counters.

Related Commands

Command	Description
cable arp	Activates cable Address Resolution Protocol (ARP).
cable arp filter	Controls the number of ARP packets that are allowable for each Service ID (SID) on a cable interface.
cable proxy-arp	Activates cable proxy ARP on the cable interface.

Command	Description
clear arp	Clears the ARP table on the router.
clear counters	Clears the packet counters on all interfaces or on a specific interface.
debug cable arp filter	Displays debugging messages about the filtering of ARP broadcasts.

show cable asf-qos-profile

To display Cable AQP Table, use the **show cable asf-qos-profile [name** *name* **| summary | verbose]**command in privileged EXEC mode.

show cable asf-qos-profile [name *name* **| summary | verbose]**

Syntax Description

name	AQP Table Entry by Name
summary	AQP Table Summary
verbose	AQP Table Verbose Summary

Command Default

None.

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows the output for `cable asf-qos-profile summary` and `cable asf-qos-profile summary gamingService`:

```
Router# cable asf-qos-profile summary
Load for five secs: 4%/0%; one minute: 3%; five minutes: 3%
Time source is NTP, 08:49:16.556 EDT Tue Jan 10 2023

AQP Name         Dir   LLASF  Classic SF SCN   LL SF SCN
ultraUS          US    true   MazBoostUS       LL_US
ultraDS          DS    true   MazBoostDS       LL_DS
gamingService    DS    true   gamerBoost       gamerLL


Router# cable asf-qos-profile gamingService
Load for five secs: 3%/0%; one minute: 3%; five minutes: 3%
Time source is NTP, 09:01:17.556 EDT Tue Jan 10 2023

Name                                    gamingService
Direction:                              Downstream
Traffic Priority:                       0
Minimum Sustained Rate:                 0 bits/sec
Max Burst:                              3044 bytes
Minimum Reserved Rate:                  0 bits/sec
Minimum Packet Size:                    0 bytes
Peak Rate:                              0 bits/sec
Low Latency ASF:                        true
Classic SF SCN:                         gamerboost
Low Latency SF SCN:                     gamerLL
AQM Coupling Factor:                    20
Scheduling Weight:                      230
Queue Protection (QP) Enable:           true
```

```
QP Latency Threshold:                    0
QP Score Threshold:                      2000
QO Drain Rate Exponent>                  19
```

Related Commands

Command	Description
cable asf-qos-profile	Configure an ASF Qos profile.

show cable bgsync

To display the statistics when SNMP background synchronization occurs on the Cisco CMTS, use the **show cable bgsync** command in privileged EXEC mode.

show cable bgsync

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **show cable snmp cache-status** command on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable bgsync** command to view the SNMP synchronization information.

Examples

The following is sample output of the **show cable bgsync** command on the Cisco cBR-8 router:

```
Router# show cable bgsync
Background Sync is active, uptime is 3 hours, 28 minutes, 34 seconds.
Background Sync last active time is 3 hours, 28 minutes, 34 seconds ago.
I-packet interval time is 1 day; P-packet interval time is 5 senconds.
Line Card with bg-sync: 9/0
Line Card working on I syncing:
Last clear cable bg sync counters Time:
Total bytes: 14197303
Total background sync packets: 565057
  Ack packets: 0
  Run Ctrl Msg packets: 1
  Data packets: 0
Interval packets: 562554
  I Type packets: 201
  P Type packets: 562353
Bg sync data IPC lost packets: 0

Background Sync statistics for the last 03:30:43
============================================================
 ipc packets 0-30k:      2502
 ipc packets 30-60k:     0
 ipc packets 60-100k:    0
 msg per packet average: 225
 msg per packet max:     256
 msg per packet min:     179
 msg per packet under 3: 0
============================================================
```

```
type       packets        cpu-total(ms)    avg(us)   max(us)
serv flow  527068         151              0         1000
sflog      0              0                0         0
cm         59             0                0         0
cmtx       10961          17               1         1000
paramset   68             1                14        1000
DXIF       9912           19               1         1000
sid        4603           2                0         1000
uschan     9883           5                0         1000
---------------------------------------------------------------
IPC PKTs   2502           365              0      ms 1      ms
================================================================================
=====
slot type       packets        bytes            pps        Bps        wrong_len_
pkts
0    serv flow  0              0                0.0        0.0        0

0    sflog      0              0                0.0        0.0        0

0    cm         0              0                0.0        0.0        0

0    cmtx       0              0                0.0        0.0        0

0    paramset   0              0                0.0        0.0        0

0    DXIF       0              0                0.0        0.0        0

0    sid        0              0                0.0        0.0        0

0    uschan     0              0                0.0        0.0        0

1    serv flow  0              0                0.0        0.0        0

1    sflog      0              0                0.0        0.0        0

1    cm         0              0                0.0        0.0        0

1    cmtx       0              0                0.0        0.0        0

1    paramset   0              0                0.0        0.0        0

1    DXIF       0              0                0.0        0.0        0

1    sid        0              0                0.0        0.0        0

1    uschan     0              0                0.0        0.0        0

2    serv flow  0              0                0.0        0.0        0

2    sflog      0              0                0.0        0.0        0

2    cm         0              0                0.0        0.0        0

2    cmtx       0              0                0.0        0.0        0

2    paramset   0              0                0.0        0.0        0

2    DXIF       0              0                0.0        0.0        0

2    sid        0              0                0.0        0.0        0

2    uschan     0              0                0.0        0.0        0

3    serv flow  0              0                0.0        0.0        0
```

```
3    sflog      0              0              0.0        0.0        0
3    cm         0              0              0.0        0.0        0
3    cmtx       0              0              0.0        0.0        0
3    paramset   0              0              0.0        0.0        0
3    DXIF       0              0              0.0        0.0        0
3    sid        0              0              0.0        0.0        0
3    uschan     0              0              0.0        0.0        0
6    serv flow  0              0              0.0        0.0        0
6    sflog      0              0              0.0        0.0        0
6    cm         0              0              0.0        0.0        0
6    cmtx       0              0              0.0        0.0        0
6    paramset   0              0              0.0        0.0        0
6    DXIF       0              0              0.0        0.0        0
6    sid        0              0              0.0        0.0        0
6    uschan     0              0              0.0        0.0        0
7    serv flow  0              0              0.0        0.0        0
7    sflog      0              0              0.0        0.0        0
7    cm         0              0              0.0        0.0        0
7    cmtx       0              0              0.0        0.0        0
7    paramset   0              0              0.0        0.0        0
7    DXIF       0              0              0.0        0.0        0
7    sid        0              0              0.0        0.0        0
7    uschan     0              0              0.0        0.0        0
8    serv flow  0              0              0.0        0.0        0
8    sflog      0              0              0.0        0.0        0
8    cm         0              0              0.0        0.0        0
8    cmtx       0              0              0.0        0.0        0
8    paramset   0              0              0.0        0.0        0
8    DXIF       0              0              0.0        0.0        0
8    sid        0              0              0.0        0.0        0
8    uschan     0              0              0.0        0.0        0
9    serv flow  527068         12729948       50.3       1210.8     0
```

```
9    sflog      0             0              0.0        0.0        0

9    cm         59            2067           0.0        0.0        0

9    cmtx       10961         319725         0.6        20.1       0

9    paramset   68            9827           0.0        0.0        0

9    DXIF       9912          697642         0.3        32.7       0

9    sid        4603          110974         0.0        6.3        0

9    uschan     9883          277056         0.7        20.6       0

================================================================================
=====
total stats:packets 562554 bytes 14147239 pps 52.4 Bps 1290.9 wrong_len_pkts 0
Router#
```

Related Commands

Command	Description
cable bgsync	Sets the data intervals for background synchronization on the Cisco CMTS.
cable bgsync active	Activates background synchronization process on the Cisco CMTS.
clear cable bgsync counters	Clears the background synchronization counters on the Cisco CMTS.

show cable bgsync sync-info cable

To display all the SNMP background synchronization data on supervisor side (when executed on supervisor IOSd) or line card side (when executed on line card IOSd), use the **show cable bgsync sync-info cable** *slot/subslot/port* command in privileged EXEC mode.

show cable bgsync sync-info cable *slot/subslot/port*

Syntax Description

cable *slot/subslot/port*	Specifies the cable interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable bgsync sync-info cable** *slot/subslot/port* command to view all the SNMP background synchronization data on supervisor or line card side.

Examples

The following is sample output of the**show cable bgsync sync-info cable** *slot/subslot/port* command on the Cisco cBR-8 router:

```
Router# show cable bgsync sync-info cable 9/0/1
 part1 for srv template:
srv_tmp_id  min_rate    max_rate    max_burst
0           0           0           0
1           0           64000       0
2           0           1000000     0
3           0           1000000     3044
4           0           0           3044
5           0           110000000   30000
6           0           0           3044
7           0           2000000000  5000000
8           0           0           3044
 part2 for srv flow:
sfid      prov_qos    adm_qos    act_qos    wb_mode    octets    pkts    delay_pkts
drop_pkts    gate_id    create_time    total_active_time
1         0           0          0          0          0         0          0          0
       0              0          0
2         0           0          0          0          0         0          0          0
       0              0          0
15        3           3          3          0          0         0          0          0
       0              3600       373
16        3           3          3          0          0         0          0          0
       0              3600       373
17        3           3          3          0          0         0          0          0
       0              3600       373
18        3           3          3          0          0         0          0          0
       0              3600       373
19        3           3          3          0          0         0          0          0
       0              3600       373
20        3           3          3          0          0         0          0          0
       0              3600       373
```

```
21       3          3          3          0          0          0          0          0
       0                3600          373
22       3          3          3          0          0          0          0          0
       0                3600          373
23       3          3          3          0          0          0          0          0
       0                3600          373
24       3          3          3          0          0          0          0          0
       0                3600          373
25       3          3          3          0          0          0          0          0
       0                3600          373
26       3          3          3          0          0          0          0          0
       0                3600          373
27       4          5          5          0          16455      69         0          0
       0                12700         282
28       6          7          7          3          0          0          0          0
       0                12700         282
29       4          5          5          3          5171       26         0          0
       0                11500         294
30       6          7          7          3          0          0          0          0
       0                11500         294
31       8          8          8          3          370        5          0          0
       0                11500         294
32       4          5          5          3          1277       11         0          0
       0                12100         288
33       6          7          7          0          0          0          0          0
       0                12100         288
34       4          5          5          0          5164       26         0          0
       0                12300         286
35       6          7          7          3          0          0          0          0
       0                12300         286
36       8          8          8          0          148        2          0          0
       0                12100         288
37       4          5          5          0          5579       27         0          0
       0                12700         287
38       6          7          7          3          0          0          0          0
       0                12700         287
39       8          8          8          3          370        5          0          0
       0                12300         291
40       4          5          5          3          5005       26         0          0
       0                13100         283
41       6          7          7          3          0          0          0          0
       0                13100         283
42       8          8          8          3          370        5          0          0
       0                12700         287
43       8          8          8          3          370        5          0          0
       0                12700         287
44       4          5          5          3          5032       27         0          0
       0                13100         283
45       6          7          7          3          0          0          0          0
       0                13100         283
46       8          8          8          3          444        6          0          0
       0                13100         283
47       8          8          8          3          444        6          0          0
       0                13100         283
48       4          5          5          3          211        5          0          0
       0                14500         269
49       6          7          7          3          0          0          0          0
       0                14500         269
50       8          8          8          3          296        4          0          0
       0                14500         269
 part3 for sid
 sid_entry[1] sid 1 service_class 2 create_time 127 total_octets 16455
 sid_entry[2] sid 2 service_class 2 create_time 115 total_octets 5579
 sid_entry[3] sid 3 service_class 2 create_time 121 total_octets 1277
```

```
 sid_entry[4] sid 4 service_class 2 create_time 123 total_octets 5571
 sid_entry[5] sid 5 service_class 2 create_time 127 total_octets 5579
 sid_entry[6] sid 6 service_class 2 create_time 131 total_octets 5005
 sid_entry[7] sid 7 service_class 2 create_time 131 total_octets 5032
 sid_entry[8] sid 8 service_class 2 create_time 145 total_octets 211
 part4 for cm and cmtx
 cm_mac: 68ee.9633.0699, tcsbmp: 0x1, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x4, rcs_id 0x1520005, tcs_id 0x1, last_reg_time 1444372688, RCP ID:00 10 00 00 10
 usch 1, modulation_type 2, rx_power 0, signal_noise 420, time_offset 2085
 cm_mac: e448.c70c.96e7, tcsbmp: 0x4, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x4, rcs_id 0x1520005, tcs_id 0x3, last_reg_time 1444372678, RCP ID:00 10 00 00 08
 usch 3, modulation_type 2, rx_power -15, signal_noise 390, time_offset 1785
 cm_mac: 0019.474a.c126, tcsbmp: 0x1, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x0, rcs_id 0x22, tcs_id 0x1, last_reg_time 1444372682, RCP ID:00 00 00 00 00
 usch 1, modulation_type 2, rx_power -15, signal_noise 381, time_offset 1792
 cm_mac: e448.c70c.982b, tcsbmp: 0x1, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x4, rcs_id 0x1520005, tcs_id 0x1, last_reg_time 1444372685, RCP ID:00 10 00 00 08
 usch 1, modulation_type 2, rx_power -10, signal_noise 390, time_offset 1786
 cm_mac: e448.c70c.96d5, tcsbmp: 0x2, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x4, rcs_id 0x1520005, tcs_id 0x2, last_reg_time 1444372688, RCP ID:00 10 00 00 08
 usch 2, modulation_type 2, rx_power -15, signal_noise 390, time_offset 1786
 cm_mac: e448.c70c.9819, tcsbmp: 0x1, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x4, rcs_id 0x1520005, tcs_id 0x1, last_reg_time 1444372692, RCP ID:00 10 00 00 08
 usch 1, modulation_type 2, rx_power -10, signal_noise 390, time_offset 1789
 cm_mac: e448.c70c.980d, tcsbmp: 0x4, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x4, rcs_id 0x1520005, tcs_id 0x3, last_reg_time 1444372695, RCP ID:00 10 00 00 08
 usch 3, modulation_type 2, rx_power -10, signal_noise 381, time_offset 1783
 cm_mac: e448.c70c.96f3, tcsbmp: 0x1, admin_status 1, md_sg_id 0x1510505, rcc_status_id
0x4, rcs_id 0x1520005, tcs_id 0x1, last_reg_time 1444372723, RCP ID:00 10 00 00 04
 usch 1, modulation_type 2, rx_power 0, signal_noise 390, time_offset 1798
 part5 for dxif info
 synced_dxif_cm_status_base[337][1]: cmstatusindex 2375681, cm_mac 68ee.9633.0699, cm_ip
0x5011961F, cm_ds_if 59881, cm_us_if 204952
 cmregmode 2, cmmodultype 2, cmdocmode 2
 synced_dxif_cm_status_base[337][2]: cmstatusindex 2375682, cm_mac e448.c70c.96e7, cm_ip
0x5011961D, cm_ds_if 59882, cm_us_if 204954
 cmregmode 2, cmmodultype 2, cmdocmode 2
 synced_dxif_cm_status_base[337][3]: cmstatusindex 2375683, cm_mac 0019.474a.c126, cm_ip
0x50119602, cm_ds_if 59914, cm_us_if 204952
 cmregmode 2, cmmodultype 2, cmdocmode 2
 synced_dxif_cm_status_base[337][4]: cmstatusindex 2375684, cm_mac e448.c70c.982b, cm_ip
0x50119612, cm_ds_if 59881, cm_us_if 204952
 cmregmode 2, cmmodultype 2, cmdocmode 2
 synced_dxif_cm_status_base[337][5]: cmstatusindex 2375685, cm_mac e448.c70c.96d5, cm_ip
0x5011960D, cm_ds_if 59881, cm_us_if 204953
 cmregmode 2, cmmodultype 2, cmdocmode 2
 synced_dxif_cm_status_base[337][6]: cmstatusindex 2375686, cm_mac e448.c70c.9819, cm_ip
0x5011961E, cm_ds_if 59881, cm_us_if 204952
 cmregmode 2, cmmodultype 2, cmdocmode 2
 synced_dxif_cm_status_base[337][7]: cmstatusindex 2375687, cm_mac e448.c70c.980d, cm_ip
0x5011961A, cm_ds_if 59882, cm_us_if 204954
 cmregmode 2, cmmodultype 2, cmdocmode 2
 synced_dxif_cm_status_base[337][8]: cmstatusindex 2375688, cm_mac e448.c70c.96f3, cm_ip
0x5011960E, cm_ds_if 59882, cm_us_if 204952
 cmregmode 2, cmmodultype 2, cmdocmode 2
 part6 uschan for md_idx 337
usport 1 micro_reflections 0 us_snr 420 snmp_sigq_unerroreds 0 snmp_sigq_correcteds 0
snmp_sigq_uncorrectables 0
usport 2 micro_reflections 0 us_snr 390 snmp_sigq_unerroreds 0 snmp_sigq_correcteds 0
snmp_sigq_uncorrectables 0
usport 3 micro_reflections 0 us_snr 381 snmp_sigq_unerroreds 0 snmp_sigq_correcteds 0
snmp_sigq_uncorrectables 0
usport 4 micro_reflections 0 us_snr 0 snmp_sigq_unerroreds 0 snmp_sigq_correcteds 0
```

```
snmp_sigq_uncorrectables 0
Router#
```

Related Commands

Command	Description
cable bgsync	Sets the data intervals for background synchronization on the Cisco CMTS.
cable bgsync active	Activates background synchronization process on the Cisco CMTS.
clear cable bgsync counters	Clears the background synchronization counters on the Cisco CMTS.

show cable bundle

To display the forwarding table for the specified interface, use the **show cable bundle** in user EXEC or privileged EXEC mode.

show cable bundle *n* [**forwarding-table** | **mobility**]

Syntax Description

n	Specifies the bundle identifier. Valid range is from 1 to 255.
forwarding-table	Displays the forwarding table for the specified interface.
mobility	Displays the mobility subnet in the bundle interface.

Command Modes

User EXEC or Privileged EXEC

Command History

Release	Modification
12.0(7)XR2	This command was introduced.
12.0(8) SC	This command was supported.
12.1(2) EC1	This command was supported.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
12.1(13)EC, 12.2(11)BC1	The Flags, Location, link, and sublink fields were added to the display to aid in debugging.
12.3(21)BC	All cable bundles are now automatically converted and configured to be in a virtual bundle, and standalone cable interfaces must be manually configured to be in a virtual bundle to operate properly. Previously, new virtual interface bundles and bundle members required reconfiguration, and there could also be standalone interfaces not part of a bundle at all.
12.2(33)SCH2	This command was modified. The **mobility** parameter was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

- For uBR series router, beginning with Cisco IOS Release 12.3(21)BC, all cable bundles are automatically converted and configured to be in a virtual bundle after loading the software image.
- For uBR series router, in releases prior to Cisco IOS Release 12.3(21)BC, if you delete the virtual bundle interface, the virtual bundle disappears.
- For uBR series router, beginning with Cisco IOS Release 12.3(21)BC, standalone cable interfaces must be manually configured to be in a virtual bundle to operate properly.
- The virtual bundle interface accumulates the counters from members; counters on member links are not cleared when they are added to the bundle. If a bundle-only counter is desired, clear the bundle counter on the members before adding them to the bundle, or before loading the image (for Cisco IOS Release 12.3(21)BC and later).

Refer to the following document on Cisco.com for additional information about cable interface bundling and virtual interface bundling on the Cisco CMTS:

- Cable Interface Bundling and Virtual Interface Bundling on the Cisco CMTS

Examples

The following is a typical example of the **show cable bundle** command:

```
Router# show cable bundle 1 forwarding-table
MAC address       Interface    Flags Location   link     sublink
00c0.5e01.0203    Cable8/0/0     3   64E5BF60   0        64E5BE00
00c0.5e01.0203    Cable7/0/0     3   64E5BE00   0        0
00c0.5e01.0101    Cable8/0/0     3   64E5BEE0   0        64E5BE40
00c0.5e01.0101    Cable7/0/0     3   64E5BE40   0        0
00c0.a375.cc1c    Cable8/0/0     1   64E5BEC0   0        0
00c0.0e01.a835    Cable8/0/0     1   64E5BEA0   0        0
00c0.0e01.a799    Cable8/0/0     1   64E5BDE0   0        0
00c0.0e01.a405    Cable8/0/0     1   64E5BF00   0        0
00c0.0e01.a5d1    Cable7/0/0     1   64E5BE20   0        0
00c0.0e01.a5d9    Cable8/0/0     1   64E5BE60   0        0
00c0.0e01.a5e1    Cable7/0/0     1   64E5BF40   0        0
00c0.0e01.a5f1    Cable7/0/0     1   64E5BE80   0        0
00c0.0eb4.0a41    Cable5/0/0     1   63704D1C   0        0
00c0.f03b.ed59    Cable6/1/0     1   6370427C   0        0
00c0.f03b.ed97    Cable6/1/0     1   63703F3C   0        0
00c0.0eb4.1373    Cable5/0/0     1   6370479C   0        0
00c0.f03b.edd3    Cable6/1/0     1   637042BC   0        0
00c0.7371.6df6    Cable5/0/0     1   63703DFC   0        0
```

The table describes the fields shown in the **show cable bundle** command display.

Table 46: show cable bundle Command Field Descriptions

Field	Description
MAC address	Identifies the MAC (hardware) address for each interface in the bundle.
Interface	Identifies the cable interface slot and port number.
Flag	The current value of the flag byte for this bundle entry. The following bits can be set: • Bit 0 (0x01) = Bundle is active. • Bit 1 (0x02) = Bundle is a static multicast group. **Note** If more than one bit is set, add the values together. For example, 3 indicates an active, static multicast group.
Location	The location in the router's memory for the flags byte for this bundle entry. This value is useful only to TAC engineers during debugging.
link	The value of the link pointer for this bundle entry. This value is useful only to TAC engineers during debugging.
sublink	The value of the sublink pointer for this bundle entry. This value is useful only to TAC engineers during debugging.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

The following example shows typical output for the **show cable bundle fowarding-table** command, supporting virtual interface bundling on the Cisco CMTS in later 12.3 BC Cisco IOS releases:

```
Router# show cable bundle 1 forwarding-tableMAC address       Interface    Flags
Location   link     sublink
00c0.5e01.0203    Cable8/0/0     3   64E5BF60   0        64E5BE00
00c0.5e01.0203    Cable7/0/0     3   64E5BE00   0        0
00c0.5e01.0101    Cable8/0/0     3   64E5BEE0   0        64E5BE40
00c0.5e01.0101    Cable7/0/0     3   64E5BE40   0        0
00c0.a375.cc1c    Cable8/0/0     1   64E5BEC0   0        0
00c0.0e01.a835    Cable8/0/0     1   64E5BEA0   0        0
00c0.0e01.a799    Cable8/0/0     1   64E5BDE0   0        0
00c0.0e01.a405    Cable8/0/0     1   64E5BF00   0        0
00c0.0e01.a5d1    Cable7/0/0     1   64E5BE20   0        0
00c0.0e01.a5d9    Cable8/0/0     1   64E5BE60   0        0
00c0.0e01.a5e1    Cable7/0/0     1   64E5BF40   0        0
00c0.0e01.a5f1    Cable7/0/0     1   64E5BE80   0        0
00c0.0eb4.0a41    Cable5/0/0     1   63704D1C   0        0
00c0.f03b.ed59    Cable6/1/0     1   6370427C   0        0
00c0.f03b.ed97    Cable6/1/0     1   63703F3C   0        0
00c0.0eb4.1373    Cable5/0/0     1   6370479C   0        0
00c0.f03b.edd3    Cable6/1/0     1   637042BC   0        0
00c0.7371.6df6    Cable5/0/0     1   63703DFC   0        0
Total = 18, sublink total = 2
Free = 1016, low_mark = 1016
```

The following example shows typical output for the **show cable bundle mobility** command:

```
Router# show cable bundle 1 mobility

Interface                      IP/IPv6 Subnet
-------------------------------------------------------------------------------
Bundle1                    ---
Bundle1.1                192.0.3.0/16
                                 192.0.3.1/16
                                 192.0.4.1/16
                                 2001:DB:5:4:100::1/32
                                 2001:DB:5:4:101::1/32
Bundle1.2              192.0.3.1/16
```

Related Commands

Command	Description
cable bundle	Creates an interface bundle.
show ip interface brief	Displays a brief summary of an interface's IP information and status, to include virtual interface bundle information.
show pxf cable (for uBR series router)	Displays multicast echo, packet intercept, or source-verify features for one or all cable interfaces, to include information for virtual interface bundles.

show cable bundle multicast

To display Multicast information for the specified virtual interface bundle, based on IGMPv3, use the **show cable bundle multicast** command in privileged EXEC mode:

show cable bundle *bundle#***multicast** *group*
show cable bundle *bundle#***multicast** [*MAC addr IP addr*]

Syntax Description

bundle#	The alphanumeric identifier for the virtual interface bundle.
group	Multicast group membership identifier.
MAC addr	Optional parameter specifies the MAC address for which to return information.
IP addr	Optional parameter specifies the IP address for which to return information.

Command Modes

User EXEC or Privileged EXEC

Command History

Release	Modification
12.3(21)BC	This command was introduced to support virtual interface bundling on the Cisco CMTS. All cable bundles are now automatically converted and configured to be in a virtual bundle, and standalone cable interfaces must be manually configured to be in a virtual bundle to operate properly. Previously, new virtual interface bundles and bundle members required reconfiguration, and there could also be standalone interfaces not part of a bundle at all.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

- For uBR series router, beginning with Cisco IOS Release 12.3(21)BC, all cable bundles are automatically converted and configured to be in a virtual bundle after loading the software image.
- For uBR series router, in releases prior to Cisco IOS Release 12.3(21)BC, if you delete the virtual bundle interface, the virtual bundle disappears.
- For uBR series router, beginning with Cisco IOS Release 12.3(21)BC, standalone cable interfaces must be manually configured to be in a virtual bundle to operate properly.
- The virtual bundle interface accumulates the counters from members; counters on member links are not cleared when they are added to the bundle. If a bundle-only counter is desired, clear the bundle counter on the members before adding them to the bundle, or before loading the image (for Cisco IOS Release 12.3(21)BC and later).

Refer to the following document on Cisco.com for additional information about cable interface bundling and virtual interface bundling on the Cisco CMTS:

- *Cable Interface Bundling and Virtual Interface Bundling on the Cisco CMTS*

Examples

The following example illustrates this new command. This command translates the bundle's multicast MAC address to Multicast IP address information, including the associated multicast source.

```
Router# show cable bundle bundle1.1 multicast
CableBundle  Interface   Source IP        Multicast IP     MAC Address
1            Bundle1.1   *                230.1.1.1        0100.5e00.0001
```

The following example illustrates multicast information for the specified virtual bundle:

```
Router# sh cable bundle 1 multicast
CableBundle  Interface   Source IP        Multicast IP     MAC Address
1            Bundle1     *                239.0.0.100      0100.5e00.0001
```

To translate a MAC address back to Multicast IP address, use the following optional syntax:

show cable bundle *bundle#* **multicast** [*<MAC addr | IP addr >*]

The following example illustrates this enhanced **show** command:

```
Router# show cable bundle bundleID multicast 0100.5e00.0001
MAC address       Interface    Flags Location   link     sublink
0100.5e00.0001    Bundle1        1   646FE4D8   0        646FE4EC
0100.5e00.0001    Cable6/0/0     1   646FE4EC   0        0
^^^^^^^^^^^^^^
```

Related Commands

Command	Description
cable bundle	Creates an interface bundle.
show ip interface brief	Displays a brief summary of an interface's IP information and status, to include virtual interface bundle information.
show pxf cable (for uBR series router)	Displays multicast echo, packet intercept, or source-verify features for one or all cable interfaces, to include information for virtual interface bundles.

show cable burst-profile

To display the upstream data burst profiles used to configure the upstream PHY, use the **show cable burst-profile** command in privileged EXEC mode.

show cable burst-profile

Note This command has been deprecated and removed in the current versions of the Cisco IOS software for all Cisco CMTS routers.

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3 NA	This command was introduced.
11.3(5)NA, 12.0(5)T1, 12.0(6)SC, 12.1(2)EC1	This command was removed and replaced with the **show cable modulation-profile** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displayed configuration of the cable burst profiles, which were what DOCSIS initially used to control the data, ranging, and station maintenance bursts. The Cisco CMTS routers now support a more comprehensive set of modulation profiles, which are displayed by the **show cable modulation-profile** command.

Note The **show cable burst-profile** command displayed fields and values that were supported only in the initial versions of the DOCSIS specification. The current DOCSIS 1.0 and 1.1 specifications use different parameters and values, as shown by the **show cable modulation-profile** command.

Examples

The following example shows typical output from the **show cable burst-profile** command:

```
Router# show cable burst-profile

Burst   Type Preamb Diff   FEC err FEC      Scrambl Max   Guard Last     Scrambl profile
number                              length           size  size  shortened
1       1    48     no     0x0     0x6      0x152   1     16    1         yes
2       1    48     no     0x0     0x6      0x152   1     12    1         no
3       1    48     no     0x5     0x2C     0x152   0     48    1         yes
4       1    48     no     0x5     0x2C     0x152   0     48    1         yes
5       1    48     no     0x5     0x32     0x152   0     20    1         yes
```

```
6       1     48      no      0x0      0x32      0x152    0      20     1          no
Router#
```

Table 47: show cable burst-profile Field Descriptions

Field	Description
Burst profile number	The number of the burst profile.
Type	Type of burst profile.
Preamb length	Length of the preamble.
Diff encode	Shows if there is a diff encode.
FEC err correct	Shows the forward error correction.
FEC codeword length	Shows the length of the forward error correction codeword.
Scrambl seed	Shows the seed of the scrambler.
Max size	Designates the maximum burst size.
Guard size	Indicates the guard time size.
Last codeword shortened	Shows the last codeword shortened.
Scrambl	Indicates whether scramble is enabled (yes) or not (no).

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable upstream modulation-profile	Configures a spectrum group to use a specified frequency.
show cable hop	Displays CM configuration settings.
show cable modulation-profile	Displays the currently defined modulation profiles.
show interface cable sid	Displays cable interface information.

show cable calls

To display voice call history information and status for PacketCable Emergency 911 Services Listing and History, use the **show cable calls** command in privileged EXEC mode. This command displays voice call history information that is enabled with the **cable high-priority-call-window** command in global configuration mode.

show cable calls [*slot slot/subslot*]

Syntax Description

interface	Selects the interface for which to enable PacketCable E911 call history.
slot	Designates the slot or slot and port for a particular cable interface on the Cisco router. The following are the valid values for the Cisco uBR7246VXR router: • *slot* can range from 3 to 6
slot/subslot	Designates the slot or slot and port for a particular cable interface on the Cisco router. The following are the valid values for the Cisco uBR10012 router: • *slot* = 5 to 8 • *subslot* = 0 or 1 The following are the valid values for the Cisco cBR-8 router: • *slot* = 0 to 9 • *subslot* = 0

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(13a)BC	This command was introduced supporting PacketCable Emergency 911 Services Listing and History on the Cisco CMTS: • Cisco uBR7246VXR router • Cisco uBR10012 router
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value ranges for *slot/subslot* variables were changed.

Usage Guidelines

This command supports the PacketCable Emergency 911 Services Listing and History feature on the Cisco CMTS. Cisco IOS release 12.3(13a)BC introduces enhanced informational support for PacketCable Emergency 911 calls on the Cisco CMTS, to include the following information and related history:

- active Emergency 911 calls
- recent Emergency 911 calls
- regular voice calls
- voice calls made after recent Emergency 911 calls

To set the call window (in minutes) during which the Cisco CMTS maintains records of Emergency 911 calls, use the **cable high-priority-call-window** command. For more information on the **cable high-priority-call-window** command, see Cisco IOS CMTS Cable Command reference.

Additional information for voice call support with PacketCable and PacketCable MultiMedia (PCMM) is available in the following document on Cisco.com:

Cisco CMTS PacketCable and PacketCable Multimedia Features Configuration Guide, Release 12.2SC

Examples

The following example illustrates call status on the Cisco CMTS:

```
Router# show cable calls
Interface   ActiveHiPriCalls  ActiveAllCalls  PostHiPriCallCMs  RecentHiPriCMs
Cable3/0    0                 0               0                 1
Cable3/1    0                 0               0                 0
Cable4/0    0                 0               0                 1
Cable4/1    0                 0               0                 0
Total       0                 0               0                 2
Router #
```

The following command example illustrates that one Emergency 911 call was made on the Cable8/1/1 interface on the Cisco uBR10012 router during the window set for high priority calls:

```
Router# show cable calls
Interface   ActiveHiPriCalls  ActiveAllCalls  PostHiPriCallCMs  RecentHiPriCMs
Cable5/0/0  0                 0               0                 0
Cable5/0/1  0                 0               0                 0
Cable5/1/0  0                 0               0                 0
Cable5/1/1  0                 0               0                 0
Cable5/1/2  0                 0               0                 0
Cable5/1/3  0                 0               0                 0
Cable5/1/4  0                 0               0                 0
Cable6/0/0  0                 0               0                 0
Cable6/0/1  0                 0               0                 0
Cable7/0/0  0                 0               0                 0
Cable7/0/1  0                 0               0                 0
Cable8/1/0  0                 0               0                 0
Cable8/1/1  1                 1               0                 0
Cable8/1/2  0                 0               0                 0
Cable8/1/3  0                 0               0                 0
Cable8/1/4  0                 0               0                 0
Total       1                 1               0                 0
```

Related Commands

Command	Description
cable high-priority-call-window	Sets the call window (in minutes) during which the Cisco CMTS maintains records of Emergency 911 calls.
show cable modem calls	Displays voice call information for a particular cable modem.

show cable card

To display various upstream/downstream phy and mac devices related information which are needed for debugging upstream and down stream traffic related issues, use **show cable card** command in privileged EXEC mode.

show cable card *slot/sub-slot* {{**ds-mac** {**all**} | {**bg**} | {**index**} | {**links**} | {**resources**} | {**state**}} | {**ds-phy**{**display** | **trigger**}} | {**memory** [**summary**]} | {**proc-cpu** [**history** | **sorted**]} | {**qam-repl** {**config-validate** }| {**group** [*group-id* [**counters** | **verbose**]]} | {**port** *downstream port number* {{**group**} | {**pilot**} | {**rf-channel** *grouplist* }}}} | {**tech-support**} | {**us-mac** {**config** {**bpi** *BPI index segment value* } | {**bwr** *physical channel number* } | {**gs** *MAC domain number* } | {**hwflow** *physical channel number SID value segment value* } | {**swflow** *HW flow value segment value* }} | {**counts** {**all**} | {**ccf**} | {**esi**} | {**frag**} | {**frame**} | {**global**} | {**ilk**} | {**interrupt**} | {**pkt**} | {**uepi**}}} | {**us-phy** {**channel** {*MG device instance physical channel number* [**clear**] *logical channel number* {{**all**} | {**get**} | {**show** *IUC number* }}} | {**fec-summary**}} | {**driver** [**MG device instance**]} | {**errors** [**MG device instance**]}}}

Syntax Description

slot/sub-slot	The slot/sub-slot number. The slot value ranges from 0 to 9 and sub-slot value is 0.
ds-mac	Specifies the ds-mac information.
all	Specifies all ds-mac information.
bg	Specifies ds-mac bg alloc information.
index	Specifies ds-mac hw-flow, DSID and BPI index allocation information.
links	Specifies ds-mac links information.
resources	Specifies ds-mac resources (free/used jib/spr grps).
state	Specifies ds-mac state information.
ds-phy	Specifies DSPHY commands to collect and display DSPHY related information.
display	Specifies DSPHY information collected from hardware.
trigger	Specifies DSPHY hardware information collection trigger.
memory	Specifies memory information.
summary	(Optional) Specifies memory statistics information.
pro-cpu	Specifies CPU information.
history	(Optional) Displays CPU history in graph format.
sorted	(Optional) Displays sorted output based on percentage of utilization.
qam-repl	Specifies card level qam-repl information.
config-validate	Specifies validate configuration for QAM replication

group	Displays qam-repl group information.
group-id	(Optional) The qam-repl group ID. The value ranges from 24576 to 25599.
counters	(Optional) Displays counters for QAM replication group.
verbose	(Optional) Displays detailed QAM replication group information.
pilot	Specifies the pilot channels on the card.
port	Specifies the downstream port.
downstream port number	The downstream port number. The value ranges from 0 to 7.
rf-channel	Displays RF channel information.
group list	The list of rf-channels and range of rf-channels.
tech-support	Displays technical support information.
us-mac	Specifies important us-mac information.
config	Specifies us-mac configuration information.
bpi	Specifies us-mac BPI configuration information.
BPI index number	The BPI index number. The value ranges from 0 to 32767.
segment value	The segment value. The value ranges from 1 to 14.
bwr	Specifies us-mac bw request configuration information.
physical channel number	The physical channel number. The value ranges from 0 to 127.
gs	Specifies us-mac gs configuration information.
MAC domain number	The MAC domain number. The value ranges from 0 to 127.
hwflow	Specifies us-mac HW flow configuration information.
SID value	The SID value. The value ranges from 0 to 16383.
swflow	Specifies us-mac SW flow configuration information.
HW flow value	The HW flow value. The value ranges from 0 to 131071.
counts	Displays us-mac count information.
all	Displays all us-mac information.
ccf	Displays us-mac ccf information.
esi	Displays us-mac esi information.
frag	Displays us-mac fragment proc information.
frame	Displays us-mac frame proc information.

global	Displays us-mac global information.
ilk	Displays us-mac ilk information.
interrupt	Displays us-mac interrupt information.
pkt	Displays us-mac packet proc information.
uepi	Displays us-mac uepi/sgmii information.
us-phy	Specifies us-phy related information.
channel	Specifies 3142 channel counters.
MG device instance	The MG device instance. The value ranges from 0 to 7.
clear	Clears the channel counters.
logical channel number	The logical channel number. The value ranges from 0 to 1.
get	Specifies get IUC from Mg's.
show *IUC number*	Displays dump IUC's.
fec-summary	Displays all channels FEC errors.
driver	Displays internal driver information.
errors	Specifies 3142 error counters.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable card** command is used for debugging downstream related issues.

Examples

The following example shows a typical display for the **show cable card** command:

```
Router#     sh cab card 3/0 ds-mac ?
all         show all ds-mac information
bg          show ds-mac bg alloc information
index       show ds-mac hw-flow index alloc information
links       show ds-mac links information
resources   show ds-mac resources (free/used jib/spr grps)
state       show ds-mac state information
```

show cable cgd-associations

To display the Channel Group Domain (CGD) downstream associations on the Cisco CMTS, use the **show cable cgd-associations** command in privileged EXEC mode.

show cable cgd-associations

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
12.2(33)SCG4 12.2(33)SCH	This command was modified. The output field Active Remote DS was modified to Active DS
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable cgd-associations** command displaying the Cisco Wideband SPA downstream association with Cisco uBR-MC3GX60V and Cisco uBR-MC20X20V line cards:

```
Router# show cable cgd-associations
CGD Host  Resource  DS Channels           Upstreams (AllUS)   Active DS
Ca7/1/0   7/1/0     4                     0-3       Yes       4
```



Note In the AllUS field, Yes indicates all the upstream channels are associated with the downstream channels in the MAC domain. If the AllUS field is blank, all the upstream channels are not associated with the downstream channels.

This table describes the fields shown in the **show cable cgd-associations command** display.

Table 48: show cable cgd-associations Field Descriptions

Field	Description
CGD Host	MAC domain interface for CGD.
Resource	Downstream cable interface line card.
DS Channels	Downstream RF channels.
Upstreams	Association of upstream channels in the MAC domain.

Field	Description
(AllUS)	Association of all upstream channels with downstream channels in the MAC domain.
Active Remote DS	Active downstream channels. **Note** Effective with Cisco IOS Release 12.2(33)SCG4, the field Active Remote DS has been modified to Active DS.
Active DS	Effective with Cisco IOS Release 12.2(33)SCG4, this field displays active downstream channels.

Related Commands

Command	Description
show cable mac-domain cable cgd-associations	Displays the summary of the CGD associations for all cable MAC domains.
show cable mac-domain cable downstream-service-group	Displays the MAC Domain Downstream Service Group information for a primary downstream channel.

show cable channel-group

To display the channel group information, use the **show cable channel-group** command in privileged EXEC mode.

show cable channel-group {**all** *group-id*}

Syntax Description

all	Displays the channel group information for all channel groups.
group-id	Channel group ID. The valid range is from 1 to 1000.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS Release 12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

The following is a sample output of the **show cable channel-group all** command:

```
Router# show cable channel-group all

--------------------------------------------------------------------------------
Channel Group 1
State: Valid
Host:  8/1/0

Upstream channels (total 1):
 Cable8/1/0 channel 1

Downstream channels (total 15):
 Modular-Cable 8/1/0 rf-channel 0-14

Associated CMC List (total/registered: 1/0):
 MAC Address     Registered   Offset
 0001.0002.0003  N            -

--------------------------------------------------------------------------------
Channel Group 710
State: Valid
Host:  7/1/0

Upstream channels (total 4):
 Cable7/1/0 channel 0-3

Downstream channels (total 16):
 Modular-Cable 7/1/0 rf-channel 0-15

Associated CMC List (total/registered: 4/1):
 MAC Address     Registered   Offset
 0010.2024.7035  Y            0
```

```
 badb.ad02.1cca  N            -
 badb.ad02.1cc6  N            -
 badb.ad02.1cee  N            -
```

The following is a sample output of the **show cable channel-group 710** command:

```
Router# show cable channel-group 710

--------------------------------------------------------------------------------
Channel Group 710
State: Valid
Host:  7/1/0

Upstream channels (total 4):
 Cable7/1/0 channel 0-3

Downstream channels (total 16):
 Modular-Cable 7/1/0 rf-channel 0-15

Associated CMC List (total/registered: 4/1):
 MAC Address     Registered   Offset
 0010.2024.7035  Y            0
 badb.ad02.1cca  N            -
 badb.ad02.1cc6  N            -
 badb.ad02.1cee  N            -
```

The table below describes the significant fields in the output of the **show cable channel-group** command.

Table 49: show cable channel-group Field Descriptions

Field	Description
Channel Group	Channel group ID.
State	State of the channel group.
Host	Host name for the channel group.
Upstream channels (total *number*)	Upstream channel information.
Downstream channels (total *number*)	Downstream channel information.
Associated CMC List (total/registered: *number*/*number*)	Information on the associated Cisco CMCs.
MAC Address	MAC address of the Cisco CMC.
Registered	Indicates if the Cisco CMC is registered.
Offset	Internal index of the Cisco CMC in the channel group.

Related Commands

Command	Description
cable channel-group	Configures channel group.

Command	Description
upstream cable channel	Configures upstream cable channel for a channel group.
downstream modular-cable rf-channel	Configures downstream modular cable RF channel for a channel group.
cmc	Configures Cisco CMC in a channel group.

show cable clock

To display clock reference status information for the clock card and to display information about displaying Timing, Communicaton and Control (TCC) card DOCSIS Timimg Interface (DTI) client and server statistic counts, use the **show cable clock** command in user EXEC or privileged EXEC mode.

Cisco uBR Series Router
show cable clock [*slot*] {**client** *port id* | **server** *port id* | **counters**}

Cisco cBR Series Router
show cable clock dti {**client** | **server**} *slot/subslot*

Syntax Description

slot	(Optional) Identifies a TCC interface on the Cisco RF Gateway 10. Valid TCC slots are 13 and 14.
client *port id*	Specifies the DTI client port ID. Valid port values are 1 and 2.
server *port id*	Specifies the DTI server port ID. Valid port values are 1 and 2.
counters	Specifies the DTI client counters.
slot/subslot	Specifies the slot and subslot location of the DTCC ports. Valid values are 4/1 or 5/1.

Command Default

Information on the TCC DTI client and server is displayed. Counters are not displayed.

Command Modes

User EXEC or Privileged EXEC

Command History

Release	Modification
12.1(1a)T1	This command was introduced.
12.1(2)EC1	This command was supported on the EC train.
12.2(1)XF1, 12.2(4)BC1	This command was supported for the Cisco uBR10012 universal broadband router.
12.3(23)BC	This command was supported for DTI mode.
12.2(44)SQ	This command was modified in Cisco IOS Release 12.2(44)SQ to support the Cisco RF Gateway 10. The *slot*, **client**, **server**, and **counters** options were added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **dti** keyword was added.

Usage Guidelines

This command supports the Cisco CMTS clock feature set, which provides a synchronized clock for improved Voice-over-IP (VoIP) operations. The clock feature set requires one of the following configurations:

- A Cisco uBR10012 router with one or two TCC+ cards that are connected to an external national clock source.

Note Beginning in Cisco IOS Release 12.3(23)BC, TCC+ is replaced with DOCSIS Timing and Control Card (DTCC).

- A Cisco uBR7246 VXR router using a Cisco uBR-MC16S, Cisco uBR-MC16E, Cisco uBR-MC28C, or Cisco uBR-MC28C-BNC cable interface line card. The router must also be equipped with a Cisco cable clock card and be running Cisco IOS 12.1(1a)T1, 12.1(2)EC1, or a later release. The Cisco cable clock card should be connected to an external national clock source.

Only these cable interface cards support the external clock card reference from a clock card to distribute that signal to CMs or set-top boxes (STBs) attached to the specific network segments. You can use other cable interface cards, such as the Cisco uBR-MC16C, with the clock card, but these other cable interfaces will not synchronize their downstream SYNC messages with the external clock source.

Each CM or STB must also support VoIP applications and the clock feature set. For example, the Cisco uBR924, running Cisco IOS Release 12.0(7)T or later, supports clock card feature automatically.

Note This command does not appear if a clock card is not installed in the system.

Examples

The following sample output from the **show cable clock** command on a Cisco uBR7246VXR router shows that both external sources are available and the clock card is providing the clock reference:

```
Router# show cable clock

Clockcard primary input is present
Clockcard secondary input is present
Cable clock reference is clockcard primary input
Cable3/0 Timestamp clock reference is from Clockcard
Cable4/0 Timestamp clock reference is from Clockcard
```

The following sample output from the **show cable clock** command on a Cisco uBR10012 router shows that both external sources are available and that the TCC+ card in slot 1/1 is providing the clock reference:

```
Router# show cable clock

Number of TCCplus Cards in the Chassis: 2
Active TCCplus Card is in slot: 1 subslot: 1
Backup TCCplus Card is in slot: 2 subslot: 1
Clock reference used by the active card is Primary T1
External T1 References:
Card: 1/1
Primary T1  : Available
Secondary T1: Available
Card: 2/1
Primary T1  : Available
Secondary T1: Available
```

The following sample output from the **show cable clock** command on a Cisco uBR10012 router shows that the TCC+ card in slot 1/1 is in maintenance mode, and that the TCC+ card in slot 2/1 is providing the clock reference:

```
Router# show cable clock

Number of TCCplus Cards in the Chassis: 2
TCCplus card in 1/1 under maintenance
Active TCCplus Card is in slot: 2 subslot: 1
Clock reference used by the active card is Primary T1
External T1 References:
Card: 2/1
Primary T1  : Available
Secondary T1: Available
```

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

The following sample output from the **show cable clock** command on a Cisco uBR10012 router shows that the DTCC card in slot 1/1 is in DTI mode.

```
Router# show cable clock

Number of TCC Cards in the Chassis: 1
Active TCC Card is in slot: 1 subslot: 1,(DTCC Eightbells card)
Clock reference used by the active card is DTI
Active TCC card in slot 1/1
TCC Card 1/1 DTI status:
-----------------------------------------
    Active Client port             : 2
    Active Client status           : normal
    Active Client Server status    : freerun
    Active Client frame error rate : < 2%
    Active Client CRC error count  : 0xAD
    Standby Client Signal detected : yes
No card in slot 2/1
```

Cisco RF Gateway 10

The following example shows the TCC DTI client and server statistic counts information:

```
Router# show cable clock
DTI Client status: TCC 13
-----------------
Client status                  : normal
Client clock type              : ITU type 1
Client firmware version        : 7
Client dti version             : 0
Client timestamp               : 657519453
Client phase correction        : 65535
Client normal time             : 65535
Client holdover time           : 0
Client transition t3 count     : 0
Client transition t4 count     : 1
Client transition t6 count     : 0
Client transition t7 count     : 0
Client port switch count       : 1
Client Integral Frequency Term : 64518
Client EFC Value               : 63282
DTI Client Port 1 Status:
```

```
-------------------------
   Port Status             : Active
   Signal detected         : yes
   CRC error count         : 2
   Frame error rate        : < 2%
   Cable advance           : 2560
    -- Connected server information ---
    Server status                  : Active free-run
    Root Server clock type         : ITU type 3
    Root Server source             : none
    Server Type                    : Root
    Client Performance Stable      : yes
    Client Cable advance Valid     : yes
DTI Client Port 2 Status:
-------------------------
   Port Status             : Inactive
   Signal detected         : no
   CRC error count         : 66
   Frame error rate        : > 5%
   Cable advance           : 0
DTI Client status: TCC 14
-----------------
Client status                  : normal
Client clock type              : ITU type 1
Client firmware version        : 7
Client dti version             : 0
Client timestamp               : 672169320
Client phase correction        : 65535
Client normal time             : 65535
Client holdover time           : 0
Client transition t3 count     : 0
Client transition t4 count     : 1
Client transition t6 count     : 0
Client transition t7 count     : 0
Client port switch count       : 1
Client Integral Frequency Term : 64760
Client EFC Value               : 63832
DTI Client Port 1 Status:
-------------------------
   Port Status             : Inactive
   Signal detected         : no
   CRC error count         : 26
   Frame error rate        : > 5%
   Cable advance           : 0

DTI Client Port 2 Status:
-------------------------
   Port Status             : Active
   Signal detected         : yes
   CRC error count         : 2
   Frame error rate        : < 2%
   Cable advance           : 1792
    -- Connected server information ---
    Server status                  : Active free-run
    Root Server clock type         : ITU type 3
    Root Server source             : none
    Server Type                    : Root
    Client Performance Stable      : yes
    Client Cable advance Valid     : yes
```

The following is sample output of a TCC card in slot 13 on a Cisco RF Gateway 10:

```
Router#show cable clock 13 client 1
DTI Client Port 1 Status:
```

```
-------------------------
   Port Status             : Inactive
   Signal detected         : no
   CRC error count         : 63006
   Frame error rate        : > 5%
   Cable advance           : 0x0000
```

Table 50: show cable clock client Field Descriptions

Field	Description
Port status	Indicates the current status of the DTI port on the TCC card.
Signal detected	Indicates whether the DTI signal was detected.
CRC error count	The number of cyclic redundancy check (CRC) errors. It can indicate intermittent upstream, laser clipping, or common-path distortion.

The following example shows the server status of the TCC card in slot 13 on a Cisco RFGW-10:

```
Router#show cable clock 13 server 2
TCC Card 13 port 2 DTI Server status:
-------------------------------------
    Server signal detected         : yes
    Server status                  : free-run
    Root Server clock type         : ITU type 3
    Root Server source             : none
    Server Type                    : Root
    Client Performance Stable      : yes
    Client Cable advance Valid     : yes
    TOD Setting Mode               : Short
    TOD gpssec                     : 902825745
    TOD leap seconds               : 14
```

Table 51: show cable clock server Field Descriptions

Field	Description
Server signal detected	Indicates whether the server was detected.
Server status	Indicates the state in which the serer is functioning. The states are warm-up, free-run state, fast mode, normal, holdover, or bridge mode.
Root server source	The server source such as internal, external, GPSor none.
Root server clock type	The clock type. The types are 1, 2, 3 or ITU Stratum 3 or DTI Min. clock.
TOD setting mode	Displays the time (user time, NTP, GPS) mode such as short or long.

The following is a sample output showing the counters on TCC card 13 on Cisco RFGW-10:

```
Router#show cable clock 13 counters
TCC Card 13 DTI counters:
-------------------------
    Client Normal time             : 0x1EB6
    Client Holdover time           : 0x0000
    Client Phase Correction        : 0
    Client Freq Correction         : 63213
```

```
Client EFC Correction          : 61039
Client transition count t3     : 0
Client transition count t4     : 1
Client transition count t6     : 0
Client transition count t7     : 0
Client port switch count       : 1
```

Related Commands

Command	Description
show controllers clock-reference	Displays hardware information, register values, and current counters for the cable clock card.
show cable clock dti status	Displays information on the DOCSIS Timing Interface (DTI) Client status.
cable clock free-run	Allows the clock to be in free-run mode.
clear cable clock counters	Clears DTI client transition counters of a TCC DTI client and server.

show cable clock dti counters

To display DTI counters for the clock card, use the **show cable clock dti counters** command in user EXEC or privileged EXEC mode.

show cable clock dti counters *slot/subslot*

Syntax Description

slot/subslot	Specifies the slot and subslot location of the DTCC ports. Valid values are 1/1 or 2/1.

Command Modes

User EXEC or Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was supported for DTI mode.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output from the **show cable clock dti counters** command in user EXEC mode:

```
Router> show cable clock dti counters 1/1
TCC Card 1/1 DTI counters:
-----------------------------------------
    Client Normal time             : 0xFFFF
    Client Holdover time           : 0x0000
    Client Phase Correction        : 0x0000
    Client Freq Correction         : 0xFBD7
    Client EFC Correction          : 0xF7AD
    Client transition count t3     : 0x00
    Client transition count t4     : 0x01
    Client transition count t6     : 0x00
    Client transition count t7     : 0x00
```

Related Commands

Command	Description
cable clock dti clear-counters	Resets the counters that are displayed with the **show cable clock dti counters** command.
show cable clock dti status	Displays information on the DOCSIS Timing Interface (DTI) Client status.

show cable clock dti status

To display information on the DOCSIS Timing Interface (DTI) Client status, use the show cable clock dti status command in privileged EXEC mode.

show cable clock dti status

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display information on the DTI Client status.

Examples

The following is a sample output from the **show cable clock dti** command:

```
Router# show cable clock dti status
Status of DTI component:
Active TCC card in slot 1/1
TCC Card 1/1 DTI status:
-----------------------------------------
    Active Client port             : 2
    Active Client status           : normal
    Active Client Server status    : freerun
    Active Client frame error rate : < 2%
    Active Client CRC error count  : 0x06
    Standby Client Signal detected : no
No card in slot 2/1
```

Related Commands

Command	Description
show cable clock	Displays clock reference status information for the clock card.

show cable cmc

To display the Cisco CMC information, use the **show cable cmc** command in privileged EXEC mode.

show cable cmc [**summary** | *cmc-value* {**cap** | **dom** | **ds_cnt** | **frx_info** | **info** | **modem** | **spec-analysis** *upstream_id low_freq high_freq* | **us_uepi_cnt** | **verbose**}]

Syntax Description

summary	Optional. Displays a summary of the Cisco CMC.
cmc-value	Optional. Specifies the details of the Cisco CMC. • *mac-address* —MAC address of the Cisco CMC. • *ip-address*—IP address of the Cisco CMC. • *cmc-index*—Cisco CMC ID. The valid range is from 1 to 4096.
cap	Displays the Cisco CMC capability information
dom	Displays the digital diagnostic monitoring information of the optical transceivers on Cisco CMC.
ds_cnt	Displays the downstream counter information for Cisco CMC.
frx_info	Displays the FRx information for the Cisco CMC.
info	Displays the Cisco CMC information.
modem	Displays the information for the cable modem associated with the Cisco CMC.
spec-analysis *upstream_id low_freq high_freq*	Displays the spectrum monitoring information for the upstream of Cisco CMC. • *upstream_id* — ID of the upstream. • *low_freq*— The lowest frequency of the spectrum. The valid range is from 5000 to 85000. • *high_freq*— The highest frequency of the spectrum. The valid range is from 5000 to 85000.
us_uepi_cnt	Displays the upstream UEPI counter information for Cisco CMC.
verbose	Displays the detailed information for Cisco CMC.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS Release 12.2(33)CX	This command was introduced.

Release	Modification
Cisco IOS Release 12.2(33)CY	This command was modified. The **dom** and **spec-analysis** keyword was added, the **verbose** keyword was modified. **Note** Cisco CMC image cmc-16x4-os-1.2.bin is required to use these command options.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

The following is a sample output of the **show cable cmc** command:

```
Router# show cable cmc

MAC Address    IP Address      State      Group Offset CMCID Conn ID    IF
0010.2024.7035 192.168.0.4     online     710   1      2     0xF0000    Gi7/1/0
```

The table below describes the significant fields in the output of the **show cable cmc** command.

Table 52: show cable cmc Field Descriptions

Field	Description
MAC Address	MAC address of the Cisco CMC.
IP Address	IP address assigned to the Cisco CMC.
State	Current state of the Cisco CMC. • Offline: CMC is not operational • Reject(i): IP assign failed • Init(d): DHCP discovery • Init(g): GCP connection establishing • Init(est): GCP connection established • Init(c): Get CMC Capability • Init(s): Download configuration to CMC • Reject(c): Get CMC Capability failed • Online: CMC is operational
Group	Channel group ID to which the Cisco CMC is assigned.
Offset	Internal index of the Cisco CMC in the channel group.
CMC ID	Cisco CMC ID.

Field	Description
Conn ID	GCP connection ID per Cisco uBR-MC3GX60V-RPHY line card.
IF	Interface to which the Cisco CMC is connected.

The following is a sample output of the **show cable cmc summary** command:

```
Router# show cable cmc summary

Gi7/1/0        :1
```

The following is a sample output of the **show cable cmc** command, which displays the capability information for the Cisco CMC with MAC address 0010.2024.7035:

```
Router# show cable cmc 0010.2024.7035 cap

 cmcDsChanNum : 16
 cmcUsChanNum : 4
 IsFRxEmbeded : 0
```

The table below describes the significant fields in the output of the **show cable cmc cap** command.

Table 53: show cable cmc cap Field Descriptions

Field	Description
cmcDsChanNum	Number of downstream channels on the Cisco CMC.
cmcUsChanNum	Number of upstream channels on the Cisco CMC.
IsFRxEmbeded	Indicates if the FRx is installed in the Cisco CMC.

The following is a sample output of the **show cable cmc** command, which displays the digital diagnostic monitoring information for the Cisco CMC with MAC address 0004.9f01.9100:

```
Router# show cable cmc 0004.9f01.9100 dom
                                          Optical    Optical
       Temperature   Voltage    Current   Tx Power   Rx Power
Port   (Celsius)     (volts)    (mA)      (dBm)      (dBm)
-----  ----------    -------    ------    -------    -------
G0/0        30.01       3.29      7.24      -4.05     -33.00

Router# show cable cmc 0004.9f01.9100 dom detail
                     High Alarm   High Warn    Low  Warn    Low Alarm
       Temperature   Threshold    Threshold    Threshold    Threshold
Port   (Celsius)     (Celsius)    (Celsius)    (Celsius)    (Celsius)
-----  ----------    ---------    ---------    ---------    ---------
G0/0        30.05      109.00       103.00       -13.00       -29.00
                     High Alarm   High Warn    Low  Warn    Low Alarm
       Voltage       Threshold    Threshold    Threshold    Threshold
Port   (volts)       (volts)      (volts)      (volts)      (volts)
-----  ----------    ---------    ---------    ---------    ---------
G0/0         3.29        3.90         3.70         2.90         2.70
                     High Alarm   High Warn    Low  Warn    Low Alarm
       Current       Threshold    Threshold    Threshold    Threshold
Port   (mA)          (mA)         (mA)         (mA)         (mA)
-----  ----------    ---------    ---------    ---------    ---------
```

```
G0/0         7.18       15.00        12.00         2.00         1.00
       Optical      High Alarm   High Warn    Low  Warn    Low Alarm
       Tx Power     Threshold    Threshold    Threshold    Threshold
Port   (dBm)        (dBm)        (dBm)        (dBm)        (dBm)
-----  -----------  ---------    ---------    ---------    ---------
G0/0        -4.06       -1.09        -1.09       -11.00       -11.07
       Optical      High Alarm   High Warn    Low  Warn    Low Alarm
       Rx Power     Threshold    Threshold    Threshold    Threshold
Port   (dBm)        (dBm)        (dBm)        (dBm)        (dBm)
-----  -----------  ---------    ---------    ---------    ---------
G0/0       -33.09        0.09        -1.00       -18.00       -20.00
```

The table below describes the significant fields in the output of the **show cable cmc dom** command.

Table 54: show cable cmc dom Field Descriptions

Field	Description
Temperature	Internally measured transceiver temperature.
Voltage	Internally measured transceiver supply voltage.
Current	Measured transmitter bias current in μA.
Optical Tx Power	Measured transmitter output power in mW.
Optical Rx Power	Measured receiver received average optical power in mW.
High Alarm Threshold	Upper limit to trigger alarm.
High Warn Threshold	Upper limit to trigger warning.
Low Alarm Threshold	Lower limit to trigger alarm.
Low Warn Threshold	Lower limit to trigger warning.

The following is a sample output of the **show cable cmc** command, which displays the downstream counter information for the Cisco CMC with ID 2:

```
Router# show cable cmc 2 ds_cnt

IpVerErr                       : 0
IpLenErr                       : 0
IpChsmErr                      : 0
QamChanMismatchErr             : 47523
SeqMismatchErr                 : 0
MpegLenErr                     : 0
L2TPv3HdrErr                   : 0
DLMPacketCounter               : 0
DepiCtrlPacketCounter          : 0
NonDepiPacketCounter           : 255
GCPPacketCounter               : 232
DepiChanPacketCounter QAMchaID : 0
DepiPacketCounter              : 2303083
DepiChanPacketCounter QAMchaID : 1
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 2
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 3
DepiPacketCounter              : 1063
```

```
DepiChanPacketCounter QAMchaID : 4
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 5
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 6
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 7
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 8
DepiPacketCounter              : 2302517
DepiChanPacketCounter QAMchaID : 9
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 10
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 11
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 12
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 13
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 14
DepiPacketCounter              : 1063
DepiChanPacketCounter QAMchaID : 15
DepiPacketCounter              : 1063
```

The table below describes the significant fields in the output of the **show cable cmc ds_cnt** command.

Table 55: show cable cmc ds_cnt Field Descriptions

Field	Description
IpVerErr	Number of IP version errors.
IpLenErr	Number of IP length errors.
IpChsmErr	Number of checksum errors in the IP header.
QamChanMismatchErr	Number of QAM channel mismatch errors.
SeqMismatchErr	Number of sequence mismatch errors.
MpegLenErr	Number of MPEG length errors.
L2TPv3HdrErr	Number of L2TPv3 header errors.
DLMPacketCounter	Number of DEPI Latency Measurement (DLM) packets.
DepiCtrlPacketCounter	Number of DEPI control packets.
NonDepiPacketCounter	Number of non-DEPI control packets.
GCPPacketCounter	Number of GCP packets.
DepiChanPacketCounter QAMchaID	Number of DEPI channel packets for the specified QAM channel ID.
DepiPacketCounter	Number of DEPI packets.

The following is a sample output of the **show cable cmc** command, which displays the FRx information for the Cisco CMC with ID 1

```
Router# show cable cmc 1 frx_info

FrxControllerType     : 8581
FrxSerialNumber       : ABCDEFGHIJK
FrxPID                : 12345678
FrxVID                : V01
FrxHWVersion          : 0.1
FrxSWId               : FRx_0.00.06
FrxTemperature        : 14.5 Celsius Degree
FrxTimeInService      : 300 day
FrxOpticalStatus      : No optical input
FrxAgcStatus          : Out of range
FrxOpticalLevelInput  : -16.0 dBm
FrxAtt                : 0 dB
FrxEQ                 : 3 dB
```

The table below describes the significant fields in the output of the **show cable cmc frx_info** command.

Table 56: show cable cmc frx_info Field Descriptions

Field	Description
FrxControllerType	Controller used to identify the FRx.
FrxSerialNumber	Serial number of the FRx.
FrxPID	Product Identifier (PID) of the FRx.
FrxVID	Version Identifier (VID) of the FRx.
FrxHWVersion	Hardware version of the FRx.
FrxSWId	Software version of the FRx.
FrxTemperature	Temperature of the FRx.
FrxTimeInService	Time for which the FRx is in service.
FrxOpticalStatus	Status of the optical input power on the FRx.
FrxAgcStatus	Status of Automatic Gain Control (AGC) on the FRx.
FrxOpticalLevelInput	Optical input power level of the FRx.
FrxAtt	FRx attenuation value in dB.
FrxEQ	FRx equalization value in dB.

The following is a sample output of the **show cable cmc** command, which displays the information for the Cisco CMC with MAC address 0010.2024.7035:

```
Router# show cable cmc 0010.2024.7035 info

Load for five secs: 5%/0%; one minute: 6%; five minutes: 6%
Time source is NTP, 04:06:39.772 UTC Mon Feb 24 2014
```

```
cmcModeName : DOCSIS-CMC-4P-FN
cmcDescription : 0
cmcVendorName : 0
cmcSerialNumber : CSJ13152101
cmcHWVersion : 1.0
cmcSWVersion : 0.10(Feb 18 10:40:03 CST 2014)
cmcTimeInService : 237616
```

The table below describes the significant fields in the output of the **show cable cmc info** command.

Table 57: show cable cmc info Field Descriptions

Field	Description
cmcModeName	Product number of the Cisco CMC.
cmcDescription	Description of the Cisco CMC.
cmcVendorName	Vendor name for the Cisco CMC.
cmcSerialNumber	Serial number of the Cisco CMC.
cmcHWVersion	Version number of the Cisco CMC hardware.
cmcSWVersion	Version number of the Cisco CMC software.
cmcTimeInService	Time for which the Cisco CMC is in service.

The following is a sample output of the **show cable cmc** command, which displays the modem information for the Cisco CMC with MAC address 0010.2024.7035:

```
Router# show cable cmc 0010.2024.7035 modem
                                                                                D
MAC Address    IP Address      I/F           MAC           Prim RxPwr  Timing Num I
                                             State         Sid  (dBmv) Offset CPE P
e448.c7bf.80aa 192.168.0.2     C7/1/0/UB     w-online(pt)  1    !-3.00  2089   0   N
```

The table below describes the significant fields in the output of the **show cable cmc modem** command.

Table 58: show cable cmc modem Field Descriptions

Field	Description
MAC Address	MAC address of the cable modem.
IP Address	IP address assigned to the cable modem.
I/F	Interface to which the cable modem is connected.
MAC State	State of the cable modem.
Prim Sid	Primary service ID assigned to the cable modem.
RxPwr (dBmv)	Power received at the cable modem in dBmV.

Field	Description
Timing Offset	Timing offset for the cable modem, in ticks, as recognized on the Cisco CMTS. A tick is 6.25/64 microseconds. This is the delay between the time when the cable modem is scheduled to make a transmission and when the Cisco CMTS actually receives it.
Num CPE	Number of Customer Premises Equipments (CPE).

The following is a sample output of the **show cable cmc** command, which displays the spectrum monitoring information for the Cisco CMC with MAC address 0004.9f01.9100:

```
Router# show cable cmc 0004.9f01.9100 spec-analysis 1 5000 85000
Spectrum Analysis Measurements for CMC spectrum-analysis upstream channel 1
Number of Bins:  251
Bin Spacing:  320 KHz
Resolution Bandwidth: 320 KHz
Amplitude Data:
Bin  Num(spec)---------------------------dBmv---------------------------------
0000( 5000KHz)  -49.00  -46.00  -48.00  -49.00  -49.00  -45.00  -48.00  -52.00
0008( 7560KHz)  -52.00  -52.00  -60.00  -55.00  -49.00  -60.00  -52.00  -49.00
0016(10120KHz)  -52.00  -55.00  -60.00  -60.00  -60.00  -52.00  -52.00  -55.00
0024(12680KHz)  -49.00  -52.00  -49.00  -49.00  -55.00  -52.00  -55.00  -49.00
0032(15240KHz)  -55.00  -55.00  -49.00  -48.00  -52.00  -60.00  -55.00  -52.00
0040(17800KHz)  -49.00  -46.00  -48.00  -46.00  -45.00  -49.00  -43.00  -44.00
0048(20360KHz)  -46.00  -48.00  -46.00  -55.00  -52.00  -55.00  -52.00  -52.00
0056(22920KHz)  -48.00  -52.00  -52.00  -48.00  -55.00  -55.00  -55.00  -52.00
0064(25480KHz)  -55.00  -52.00  -48.00  -49.00  -55.00  -60.00  -48.00  -46.00
0072(28040KHz)  -55.00  -48.00  -44.00  -48.00  -55.00  -55.00  -49.00  -43.00
0080(30600KHz)  -46.00  -55.00  -52.00  -52.00  -60.00  -48.00  -49.00  -49.00
0088(33160KHz)  -46.00  -49.00  -49.00  -44.00  -46.00  -48.00  -49.00  -55.00
0096(35720KHz)  -52.00  -48.00  -48.00  -46.00  -48.00  -55.00  -48.00  -45.00
0104(38280KHz)  -45.00  -49.00  -48.00  -49.00  -55.00  -52.00  -46.00  -52.00
0112(40840KHz)  -60.00  -52.00  -48.00  -52.00  -55.00  -48.00  -46.00  -48.00
0120(43400KHz)  -52.00  -60.00  -52.00  -46.00  -48.00  -55.00  -48.00  -49.00
0128(45960KHz)  -55.00  -55.00  -48.00  -52.00  -52.00  -60.00  -55.00  -52.00
0136(48520KHz)  -55.00  -52.00  -52.00  -52.00  -60.00  -47.00  -48.00  -45.00
0144(51080KHz)  -46.00  -49.00  -52.00  -55.00  -52.00  -60.00  -60.00  -55.00
0152(53640KHz)  -55.00  -55.00  -60.00  -55.00  -60.00  -60.00  -55.00  -55.00
0160(56200KHz)  -55.00  -52.00  -48.00  -52.00  -60.00  -60.00  -55.00  -52.00
0168(58760KHz)  -52.00  -52.00  -55.00  -55.00  -48.00  -55.00  -55.00  -49.00
0176(61320KHz)  -46.00  -46.00  -48.00  -55.00  -55.00  -49.00  -46.00  -46.00
0184(63880KHz)  -49.00  -55.00  -55.00  -55.00     N/A     N/A     N/A     N/A
0192(66440KHz)     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
0200(69000KHz)     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
0208(71560KHz)     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
0216(74120KHz)     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
0224(76680KHz)     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
0232(79240KHz)     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
0240(81800KHz)     N/A     N/A     N/A     N/A     N/A     N/A     N/A     N/A
0248(84360KHz)     N/A     N/A     N/A
```

The following is a sample output of the **show cable cmc** command, which displays the upstream UEPI count information for the Cisco CMC with MAC address 0010.2024.7035:

```
Router# show cable cmc 0010.2024.7035 us_uepi_cnt

logicChannelID:     0, CounterType:    DataPacketCounter, CounterValue: 11
logicChannelID:     0, CounterType:      DataByteCounter, CounterValue: 3715
```

```
logicChannelID:     0, CounterType:  RngReqPacketCounter, CounterValue: 274
logicChannelID:     0, CounterType:    RngReqByteCounter, CounterValue: 56444
CounterType:     BwReqPacketCount, CounterValue: 34
CounterType:     BwReqByteCounter, CounterValue: 2176
```

The following is a sample output of the **show cable cmc** command, which displays the detailed information for the Cisco CMC with MAC address 0010.2024.7035:

```
Router# show cable cmc 0002.3dfe.fe01 verbose

Primary Mac Address : 0002.3dfe.fe01
IP Address          : 192.80.0.2
Last IP Address     : 0.0.0.0
IP Mode             : DHCP
State               : online
Next Hop Hw Address : 0002.3dfe.fe01
Next Hop IP Address : 0.0.0.0
Online Time         : 325285 seconds
ARP Enabled         : FALSE
Reason              : unknown
Ds8/0/0:0  Frequency: 626.000 MHz
Ds8/0/0:1  Frequency: 634.000 MHz
Ds8/0/0:2  Frequency: 642.000 MHz
Ds8/0/0:3  Frequency: 650.000 MHz
Ds8/0/0:4  Frequency: 658.000 MHz
Ds8/0/0:5  Frequency: 666.000 MHz
Ds8/0/0:6  Frequency: 674.000 MHz
Ds8/0/0:7  Frequency: 682.000 MHz
Us8/0/0:0  Frequency: 60.000 MHz
Us8/0/0:1  Frequency: 53.600 MHz
Us8/0/1:0  Frequency: 60.000 MHz
```

The table below describes the significant fields in the output of the **show cable cmc verbose** command.

Table 59: show cable cmc verbose Field Descriptions

Field	Description
Primary MAC Address	MAC address of the Cisco CMC.
IP Address	IP address assigned to the Cisco CMC.
Last IP Address	Previous IP address assigned to the Cisco CMC.
IP Mode	IP mode of the Cisco CMC.
State	State of the Cisco CMC.
Next Hop Hw Address	The hardware address of the CMTS's next hop between CMTS and CMC.
Next Hop IP Address	The IP address of the CMTS's next hop between CMTS and CMC.
Online Time	Time, in seconds, for which the Cisco CMC is online.
ARP Enabled	Indicates if ARP is enabled.
Reason	Reason for the previous reset of the Cisco CMC.

Related Commands

Command	Description
cable cmc	Configures the downstream RF power and FRx on the Cisco CMC.
clear cable cmc	Clears the information on the Cisco CMC.

show cable cmts-id

To display the configured CMTS ID, use the **show cable cmts-id** command in privileged EXEC mode.

show cable cmts-id

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Example

The following is a sample output of the **show cable cmts-id** command:

```
Router# show cable cmts-id

Configured CMTSID is:9000
```

Related Commands

Command	Description
cable cmts-id	Configures the CMTS ID.

show cable depi multicast

To display the DEPI multicast information, use the **show cable depi multicast** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable depi multicast [**counter** { **Downstream-Cable** | **interface** | **ip** { *ip_address* | **ipv6** *ipv6_address*] **ip** { *ip_address* | **all** } | **ipv6** { *ipv6_address* | **all** } | **pool** [**id** *id* | **ipv4 |** **ipv6** [**id** *id*]] }

Syntax Description

ip *ip_address*	Assigned IP address.
ipv6 *ipv6_address*	Assigned IPv6 address.
id *id*	DEPI multicast pool ID.
ipv6 id *id*	IPv6 DEPI multicast pool ID.
counter	Statistics information of each group
Downstream-Cable	Downstream-Cable controller
interface	Interface of DPIC

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This **counter** statement is introduced for the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Fuji 16.7.1	This command is introduced for the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display the DEPI multicast information.

The following example shows the IPv6 multicast DEPI pool:

```
Router#show cable depi multicast pool ipv6
Load for five secs: 8%/2%; one minute: 7%; five minutes: 8%
No time source, *06:57:11.898 UTC Sun Oct 22 2017
POOL ID    IPv6                                          DESCRIPTION
22         FF3B::8000:0/100
50         FF3A::8000:0/126                              zyq
100        FF39::8000:0/120                              zyq

Infra_C05#show cable depi multicast pool ipv6 id 22
Load for five secs: 8%/2%; one minute: 8%; five minutes: 8%
No time source, *07:00:03.577 UTC Sun Oct 22 2017
POOL ID    IPv6                                          DESCRIPTION
```

```
22          FF3B::8000:0/100
```

The following example shows the assigned IPv6 multicast address:

```
Router#show cable depi multicast ipv6 all
Load for five secs: 10%/3%; one minute: 8%; five minutes: 8%
No time source, *07:01:33.659 UTC Sun Oct 22 2017
IPv6                                            POOL ID    CONTROLLER
FF3A::8000:0                                    50         9/0/2(291)
FF3A::8000:1                                    50         9/0/28(317)
FF39::8000:0                                    100        9/0/29(318)
FF3A::8000:2                                    50         9/0/30(319)
```

The following example shows the statistics information of each group:

```
Router#show cable depi multicast counter
IP                                          POOL ID pps          bps          IF
Controller
225.225.225.0                               1       4686         39335848     Te3/1/0
DS3/0/1
```

show cable device access-group

To display a list of CMs and their customer premises equipment (CPE) devices, along with their access groups, use the **show cable device access group** command in privileged EXEC mode.

show cable device [*ip-address*] **access-group**

Note The **show cable device access-group** command is not supported on the Cisco uBR10012 universal broadband router.

Syntax Description

ip-address	(Optional) Specifies the IP address for a particular CM or host.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.NA	This command was introduced.
12.1(3a)EC1	Support was added to the Release 12.1 EC train.
12.2(4)BC1	Support was added to the Release 12.2 BC train for the Cisco uBR7100 series and Cisco uBR7200 series routers. (This command might appear in the CLI for the Cisco uBR10012 router but is not functional.)
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays information about both CMs and their associated CPE devices. To display information only for hosts and other CPE devices, use the **show cable host access-group** command. To display information only for CMs, use the **show cable modem access-group** command.

If an SNMP manager is requesting information about CM or CPE devices at the same time that this command is given, the command displays the following error message:

```
No information is available, please try later.
```

Wait until the SNMP retrieval is done and retry the CLI command.

Examples

The following example shows how to display a list of the CMs and their hosts:

```
Router# show cable device access-group

MAC address      IP address      Type    Access-group
00d0.ba77.7595   10.20.114.34    modem   resident
0020.4065.828c   10.27.29.128    modem   resident
0080.c6f9.b42e   24.168.220.52   host
0020.7806.defe   192.168.28.134  host
0020.4066.5c5c   10.27.33.128    modem   resident
```

```
0050.baa0.5ccd   24.168.223.251  host
0020.4070.56d8   10.27.29.129    modem   resident
0050.046f.f4cf   192.168.33.25   host
0020.40b4.0c80   10.27.33.129    modem   resident
0050.bacf.5d89   192.168.37.113  host
0020.4071.698e   10.27.29.130    modem   resident
0050.1800.a8cb   192.168.33.90   host
0020.407a.c196   10.27.33.130    modem   resident
0040.d00f.44f0   192.168.34.128  host
0020.407f.0c2c   10.27.33.131    modem   resident
0050.e456.9641   192.168.39.66   host
0020.4071.65de   10.27.29.131    modem   resident
0050.badd.2883   192.168.32.230  host
0020.4071.64b4   10.27.29.132    modem   resident
0050.badd.3b12   192.168.33.246  host
00D0.ba41.41fc   10.27.33.132    modem   resident
0020.78c7.f887   192.168.32.32   host
00D0.ba3d.871e   10.27.29.133    modem   resident
00e0.2969.a1a5   192.168.36.246  host
00D0.ba40.fff3   10.27.29.135    modem   resident
0020.78d5.ddf0   192.168.32.107  host
00001.02c5.9936   192.168.38.233 host
00D0.ba40.fe30   10.27.33.157    modem   resident
0020.78d0.fb32   192.168.28.45   host
00D0.ba3b.e08d   10.27.33.158    modem   resident
0050.1800.f458   192.168.36.209  host
0002.e301.df8f   192.168.30.191  host
00D0.ba3e.7b9c   10.27.29.158    modem   resident
00a0.2451.b7eb   24.168.223.41   host
00D0.ba3c.3ff2   10.27.29.160    modem   resident
0080.c7db.afba   192.168.33.153  host
00D0.2717.1899   192.168.39.189  host
00D0.ba33.a164   10.27.33.161    modem   resident
Router#
```

This table describes the fields that are shown in the **show cable device access-group** display:

Table 60: Descriptions for the show cable device access-group Fields

Field	Description
MAC Address	The MAC address for the CM or CPE device.
IP Address	The IP address that the DHCP server has assigned to the CM or CPE device.
Type	Identifies the type of device: • host = CPE device • modem = cable modem
Access-group	Displays the access group name or number in use (if any) for this CM or CPE device.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable device	Configures the access list for a CM device or host.
cable host access-group	Configures the access list for the specified hosts.
clear cable host	Clears the host from the table.
show cable host access-group	Displays the hosts behind the CMs in the network, along with their access groups.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.

show cable downstream controller-profile

To display the cable downstream controller profile, use the **show cable downstream controllerprofile** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable downstream controller profile *id*

Syntax Description

profile	*id*	Profile identifiler.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to verify the cable downstream controller profile.

The following example shows the sample output for the **show cable downstream controllerprofile** command:

```
Router#show cable downstream controller-profile 100
Load for five secs: 24%/3%; one minute: 10%; five minutes: 8%
No time source, *07:10:28.074 UTC Sun Oct 22 2017

Downstream controller-profile 100, type RPHY
Description:
Downstream controller-profile 100 is being used by controller Downstream-Cable:
  0/0/30,
  Admin:  UP
  MaxOfdmSpectrum: 192000000
  MaxCarrier: 158
  Mode: normal
  Free freq block list has 3 blocks:
    45000000  - 449999999
    594000000 - 602999999
    795000000 - 1217999999
  DS Splitting: Yes
  Multicast Pool ID: 50
  OFDM frequency exclusion bands: None

Configured RF Channels:
Chan Admin Frequency  Type        Annex Mod  srate Qam-profile  dcid  output
 0    UP   453000000  DOCSIS       B    256   5361  1           1     NORMAL
 1    UP   459000000  DOCSIS       B    256   5361  1           2     NORMAL
 2    UP   465000000  DOCSIS       B    256   5361  1           3     NORMAL
```

show cable dp aqm

To display cable dataplane aqm information, use the **show cable dp aqm**command in Privileged EXEC mode.

show cable dp aqm { **Cable** | **Downstream-Cable** | **Integrated-Cable** | **Wideband-Cable** } *slot/subslot/port:interface-number* { **hist** | **low-latency** }

Syntax Description

aqm	Specifies cable dataplane aqm information.
Cable	Specifies CMTS interface.
Downstream-Cable	Specifies downstream cable interface.
Integrated-Cable	Specifies integrated cable interface.
Wideband-Cable	Specifies wideband CMTS interface.
slot/subslot/port:interface-number	• *slot/subslot* - The slot/subslot where the linecard resides. • *port* - Downstream controller number on the linecard. • *interface-number* - The cable interface number.
hist	Specifies the latency histogram stats, if available.
low-latency	Specifies the low latency flow stats.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1x	You can used this command to view Queue protection Statistics.
Cisco IOS XE Cupertino 17.9.1x	This command is introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable dp aqm** command displays queue information for the specified interface.

Examples

The following example shows a typical display for the **show cable dp aqm** command:

```
Router# show cable dp aqm wi1/0/1:1
MAC Address    I/F   Sfid class-name Length/ Dequeues qDrops/   rDrops/  pDrops Marked
Target
                                          Max          Sanctions  Sanctions
Latency(ms)
0cb9.3772.7c9c Ca1/0/1 16 class-default 34/255 425769  5952339  5904109  0       0
10
```

```
0cb9.3772.7c9c Ca1/0/1 46 4class-map  35/255 3768835 10146943 6378108    0       0
10

Router# show cable dp aqm wi1/0/1:1 low-latency
MAC Address    I/F   Sfid class-name Length/ Dequeues qDrops/ rDrops/  Marked ECT(1) ECT(0)
   Target
                                      Max           Sanctions Sanctions
    Latency(ms)
0cb9.3772.7c9c Ca1/0/1 46 4class-map 35/255 3768835 10146943  6378108     0     0   3768835
     10

Router# show cable dp aqm wi1/0/1:1 hist
MAC Address    I/F    Sfid class-name  Dequeues qDrops/  Target      updt_  Max Range Lo-
  pac-
                                           Sanctions Latency(ms) num    (ms)     Hi(ms)
 kets
0cb9.3772.7c9c Ca1/0/1 46  4class-map  3987667 10736054  10          3.959M  0.00 -  0.20
  18
                                                                             0.20 -  0.40
  0
                                                                             0.40 -  0.60
  3
                                                                             0.60 -  0.80
  30
                                                                             0.80 -  1.00
  57
                                                                             1.00 -  1.20
  89
                                                                             1.20 -  1.40
  97
                                                                             1.40 -  1.60
3958731
                                                                             1.60 -  1.80
  5
                                                                             1.80 -  2.00
  5
                                                                             2.00 -  2.20
  4
                                                                             2.20 -  2.40
  1
                                                                             2.40 -  2.60
  2
                                                                             2.60 -  2.80
  6
                                                                             2.80 -  3.00
  8
                                                                             3.00 -  Inf.
  87
```

Related Commands

Command	Description
show cable dp pfg	Displays cable dataplane packet filter group information.

show cable dp pfg

To display cable dataplane packet-filter-group information, use **show cable dp pfg** command in Privileged EXEC mode.

show cable dp pfg group { *group-id* | **all** }

Syntax Description

pfg	Specifies cable dataplane packet-filter-group information.
group	Specifies cable filter group number.
group-id	Specifies the group-id. The valid range is from 1 to 255.
all	Display information for all group-id values.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable dp pfg** command displays packet-filter-group information.

Examples

The following example shows a typical display for the **show cable dp pfg** command:

```
CBR8#show cable dp pfg group 1
Extended IP access list CMTS_PKT_FILTER_GROUP_1
    51200 permit ip any any (8 matches)
IPv6 access list CMTS_PKT_FILTER_GROUP_IPV6_1 (TCAM loaded) (hidden) (refcount: 1)
    permit tcp any range 0 65535 any range 0 65535 flow-label 1111 sequence 200
    permit udp any range 0 65535 any range 0 65535 flow-label 1111 sequence 201
    permit ipv6 any any sequence 51200
```

Related Commands

Command	Description
show cable dp queue	Displays cable dataplane queue information.

show cable dp queue

To display cable dataplane queue information, use **show cable dp queue** command in Privileged EXEC mode.

show cable dp queue { **Integrated-Cable** | **Wideband-Cable** } *slot/subslot/port:interface-number*

Syntax Description

queue	Specifies cable dataplane queue information.
Integrated-Cable	Specifies integrated cable interface.
Wideband-Cable	Specifies wideband CMTS interface.
slot/subslot/port:interface-number	• *slot/subslot* - The slot/subslot where the linecard resides. • *port* - Downstream controller number on the linecard. • *interface-number* - The cable interface number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable dp queue** command displays queue information for the specified interface.

Examples

The following example shows a typical display for the **show cable dp queue** command:

```
Router#   sh cable dp queue wi2/0/2:2
MAC Address    I/F      Sfid      Flg class-name        Length/Max     Dequeues  qDrops
 pDrops
0025.2e2d.7986 Ca2/0/10 190           class-default          0/63      0         0
 0
0025.2e2d.7986 Ca2/0/10 205           16--class-map          0/63      0         0
 0
0025.2e2d.7968 Ca2/0/10 192           class-default          0/63      7         0
 0
0025.2e2d.7968 Ca2/0/10 206           16--class-map          0/63      0         0
 0
0025.2e2d.762c Ca2/0/10 194           class-default          0/63      7         0
 0
0025.2e2d.762c Ca2/0/10 207           16--class-map          0/63      0         0
 0
0025.2e2d.762e Ca2/0/10 196           class-default          0/63      7         0
 0
0025.2e2d.762e Ca2/0/10 208           16--class-map          0/63      0         0
 0
0025.2e2d.7806 Ca2/0/10 198           class-default          0/63      7         0
 0
0025.2e2d.7806 Ca2/0/10 210           16--class-map          0/63      0         0
 0
```

```
0025.2e2d.7776 Ca2/0/10 200           class-default          0/63      7          0
 0
0025.2e2d.7776 Ca2/0/10 209           16--class-map          0/63      0          0
 0
0025.2e2d.77ea Ca2/0/10 202           class-default          0/63      7          0
 0
0025.2e2d.77ea Ca2/0/10 211           16--class-map          0/63      0          0
 0
0025.2e2d.7630 Ca2/0/10 204           class-default          0/63      7          0
 0
0025.2e2d.7630 Ca2/0/10 212           16--class-map          0/63      0          0
 0
Flags Legend:
$: Low Latency Queue (aggregated)
~: CIR Queue
#: Byte Queue Limit
```

Related Commands

Command	Description
show cable dp pfg	Displays cable dataplane packet filter group information.

show cable dsg

To display the current DOCSIS Set-Top Gateway (DSG) tunneling parameters, use the **show cable dsg** command in privileged EXEC mode.

show cable dsg {**stats** | **tunnel**} [**vendor** *CA-vendor-nametunnel-mac-address*]

Syntax Description

stats	Displays configuration and run-time statistics about the currently-defined DSG tunnels.
tunnel	Displays the mapping of DSG tunnels to vendors or well-known MAC addresses.
vendor *CA-vendor-name*	(Optional) Displays information about a specific Conditional Access (CA) vendor. This parameter can be any arbitrary string up to 8 characters in length.
tunnel-MAC-address	(Optional) Displays information for the specified well-known MAC address for the DSG tunnel. If you specify a MAC address of 0000.0000.0000, the command displays information for all DSG tunnels, which is the default display.

Command Default

Displays information for all DSG tunnels.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7100 series and Cisco uBR7246VXR routers.
12.3(9a)BC	This command was introduced on the Cisco uBR10012 router.
12.3(13a)BC	This command is obsolete and replaced by the **show cable dsg tunnel** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows a typical display for the **show cable dsg tunnel** form of the command:

```
Router# show cable dsg tunnel

Group-ip        Src-ip          Tunnel-MAC      Interface   Packets   CA-vendor
225.2.2.2       *               0001.0002.0003  Cable3/0    1589      BBB
230.6.6.6       *               000d.000d.000d  Cable3/0    12868464  abc
230.7.7.7       *               000e.000e.000e  Cable3/0    24330138  abc
230.4.4.4       *               000b.000b.000b  Cable3/0    22008648  cisco
230.5.5.5       *               000c.000c.000c  Cable3/0    6424012   abc
229.1.1.1       *               0009.0009.0009  Cable3/0    12868440  cisco
228.1.1.1       *               0008.0008.0008  Cable3/0    6424012   cisco
230.1.1.1       *               000a.000a.000a  Cable3/0    24370812  cisco
230.8.8.8       *               000f.000f.000f  Cable3/0    23035116  abc
Router#
```

The following example shows a typical display for the **show cable dsg stats** command:

```
Router# show cable dsg stats

DSG statistics information
DSG keepalive is set
Vendor: DDD, Tunnel count: 1
Vendor: BBB, Tunnel count: 2
Vendor name is DDD, tunnel MAC is 0001.0002.0003
Group address is 226.2.2.2, source address is *
  Interface is Cable5/1,   mapping entry is used 1
    Received 5968 packets,  forwarded 5289 packets
    Dropped 679 packets,  last second rate 16878 bits/sec
Vendor name is BBB, tunnel MAC is 0009.0010.0011
Group address is 227.2.2.2, source address is *
  Interface is Cable3/0,  interface Cable3/0 is bundle master
  mapping entry is used 2
    Received 0 packets,  forwarded 0 packets
    Dropped 0 packets,  last second rate 0 bits/sec
Vendor name is CCC, tunnel MAC is 0005.0006.0007
Group address is 228.3.3.3, source address is *
  Interface is Cable5/1,   mapping entry is used 2
    Received 5970056 packets,  forwarded 400333 packets
    Dropped 5569723 packets,  last second rate 96768 bits/sec
Router#
```

The following example shows a typical display for the **show cable dsg stats** command for an individual vendor:

```
Router# show cable dsg stats vendor CCC

DSG statistics information
DSG keepalive is set
Vendor: CCC, Tunnel count: 1
Vendor name is CCC, tunnel MAC is 0005.0006.0007
Group address is 228.3.3.3, source address is *
  Interface is Cable5/1,   mapping entry is used 2
    Received 5970056 packets,  forwarded 400333 packets
    Dropped 5569723 packets,  last second rate 96768 bits/sec
Router#
```



Note The packet counters for both the **stats** and **tunnel** options for a particular DSG tunnel continue to increase as long as traffic is received over that tunnel. If the tunnel does not receive any traffic for three minutes or more, the counters are automatically reset to 0.

The following example shows a typical display for the **show cable dsg stats** command for an individual vendor when the associated cable interface is shut down. The Received, Forwarded, and Dropped counters are not displayed when an interface is shut down.

```
Router(config)# interface c5/1

Router(config-if)# shutdown

Router(config-if)# exit

Router(config)# exit

Router# show cable dsg stats vendor CCC
```

```
DSG statistics information
DSG keepalive is set
Vendor: CCC, Tunnel count: 1
Vendor name is CCC, tunnel MAC is 0005.0006.0007
Group address is 228.3.3.3, source address is *
  Interface is Cable5/1,   mapping entry is used 2
Router#
```

Table 0-1 describes the major fields shown in the **show cable dsg** command:

Table 61: show cable dsg Field Descriptions

Field	Description
DSG keepalive is set	If keepalive messages have been enabled for an IP multicast group, using the **cable dsg keepalive** command, this message is displayed.
Dest-ip, Group address	Multicast group IP address for the DSG stream.
Src-ip, Source address	Source IP address for the DSG stream. If an asterisk (*) appears as the source IP address, it indicates that the source IP address is 0.0.0.0, which allows any IP address as the source IP address.
Mapped-MAC, Tunnel-MAC	Well-known MAC address used for the DSG tunnel. If you configured the DSG tunnel with a MAC address of 0000.0000.0000 using the **cable dsg** command, this field shows the MAC address that the CMTS derived using the MAC to IP multicast addressing mapping that is specified in RFC 1112.
Interface	Cable interface on which this DSG tunnel is configured.
mapping entry is used	Number of times that this particular DSG tunnel mapping has been used to resolve the well-known MAC address from the tunnel's group address. This can be used as a very rough approximation of the number set-top boxes (STBs) that have been mapped to this DSG tunnel since the last time the counter was cleared. **Note** Use the **clear cable dsg** command to clear this counter.
Packets	Number of packets transmitted over the DSG tunnel.
CA-vendor	Name for the Conditional Access (CA) vendor that owns this tunnel.
Received	Number of packets received by the multicast group. This counter includes all interfaces that are receiving traffic for the multicast group. The field is not shown when an interface is shut down, but the counter continues to increase as long as the multicast group is receiving traffic. When the interface is reenabled, the counter shows the latest number of packets received.
Forwarded	Number of packets forwarded on the cable interface for the multicast group. This counter is reset to 0 whenever an interface is shut down and reenabled. The field is not shown when an interface is shut down.

Field	Description
Dropped	Number of packets that were dropped that were for the multicast group. This counter includes all interfaces that are receiving traffic for the multicast group. The field is not shown when an interface is shut down, but the counter continues to increase as long as the multicast group is receiving traffic and dropping packets. When the interface is reenabled, the counter shows the latest number of packets dropped.



Note The Received and Dropped counters reflect activity for the multicast group and are not affected when a cable interface is shut down and reenabled, as long as the multicast group continues to receive traffic. The Forwarded counter reflects activity for the particular cable interface and is reset to zero whenever the interface is shut down and reenabled. All packet counters are also automatically reset to zero if the DSG tunnel does not receive traffic for three minutes or more.

Related Commands

Command	Description
cable dsg	Enables the DOCSIS Set-Top Gateway (DSG) on a cable interface, and configures its tunnel-mapping parameters.
cable dsg keepalive	Enables keepalive messages over DOCSIS Set-Top Gateway (DSG) tunnels on a cable interface.
clear cable dsg	Resets counters related to DOCSIS Set-Top Gateway (DSG) tunnels.
debug cable dsg	Enables the display of debugging messages for the operation of the DOCSIS Set-Top Gateway (DSG) feature.

show cable dsg cfr

To display DOCSIS Set-Top Gateway (DSG) classifier details, such as the classifier state, source, and destination IP addresses, use the **show cable dsg cfr** command in privileged EXEC mode.

show cable dsg cfr [*index*] [**verbose**]

Syntax Description

index	DSG classifier identification. The valid range is from 1 to 65535.
verbose	Provides detailed output for DSG classifiers.

Command Default

Displays details of all DSG classifiers.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable dsg cfr** command that shows details of all DSG classifiers:

```
Router# show cable dsg cfr
cfr id state resolved applied conflict dest-ip           src-ip
------------------------------------ ----------------- -----------------
1000   en    yes      yes     no       232.10.10.0       dsg-server-a
                                                         (40.0.0.30)
1010   en    yes      yes     no       232.10.10.10      dsg-server-b
                                                         (40.0.0.40)
2000   en    yes      yes     no       232.10.11.0       dsg-server-c
                                                         (40.0.0.50)
2010   en    no       no      no       232.10.11.10      non-exist-hostnam
                                                         (----)
```

The following is a sample output of the **show cable dsg cfr** command that shows details of a specified DSG classifier:

```
Router# show cable dsg cfr 1010
cfr id state resolved applied conflict dest-ip           src-ip
------------------------------------ ----------------- ---------------
1010   en    yes      yes     no       232.10.10.10      dsg-server-b
                                                         (40.0.0.40)
```

The following is a sample output of the **show cable dsg cfr** command with the verbose keyword that shows detailed output for all DSG classifiers:

```
Router# show cable dsg cfr verbose
Cfr Id                    : 1000
State                     : enable
```

```
Resolved                : yes
Applied                 : yes
Conflict                : no
Conflict Cfr Id         : --
Error Code              : 0(DSG_CFR_ERR_NONE)
Tunnel Id               : 1000
Dest Hostname           : ----
Dest Hostname IP        : ----
Dest IP                 : 232.10.10.0
Src Hostname            : dsg-server-a
Src Hostname IP         : 40.0.0.30
Src IP                  : 40.0.0.30
Src Prefix Length       : 32
Dest Port Start         : 2000
Dest Port End           : 13821
Priority                : 1
In DCD                  : yes
Forwarded               : 0
Received                : 0
Cfr Id                  : 1010
State                   : enable
Resolved                : yes
Applied                 : yes
Conflict                : no
Conflict Cfr Id         : --
Error Code              : 0(DSG_CFR_ERR_NONE)
Tunnel Id               : 1010
Dest Hostname           : ----
Dest Hostname IP        : ----
Dest IP                 : 232.10.10.10
Src Hostname            : dsg-server-b
Src Hostname IP         : 40.0.0.40
Src IP                  : 40.0.0.40
Src Prefix Length       : 32
Dest Port Start         : 2000
Dest Port End           : 13821
Priority                : 1
In DCD                  : yes
Forwarded               : 0
Received                : 0
Cfr Id                  : 2000
State                   : enable
Resolved                : yes
Applied                 : yes
Conflict                : no
Conflict Cfr Id         : --
Error Code              : 0(DSG_CFR_ERR_NONE)
Tunnel Id               : 2000
Dest Hostname           : ----
Dest Hostname IP        : ----
Dest IP                 : 232.10.11.0
Src Hostname            : dsg-server-c
Src Hostname IP         : 40.0.0.50
Src IP                  : 40.0.0.50
Src Prefix Length       : 32
Dest Port Start         : 13822
Dest Port End           : 13822
Priority                : 1
In DCD                  : yes
Forwarded               : 0
Received                : 0
Cfr Id                  : 2010
State                   : enable
Resolved                : no
```

```
Applied                 : no
Conflict                : no
Conflict Cfr Id         : --
Error Code              : 0(DSG_CFR_ERR_NONE)
Tunnel Id               : 2010
Dest Hostname           : ----
Dest Hostname IP        : ----
Dest IP                 : 232.10.11.10
Src Hostname            : non-exist-hostname
Src Hostname IP         : ----
Src IP                  : 0.0.0.0
Src Prefix Length       : 32
Dest Port Start         : 2000
Dest Port End           : 13821
Priority                : 1
In DCD                  : yes
Forwarded               : 0
Received                : 0
Cfr Id                  : 3000
State                   : enable
Resolved                : yes
Applied                 : yes
Conflict                : no
Conflict Cfr Id         : --
Error Code              : 0(DSG_CFR_ERR_NONE)
Tunnel Id               : 3000
Dest Hostname           : ----
Dest Hostname IP        : ----
Dest IP                 : 239.10.11.11
Src Hostname            : ----
Src Hostname IP         : ----
Src IP                  : 0.0.0.0
Src Prefix Length       : 32
Dest Port Start         : 2000
Dest Port End           : 13821
Priority                : 1
In DCD                  : yes
Forwarded               : 0
Received                : 0
```

The following is a sample output of the **show cable dsg cfr** command with the verbose keyword that shows detailed output for a single DSG classifier:

```
Router# show cable dsg cfr 1010 verbose
Cfr Id                  : 1010
State                   : enable
Resolved                : yes
Applied                 : yes
Conflict                : no
Conflict Cfr Id         : --
Error Code              : 0(DSG_CFR_ERR_NONE)
Tunnel Id               : 1010
Dest Hostname           : ----
Dest Hostname IP        : ----
Dest IP                 : 232.10.10.10
Src Hostname            : dsg-server-b
Src Hostname IP         : 40.0.0.40
Src IP                  : 40.0.0.40
Src Prefix Length       : 32
Dest Port Start         : 2000
Dest Port End           : 13821
Priority                : 1
In DCD                  : yes
```

```
Forwarded                : 0
Received                 : 0
```

This table describes the significant fields shown in the **show cable dsg cfr** command display:

Table 62: show cable dsg cfr Field Description

Field	Description
cfr id	DSG classifier ID.
state	DSG classifier state shown either as “enable” or “disable.”
resolved	Indicates whether the destination and source IP addresses of a hostname are resolved or not.
applied	Indicates that a hostname is configured without any error.
conflict	Indicates that the IP address of the hostname is changed after the hostname is configured, and the DSG classifier cannot be updated due to an error.
dest-ip	IP address configured as the destination IP address or the resolved hostname IP address. This IP address might differ from the destination hostname IP address if the classifier is not applied or in a conflict state.
src-ip	IP address configured as the source IP address or the resolved hostname IP address. This IP address might differ from the source hostname IP address if the classifier is not applied or in a conflict state.
Conflict Cfr Id	Indicates the classifier ID that conflicts with the new classifier due to an identical MAC address or classifier ID.
Error Code	Indicates why the classifier is resolved but cannot be applied.
Tunnel Id	DSG tunnel ID.
Dest Hostname	The hostname configured as the destination IP address.
Dest Hostname IP	Resolved IP address of the destination hostname.
Src Hostname	The hostname configured as the source IP address.
Src Hostname IP	Resolved IP address of the source hostname.
Src Prefix Length	Source prefix length of the source IP address.
Dest Port Start	Start range for the Destination TCP/UDP port.
Dest Port End	End range for the Destination TCP/UDP port.
Priority	DSG classifier priority.
In DCD	Indicates whether the DSG classifier is included or excluded from the downstream channel descriptor (DCD) message.
Forwarded	Forwarded statistics.

Field	Description
Received	Received statistics.

Related Commands

Command	Description
show cable dsg host	Displays the mapping of the DSG host names and IP addresses on the Cisco CMTS router.

show cable dsg host

To display the mapping of the hostnames and IP addresses on a Cisco CMTS router, use the **show cable dsg host** command in privileged EXEC mode.

show cable dsg host [**verbose**]

Syntax Description

verbose	Provides verbose description on the mapping of the hostnames and IP addresses.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The show cable dsg host command is used for debugging of host IP addresses.

Examples

The following is a sample output of the **show cable dsg host** command that shows the mapping of the host names and IP addresses on a Cisco CMTS router:

```
Router# show cable dsg host
Host              IP Address      Reference  Last Update Time
dsgserver1        232.1.1.10      2          21:41 08/01/2011
dsgserver2        234.3.2.1       1          21:41 08/01/2011
dsgserver3        ----            1          never
dsgserver4        ----            1          never
dsgserver5        ----            1          never
dsgserver6        235.5.5.5       1          21:41 08/01/2011
dsgserver7        235.0.0.2       1          21:41 08/01/2011
```

The following is a sample output of the **show cable dsg host** command with the **verbose** keyword on a Cisco CMTS router:

```
Router# show cable dsg host verbose
Host                    IP Address      Reference  Last Update Time
dsgserver1       232.1.1.10      2          21:41 08/01/2011
  Cfrs:
  cable dsg cfr 2 dest-ip 232.1.1.125 tunnel 1 priority 0 src-ip a.b.c.d d...
  cable dsg cfr 3 dest-ip 232.1.1.125 tunnel 1 priority 10 src-ip a.b.c.d ...
dsgserver2       234.3.2.1       1          21:41 08/01/2011
  Cfrs:
  cable dsg cfr 4 dest-ip aaabbccc priority 0 src-ip cccdddeee disable
dsgserver3       ----     1          never
  Cfrs:
  cable dsg cfr 4 dest-ip aaabbccc priority 0 src-ip cccdddeee disable
dsgserver4       235.0.0.2       1          21:41 08/01/2011
  Cfrs:
  cable dsg cfr 24 dest-ip g2 priority 0 disable
dsgserver5        235.0.0.3       1          21:41 08/01/2011
```

```
Cfrs:
cable dsg cfr 30 dest-ip g3 tunnel 1 priority 0 disable
```

This table describes the significant fields shown in the **show cable dsg host** command display:

Table 63: show cable dsg host Field Description

Field	Description
Host	Hostname of the DSG classifier.
IP Address	IP address that is mapped to the hostname.
Reference	DSG classifiers that use the host as a fully-qualified domain name (FQDN).
Last Update Time	Last updated time of the DSG server.

Related Commands

Command	Description
show cable dsg cfr	Displays DSG classifier details.

show cable dsg static-group bundle

To display details of the DOCSIS Set-Top Gateway (DSG) static groups configured under a bundle interface, use the **show cable dsg static-group bundle** command in privileged EXEC mode.

show cable dsg static-group bundle *index*

Syntax Description

index	Bundle interface number. The valid range is from 1 to 255.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The IGMP static group IP address created automatically under a bundle interface at the time of DSG configuration is not displayed in the **show running-config interface command output i**n Cisco IOS Release 12.2(33)SCG and later. To display the DSG static groups configured under a bundle interface, use the **show cable dsg static-group bundle** command in privileged EXEC mode **i**n Cisco IOS Release 12.2(33)SCG and later.

Examples

The following is a sample output of the show cable dsg static-group bundle command that lists the DSG static groups configured under a bundle interface on the Cisco uBR10012 router:

```
Router# show cable dsg static-group bundle 2
Bundle Interface     Group           Source
Bundle2              228.0.0.1       0.0.0.0
Bundle2              228.0.0.1       1.2.3.4
Bundle2              232.1.1.1       2.3.4.5
```

This table describes the significant fields shown in the **show cable dsg static-group bundle command** display:

Table 64: show cable dsg static-group bundle Command Field Description

Field	Description
Bundle Interface	Bundle interface number.
Group	DSG static group configured under the specified bundle interface.
Source	SSM source address.

Related Commands

Command	Description
cable dsg cfr	Enables Advanced-mode DOCSIS Set-Top Gateway (A-DSG) classifiers on the Cisco CMTS router.

show cable dsg tg

To display information about the Advanced-mode DOCSIS Set-top Gateway (A-DSG) tunnel group configuration on a Cisco CMTS router, use the show cable dsg tg command in privileged EXEC mode.

show cable dsg tg [*tunnel-group-id* {**channel** *channel-id*} [**verbose**]

Syntax Description

tunnel-group-id	(Optional) Alphanumeric identifier for a specified tunnel group.
channel *channel-id*	Specifies the DSG tunnel group channel identifier.
verbose	(Optional) Displays DSG tunnel group detail information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(17a)BC	This command was introduced to support A-DSG on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD5	This command was modified. The output of the **show cable dsg tg** command was changed.
12.2(33)SCG	The command output was changed.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS-XE Gibraltar 16.10.1f	This command was enahnaced to support DSG configuration under mac-domain with OPS md-profile.

Usage Guidelines

This command displays information about all DSG tunnel groups. Beginning with Cisco IOS Release 12.2(33)SCG, the “TG state” field in the **show cable dsg tg** command output was replaced by “Channel state” to indicate that a channel belonging to a tunnel group is either enabled or disabled. It is possible that a tunnel group is enabled but a particular channel in that tunnel group is disabled.

Examples

The following is a sample output from the **show cable dsg tg** command with the configured parameters for all DSG tunnel groups in Cisco IOS Release 12.2(33)SCG and later:

```
Router# show cable dsg tg
TG    Chan  Chan         Rule Vendor UCID
id    id    state I/F    pri  Param  list
----- ----- ----- ------ ---- ------ ---------------
10    1     en    C6/0   0
```

```
10    2     en    C6/0   0
10    3     en    C6/1   0
10    4     en           0
10    5     en           0
10    6     en           0
```

The following is a sample output from the **show cable dsg tg** command with the configured parameters for all DSG tunnel groups in Cisco IOS Release 12.2(33)SCE and earlier:

```
Router# show cable dsg tg
TG    Chan  TG           Rule Vendor UCID
id    id    state I/F    pri  Param  list
1     1     en    C5/0   16   1      1 2 3 4
1     2     en           0
2     1     en    C5/0   11   2
                  C5/1
2     2     en           0
```

The following is a sample output from the **show cable dsg tg** command with the configured parameters for all DSG tunnel groups in Cisco cBR 16.10.1f and later:

```
Router# show cable dsg tg
TG     Chan  TG              Rule  Vendor UCID     Service-group   Profile
id     id    state  I/F        pri  Param  list      profile        chan state
------ ------ ------- ---------- ------ -------- ------ ------------------ -------------
2000    1     en    C1/0/0     0                       SG1              en
4500    1     en    C1/0/0     2     2      1 2        SG1              dis
4500    2     en               0                        -                -
```

The following is a sample output from the **show cable dsg tg 1 channel 1** command with the configured parameters for all DSG tunnel groups for the specified tunnel group and channel.

```
Router# show cable dsg tg 1 channel 1
TG    Chan  Chan        Rule Vendor UCID
id    id    state I/F    pri  Param  list
1     1     en    C5/0   16   1      1 2 3 4
```

The following is a sample output from the **show cable dsg tg 1 channel 1 verbose** command with the detailed information for the specified tunnel group.

```
Router# show cable dsg tg 1 channel 1 verbose
TG: 1     Chan: 1     state: en pri: 16 Vendor: 1     UCID: 1 2 3 4
          rule        tunnel                    cfr                       clients
 I/F    id state id state mac-addr       id  state dest-ip         In-DCD listId
 C7/0/0 1     en 1     en 0101.5e01.0001 1      en 230.1.0.1       yes    1
                                         6      en 231.1.1.6       no
                                         7      en 231.1.1.7       no
                                         8      en 231.1.1.8       no
        2     en 2     en 0101.5e01.0002 2      en 230.1.0.2       yes    2
        3     en 3     en 0101.5e01.0003 3      en 230.1.0.3       yes    3
```

The following is sample output of the **show cable dsg tg** command that displays the ignore option, introduced in Cisco IOS Release 12.2(33)SCD5, under the 'In DCD' column.

```
Router# show cable dsg tg 1 channel 1 verbose
TG: 1     Chan: 1     state: en pri: 16 Vendor: 1     UCID: 1 2 3 4
          rule        tunnel                    cfr                       clients
 I/F    id state id state mac-addr       id  state dest-ip         In-DCD listId
------ -------- ----------------------- ------------------------- --- -------
```

```
C7/0/0 1     en 1     en 0101.5e01.0001 1      en 230.1.0.1       ign    1
                                        6      en 231.1.1.6       no
                                        7      en 231.1.1.7       no
                                        8      en 231.1.1.8       no
       2     en 2     en 0101.5e01.0002 2      en 230.1.0.2       yes    2
       3     en 3     en 0101.5e01.0003 3      en 230.1.0.3       yes    3
```

Table 1 describes the significant fields shown in the output.

Table 65: show cable dsg tg Field Descriptions

Field	Description
TG id	Tunnel group identifier.
Chan id	Channel identifier.
TG state	Current state of the cable interface.
Chan state	Current state of the channel (enabled or disabled).
pri	Traffic priority parameter.
Vendor	Vendor name.
UCID	Upstream channel identifier.
I/F	Interface.
rule id	Rule identifier.
tunnel state	Tunnel state.
mac-addr	MAC address.
cfr state	Classifier state.
dest-ip	Destination IP address.
In-DCD	Downstream channel descriptor.
clients listId	Client list identifier.

Related Commands

Command	Description
debug cable dsg	Enables general, DCD, or packet-related debugging.
show cable dsg tunnel	Displays information about A-DSG tunnel configuration on a Cisco CMTS router.
show interface	Displays general interface information for the specified or all interfaces.
show interface cable dsg downstream	Displays A-DSG configuration and status information for downstream interfaces.

show cable dsg tunnel

To display information about Advanced-mode DOCSIS Set-top Gateway (A-DSG) tunnel configuration on a Cisco CMTS router, use the show cable dsg tunnel command in privileged EXEC mode.

show cable dsg tunnel *tunnel-id* [**cfrs** | **clients** | **interfaces** | **statistics** | **verbose**]

Syntax Description

tunnel-id	(Optional) Alphanumeric identifier for a specified tunnel.
cfrs	Show DSG tunnel classifiers.
clients	Show DSG tunnel clients.
interfaces	Show DSG tunnel interfaces.
statistics	Show DSG tunnel statistics.
verbose	Show DSG tunnel detail information.

Command Default

No default behaviors or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.3(17a)BC	The output was modified to support A-DSG 1.2. • The "TG id" field was added to the **show cable dsg tunnel** and **verbose** forms of the command. • The "State" and "MAC Addr" fields switched places in the **show cable dsg tunnel verbose** form of the command. • The "vendor group" field was added to the **show cable dsg tunnel clients** form of the command.
12.2SB	This command was integrated into Cisco IOS Release 12.2SB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command replaces the **show cable dsg** form of command available in Cisco IOS Release 12.3(9a)BC.

Examples

The following example displays CLI help for show cable dsg tunnel command syntax.

```
Router# show cable dsg tunnel 1 ?
cfrs        Show DSG tunnel classifiers
clients     Show DSG tunnel clients
```

```
interfaces  Show DSG tunnel interfaces
statistics  Show DSG tunnel statistics
verbose     Show DSG tunnel detail information
|           Output modifiers
<cr>
```

Examples: Displaying information about all A-DSG Tunnels

The following command displays tunnel MAC address, state, associated classifiers, and state information for Advanced-mode DSG version 1.1 tunnels on a Cisco CMTS router. This output was changed in Cisco IOS Release 12.3(17a)BC for A-DSG version 1.2 (see following example).

```
Router# show cable dsg tunnel
tunnel tunnel tunnel          cfr  cfr   tunnel in  rule rule  client service
id     state  mac-addr        id   state interface  id   state listId class
1      en     0100.5e01.0114  1    en    Cable6/0   1    en    2      SI
                              5    en                7    en    10
                              11   en                8    en    2
                              14   en                20   en    2
                                        Cable6/1   1    en    4
                                                   3    en    3
                                                   4    en    4
                                                   11   en    2
2      en     0100.5e01.011e  2    en    Cable6/0   2    en    2      NDS-CA
                              10   en
3      en     0100.5e01.0128  3    en    Cable6/0   3    en    3      NDS-APP
4      en     0100.5e01.0132  4    en    Cable6/0   4    en    4      MOTO-CA
5      en     0100.5e01.013c  9    en    Cable6/0   5    en    5      MOTO-APP
                                        Cable6/1   5    en    5
6      dis    0100.5e01.0146            Cable6/0   6    en    6      SA-CA
                                        Cable6/1   6    en    6
7      dis    0100.5e01.0150  7    en    Cable6/1   8    en    7      SA-APP
                              13   dis
8      en     0100.5e01.0119  8    en                                  NDS-DNLD
9      en     0100.5e01.0133                                         MOTO-DNLD
10     en     0100.5e01.0147                                         SA-DNLD
11     en     2222.2222.2222
12     en     3333.3333.3333  12   en
```

Beginning in Cisco IOS Release 12.3(17a)BC, this output was modified to add the tunnel group ID ("TG id") field in support of A-DSG version 1.2 as shown below:

```
Router# show cable dsg tunnel
     tunnel              TG
      cfr     tunnel   rule   client service
id  state mac-addr       id
    id  state I/F    id state listId class
1      en 0100.5e01.0001 1     1      en C5/0   1     en 1      DSG-Rate1
                               6      en
                               7      en
                               8      en
2      en 0100.5e01.0002 1     2      en C5/0   2     en 2
3      en 0100.5e01.0003 1     3      en C5/0   3     en 3
4      en 0002.0002.0001 2     4      en C5/0   4     en 1
                                     C5/1   1     en 1
5      en 0002.0002.0002 2     5      en C5/0   5     en 2      DSG-Rate2
                                     C5/1   2     en 2
6      en 0002.0002.0003 2     9      en C5/0   6     en 21
                                     C5/1   3     en 21
```

Examples: Displaying Information for a Specified A-DSG Tunnel

The following example displays the same information as the **show cable dsg tunnel** command, but for a specified tunnel. The following example shows sample output for A-DSG version 1.1. This output was changed in Cisco IOS Release 12.3(17a)BC for A-DSG version 1.2 (see following example).

```
Router# show cable dsg tunnel 1
tunnel tunnel tunnel          cfr  cfr   tunnel in  rule rule  client service
id     state  mac-addr        id   state interface  id   state listId class
1      en     0100.5e01.0114  1    en    Cable6/0   1    en    2      SI
                              5    en               7    en    10
                              11   en               8    en    2
                              14   en               20   en    2
                                         Cable6/1   1    en    4
                                                    3    en    3
                                                    4    en    4
                                                    11   en    2
```

Beginning in Cisco IOS Release 12.3(17a)BC, this output was modified to add the tunnel group ID ("TG id") field in support of A-DSG version 1.2 as shown below:

```
Router# show cable dsg tunnel 1
     tunnel              TG
      cfr     tunnel   rule   client service
id  state mac-addr       id
    id  state I/F    id state listId class
1      en 0100.5e01.0001 1     1      en C5/0   1     en 1      DSG-Rate1
                               6      en
                               7      en
                               8      en
```

Examples: Displaying Information for A-DSG Tunnel Classifiers

The following example displays detailed information about all A-DSG classifiers associated with the specified tunnel.

```
Router# show cable dsg tunnel 1 cfrs
tunnel cfr   cfr   cfr destination ip   source ip        srcPre d_port d_port
id     id    state pri address          address          length start  end
1      1     en    1   230.1.1.20       0.0.0.0          32     0      65535
       5     en    1   230.1.1.60       0.0.0.0          32     0      65535
       11    en    1   224.25.25.134    0.0.0.0          32     0      65535
       14    en    0   230.1.1.20       0.0.0.0          32     1000   2000
```

Examples: Displaying Information for A-DSG Tunnel Clients

The following example displays detailed information about all the clients associated with the specified tunnel for A-DSG version 1.1. This output was changed in Cisco IOS Release 12.3(17a)BC for A-DSG version 1.2 (see following example).

```
Router# show cable dsg tunnel 1 clients
tunnel client client client          client
id     listId id     id type         address
```

```
1       2       1       CA System ID    0X951
                3       Broadcast
                8       MAC Addr        1111.1111.1111
        3       1       Application ID  0X1
        4       1       CA System ID    0X701
        10      1       Application ID  0X6
```

Beginning in Cisco IOS Release 12.3(17a)BC, this output was modified to add the “vendor group” field in support of A-DSG version 1.2 as shown below:

```
Router# show cable dsg tunnel 1 clients
tunnel client client client          client          vendor
id     listId id     id type         address         group
1      1      1      MAC Addr        0100.5e00.0001
              2      Application ID  0x0951
              3      Broadcast       Unspecified
              4      Broadcast       4
```

Examples: Displaying Information for A-DSG Tunnel Interfaces

The following example displays all the interfaces and rules associated with a specified tunnel.

```
Router# show cable dsg tunnel 1 interfaces
tunnel downstream   rule
id     interface    id
1      Cable6/0     1   7   8   20
       Cable6/1     1   3   4   11
```

Examples: Displaying Information for A-DSG Tunnel Statistics

The following example displays the packets statistics information about the specified tunnel.

```
Router# sh cab dsg tunnel 1 statistics
tunnel cfr   cfr   destination ip   source ip        total      total
id     id    state address          address          forwarded  received
1      1     en    230.1.1.20       0.0.0.0          0          0
       5     en    230.1.1.60       0.0.0.0          0          0
       11    en    224.25.25.134    0.0.0.0          0          0
       14    en    230.1.1.20       0.0.0.0          0          0
```

Examples: Displaying Detailed Information for a Specified A-DSG Tunnel

The following example shows all the detailed information about a specified tunnel for A-DSG version 1.1. This output was changed in Cisco IOS Release 12.3(17a)BC for A-DSG version 1.2 (see following example).

```
Router# show cable dsg tunnel 1 verbose
Tunnel ID                    : 1
MAC Addr                     : 0100.5e01.0114
State                        : enable
Cfr Id                       : 1
State                        : enable
Priority                     : 1
Dest IP                      : 230.1.1.20
Src IP                       : 0.0.0.0
```

```
Src Prefix Length            : 32
Dest Port Start              : 0
Dest Port End                : 65535
Forwarded                    : 0
Received                     : 0
Cfr Id                       : 5
State                        : enable
Priority                     : 1
Dest IP                      : 230.1.1.60
Src IP                       : 0.0.0.0
Src Prefix Length            : 32
Dest Port Start              : 0
Dest Port End                : 65535
Forwarded                    : 0
Received                     : 0
Cfr Id                       : 11
State                        : enable
Priority                     : 1
Dest IP                      : 224.25.25.134
Src IP                       : 0.0.0.0
Src Prefix Length            : 32
Dest Port Start              : 0
Dest Port End                : 65535
Forwarded                    : 0
Received                     : 0
Cfr Id                       : 14
State                        : enable
Priority                     : 0
Dest IP                      : 230.1.1.20
Src IP                       : 0.0.0.0
Src Prefix Length            : 32
Dest Port Start              : 1000
Dest Port End                : 2000
Forwarded                    : 0
Received                     : 0
Client List Id               : 2
Client Id                    : 1
Client Id Type               : CA System ID: 0951
Client Id                    : 3
Client Id Type               : Broadcast
Client Id                    : 8
Client Id Type               : MAC Addr: 1111.1111.1111
Client List Id               : 3
Client Id                    : 1
Client Id Type               : Application ID: 0001
Client List Id               : 4
Client Id                    : 1
Client Id Type               : CA System ID: 0701
Client List Id               : 10
Client Id                    : 1
Client Id Type               : Application ID: 0006
Interface                    : Cable6/0
Rule Id                      : 1
Rule Id                      : 7
Rule Id                      : 8
Rule Id                      : 20
Interface                    : Cable6/1
Rule Id                      : 1
Rule Id                      : 3
Rule Id                      : 4
Rule Id                      : 11
```

Beginning in Cisco IOS Release 12.3(17a)BC, this output was modified to add the “TG id” field in support of A-DSG version 1.2. The “State” and “MAC Addr” fields also switched positions in the output.

```
Router# show cable dsg tunnel 1 verbose

Tunnel ID                                       : 1
State                                           : enable
MAC Addr                                        : 0100.5e01.0001
TG Id                                           : 1
Cfr Id                                          : 1
State                                           : enable
Priority                                        : 0
Dest IP                                         : 230.1.0.1
Src IP                                          : 0.0.0.0
Src Prefix Length                               : 32
Dest Port Start                                 : 0
Dest Port End                                   : 65535
Forwarded                                       : 0
Received                                        : 0
Cfr Id                                          : 6
State                                           : enable
Priority                                        : 0
Dest IP                                         : 231.1.1.6
Src IP                                          : 0.0.0.0
Src Prefix Length                               : 32
Dest Port Start                                 : 0
Dest Port End                                   : 65535
Forwarded                                       : 0
Received                                        : 0
Cfr Id                                          : 7
State                                           : enable
Priority                                        : 0
Dest IP                                         : 231.1.1.7
Src IP                                          : 0.0.0.0
Src Prefix Length                               : 32
Dest Port Start                                 : 0
Dest Port End                                   : 65535
Forwarded                                       : 0
Received                                        : 0
Cfr Id                                          : 8
State                                           : enable
Priority                                        : 0
Dest IP                                         : 231.1.1.8
Src IP                                          : 0.0.0.0
Src Prefix Length                               : 32
Dest Port Start                                 : 0
Dest Port End                                   : 65535
Forwarded                                       : 0
Received                                        : 0
Client List Id                                  : 1
Client Id                                       : 1
Client Id Type                                  : MAC Addr        0100.5e00.0001
Client Id                                       : 2
Client Id Type                                  : Application ID  0x0951
Client Id                                       : 3
Client Id Type                                  : Broadcast       Unspecified
Client Id                                       : 4
Client Id Type                                  : Broadcast       4
Interface                                       : Cable5/0
Rule Id                                         : 1
```

Related Commands

Command	Description
debug cable dsg	Enables general, DCD or packet-related debugging.
show cable dsg tg	Displays information about A-DSG tunnel groups on a Cisco CMTS router.
show interface	Displays general interface information for the specified or all interfaces.
show interface cable dsg downstream	Displays A-DSG configuration and status information for downstream interfaces.

show cable dynamic-qos trace

To display the number of subscribers for whom call trace is enabled on the Cisco CMTS router, use the **show cable dynamic-qos trace** command in privileged EXEC mode.

show cable dynamic-qos trace

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS Release 12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The output of the command was changed.

Usage Guidelines

Use the **show cable dynamic-qos trace** command after enabling the call trace functionality for PacketCable or PacketCable Multimedia (PCMM) service subscribers using the **cable dynamic-qos trace** command.

Examples

The following is a sample output of the **show cable dynamic-qos trace** command that shows the number of subscribers for whom call trace is enabled on the Cisco uBR10012 router in Cisco IOS Release 12.2(33)SCF:

```
Router# show cable dynamic-qos trace
Total number of subscribers: 0
Max configured number of subscribers: 12
```

The following is a sample output of the **show cable dynamic-qos trace** command that shows the number of subscribers for whom call trace is enabled on the Cisco cBR-8 router:

```
Router# show cable dynamic-qos trace
Total number of subscribers: 0
```

This table describes the significant fields shown in the show packetcable cms command display.

Table 66: show packetcable cms Field Descriptions

Field	Description
Total number of subscribers	Number of subscribers for whom call trace is enabled. The number ranges from 0 to the maximum configured number of subscribers.
Max configured number of subscribers	Maximum number of subscribers for whom call trace can be enabled at any point of time.

Related Commands

Command	Description
cable dynamic-qos trace	Enables the call trace functionality on the Cisco CMTS router for PacketCable or PCMM service subscribers.
debug cable dynamic-qos subscriber	Enables debugging of the call trace functionality on the Cisco CMTS router for a particular subscriber.
debug cable dynamic-qos trace	Enables call trace debugging on the Cisco CMTS router for all the subscribers for whom call trace is configured.

show cable dynamic-bonding-group

To display the details of the dynamically created bonding groups, use the **show cable dynamic-bonding-group** command in privileged EXEC mode.

show cable dynamic-bonding-group [**quota**] [**reclaim-history**] **summary** *slot/subslot/controller*

Syntax Description

quota	Shows the usage of bonding group resource.
reclaim-history	Shows the the reclaimed bonding group
slot/subslot/controller	Modular cable line card slot, subslot, and controller. • slot—Modular cable line card slot. • subslot—Modular cable line card subslot. • controller—Modular cable line card controller.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 16.7.1a	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable dynamic-bonding-group** command to check the dynamic bonding group configuration details.

Examples

The following is a sample output of the **show cable dynamic-bonding-group summary** command that shows the details of the dynamically created bonding groups:

```
Router# show cable dynamic-bonding-group summary
Dynamic bonding group: Enable
DBG operation with Registration: Enable
DBG operation with Load-Balance: Enable
BG ID BG Name   BG Size CMs ServFlows Create Time   Create Client BG State     RFid list
33026 Wi6/0/1:1 33      2   2         Dec 22 16:03  MODEM_ONLINE  OPERATIONAL  33024-33055
33282 Wi6/0/2:1 33      2   2         Dec 22 16:05  MODEM_ONLINE  OPERATIONAL  33280-33311
```

The following is a sample output of the **show cable dynamic-bonding-group slot** command:

```
Router# show cable dynamic-bonding-group slot 6
Dynamic bonding group: Enable
BG ID BG Name    BG Size  CMs ServFlows Create Time  Create Client BG State     RFid list
33026 Wi6/0/1:1  33       2   2         Dec 22 16:03 MODEM_ONLINE  OPERATIONAL  33024-33055
33282 Wi6/0/2:1  33       2   2         Dec 22 16:05 MODEM_ONLINE  OPERATIONAL  33280-33311
```

The following is a sample output of the **show cable dynamic-bonding-group controller** command:

```
Router# show cable dynamic-bonding-group controller 6/0/1
Dynamic bonding group: Enable
```

```
BG ID BG Name   BG Size CMs ServFlows Create Time  Create Client BG State    RFid list
33026 Wi6/0/1:1 33      2   2         Dec 22 16:03 MODEM_ONLINE  OPERATIONAL 33024-33055

Router# show cable dynamic-bonding-group controller 6/0/2
Dynamic bonding group: Enable
BG ID BG Name   BG Size CMs ServFlows Create Time  Create Client BG State     RFid list
33282 Wi6/0/2:1 33      2   2         Dec 22 16:05 MODEM_ONLINE  OPERATIONAL  33280-3331
```

The following is a sample output of the **show cable dynamic-bonding-group quota controller** command that shows the usage of bonding group resource:

```
Router# show cable dynamic-bonding-group quota controller 6/0/2
slot/subslot/ctrlr: 6/0/2
  Total BG number: 128
  Used BG number (static/dynamic): 2(1/1)
  Available BG number: 126
  Available BG list port: 2-127

Router# show cable dynamic-bonding-group quota controller 6/0/1
slot/subslot/ctrlr: 6/0/1
  Total BG number: 128
  Used BG number (static/dynamic): 2(1/1)
  Available BG number: 126
  Available BG list port: 2-127
```

The following is a sample output of the **show cable dynamic-bonding-group quota slot** command:

```
tb32-cbr8#show cable dynamic-bonding-group quota slot 6
slot/subslot/ctrlr: 6/0/0
  Total BG number: 128
  Used BG number (static/dynamic): 4(4/0)
  Available BG number: 124
  Available BG list port: 4-127
slot/subslot/ctrlr: 6/0/1
  Total BG number: 128
  Used BG number (static/dynamic): 2(1/1)
  Available BG number: 126
  Available BG list port: 2-127
slot/subslot/ctrlr: 6/0/2
  Total BG number: 128
  Used BG number (static/dynamic): 2(1/1)
  Available BG number: 126
  Available BG list port: 2-127
slot/subslot/ctrlr: 6/0/3
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/4
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/5
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/6
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/7
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
```

```
  Available BG number: 127
  Available BG list port: 1-127
```

The following is a sample output of the **show cable dynamic-bonding-group quota summary** command:

```
Router# show cable dynamic-bonding-group quota summary
Available DSBG Interface:
slot/subslot/ctrlr: 6/0/0
  Total BG number: 128
  Used BG number (static/dynamic): 4(4/0)
  Available BG number: 124
  Available BG list port: 4-127
slot/subslot/ctrlr: 6/0/1
  Total BG number: 128
  Used BG number (static/dynamic): 2(1/1)
  Available BG number: 126
  Available BG list port: 2-127
slot/subslot/ctrlr: 6/0/2
  Total BG number: 128
  Used BG number (static/dynamic): 2(1/1)
  Available BG number: 126
  Available BG list port: 2-127
slot/subslot/ctrlr: 6/0/3
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/4
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/5
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/6
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 6/0/7
  Total BG number: 128
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 127
  Available BG list port: 1-127
slot/subslot/ctrlr: 7/0/0
  Total BG number: 64
  Used BG number (static/dynamic): 2(2/0)
  Available BG number: 62
  Available BG list port: 2-63
slot/subslot/ctrlr: 7/0/1
  Total BG number: 64
  Used BG number (static/dynamic): 1(1/0)
  Available BG number: 63
  Available BG list port: 1-63
slot/subslot/ctrlr: 7/0/2
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/3
```

```
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/4
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/5
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/6
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/7
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/8
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/9
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/10
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/11
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/12
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/13
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/14
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/15
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
```

```
slot/subslot/ctrlr: 7/0/16
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/17
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/18
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/19
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/20
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/21
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/22
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/23
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/24
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/25
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/26
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/27
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/28
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
```

```
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/29
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/30
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
slot/subslot/ctrlr: 7/0/31
  Total BG number: 64
  Used BG number (static/dynamic): 0(0/0)
  Available BG number: 64
  Available BG list port: 0-63
```

The following is a sample output of the **show cable dynamic-bonding-group reclaim-history summary** command that shows the the reclaimed bonding group:

```
Router# show cable dynamic-bonding-group reclaim-history summary
BG ID BG Name   BG Size Create Time  Create Client Reclaim Time    Reclaim Client RFid list
33026 Wi6/0/1:1 33     Dec 22 16:03 MODEM_ONLINE  Dec 22 16:09:48 DBG_INTERNAL   33024-33055
```

The following is a sample output of the **show cable dynamic-bonding-group reclaim-history slot** command:

```
Router# show cable dynamic-bonding-group reclaim-history slot 6
BG ID BG Name   BG Size Create Time  Client Client Reclaim Time Reclaim Client RFid list
33026 Wi6/0/1:1 33      Dec 22 16:03 MODEM_ONLINE  Dec 22 16:09 DBG_INTERNAL   33024-33055
```

The following is a sample output of the **show cable dynamic-bonding-group reclaim-history controller** command:

```
Router# show cable dynamic-bonding-group reclaim-history controller 6/0/1
BG ID BG Name   BG Size Create Time  Create Client Reclaim Time Reclaim Client RFid list
33026 Wi6/0/1:1 33      Dec 22 16:03 MODEM_ONLINE  Dec 22 16:09 DBG_INTERNAL   33024-33055
```

The following examples shows the DBG created with contiguous frequency channels for load balance purpose.

```
Router#show cable dynamic-bonding-group summary
 Dynamic bonding group: Enable
 DBG operation with Registration: Enable
 DBG operation with Load-Balance: Enable
 BG ID BG Name      BG Size  CMs  ServFlows Create Time           Create Client        BG
State             RFid list
 24578 Wi3/0/0:1    24       4    4         Sep 26 15:07:22.760   MODEM_ONLINE
OPERATIONAL          24576-24599
 24577 Wi3/0/0:0    8        17   17        Sep 26 16:35:01.240   MODEM_ONLINE
OPERATIONAL          24584-24591
 24579 Wi3/0/0:2    8        7    7         Sep 26 16:53:48.857   DYNAMIC_LOAD_BALANCE
OPERATIONAL          24577-24584
 24580 Wi3/0/0:3    8        6    6         Sep 26 16:56:49.790   DYNAMIC_LOAD_BALANCE
OPERATIONAL          24588-24595

 Router#show derived-config interface wideband-Cable 3/0/0:3
 Building configuration...

 Derived configuration : 141 bytes
 !
 interface Wideband-Cable3/0/0:3
  cable bundle 255
  cable rf-channels channel-list 12-19 bandwidth-percent 1
  no snmp trap link-status
```

```
end

Router#show derived-config interface wideband-Cable 3/0/0:2
Building configuration...

Derived configuration : 139 bytes
!
interface Wideband-Cable3/0/0:2
 cable bundle 255
 cable rf-channels channel-list 1-8 bandwidth-percent 1
 no snmp trap link-status
end
```

This table describes the significant fields shown in the show cable dynamic-bonding-group command display.

Table 67: show cable dynamic-bonding-group summary — Field Descriptions

Field	Description
BG ID	Bonding group ID.
BG Name	Name of the bonding group.
BG Size	Size of the bonding group.
CMs	Total number of CMs associated with the dynamic bonding group.
ServFlows	The total number of service flows used on the dynamic bonding group.
Create Time	The time when the dynamic bonding group was created.
Create Client	Client that creates the dynamic bonding group. Client can be modem registration, static load balance, or dynamic load balance.
BG State	Current state of the dynamic bonding group.
RFid list	RF ID associated to a specific bonding group.

Related Commands

Command	Description
cable dynamic-bonding-group	Enables dynamic bonding group.
show cable load-balance docsis-group target wide **show cable load-balance docsis-group target dbg**	Check the potential target bonding group for each of the source bonding group.

show cable entropy status

To view the status of the cBR-8 entropy sources, use the **show cable entropy status** command in user EXEC or privileged EXEC mode. This command is only supported on SUP IOSd.

show cable entropy status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	This command is introduced on the Cisco cBR-8 Converged Broadband Routers.

Usage Guidelines

The command displays the status of the cBR-8 entropy sources.

Examples

The following example shows typical output:

```
Router#show cable entropy status
Load for five secs: 2%/0%; one minute: 4%; five minutes: 5%
Time source is NTP, 13:02:40.227 EDT Fri Apr 14 2023

Entropy source    successes      failures
==========================================
RDRAND            473            0
CPU Jitter        457            0
ACT2              0              0
```

Here, `ACT2` is the backup source for `CPU jitter`.

show cable fiber-node

To display information about a fiber node, use the **show cable fiber-node** command in privileged EXEC mode.

show cable fiber-node *fiber-node-id* [**spectrum | mapping | derived**]

Syntax Description

fiber-node-id	Specifies a fiber node ID. Valid values range from 1 to 256. The valid values for the Cisco cBR router is 1 to 512.
spectrum	Displays upstream channel frequency assignment information and the spectrum group number.
mapping	Displays upstream and downstream channel mapping information.
derived	Displays MAC domain and wideband interfaces assocated to this fiber-node.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3BC	This command was introduced
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.
IOS-XE 3.17.0S	This command was modified. The **mapping** and **derived** keywords were added.

Usage Guidelines

For each fiber node, a traditional DOCSIS downstream channel on a Cisco uBR10-MC5X20 cable interface line card is used to carry MAC management and signaling messages. This traditional DOCSIS downstream channel used for a MAC domain is called the *primary downstream channel* . The associated traditional DOCSIS upstream channel is used for return data traffic and signaling.

Examples

The following is a sample output of the **show cable fiber-node** command:

```
Router# show cable fiber-node 2
Fiber-Node         Config Status
Fiber-Node 2
       downstream Modular-Cable 1/0/0:  0-3
       downstream Cable 7/1/0
       upstream Cable 7/1:  10-19
    FN Config Status: Configured (status flags = 0x01)
    MDD Status: Valid
Router#
```

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The output of the command is updated to display the RPD Alias (RPD Name) and RPD mac.

The following is a sample output of the **show cable fiber-node** command on the Cisco cBR router:

```
Router# show cable fiber-node
Load for five secs: 8%/0%; one minute: 5%; five minutes: 5%
No time source, *07:11:31.689 EDT Fri Sep 13 2024

 ------------------------------------------------------------------------------

Fiber-Node 1
  Channel(s)   :  downstream Downstream-Cable 8/0/0:  0-31, 158
  Channel ID(s):   1   2   3   4   5   6   7   8   9  10  11  12  13  14
                  15  16  17  18  19  20  21  22  23  24  25  26  27  28
                  29  30  31  32 159
  Upstream-Cable 8/0/0
    FN Config Status: Configured (status flags = 0x01)
    MDD Status: Valid
  RPD Details:
    MAC Address       Name
    NA                NA

 ------------------------------------------------------------------------------

Fiber-Node 2
  Channel(s)   :  downstream Downstream-Cable 8/0/0:  0-31, 158
  Channel ID(s):   1   2   3   4   5   6   7   8   9  10  11  12  13  14
                  15  16  17  18  19  20  21  22  23  24  25  26  27  28
                  29  30  31  32 159
  Upstream-Cable 8/0/1
    FN Config Status: Configured (status flags = 0x01)
    MDD Status: Valid
  RPD Details:
    MAC Address       Name
    9088.556b.a454    RPD_dev1

 ------------------------------------------------------------------------------

Fiber-Node 3
  Channel(s)   :  downstream Downstream-Cable 8/0/1:  0-31, 158
  Channel ID(s):   1   2   3   4   5   6   7   8   9  10  11  12  13  14
                  15  16  17  18  19  20  21  22  23  24  25  26  27  28
                  29  30  31  32 159
  Upstream-Cable 8/0/2
    FN Config Status: Configured (status flags = 0x01)
    MDD Status: Valid
  RPD Details:
    MAC Address       Name
    246c.84f4.1a60    RPD_dev2

 ------------------------------------------------------------------------------

Fiber-Node 4
  Channel(s)   :  downstream Downstream-Cable 8/0/1:  0-31, 158
  Channel ID(s):   1   2   3   4   5   6   7   8   9  10  11  12  13  14
                  15  16  17  18  19  20  21  22  23  24  25  26  27  28
                  29  30  31  32 159
  Upstream-Cable 8/0/3
    FN Config Status: Configured (status flags = 0x01)
```

```
    MDD Status: Valid
  RPD Details:
    MAC Address       Name
    246c.84f4.1a60    RPD_dev2

 ------------------------------------------------------------------------------

Fiber-Node 5
  Channel(s)   :  downstream Downstream-Cable 8/0/2:  0-31, 158
  Channel ID(s):   1   2   3   4   5   6   7   8   9  10  11  12  13  14
                  15  16  17  18  19  20  21  22  23  24  25  26  27  28
                  29  30  31  32 159
  Upstream-Cable 8/0/4
    FN Config Status: Configured (status flags = 0x01)
    MDD Status: Valid
  RPD Details:
    MAC Address       Name
    9088.556b.a40c    RPD_dev3

 ------------------------------------------------------------------------------

Fiber-Node 6
  Channel(s)   :  downstream Downstream-Cable 8/0/2:  0-31, 158
  Channel ID(s):   1   2   3   4   5   6   7   8   9  10  11  12  13  14
                  15  16  17  18  19  20  21  22  23  24  25  26  27  28
                  29  30  31  32 159
  Upstream-Cable 8/0/5
    FN Config Status: Configured (status flags = 0x01)
    MDD Status: Valid
  RPD Details:
    MAC Address       Name
    9088.556b.a40c    RPD_dev3
```

This table describes the fields shown in the **show cable fiber-node** command display.

Table 68: show cable fiber-node Field Descriptions

Field	Description
Fiber-Node	Displays the fiber nodes configured on the CM.
Config Status	Displays the configuration status of the fiber node. Status flags are as follows: • 0x01 - CMTS_FN_CONFIG • 0x02 - CMTS_FN_FREQ_INVALID • 0x04 - CMTS_FN_CHID_INVALID • 0x08 - CMTS_FN_BUNDLE_INVALID • 0x10 - CMTS_FN_BOND_CHID_INVALID • 0x20 - CMTS_FN_US_FREQ_INVALID • 0x40 - CMTS_FN_NO_US_CONFIGURED
MDD Status	Displays the MAC Domain Descriptor (MDD) status. MDD status of a fiber node is set as invalid in the following cases: • Frequency is not unique. • Channel ID is not unique. • Bonding group ID is not unique. • Bundle is mismatched.

```
Router# show cable fiber-node 2 spectrum

Fiber            Upstream        Physical     Frequency       Spectrum
Node No.         Port            Port         (MHz)           Group No.
2                Cable7/1/0 U0   10           21.939 [1.6]    1
2                Cable7/1/0 U1   11           10.695 [1.6]    1
2                Cable7/1/0 U2   12            5.834 [1.6]    1
2                Cable7/1/0 U3   13            9.055 [1.6]    1
2                Cable7/1/4 U0   16           unassigned      No
2                Cable7/1/4 U1   17           unassigned      No
2                Cable7/1/4 U2   18           unassigned      No
2                Cable7/1/4 U3   19           unassigned      No
```

This example shows the output of the **spectrum** keyword on the Cisco cBR router:

```
Router# show cable fiber-node 2 spectrum

Fiber            Upstream         Physical     Frequency       Spectrum
Node No.         Port             Port         (MHz)           Group No.

2                UC3/0/1:U0       1            13.200 [6.4]    No
2                UC3/0/1:U1       1            19.600 [6.4]    No
2                UC3/0/1:U2       1            26.000 [6.4]    No
2                UC3/0/1:U3       1            32.400 [6.4]    No
2                UC3/0/1:U4       1            unassigned      No
2                UC3/0/1:U5       1            unassigned      No
2                UC3/0/1:U6       1            unassigned      No
2                UC3/0/1:U7       1            unassigned      No
2                UC3/0/1:U8       1            unassigned      No
2                UC3/0/1:U9       1            unassigned      No
2                UC3/0/1:U10      1            unassigned      No
2                UC3/0/1:U11      1            unassigned      No
```

This table describes the fields shown in the **show cable fiber-node** command display when the **spectrum** keyword is used.

Table 69: show cable fiber-node Field Descriptions

Field	Description
Upstream Port	Displays the upstream port associated with the fiber node.
Physical Port	Displays the physical port of the upstream channel.
Frequency	Displays the upstream channel frequency of the CM.
Spectrum Group No.	Displays the spectrum group number of the fiber node. A spectrum group is a list of upstream frequencies and nominal power levels. Spectrum groups ranging from 1 to 32 can be created for each cable modem upstream port.

This example shows the output of the **mapping** keyword on the Cisco cBR router:

```
Router# show cable fiber-node 2 mapping

Fiber-node 2:
Upstream:
```

```
Sg chan Us-chan      Op state
0       3/0/0 0      Up
1       3/0/0 1      Up
2       3/0/0 2      Up
3       3/0/0 3      Up
4       3/0/0 4      Up
5       3/0/0 5      Up
6       3/0/0 6      Up
7       3/0/0 7      Up
Downstream:
Sg  chan Ds-rf-chan Op state
0        3/0/0:0    Up
1        3/0/0:1    Up
2        3/0/0:2    Up
3        3/0/0:3    Up
4        3/0/0:4    Up
5        3/0/0:5    Up
6        3/0/0:6    Up
7        3/0/0:7    Up
8        3/0/0:8    Up
9        3/0/0:9    Up
10       3/0/0:10   Up
11       3/0/0:11   Up
12       3/0/0:12   Up
13       3/0/0:13   Up
14       3/0/0:14   Up
15       3/0/0:15   Up
```

This table describes the fields shown in the **show cable fiber-node** command display when the **mapping** keyword is used.

Table 70: show cable fiber-node Field Descriptions

Field	Description
Sg chan	Disaply the service group channel ID in service group profile.
Us-chan	Physical upstream channel.
Op state	Displays the state of the channel.
Ds-rf-chan	Physical downstream RF channel

This example shows the output of the **derived** keyword on the Cisco cBR router:

```
Router# show cable fiber-node 2 derived

Fiber-node 2:
Assoc                              successed
mac-domain 0 interface Cable3/0/0   Y
Wideband 1 Wideband-Cable3/0/0:0    Y
```

This table describes the fields shown in the **show cable fiber-node** command display when the **derived** keyword is used.

Table 71: show cable fiber-node Field Descriptions

Field	Description
Assoc	Display the assocation infomation of mac domain and wideband interface in service group profile which is assocated to this fiber-node.
succeeded	Shows if all configuration of these interfaces are generated successfully.

Related Commands

Command	Description
show cable modem	Displays information for registered and unregistered cable modems (including wideband cable modems).
show cable modem wideband	Displays information for registered and unregistered wideband cable modems.

show cable filter

To display the DOCSIS 1.1 filter groups that are currently defined, use the **show cable filter** command in user EXEC or privileged EXEC mode.

show cable filter [**group** *group-index* [**index** *index-num*]] [**verbose**]

Syntax Description

group *group-id*	(Optional) Specifies the filter group to be displayed. The valid range is 1 to 256. For Cisco cBR-8 routers, the valid range is 1 to 254
index *index-num*	(Optional) Specifies the index of the particular filter within a group to be displayed. The valid range is 1 to 128 on a uBR7200 series router and 1 to 256 on a uBR10012 router. For Cisco cBR-8 routers, valid range is 1 to 256.
verbose	(Optional) Displays complete information about the filter groups in a format that is easier to read than the default display.

Command Modes

User EXEC, Privileged EXEC (#)

Command History

Release	Modification
12.1(6)EC1	This command was introduced on the Cisco uBR7100 series and Cisco uBR7200 series routers.
12.2(2)XF, 12.2(4)BC1	This command was supported on the Cisco uBR10012 routers.
12.2(8)BC2	An option was added to the **cable filter group** command to allow filter groups to be activated and deactivated without removing the filter group's configuration.
12.2(33)SCA	The output was changed to add fields for IPv6 information, including the "v6" field in the **show cable filter** command, and the "Source IPv6 Address," and "Destination IPv6 Address" fields of the **show cable filter verbose** command.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a typical display of the **show cable filter** command:

```
Router# show cable filter
 Filter SrcAddr/Mask       DestAddr/Mask      Prot ToS  SPort DPort TCP   Action  Status
Grp Id                                                             Flags
1   1                                        256             137   0,0   drop active
1   2                     10.37.11.151/24    6               23    2,0   drop active
1   3                                        17        68    67    0,0   drop active
1   4                                        256             161   0,0   drop active
1   5                                        256             53    0,0   drop active
1   6                     10.37.11.151/29    256                         accept active
1   7   10.37.11.196/29   10.11.0.98/32      256                         accept active
1   8   10.37.11.195/32   10.11.0.98/32      6                           drop active
```

```
1   9   10.37.11.195/32    10.11.0.98/32      256                          accept active
1   10  10.37.11.194/32    10.11.0.98/16      6                            accept active
1   11  10.37.11.193/32    10.11.0.98/8       17                           drop active
1   12  10.37.11.192/32    10.11.0.98/32      6   F,F                      accept active
1   13  10.37.11.191/32    10.11.0.98/32      17  F,F                      accept active
1   14  10.37.11.190/32    10.11.0.98/24      17  8,F                      accept active
1   15  10.37.11.189/32    10.11.0.98/32      256 F,8                      drop active
1   16  10.37.11.189/32    10.11.0.98/32      256 F,8                      accept active
1   17  10.37.11.188/32    10.11.0.98/8       17                           accept active
1   18  10.37.11.188/32    10.11.0.98/32      6                            drop active
1   19  10.37.11.187/32    10.11.0.98/30      256                          accept active
1   20                     10.11.0.98/0       256                          drop active
Router#
```

The following shows typical output for the verbose form of this command:

```
Router# show cable filter group 10 index 10 verbose

Filter Group                              : 1
Filter Index                              : 1
Matches                                   : 0
    Match action                          : accept
    Status                                : active
Filter Group                              : 10
Filter Index                              : 10
Matches                                   : 0
    Source IP Address                     : 10.7.7.7/16
    Destination IP Address                : 10.8.8.8/16
    IP Protocol type                      : 256
    IP ToS (Mask, Value)                  : 1, 2
    TCP/UDP Source Port                   : 2000
    TCP/UDP Destination Port              : 3000
    TCP Flags (mask, value)               : 0, 0
    Match action                          : accept
    Status                                : active
Router#
```

IPv6 Examples

The following examples show examples of output for the **show cable filter** commands with changes beginning in Cisco IOS Release 12.2(33)SCA in support of IPv6 cable filter groups.

```
Router# show cable filter
Filter    SrcAddr/Mask       DestAddr/Mask      Prot ToS  SPort DPort TCP   Action Status
Grp Id v6                                                              Flags
254 128Y  Use Verbose        Use Verbose                                 drop   active
Router# show cable filter group 254
Filter    SrcAddr/Mask       DestAddr/Mask      Prot ToS  SPort DPort TCP   Action Status
Grp Id v6                                                              Flags
254 128Y  Use Verbose        Use Verbose                                 drop   active
Router# show cable filter group 254 index 128
Filter    SrcAddr/Mask       DestAddr/Mask      Prot ToS  SPort DPort TCP   Action Status
Grp Id v6                                                              Flags
254 128Y  Use Verbose        Use Verbose                                 drop   active
```

Table 72: show cable filter Field Descriptions

Field	Description
Filter Gp	ID number of the filter group. Defined by the *group-id* argument of the **cable filter group** command.
Filter Id	Index number of the filter group. Defined by the *index-num* argument of the **cable filter group** command.
v6	IP version 6 filter group type indicator. Defined by the **ip-version** keyword of the **cable filter group** command. Possible values are Y or N.
SrcAddr/Mask	• IP version 4—Filter source IP address and mask to be matched by the filter. Defined by the **src-ip** and **src-mask** keywords of the **cable filter group** command.. • IP version 6—"Use Verbose" appears because IPv6 addresses will not fit in the output display area; need to use the **show cable filter group verbose** command to view IPv6 addresses.
DestAddr/Mask	• IP version 4—Filter destination IP address and mask to be matched by the filter. Defined by the **dest-ip** and **dest-mask** keywords of the **cable filter group** command. • IP version 6—"Use Verbose" appears because IPv6 addresses will not fit in the output display area; need to use the **show cable filter group verbose** command to view IPv6 addresses.
Prot	IP protocol number(s) to be matched by the filter. Defined by the **ip-proto** keyword of the **cable filter group** command.
ToS	Type of Service mask and value to be matched by the filter. Defined by the **ip-tos** keyword of the **cable filter group** command.
SPort	TCP/UDP source port number to be matched by the filter. Defined by the **src-port** keyword of the **cable filter group** command.
DPort	TCP/UDP destination port number to be matched by the filter. Defined by the **dest-port** keyword of the **cable filter group** command.
TCP Flags	TCP flag mask and value to be matched by the filter. Defined by the **tcp-flags** keyword of the **cable filter group** command.
Action	Action to be taken on packet (accept or drop) when filter match occurs. Defined by the **match-action** keyword of the **cable filter group** command.
Status	Filter group status (active or inactive). Defined by the **status** keyword of the **cable filter group** command.

```
Router# show cable filter group 254 index 128 verbose
Filter Group                          : 254
Filter Index                          : 128
Filter Version                        : IPv6
Matches                               : 0
    Source IPv6 address               : 2001:33::20B:BFFF:FEA9:741F/128
    Destination IPv6 address          : 2001:1::224/128
```

```
Match action                    : drop
Status                          : active
```

Table 73: show cable filter verbose Field Descriptions

Field	Description
Filter Group	ID number of the filter group. Defined by the *group-id* argument of the **cable filter group** command.
Filter Index	Index number of the filter group. Defined by the *index-num* argument of the **cable filter group** command.
Filter Version	IP version of the filter group. Defined by the **ip-version** keyword of the **cable filter group** command. Possible values are IPv4 or IPv6.
Matches: Source IP address or Matches: Source IPv6 address	• Source IP address—IPv4 source IP address and mask to be matched by the filter. Defined by the **src-ip** and **src-mask** keywords of the **cable filter group** command. • Source IPv6 address—IPv6 source IP address and prefix to be matched by the filter. Defined by the **v6-src-address** and **v6-src-pfxlen** keywords of the **cable filter group** command.
Matches: Destination IP address or Matches: Destination IPv6 address	• Destination IP address—IPv4 destination IP address and mask to be matched by the filter. Defined by the **dest-ip** and **dest-mask** keywords of the **cable filter group** command. • Destination IPv6 address—IPv6 destination IP address and prefix to be matched by the filter. Defined by the **v6-dest-address** and **v6-dest-pfxlen** keywords of the **cable filter group** command.
Matches: IP Protocol type	IP protocol number(s) to be matched by the filter. Defined by the **ip-proto** keyword of the **cable filter group** command.
Matches: IP ToS (Mask, Value)	Type of Service mask and value to be matched by the filter. Defined by the **ip-tos** keyword of the **cable filter group** command.
Matches: TCP/UDP Source Port	TCP/UDP source port number to be matched by the filter. Defined by the **src-port** keyword of the **cable filter group** command.
Matches: TCP/UDP Destination Port	TCP/UDP destination port number to be matched by the filter. Defined by the **dest-port** keyword of the **cable filter group** command.
Matches: TCP Flags (mask, value)	TCP flag mask and value to be matched by the filter. Defined by the **tcp-flags** keyword of the **cable filter group** command.
Matches: Match action	Action to be taken on packet (accept or drop) when filter match occurs. Defined by the **match-action** keyword of the **cable filter group** command.
Matches: Status	Filter group status (active or inactive). Defined by the **status** keyword of the **cable filter group** command.

This example shows the output for the **show cable filter** command on the Cisco cBR-8 router:

```
Router#show cable filter
```

```
Grp Id v6 SrcAddr/Mask       DestAddr/Mask      Prot ToS         Action Status
255 1  N                                                        drop   active
Router#
```

Related Commands

Command	Description
cable filter group	Creates, configures, and activates a DOCSIS 1.1 filter group that filters packets on the basis of the TCP/IP and UDP/IP headers.

show cable flap-list

To display the cable flap-list on a Cisco CMTS, use the **show cable flap-list** command in user EXEC or privileged EXEC mode.

show cable flap-list
show cable flap-list sort-interface [**sort-flap** | **sort-int** | **sort-mac** | **sort-time**]

Cisco cBR Series Converged Broadband Router
show cable flap-list
show cable flap-list [**cable** *slot/subslot/cable-interface-index*] [**sort-flap** | **sort-interface** | **sort-time**]

Syntax Description

cable *slot/port*	(Optional) Displays information for all CMs on the specified cable interface and downstream port on the Cisco uBR7100 series and Cisco uBR7200 series routers: • *slot*—Chassis slot number of the cable interface line card. • *port*—Downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot/subslot/port*	(Optional) Displays information for all CMs on the specified cable interface on a Cisco uBR10012 router: • *slot* —Chassis slot number of the cable interface line card. Valid slots are from 5 to 8. • *subslot* —Secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot/subslot/cable-interface-index*	(Optional) Displays information for all CMs on the specified cable interface on a Cisco cBR router: • *slot* —Chassis slot number of the cable interface line card. Valid slots are from 0 to 3, and 6 to 9. • *subslot* —Secondary slot number of the cable interface line card. Valid subslot is 0. • *cable-interface-index* —cable interface index number. Valid index numbers are 0 to15.
upstream *port*	(Optional) Displays the flap list for a particular upstream on the selected cable interface.
sort-interface	(Optional) Displays the flap list for all cable interfaces, sorted by interface.
sort-flap	(Optional) Sorts the list by the number of times the CM has flapped.

sort-int	(Optional) Sorts the list first by the Cisco CMTS cable interface. This keyword is not supported on Cisco cBR-8 router
sort-mac	(Optional) Sorts the list first by the Cisco CMTS cable interface and then by the CM MAC (hardware) address. This keyword is not supported on Cisco cBR-8 router
sort-time	(Optional) Sorts the list by the most recent time the CM is detected to have flapped.

Command Modes

User EXEC (>), Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0(3)T	This command was supported on the Cisco mainline release.
12.0(7)XR and 12.1(1a)T1	The output of this command was enhanced to show that the Cisco CMTS has detected an unstable return path for a particular CM and has compensated with a power adjustment. An asterisk (*) appears in the power adjustment field for a modem when a power adjustment has been made; an exclamation point (!) appears when the CM has reached its maximum power transmit level and cannot increase its power level further.
12.3(9a)BC	The **sort-int** and **sort-mac** options were added.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC	The output of this command was modified to show the aggregated data across all upstream channels for each flap detector for CMs in the Multiple Transmit Channel (MTC) mode on a Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** and **sort-mac** keywords were removed.

Usage Guidelines

The **sort** options operate differently on the different Cisco CMTS routers. On the Cisco uBR7100 series and Cisco uBR7200 series routers, the **sort** options apply to all cable interface line cards and merge the output into a single display.

On the Cisco uBR10012 router, the sort options apply to individual cable interfaces. For example, the **sort-time** option sorts all of the flap entries on the first cable interface (c5/0/0), then the entries on the second cable interface (c5/0/1), and so forth.

Note Occasionally, the **show cable flap-list** command might temporarily show duplicate entries for the same cable modem. This can occur after a cable modem has gone offline and before it has completed the registration process and come back online. When the cable modem does reach the online state, the duplicate entries disappear.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

The following example shows the output of the **show cable flap-list** command:

```
router# show cable flap-list
MAC Address     Upstream     Ins   Hit   Miss  CRC   P-Adj Flap  Time
 0010.7bb3.fd19  Cable5/0/U1  0     2792  281   0     *45    58    Jul 27 16:54:50
 0010.7bb3.fcfc  Cable5/0/U1  0     19    4     0     !43    43    Jul 27 16:55:01
 0010.7bb3.fcdd  Cable5/0/U1  0     19    4     0     *3     3     Jul 27 16:55:01
```

Note The asterisk (*) in the P-Adj field indicates that a power adjustment has been made for that CM. The exclamation point (!) indicates that the CM has reached its maximum power transmit level and cannot increase its power level further.

The following example shows the display of flap-list tables sorted by MAC address:

```
router# show cable flap-list sort-flap
Mac Addr           CableIF    Ins    Hit    Miss    CRC  P-Adj   Flap    Time
0010.1eab.2c0b     C6/0 U0    108    318     27      0      0    108 Sep 10 15:26:56
0010.1eb2.bb07     C6/0 U0      0    293     31      1      1      1 Sep 10 15:15:49
0010.7b6b.71cd     C6/0 U0      1    288     32      0      0      1 Sep 10 15:12:13
0010.1eb2.bb8f     C6/0 U0      1    295     30      0      0      1 Sep 10 15:11:44
```

The following example shows the display of flap-list tables sorted by time:

```
Router# show cable flap-list sort-time
Mac Addr       CableIF    Ins    Hit    Miss    CRC  P-Adj   Flap    Time
00e0.2222.2202 C4/0 U0    464   2069    242      0    421    885 Oct 16 22:47:23
0010.7b6b.57e1 C4/0 U0      0   2475     43      0   1041   1041 Oct 16 22:47:04
```

The following sample output of the **show cable flap-list** command provides the aggregated data across all upstream channels for CMs in the MTC mode on a uBR10012 router in Cisco IOS Release 12.2(33)SCC:

```
router# show cable flap-listMAC Address    Upstream    Ins   Hit   Miss  CRC   P-Adj
Flap  Time
001e.6bfb.0f9e C5/0/0/UB   0     62539 0     0     2     2     Apr 18 03:53:00
0050.f110.b277 C5/0/0/UB   0     10965 211   0     0     9     Apr 18 03:53:00
```

Table 74: show cable flap-list Command Field Descriptions

Field	Description
Mac Addr	The MAC address for the CM.
CableIF	The cable interface line card, including upstream, for this CM.
Ins	The number of times the CM comes up and inserts itself into the network. This counter is indicates the number of times the RF link was abnormally reestablished into the network. This counter is increased when the time between initial link establishment and a reestablishment was less than the threshold parameter configured using the **cable flap-list insertion-time** command. Normal modem activity uses the following sequence: • Initial link insertion is followed by a station maintenance message between the CMTS and cable modem. • Power on • Initial maintenance • Station maintenance • Power off When the link is broken, initial maintenance is repeated to reestablish the link. • Initial maintenance @ Time T1 • Station maintenance • Initial maintenance @ Time T2 The Ins and Flap counters in the flap list are incremented whenever T2 – T1 < *N* where *N* is the insertion-time parameter configured in the **cable flap-list insertion-time** command. This count may indicate intermittent downstream synchronization loss or DHCP or modem registration problems. In the latter case, the Ins count tends to track the Flap count. If the downstream is unstable (levels move outside the modem's range occasionally), insertions can occur. If the modem cannot provision correctly, many insertions occur. If link reestablishment happens too frequently, the modem usually has a registration problem. To check for this potential problem, check to see if the insertion counter is the same order of magnitude as the Flap counter.
Hit	The number of times the CM responds to MAC-layer station maintenance (keepalive) messages. (The minimum hit rate is once per 30 seconds. It can indicate intermittent upstream, laser clipping, or common-path distortion.

Field	Description
Miss	The number of times the CM misses and does not respond to a MAC-layer station maintenance (keepalive) message. An 8 percent miss rate is normal for the Cisco cable interface line cards. It can indicate intermittent upstream, laser clipping, or common-path distortion.

Field	Description

Field	Description
Note The Hit and Miss columns are keepalive polling statistics between the CMTS and the cable modem. The station maintenance process occurs for every modem approximately every 25 seconds. When the CMTS receives a response from the modem, the event is counted as a hit. If the CMTS does not receive a response from the cable modem, the event is counted as a miss. Ideally, the hit count should be much greater than the miss count. If a modem has a hit count much less than its miss count, then registration is failing. Noisy links cause the miss or hit ratio to deviate from a nominal 10 percent or less. High miss counts can indicate: • Intermittent upstream possibly due to noise • Laser clipping • Common-path distortion • Ingress or interference • Too much or too little upstream attenuation A cable modem fails to respond either because of noise or if it is down. Modems that log only misses and zero hits are assumed to be powered off. If noise caused a poll to be missed, then the transition from miss to hit is detected as a flap condition. The poll rate is increased to 1 per second whenever the modem misses a poll. This is used to accelerate the offline state detection and decrease station maintenance overhead. Misses are not desirable, because they usually indicate a return path problem; however, having a small number of misses is normal. After 16 misses, the modem is assumed to have powered off and the link is broken. The flap count is incremented if there are M consecutive misses, where M is configured in the **cable flap miss-threshold** command. The parameter value ranges from 1 to 12, with a default of 6.	

Field	Description
Hit and miss analysis could be done after the Ins count stops incrementing. In general, if the hit and miss counts are about the same order of magnitude, and the CRC count is low or nonexistent, then the upstream is experiencing noise. If the miss count is greater, then the modem is probably experiencing common-path distortion and is dropping out frequently or not completing registration. Check grounding connections and if you see noise disappear after breaking a cable connection, but build back up again later, check the end-of-line terminators. You may be using a substandard frequency translator instead of a Digital Signal Processor. If the line is simply noisy, but not too noisy, you see an increase in the percentage of misses. If it is very noisy, then more than 80% of the ranging responses (RNG-RSP) are missed and the modem has many insertions.	
CRC	The number of cyclic redundancy check (CRC) errors for this cable modem. CRC errors are calculated on per modem basis and refer to upstream impairments. Cable modems with high CRC errors either have bad upstream paths, or have in-home wiring problems. The CRC counter field indicates: • Intermittent upstream • Laser clipping • Common-path distortion • Impulsive noise or interference

Field	Description
P-Adj	The number of times the headend instructed the CM to adjust transmit (TX) power more than 3 dB. It can indicate amplifier degradation, poor connections, or thermal sensitivity. * means the noise power-adjustment method is active for this modem. ! means the modem has reached its maximum transmit power. The station maintenance poll in the CMTS constantly adjusts the modem transmit power, frequency, and timing. The power-adjustment (P-Adj) column indicates the number of times the modem's power adjustment exceeded the threshold value. The power adjustment threshold may be set using the **cable flap-list power-adjust threshold** command with a value range of 0 to 10 dB and a default value of 2 dB. Tuning this threshold is recommended to decrease irrelevant entries in the flap list. Power-adjustment values of 2 dB and below continuously increment the P-Adj counter. The modem transmitter step size is 1.5 dB, whereas the headend may command 0.25 dB step sizes. Power-adjustment flap strongly suggests upstream plant problems such as: • Amplifier degradation • Poor connections • Thermal sensitivity • Attenuation problem The P-Adj column is often watched as an indicator of plant stability. It may give a forewarning of a future plant outage. If the upstream path contains too much or too little loss, the modem is undergoing many power adjustments.
Flap	The total number of times a modem has flapped, which is the sum of P-Adj and Ins values. This counter is incremented when one of the following events is detected: • Unusual modem insertion or re-registration attempts. The Flap and the Ins counters are incremented when the modem tries to reestablish the RF link with the CMTS within a period of time that is less than the user-configured insertion interval value. • Abnormal miss or hit ratio. The Flap counter is incremented when N consecutive misses are detected after a hit where N can be user-configured with a default value of 6. • Unusual power adjustment. The Flap and P-Adj counters are incremented when the modem's upstream power is adjusted beyond a user-configured power level.

Field	Description
Time	Time is the most recent time that the modem dropped the connection or flapped. The value is based on the clock configured on the local CMTS. If no time is configured, this value is based on the current uptime of the CMTS. When a cable modem meets one of the three flap list criteria, the Flap counter is incremental and Time is set to the current time. **Note** This field displays a value in brackets in the output of the show cable modem flap command to indicate the duration (milliseconds) between the cable interface to become active and the first ranging success after a line card switchover (cable modem recovery time).

Examples for the Cisco cBR Series Converged Broadband Router

This example shows the output of the **show cable flap-list** command on the Cisco cBR router:

```
Router#show cable flap-list
MAC Address    Upstream    Ins   Hit   Miss  CRC   P-Adj Flap  Time
b0c2.87c2.830b C9/0/0/UB   0     3734  16    0     3     5     Jan 4  02:38:40
0010.18de.8134 C9/0/0/UB   0     4139  11    0     0     2     Jan 4  00:26:45
0025.2e2d.74e4 C9/0/0/U2   *** No data available ***           Jan 3  23:33:00
Router#
```

This example shows the output of the **show cable flap-list sort-flap**command on the Cisco cBR router:

```
Router#show cable flap-list sort-flap
MAC Address    Upstream    Ins   Hit   Miss  CRC   P-Adj Flap  Time
b0c2.87c2.830b C9/0/0/UB   0     3749  16    0     3     5     Jan 4  02:38:40
0010.18de.8134 C9/0/0/UB   0     4154  11    0     0     2     Jan 4  00:26:45
0025.2e2d.74e4 C9/0/0/U2   *** No data available ***           Jan 3  23:33:00
Router#
```

This example shows the output of the **show cable flap-list sort-interface**command on the Cisco cBR router:

```
Router#show cable flap-list sort-interface
MAC Address    Upstream    Ins   Hit   Miss  CRC   P-Adj Flap  Time
b0c2.87c2.830b C9/0/0/UB   0     3753  16    0     3     5     Jan 4  02:38:40
0010.18de.8134 C9/0/0/UB   0     4158  11    0     0     2     Jan 4  00:26:45
0025.2e2d.74e4 C9/0/0/U2   *** No data available ***           Jan 3  23:33:00
Router#
```

This example shows the output of the **show cable flap-list sort-time**command on the Cisco cBR router:

```
Router#show cable flap-list sort-time
MAC Address    Upstream    Ins   Hit   Miss  CRC   P-Adj Flap  Time
```

```
b0c2.87c2.830b C9/0/0/UB   0     3756  16    0     3     5     Jan 4  02:38:40
0010.18de.8134 C9/0/0/UB   0     4161  11    0     0     2     Jan 4  00:26:45
0025.2e2d.74e4 C9/0/0/U2   *** No data available ***           Jan 3  23:33:00
Router#
```

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a CM in the flap-list table before aging it out of the table.
cable flap-list insertion-time	Sets the insertion time interval that determines whether a CM is placed in the flap list.
cable flap-list miss-threshold	Specifies the miss threshold for recording a flap-list event.
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a CM flap-list event.
cable flap-list size	Specifies the maximum number of CMs that can be listed in the flap-list table.
clear cable flap-list	Clears all the entries in the flap-list table.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
ping docsis	Sends a DOCSIS ping to a CM and increments the flap-list counters as appropriate.
show cable modem	Displays information about all CMs on an interface or about a particular CM.
show cable modem flap	Displays flap list statistics for one or more cable modems.

show cable flap-list reset-cm-list

To display the Docsis 3.1 cable modem list that was reset by the partial service reset timer, use the **show cable flap-list reset-cm-list** command in privileged EXEC mode.

show cable flap-list reset-cm-list

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

None

Examples

This example shows the output of the **show cable flap-list reset-cm-list** command:

```
router# show cable flap-list reset-cm-list
```

Related Commands

Command	Description
cable lcha partial-service-reset-timer	Configures the timer to reset cable modems in partial service mode.

show cable flap-list wb-rf

To display the wideband RF related data for all w-online cable modems, use the **show cable flap-list wb-rf** command in privileged EXEC mode.

show cable flap-list [**cable** *slot/subslot/port*]**wb-rf** [**modular-cable** *slot/bay/port* | **integrated-cable** *slot/bay/port WB RF channel number*] [**QAM** | **MDD**]

Cisco cBR Series Converged Broadband Router
show cable flap-list [**cable** *slot/subslot/cable-interface-index*]**wb-rf integrated-Cable** *slot/subslot/port*

Syntax Description

cable *slot/subslot/port*	(Optional) Displays information for all cable modems on the specified cable interface on a Cisco uBR10012 router, where: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
cable *slot/subslot/cable-interface-index*	On a Cisco cBR-8 router: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid slots are 0 to 3, and 6 to 9. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslot is 0. • *cable-interface-index* —Specifies the cable interface index. Valid indices are 0 to 15.
modular-cable *slot/bay/port*	(Optional) Displays information for all cable modems on the specified modular cable interface on a Cisco uBR10012 router, where • *slot*—The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs. • *bay*—The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay). • *port*—Specifies the interface number on the SPA. This keyword is not supported on Cisco cBR-8 router.
integrated-cable *slot/subslot/port*	(Optional) Displays information for all cable modems on the specified integrated cable interface on a Cisco cBR-8 router, where • *slot*—Valid slots are 0 to 3 and 6 to 9. • *subslot*—Valid subslot is 0. • *port*—Valid ports are 0 to 15.

integrated-cable *slot/bay/port*	(Optional) Displays information for all cable modems on the specified integrated cable interface on a Cisco uBR10012 router, where • *slot*—The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs. • *bay*—The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay). • *port*—Specifies the interface number on the SPA.
WB RF channel number	(Optional) Specifies the wideband RF channel number.
QAM	(Optional) Specifies the number of QAM flaps.
MDD	(Optional) Specifies the number of MDD flaps.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **QAM** and **MDD** keywords and *WB-RF channel number* variable were removed.

Usage Guidelines

None

Examples

This example shows the output of the **show cable flap-list wb-rf** command:

```
router# show cable flap-list wb-rf

RF       Timeout Recover Failure Recover Flaps CM      Percent
-------- ------- ------- ------- ------- ----- ------- -------
3/0/0 1  1       1       0       0       1     3       33
      2  0       0       1       0       1     3       33
```

Examples for the Cisco cBR Series Converged Broadband Router

This example shows the output of the **show cable flap-list wb-rf** command on the Cisco cBR router:

```
Router#show cable flap-list wb-rf
               MDD           QAM/FEC
RF       Timeout Recover Failure Recover Flaps CM      Percent
-------- ------- ------- ------- ------- ----- ------- -------
1/0/0 158 0       0       1       0       0     2       0

Router#
```

Related Commands

Command	Description
show cable flap-list	Displays the cable flap-list on a Cisco CMTS.
clear cable flap-list	Clears all the entries in the flap-list table.
debug cable flap	Displays information about the operation of the CM flap list that is maintained for the cable interfaces.
show cable modem flap	Displays flap list statistics for one or more cable modems.

show cable freq-profile

To display information about the frequency profile, use the **show cable freq-profile** command in privileged EXEC mode.

show cable freq-profile *freq-profile-id*

Syntax Description

freq-profile-id	Specifies a freq-profile ID. Valid values range from 0 to 15.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable freq-profile** command to display information about a qam-profile. If you specify the *freq-profile-id*, the command displays the frequency profile with the specified ID.

Examples

The following is a sample output of the **show cable freq-profile** command:

```
Router# show cable freq-profile
Frequency Profile ID 0 annex-b-low:
        Lane 1 start-freq 90000000hz
                Block 1 start-freq 90000000hz
                Block 2 start-freq 138000000hz
                Block 3 start-freq 186000000hz
                Block 4 start-freq 234000000hz
        Lane 2 start-freq 282000000hz
                Block 1 start-freq 282000000hz
                Block 2 start-freq 330000000hz
                Block 3 start-freq 378000000hz
                Block 4 start-freq 426000000hz
        Lane 3 start-freq 474000000hz
                Block 1 start-freq 474000000hz
                Block 2 start-freq 522000000hz
                Block 3 start-freq 570000000hz
                Block 4 start-freq 618000000hz
        Lane 4 start-freq 666000000hz
                Block 1 start-freq 666000000hz
                Block 2 start-freq 714000000hz
                Block 3 start-freq 762000000hz
                Block 4 start-freq 810000000hz

Frequency Profile ID 1 annex-b-high:
        Lane 1 start-freq 234000000hz
                Block 1 start-freq 234000000hz
                Block 2 start-freq 282000000hz
                Block 3 start-freq 330000000hz
                Block 4 start-freq 378000000hz
        Lane 2 start-freq 426000000hz
                Block 1 start-freq 426000000hz
                Block 2 start-freq 474000000hz
                Block 3 start-freq 522000000hz
```

```
                Block 4 start-freq 570000000hz
        Lane 3 start-freq 618000000hz
                Block 1 start-freq 618000000hz
                Block 2 start-freq 666000000hz
                Block 3 start-freq 714000000hz
                Block 4 start-freq 762000000hz
        Lane 4 start-freq 810000000hz
                Block 1 start-freq 810000000hz
                Block 2 start-freq 858000000hz
                Block 3 start-freq 906000000hz
                Block 4 start-freq 954000000hz

Frequency Profile ID 2 annex-a-low:
        Lane 1 start-freq 94000000hz
                Block 1 start-freq 94000000hz
                Block 2 start-freq 142000000hz
                Block 3 start-freq 190000000hz
                Block 4 start-freq 238000000hz
        Lane 2 start-freq 286000000hz
                Block 1 start-freq 286000000hz
                Block 2 start-freq 334000000hz
                Block 3 start-freq 382000000hz
                Block 4 start-freq 430000000hz
        Lane 3 start-freq 478000000hz
                Block 1 start-freq 478000000hz
                Block 2 start-freq 526000000hz
                Block 3 start-freq 574000000hz
                Block 4 start-freq 622000000hz
        Lane 4 start-freq 670000000hz
                Block 1 start-freq 670000000hz
                Block 2 start-freq 718000000hz
                Block 3 start-freq 766000000hz
                Block 4 start-freq 814000000hz

Frequency Profile ID 3 annex-a-high:
        Lane 1 start-freq 267000000hz
                Block 1 start-freq 267000000hz
                Block 2 start-freq 315000000hz
                Block 3 start-freq 363000000hz
                Block 4 start-freq 411000000hz
        Lane 2 start-freq 459000000hz
                Block 1 start-freq 459000000hz
                Block 2 start-freq 507000000hz
                Block 3 start-freq 555000000hz
                Block 4 start-freq 603000000hz
        Lane 3 start-freq 651000000hz
                Block 1 start-freq 651000000hz
                Block 2 start-freq 699000000hz
                Block 3 start-freq 747000000hz
                Block 4 start-freq 795000000hz
        Lane 4 start-freq 843000000hz
                Block 1 start-freq 843000000hz
                Block 2 start-freq 891000000hz
                Block 3 start-freq 939000000hz
                Block 4 start-freq 987000000hz
```

The following is a sample output of the **show cable freq-profile** *freq-profile-id* command:

```
Router# show cable freq-profile 1
Frequency Profile ID 1 annex-b-high:
        Lane 1 start-freq 234000000hz
                Block 1 start-freq 234000000hz
                Block 2 start-freq 282000000hz
                Block 3 start-freq 330000000hz
```

```
        Block 4 start-freq 378000000hz
Lane 2 start-freq 426000000hz
        Block 1 start-freq 426000000hz
        Block 2 start-freq 474000000hz
        Block 3 start-freq 522000000hz
        Block 4 start-freq 570000000hz
Lane 3 start-freq 618000000hz
        Block 1 start-freq 618000000hz
        Block 2 start-freq 666000000hz
        Block 3 start-freq 714000000hz
        Block 4 start-freq 762000000hz
Lane 4 start-freq 810000000hz
        Block 1 start-freq 810000000hz
        Block 2 start-freq 858000000hz
        Block 3 start-freq 906000000hz
        Block 4 start-freq 954000000hz
```

Related Commands

Command	Description
cable downstream freq-profile	Set the frequency profile for the cable interface line card.

show cable hop

To display cable-hop statistics on a Cisco CMTS, use the **show cable hop** command in privileged EXEC mode.

show cable hop [**cable** *slot/port*] [**upstream** *uport*] [**history**] [**threshold**]
show cable hop [**cable** *slot/subslot/port*] [**upstream** *uport*] [**history**] [**threshold**]

Cisco cBR-8 Converged Broadband Router
show cable hop [**upstream-cable** *slot/subslot/controller*] [**upstream** *uport*] [**history**] [**threshold**]

Syntax Description

cable *slot/port*	(Optional) Specifies a cable interface on the Cisco uBR7100 series and Cisco uBR7200 series routers. On the Cisco uBR7100 series router, the only valid value is **1/0**. On the Cisco uBR7200 series router, *slot* can range from 3 to 6, and *port* can be 0 or 1, depending on the cable interface.
cable *slot/subslot/port*	(Optional) Specifies a cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* —Chassis slot number of the cable interface line card. Valid slots are from 5 to 8. • *subslot* —Secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Downstream port number. Valid ports are from 0 to 4, depending on the cable interface line card.
upstream*uport*	(Optional) Specifies an upstream port for which to display the frequency hop status.
upstream-cable *slot/subslot/controller*	(Optional) Specifies a cable interface on the Cisco cBR router. The following are the valid values: • *slot* —Chassis slot number. Valid slots are from 0 to 3, and 6 to 9. • *subslot* —Secondary slot number. Valid subslot is 0. • *controller* —Upstream controller. Valid controllers are from 0 to 4, depending on the cable interface line card.
history	(Optional) Displays changes from one state to another, at any time and for any reason, for frequency, modulation, and channel width.
summary	(Optional) Displays summary of information for Cisco cBR router.
threshold	(Optional) Displays the user defined thresholds and current carrier-to-noise ratio (CNR), signal-to-noise ratio (SNR), correctable forward error correction (FEC) percentage, uncorrectable FEC percentage, and missed station maintenances percentage values of the upstreams.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(4)XI	This command was introduced.
12.3(13a)BC	This command was enhanced with the addition of two new keywords, **history** and **threshold**.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.3(23)BC7	The output of the **show cable hop history** command is modified to include more information in the 'change from' and 'change to' fields of the output. Now, the modulation profile number is displayed when a change occurs, instead of the modulation order.
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **summary** and **upstream-cable** keywords were added.

Examples

The following example shows typical output from the **show cable hop** command:

```
Router# show cable hop

Upstream      Port       Poll Missed Min    Missed Hop   Hop     Corr    Uncorr
Port          Status     Rate Poll   Poll   Poll   Thres Period  FEC     FEC
                         (ms) Count  Sample Pcnt   Pcnt  (sec)   Errors  Errors
Cable4/0/U0   down       1000 * * *   frequency not set    * * * 0       0
Cable4/0/U1   down       1000 * * *   frequency not set    * * * 0       0
Cable4/0/U2   down       1000 * * *   frequency not set    * * * 0       0
Cable4/0/U3   down       1000 * * *   frequency not set    * * * 0       0
Cable4/0/U4   down       1000 * * *   frequency not set    * * * 0       0
Cable4/0/U5   down       1000 * * *   frequency not set    * * * 0       0
Cable5/0/U0   down       1000 * * *   interface is down    * * * 0       0
Cable5/0/U1   down       1000 * * *   frequency not set    * * * 0       0
Cable5/0/U2   down       1000 * * *   interface is down    * * * 0       0
Cable5/0/U3   down       1000 * * *   interface is down    * * * 0       0
Cable5/0/U4   down       1000 * * *   interface is down    * * * 0       0
Cable5/0/U5   down       1000 * * *   interface is down    * * * 0       0
Cable6/0/U0   down       1000 * * *   interface is down    * * * 0       0
Cable6/0/U1   22.000 Mhz 1000 * * *set to fixed frequency * * *  31375  1912
Cable6/0/U2   26.000 Mhz 1000 * * *set to fixed frequency * * *  0      0
Cable6/0/U3   admindown  1000 * * *   frequency not set   * * *  0      0
The following example shows typical output from the show cable hop
 upstream
 command:
Router# show cable hop c2/0 upstream 2

Upstream    Port       Poll Missed Min    Missed Hop   Hop     Corr    Uncorr
Port        Status     Rate Poll   Poll   Poll   Thres Period  FEC     FEC
                       (ms) Count  Sample Pcnt   Pcnt  (sec)   Errors  Errors
Cable2/0/U2 admindown  1000 * * *   frequency not set    * * * 0       0
Router#
```

Table 75: show cable hop Command Field Descriptions

Field	Description
Upstream Port	The upstream port for this information line.

Field	Description
Port Status	Lists the status of the port. Valid states are down if frequency is unassigned or admindown if the port is shut down. If the port is up, this column shows the center frequency of the channel.
Poll Rate	The rate that station maintenance polls are generated (in milliseconds).
Missed Poll Count	The number of missing polls, per codeword/FEC block.
Min Poll Sample	The number of polls in the sample, per codeword/FEC block.
Missed PollPcnt	The ratio of missing polls to the number of polls, expressed as a percentage.
Hop Thres Pcnt	The level that the missed poll percentage must exceed to trigger a frequency hop, expressed as a percentage.
Hop Period	The maximum rate that frequency hopping will occur (in seconds).
Corr FEC Errors	The number of correctable forward error corrections (FEC) errors on this upstream port, per codeword/FEC block.
Uncorr FEC Errors	The number of uncorrectable FEC errors on this upstream port, per codeword/FEC block.
Note The **show cable hop** and **show controllers cable** commands display FEC errors per codewords, while the **show interface cable upstream** command displays FEC errors per packets, where a packet could contain multiple codewords.	

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

The following example shows typical output from the **show cable hop threshold** command:

```
Router# show cable hop c6/0/0 threshold
Upstream SNR(dB) CNR(dB) CorrFEC% UncorrFEC% MissedSM%
Port Val Thre1 Thre2 Val Thre1 Thre2 Pcnt Thre Pcnt Thre Pcnt Thre
Ca6/0/0/U0 27   25   15    39   35   25    0    3    0    1          75   75
Ca6/0/0/U1 31   25   15    51   35   25    0    3    0    1          90   75
Ca6/0/0/U2 --   35   25    --   35   25    0    3    0    1          0    75
Ca6/0/0/U3 --   35   25    --   35   25    0    3    0    1          0    75
```

Table 76: show cable hop threshold Command Field Descriptions

Field	Description
Upstream Port	The upstream port for this information line.
SNR (dB)	The signal-to-noise ratio (SNR) for a particular cable modem (CM), in decibels (dB).
CNR (dB)	The current upstream carrier-to-noise ratio (CNR) for a particular cable modem (CM), in decibels (dB).
Corr FEC Errors	The number of correctable forward error corrections (FEC) errors on this upstream port, per codeword/FEC block.
Uncorr FEC Errors	The number of uncorrectable FEC errors on this upstream port, per codeword/FEC block.
Missed SM	The number of missing station maintenance polls, per codeword/FEC block.

The following example shows typical output from the **show cable hop history** command:

```
Router# show cable hop c8/1/1 upstream 0 history
F = Frequency Hop, M = Modulation Change, C = Channel Width Change
Upstream   Action            Chg    Chg    Action
Port       Time          Code From   To     Reason
C8/1/1 U0  Feb 20 12:21:29 M  142    141    SNR 28>=28 CFEC 0<=3 UnCFEC 0<=1
           Feb 20 12:09:08 F   0.000 24.000 Configuration changed
```

Table 77: show cable hop history Command Field Descriptions

Field	Description
Upstream Port	The upstream port for this information line.
Action Time	The time of the spectrum management action.
Code	The code associated with the type of hop.
Chg From	The previous state of the spectrum management action.
Chg To	The current state of the spectrum management action.
Action Reason	The reason for changing the frequency.

This example shows the output of the **show cable hop upstream-cable** command on the Cisco cBR-8 Converged Broadband Router.

```
Router# show cable hop upstream-cable 1/0/0
Upstream         Channel    Poll Missed Min    Missed          Hop   Hop     Corr    Uncorr
Channel          Status     Rate Poll   Poll   Poll            Thres Period  FEC     FEC
                            (ms) Count  Sample Pcnt            Pcnt  (sec)   Errors  Errors
UC1/0/0:U0       13.200 MHz 1000 * * *  set to fixed frequency  * * *       0       0
UC1/0/0:U1       19.600 MHz 1000 * * *  set to fixed frequency  * * *       0       2
UC1/0/0:U2       26.000 MHz * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U3       32.400 MHz * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U4       admindown  * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U5       admindown  * * *  us-channel is not binded to any MD  * * * 0       0
```

```
UC1/0/0:U6       admindown  * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U7       admindown  * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U8       admindown  * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U9       admindown  * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U10      admindown  * * *  us-channel is not binded to any MD  * * * 0       0
UC1/0/0:U11      admindown  * * *  us-channel is not binded to any MD  * * * 0       0

Router#
```

Related Commands

Command	Description
cable spectrum-group hop period	Changes the minimum time between frequency hops.
cable spectrum-group hop threshold	Specifies a frequency hop threshold for a spectrum group.
cable upstream hop-priority	Configures the priority of the corrective actions to be taken when a frequency hop is necessary due to ingress noise on the upstream.
cable upstream modulation-profile	Configures up to three modulation profiles to an upstream port to activate Dynamic Upstream Modulation.
cable upstream threshold	Configures the upstream for the CNR and FEC threshold values to be used in determining the allowable noise levels.
cable upstream threshold hysteresis	Configures a hysteresis value to be used in conjunction with the dynamic modulation upgrade thresholds.
clear cable hop	Clears the forward error corrections (FEC) hop counters on one or all cable interfaces on a Cisco CMTS.
show cable host access-group	Displays the statistics for the host behind the CM.
show cable modem	Displays CM configuration settings.

show cable host access-group

To display the hosts and other customer premises equipment (CPE) devices behind the CMs in the network, along with their access groups, use the **show cable host access-group** command in privileged EXEC mode.

show cable host [*ip-addressmac-address*] **access-group**

Note The **show cable host** command is not supported on the Cisco uBR10012 universal broadband router.

Syntax Description

mac-address	(Optional) Specifies the 48-bit hardware address for a particular CM or host.
ip-address	(Optional) Specifies the IP address for a particular CM or host.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.NA	This command was introduced.
12.1(3a)EC1	Support was added to the Release 12.1 EC train.
12.2(4)BC1	Support was added to the Release 12.2 BC train for the Cisco uBR7100 series and Cisco uBR7200 series routers. (This command also appears in the CLI for the Cisco uBR10012 router but is not functional.)
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays information only for hosts and other CPE devices. To display information for CMs and their associated CPE devices, use the **show cable device access-group** command. To display information only for CMs, use the **show cable device access-group** command.

If an SNMP manager is requesting information about CM or CPE devices at the same time that this command is given, the command displays the following error message:

```
No information is available, please try later.
```

Wait until the SNMP retrieval is done and retry the CLI command.

Examples

The following example shows how to display all the hosts behind the CMs in the network:

```
Router# show cable host access-group
MAC address      IP address      Type    Access-group
0080.c6f9.b42e   24.168.220.52   host
0020.7806.defe   192.168.28.134  host
0050.baa0.5ccd   24.168.223.251  host
0050.046f.f4cf   192.168.33.25   host
```

```
0050.bacf.5d89   192.168.37.113  host
0050.1800.a8cb   192.168.33.90   host
0040.d00f.44f0   192.168.34.128  host
0050.e456.9641   192.168.39.66   host
0050.badd.2883   192.168.32.230  host
0050.badd.3b12   192.168.33.246  host
0020.78c7.f887   192.168.32.32   host
00e0.2969.a1a5   192.168.36.246  host
0020.78d5.ddf0   192.168.32.107  host
00001.02c5.9936  192.168.38.233  host
0020.78d0.fb32   192.168.28.45   host
0050.1800.f458   192.168.36.209  host
0002.e301.df8f   192.168.30.191  host
00a0.2451.b7eb   24.168.223.41   host
0080.c7db.afba   192.168.33.153  host
00D0.2717.1899   192.168.39.189  host
Router#
```

This table describes the fields that are shown in the **show cable host access-group** display:

Table 78: show cable host access-group Field Descriptions

Field	Description
MAC Address	The MAC address for the CPE device.
IP Address	The IP address that the DHCP server has assigned to the CPE device.
Type	Identifies the type of device. With this command, this field should always be host to indicate a CPE device. Use the **show cable device access-group** or **show cable modem access-group** command to display information for CMs.
Access-group	Displays the access group name or number in use (if any) for this CPE device.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable device	Configures the access list for a CM device or host.
cable host access-group	Configures the access list for the specified hosts.
clear cable host	Clears the host from the table.
show cable device access-group	Displays a list of CMs and their CPE devices, along with their access groups.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.

show cable ib-ipc

To display the status of local IB IPC server and information on participating line cards, use the show cable ib-ipc command in privileged EXEC mode.

show cable ib-ipc {**status** | **ports**}

Syntax Description

status	Displays status of local IB IPC server.
ports	Displays information on participating line cards.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show cable ib-ipc** command. The command **show cable ib-ipc ports** displays the internal virtual channel identifiers and internal service flows for Ironbus based IPC.

```
Router# show cable ib-ipc ports
6/0: LCP High Priority VCCI 135, SFID 32891
LCP Normal Priority VCCI 135, SFID 135
8/0: LCP High Priority VCCI 153, SFID 32909
LCP Normal Priority VCCI 153, SFID 153
```

show cable ipc-stats

To display statistics of all IPC messages on a Cisco CMTS router, use the **show cable ipc-stats** command in privileged EXEC mode.

show cable ipc-stats

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
12.2(33)SCF	The command output displays the IPC port information such as service type of the IPC messages.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

You must enable the Cable IPC Statistics Collection tool using the cable ipc-stats command before using the show cable ipc-stats command. When you use this show command, a separate shadow database buffer is allocated, and the contents of the active database are copied into the shadow database to display the IPC statistics. This ensures that all the statistics are frozen at the same time for easy comparison and analysis.

Examples

The following is a sample output of the show cable ipc-stats command that shows statistics of all IPC messages on a Cisco CMTS router:

```
Router# show cable ipc-stats
--- TIME ---
Start: 05:25:22 UTC Tue May 24 2011
End  : 05:26:39 UTC Tue May 24 2011
Total: 0 days 00 hrs 01 mins 17 secs (77 seconds)
size : 2186112 bytes
--- CMTS MSG ---
entity app      io    s/s reqid idx dbg :    pkts      bytes lastEvt totalDur maxDur lastMax

                                                              (sec)    (msec)    (msec) (sec)
rp-lc c10k     TxReq 1/0 10241   1 off :       2         48      58
rp-lc c10k     TxReq 1/0    10  14 off :      15        960       4
rp-lc c10k     TxReq 1/1    10  14 off :      15        960       4
rp-lc c10k     TxReq 2/1    10  14 off :      16       1024       2
rp-lc c10k     TxReq 4/1    10  14 off :      15        960       4
rp-lc c10k     TxReq 5/1 10252   2 off :      24       1840       3
rp-lc c10k     TxReq 5/1    10  14 off :      16       1024       0
rp-lc c10k     TxReq 7/0 10252   2 off :      17       1112       4
rp-lc c10k     TxReq 7/0    10  14 off :      15        960       4
rp-lc c10k     TxReq 8/1 10252   2 off :      22       6080       2
rp-lc c10k     TxReq 8/1    10  14 off :      15        960       2
```

```
rp-lc c10k     RxRsp 1/0 10241   1 off :       2          8      58         4      4
58
rp-lc c10k     RxRsp 8/1 10252   2 off :       1         72       2         0      0
2
rp-lc c10k     RxReq 1/0 10241   1 off :       2         64      58         0      0
58
rp-lc c10k     RxReq 1/0    10  14 off :      15        960       4         0      0
4
rp-lc c10k     RxReq 1/1 10241   1 off :      38      19684       1         0      0
1
rp-lc c10k     RxReq 1/1    10  14 off :      15        960       4         0      0
4
rp-lc c10k     RxReq 2/1 10241   1 off :      37      19166       1         0      0
1
rp-lc c10k     RxReq 2/1    10  14 off :      16       1024       2         0      0
2
rp-lc c10k     RxReq 4/1 10241   1 off :      32       2144       0         0      0
0
rp-lc c10k     RxReq 4/1    10  14 off :      15        960       4         0      0
4
rp-lc c10k     RxReq 5/1 10252   2 off :     242     733456       2         0      0
2
rp-lc c10k     RxReq 5/1    10  14 off :      16       1088       0         0      0
0
rp-lc c10k     RxReq 7/0 10252   2 off :     257     783364       1         0      0
1
rp-lc c10k     RxReq 7/0    10  14 off :      15       1020       4         0      0
4
rp-lc c10k     RxReq 8/1 10252   2 off :     241     714668       4         0      0
4
rp-lc c10k     RxReq 8/1    10  14 off :      15       1020       2         0      0
2
rp-lc pnego    TxReq 5/1    14   6 off :       1         30      77

entity app      io    s/s reqid idx dbg :    pkts      bytes lastEvt totalDur maxDur lastMax

                                                                 (sec)    (msec)    (msec) (sec)
rp-lc pnego    TxReq 7/0    14   6 off :       1         30      77
rp-lc pnego    TxReq 8/1    14   6 off :       1         30      77
rp-lc plfm     RxReq 5/1    24  17 off :       2         24      12         0      0
12
rp-lc plfm     RxReq 5/1    27  20 off :     225      23400       2        36      4
12
rp-lc plfm     RxReq 5/1    28  21 off :    9900     554400       2      1584      4
12
rp-lc plfm     RxReq 7/0    24  17 off :       1         12      21         0      0
21
rp-lc plfm     RxReq 7/0    27  20 off :     240      24960       1        72      4
1
rp-lc plfm     RxReq 7/0    28  21 off :   10560     591360       1      3168      4
1
rp-lc plfm     RxReq 8/1    24  17 off :       1         12      28         0      0
28
rp-lc plfm     RxReq 8/1    27  20 off :     225      23400       4        32      4
4
rp-lc plfm     RxReq 8/1    28  21 off :    9900     554400       4      1408      4
4
rp-lc docsis   TxReq 5/1   118 109 off :      30        240       3
rp-lc docsis   TxReq 7/0   118 109 off :      16        128       4
rp-lc docsis   TxReq 8/1   118 109 off :      16        128       3
rp-lc docsis   RxReq 5/1   153 144 off :     345      19320       2       184      4
7
rp-lc docsis   RxReq 7/0   153 144 off :     384      21504       1       192      4
66
```

```
rp-lc docsis   RxReq 8/1   153 144 off :      60       3360       4       80       4
9
rp-lc docsis   RxReq 8/1   154 145 off :      15        480       4       20       4
9
rp-lc snmp     RxReq 5/1    42  42 off :       2         32       5        4       4
5
rp-lc test     TxReq 8/1    10   3 off :       1         16       2
rp-lc test     TxReq 8/1    20  13 off :     100       1600       2
rp-lc test     RxRsp 8/1    10   3 off :       1         16       2        0       0
2
--- CMTS TXQ ---
TXQ_5_1_default
enQ: 24 pkts  max Q size 1 at 3 sec ago
deQ: 24 pkts  max delay 0 msec at 3 sec ago
   delay between (  0,  10) msec:       24 pkts
   delay between (  0,   1) sec :       24 pkts
flush: 0 ptks  0 times
TXQ_7_0_default
enQ: 17 pkts  max Q size 1 at 4 sec ago
deQ: 17 pkts  max delay 0 msec at 4 sec ago
   delay between (  0,  10) msec:       17 pkts
   delay between (  0,   1) sec :       17 pkts
flush: 0 ptks  0 times
TXQ_8_1_default
enQ: 17 pkts  max Q size 1 at 3 sec ago
deQ: 17 pkts  max delay 0 msec at 3 sec ago
   delay between (  0,  10) msec:       17 pkts
   delay between (  0,   1) sec :       17 pkts
flush: 0 ptks  0 times
TXQ_8_1_inband
enQ: 5 pkts  max Q size 5 at 2 sec ago
deQ: 5 pkts  max delay 4 msec at 2 sec ago
   delay between (  0,  10) msec:        5 pkts
   delay between (  0,   1) sec :        5 pkts
flush: 0 ptks  0 times
--- CMTS WATERMARK ---
--- CMTS RXQ ---
CMTS rxq
enQ: 956 pkts  max Q size 6 at 41 sec ago
deQ: 956 pkts  max delay 4 msec at 69 sec ago
   delay between (  0,  10) msec:      956 pkts
   delay between (  0,   1) sec :      956 pkts
flush: 0 ptks  0 times
CMTS LP rxq
enQ: 742 pkts  max Q size 6 at 41 sec ago
deQ: 742 pkts  max delay 8 msec at 64 sec ago
   delay between (  0,  10) msec:      742 pkts
   delay between (  0,   1) sec :      742 pkts
flush: 0 ptks  0 times
```

This table describes the fields displayed by the **show cable ipc-stats** command.

Table 79: show cable ipc-stats Command Field Descriptions

Field	Description
entity	Route processor-to-line card connection or a line card-to-line card connection.
app	Message group.
io	Send request or a send response, or a receiver request or a receiver response.
s/s	Slot/subslot

Field	Description
reqid	Nonsequential message ID for the original request.
idx	Sequential message index for the original request.
pkts	Number of messages.
bytes	Number of bytes.
lastEvt (sec)	Seconds since the last send or receive event.
totalDur (msec)	Total time in milliseconds for the blocked send wait or received request process.
maxDur (msec)	Maximum time in milliseconds for the blocked send wait or received request process.
lastMax (sec)	Seconds since the last maxDur is recorded.

Related Commands

Command	Description
cable ipc-stats	Enables the Cable IPC Statistics Collection tool on a Cisco CMTS router.
clear cable ipc-stats	Clears the active database and resets all IPC statistics in the active database to zero.

show cable ipv6 leasequery-filter

On the Cisco cBR Series Converged Broadband Router, to view the subscriber information, use the **show cable ipv6 leasequery-filter** command to view the leasequery filter statistics.

show cable ipv6 leasequery-filter[**cable***slot/subslot/cable-interface-index*]

Syntax Description

cable*slot/subslot/cable-interface-index*	(Optional) For the Cisco cBR router— • The valid range for the *slot* is 0 to 3 and 6 to 9. • The valid value for the *subslot* is 0. • The valid range for *cable-interface-index*is 0 to 15.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

To view the leasequery filter statistics for a specific cable interface, use the **cable***slot/subslot/cable-interface-index* option.

Example for Cisco cBR router

This example shows the output for the **show cable ipv6 leasequery-filter** command on the Cisco cBR router:

```
Router#show cable ipv6 leasequery-filter
Lease Query IPv6 Filter statistics for Unknown Sid
  Requests Sent : 0 total. 0 unfiltered, 0 filtered

Router#
```

This example shows the output for the **show cable ipv6 leasequery-filter** command for a specific cable interface on the Cisco cBR router:

```
Router#show cable ipv6 leasequery-filter cable 1/0/0
Lease Query IPV6 Filter statistics for Cable1/0/0:
  Requests Sent : 0 total. 0 unfiltered, 0 filtered

Router#
```

show cable ipv6 leasequery-stats

To display the IPv6 cable leasequery packet processing statistics. Counters collect statistics and show the queries that are sent to the DHCP server and the replies received by the cBR-8 routers. Use the **show cable ipv6 leasequery-stats** command in the privileged EXEC mode.

show cable ipv6 leasequery-stats [**clear**]

Cisco cBR Series Converged Broadband Router
show cable ipv6 leasequery-stats [**clear**]

Syntax Description

clear	(Optional) Resets all DHCPv6 counters on the cBR-8 router to zero.

Command Modes

Privileged EXEC (#)

Release	Modification
17.6.1z1	This command was introduced.

Usage Guidelines

The **show cableipv6 leasequery-stats** command displays the IPv6 cable leasequery packet processing statistics. The counters are grouped by queries and replies.

Examples

The following example shows the IPv4 cable leasequery statistics output on the cBR-8 router:

```
Router# show cable ipv6 leasequery-stats
IPv4 Source Verify LeaseQuery Statistics:
Queries: 1 sent, 0 timed out
Replies: 1 allowed, 0 rogues, 0 dropped
```

Table 80: show cable leasequery-stats Field Descriptions

Field	Description
Queries	
Sent	Number of leasequeries sent by cBR-8.
Timed out	Number of leasequeries timed out before receiving replies.
Replies	
Allowed	Number of replies that are valid, so that the CPE traffic is allowed.
Rogue	Number of replies that indicate a CPE is a rogue device, so that the CPE is added into the rogue list.
Dropped	No of replies that are invalid, so they are dropped without further processing.

show cable l2-vpn dot1q-nsi-redundancy

The **show cable l2-vpn dot1q-nsi-redundancy** command in privileged EXEC mode displays the following information:

- Configured primary and the backup DOT1Q Ethernet Network System Interface (NSI).
- Current active NSI, through which the traffic flows.
- Time elapsed from latest switchover.

show cable l2-vpn dot1q-nsi-redundancy

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33) SCJ	This command was introduced on the Cisco uBR Series Universal Broadband Routers
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The following conditions trigger a restart as indicated by the Elapsed-after-SW field:

- When the backup pair is created for the first time.
- When the Active-NSI in the pair fails and triggers a switchover.
- When you manually switch over the current active uplink NSI port.

Example

The following example shows the DOT1Q NSI port backup pair details:

```
Router# show cable l2-vpn dot1q-nsi-redundancy
Primary-NSI    Backup-NSI     Active-NSI     Elapsed-after-SW
Te4/0/1        Te4/0/7        Te4/0/1        31m9s
Te4/0/2        Te4/0/3        Te4/0/2        59s
```

When two uplink DOT1Q NSI ports are UP, you can manually switch over an active uplink port from current active uplink port to another using **cable l2-vpn dot1q-nsi-redundancy force-switchover from `Te4/0/1`** command. The following example shows the current NSI uplink active port after switchover:

```
Router# show cable l2-vpn dot1q-nsi-redundancy
Primary-NSI    Backup-NSI     Active-NSI     Elapsed-after-SW
```

```
Te4/0/1         Te4/0/7         Te4/0/7         41m27s
Te4/0/2         Te4/0/3         Te4/0/2         10m17s
```

show cable l2-vpn dot1q-vc-map

To display the mapping of one or all cable modems to IEEE 802.1Q Virtual Local Area Networks (VLANs) on the router's Ethernet interfaces, use the **show cable l2-vpn dot1q-vc-map** command in privileged EXEC mode.

show cable l2-vpn dot1q-vc-map [*mac-address* [**vpn** *vpnid*] [**verbose**]] [**customer** *cust-name*] [**vpn** *vpnid*]

Syntax Description

mac-address	(Optional) Displays the mapping for the cable modem with the specified hardware MAC address.
vpn *vpnid*	(Optional) Displays Layer 2 VPN information on a cable modem with the specified MAC address, or for the specified VPN ID across all cable modems.
verbose	(Optional) Displays additional information about the Layer 2 mapping, including the number of packets and bytes received on the upstream and downstream.
customer *cust-name*	(Optional) Displays the VLAN mappings for this particular customer name.

Command Default

Displays information for all cable modems that have a defined IEEE 802.1Q VLAN mapping.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(15)BC2	This command was introduced for Cisco uBR7246VXR universal broadband routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA on the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers. Support for the Cisco uBR7225VXR router was added. The **vpn** keyword was added and the output fields were modified to display L2VPN information.
12.2(33)SCF	This command is obsolete for Cisco uBR10012 Series Universal Broadband Routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays the cable modem to VLAN mappings that have been defined using the **cable dot1q-vc-map** command. It displays the MAC address, service ID (SID), and cable interface being used by the cable modem, and the interface and VLAN ID to which it has been mapped.

Tip The **customer** option displays only those VLAN mappings that have been configured with a particular customer name, using the **cable dot1q-vc-map** command.

The command also displays L2VPN information for cable modem traffic and service flows on CMTS router Ethernet interfaces that have been defined using the **cable l2-vpn-service default-nsi** command.

TLS in Cisco IOS Release 12.2BC Examples

The following example shows typical output for the **show cable l2-vpn dot1q-vc-map** command for all cable modems that are mapped to IEEE 802.1Q VLANs:

```
Router# show cable l2-vpn dot1q-vc-map
MAC Address    Ethernet Interface      VLAN ID   Cable Intf  SID   Priv Bits
0010.7bed.9c95 FE0/0.2                 3         Cable4/0    3     0
0007.0e03.69f9 FE0/0.1                 4         Cable4/0    1     0
Router#
```

The following example shows typical output for a particular cable modem with the MAC address of 0001.0203.0405:

```
Router# show cable l2-vpn dot1q-vc-map 0001.0203.0405

MAC Address    Ethernet Interface      VLAN ID   Cable Intf  SID   Priv Bits
0010.7bed.9c91 GE2/0                   5         Cable5/0    7     0
Router#
```

The following example shows a typical example for the **verbose** option:

```
Router# show cable l2-vpn dot1q-vc-map 0001.0203.0405 verbose

MAC Address                       : 0010.7bed.9c91
Prim Sid                          : 7
Cable Interface                   : Cable5/0
Ethernet Interface                : GigabitEthernet2/0
DOT1Q VLAN ID                     : 5
Total US pkts                     : 6
Total US bytes                    : 1402
Total DS pkts                     : 71
Total DS bytes                    : 21975
```

This table describes the fields shown in the display.

Table 81: show cable l2-vpn dot1q-vc-map Field Descriptions

Field	Description
MAC Address	Hardware (MAC) address for the CM being mapped.
Ethernet Interface	Destination interface (Ethernet, Fast Ethernet, or Gigabit Ethernet) for the VLAN being used for the mapping.
VLAN ID	Destination VLAN on the Ethernet, Fast Ethernet, or Gigabit Ethernet interface for the traffic coming from the CM.
Cable Intf	Cable interface to which the CM is connected.
SID	Primary service ID (SID) for this cable modem.

Field	Description
Priv Bits	Identifies the current settings of the two privacy bits in the extended header (EH) that is used for BPI-encrypted packets. • First bit = Enable bit. Set to 1 when BPI or BPI+ is enabled. • Second bit = Toggle bit. Matches the least-significant bit (LSB) of the key sequence number (KSN) in the EH. For example, a value of "0" indicates that BPI is not enabled. A value of "10" indicates that BPI is enabled and that the KSN is an even number. A value of "11" indicates that BPI is enabled and that the KSN is an odd number. **Note** For more information on these bits, see the DOCSIS Baseline Privacy Interface Plus Interface Specification (SP-BPI+-I08-020301 or later).
Total US pkts/bytes	Total number of packets and bytes sent on the upstream to the Layer 2 tunnel by this cable modem.
Total DS pkts/bytes	Total number of packets and bytes received on the downstream from the Layer 2 tunnel by this cable modem.

L2VPN over Cable in Cisco IOS Release 12.2SB Examples

The following example shows sample output of VLAN information for all cable modems configured for L2VPN support:

```
Router# show cable l2-vpn dot1q-vc-map
MAC Address    Ethernet Interface      VLAN ID   Cable Intf  SID  Customer Name/VPN ID
0014.f8c1.fd66 GigabitEthernet4/0/0        68    Cable6/0/0  3    0234560001
```

The following example shows sample output of VLAN information for a VPN with ID 0234560001:

```
Router# show cable l2 dot1q-vc-map vpn 0234560001

MAC Address    Ethernet Interface      VLAN ID   Cable Intf  SID  Customer Name/VPNID
0014.f8c1.fd66 GigabitEthernet4/0/0        68    Cable6/0/0  3    0234560001
```

The following example shows sample output of VLAN information for a VPN with ID 0234560001 on the cable modem with MAC address 0014.f8c1.fd66:

```
Router# show cable l2-vpn dot1q-vc-map 0014.f8c1.fd66 vpn 0234560001

MAC Address    Ethernet Interface      VLAN ID   Cable Intf  SID  Customer Name/VPNID
0014.f8c1.fd66 GigabitEthernet4/0/0        68    Cable6/0/0  3    0234560001
```

The following example shows sample output of detailed VLAN information for a VPN with ID 0234560001 on the cable modem with MAC address 0014.f8c1.fd66:

```
Router# show cable l2-vpn dot1q-vc-map 0014.f8c1.fd66 vpn 0234560001 verbose
MAC Address                    : 0014.f8c1.fd66
Prim Sid                       : 3
Cable Interface                : Cable6/0/0
VPN ID                         : 0234560001
```

```
L2VPN SAID                          : 12294
Upstream SFID                       : 23
Downstream CFRID[SFID]              : 2[24]
CMIM                                : 0x60
Ethernet Interface                  : GigabitEthernet4/0/0
DOT1Q VLAN ID                       : 68
Total US pkts                       : 1372
Total US bytes                      : 500226
Total US pkt Discards               : 0
Total US byte Discards              : 0
Total DS pkts                       : 1248
Total DS bytes                      : 415584
Total DS pkt Discards               : 0
Total DS byte Discards              : 0
```

The following example shows sample output of detailed VLAN information for a cable modem with MAC address 0014.f8c1.fd66:

```
Router# show cable l2-vpn dot1q-vc-map 0014.f8c1.fd66 verbose
MAC Address                         : 0014.f8c1.fd66
Prim Sid                            : 3
Cable Interface                     : Cable6/0/0
L2VPNs provisioned                  : 1
DUT Control/CMIM                    : Enable/0xFFFFFFFF
VPN ID                              : 0234560001
L2VPN SAID                          : 12294
Upstream SFID                       : 23
Downstream CFRID[SFID]              : 2[24]
CMIM                                : 0x60
Ethernet Interface                  : GigabitEthernet4/0/0
DOT1Q VLAN ID                       : 68
Total US pkts                       : 1374
Total US bytes                      : 501012
Total US pkt Discards               : 0
Total US byte Discards              : 0
Total DS pkts                       : 1250
Total DS bytes                      : 416250
Total DS pkt Discards               : 0
Total DS byte Discards              : 0
```

This table describes the fields shown in the display.

Table 82: show cable l2-vpn dot1q-vc-map with L2VPN Field Descriptions

Field	Description
MAC Address	Hardware (MAC) address for the CM being mapped.
Prim Sid	Primary service ID for the CM.
Cable Interface	Cable interface to which the CM is connected.
L2VPNs provisioned	Number of L2VPNs supported by the CM.
DUT Control/CMIM	State of Downstream Unencrypted Traffic (DUT) filtering and Cable Modem Interface Mask (CMIM).
VPN ID	Identification number of the Layer 2 VPN tunnel.
L2VPN SAID	Layer 2 VPN Security Association Identifier (SAID).

Field	Description
Upstream SFID	Upstream Service Flow Identifier (SFID).
Downstream CFRID [SFID]	Downstream classifiers (classifier identifiers) and corresponding downstream service flows identifiers for this L2VPN.
CMIM	Cable Modem Interface Mask.
Ethernet Interface	Ethernet Network System Interface (NSI).
DOT1Q VLAN ID	Destination VLAN on the Ethernet, Fast Ethernet, or Gigabit Ethernet interface for the traffic coming from the CM.
Total US pkts/bytes	Total number of packets and bytes sent on the upstream to the Layer 2 tunnel by this CM.
Total US pkt/byte Discards	Total number of packets and bytes dropped on the upstream to the Layer 2 tunnel by this CM.
Total DS pkts/bytes	Total number of packets and bytes received on the downstream from the Layer 2 tunnel by this CM.
Total DS pkt/byte Discards	Total number of packets and bytes dropped on the downstream from the Layer 2 tunnel by this CM.

Related Commands

Command	Description
cable l2-vpn-service dot1q	Enables the use of Layer 2 tunnels for the Customer Premises Equipment (CPE) traffic that is behind cable modems so that individual CPE traffic can be routed over a particular Virtual Local Area Network (VLAN).
cable dot1q-vc-map	Maps a cable modem to a particular VLAN on a local outbound Ethernet interface.
cable l2-vpn-service default-nsi	Configures an Ethernet Network System Interface for Layer 2 VPN support over cable.
debug cable l2-vpn	Displays debugging messages for the Layer 2 mapping of cable modems to particular PVCs or VLANs.

show cable l2-vpn vc-map

To display the mapping of one or all cable modems to permanent virtual connections (PVC) on Asynchronous Transfer Mode (ATM) interfaces, use the **show cable l2-vpn vc-map** command in privileged EXEC mode.

show cable l2-vpn vc-map [*mac-address*] [**customer** *cust-name*]

Syntax Description

mac-address	(Optional) Displays the mapping for the cable modem with the specified hardware (MAC).
customer *cust-name*	(Optional) Displays the PVC mappings for this particular customer name.

Command Default

Displays information for all cable modems that have a defined ATM PVC mapping.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(11)BC3	This command was introduced for Cisco uBR7100 series and Cisco uBR7246VXR universal broadband routers.
12.2(15)BC2	Support was added for the **customer** option.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays the cable modem to ATM PVC mappings that have been defined using the **cable vc-map** command. It displays the MAC address, service ID (SID), and cable interface being used by the cable modem, and the ATM interface and PVC/PVI to which it has been mapped.

Tip The **customer** option displays only those PVC mappings that have been configured with a particular customer name, using the **cable vc-map** command.

Examples

The following example shows typical output for the **show cable l2-vpn vc-map** command for all cable modems that are mapped to ATM PVCs:

```
Router# show cable l2-vpn vc-map
MAC Address    ATM Intf    VPI/VCI   Cable Intf  SID   Priv Bits
0010.7bed.9c95 ATM2/0.2       1/2    Cable4/0    3     0
0007.0e03.69f9 ATM2/0.1       1/1    Cable4/0    1     0
Router#
```

The following example shows typical output for a particular cable modem with the MAC address of 0001.0203.0405:

```
Router# show cable l2-vpn vc-map 0001.0203.0405
```

```
MAC Address    ATM Intf    VPI/VCI   Cable Intf  SID   Priv Bits
0001.0203.0405 ATM3/0.2       1/2    Cable5/0    3     0
Router#
```

Table 83: show cable l2-vpn vc-map Field Descriptions

Field	Description
MAC Address	Hardware (MAC) address for the CM being mapped.
ATM Intf	Destination ATM interface that contains the VPI/VCI being used for the mapping.
VPI/VCI	Destination VPI/VCI on the ATM interface for the traffic coming from the CM.
Cable Intf	Cable interface to which the CM is connected.
SID	Primary service ID (SID) for this cable modem.
Priv Bits	Identifies the current settings of the two privacy bits in the extended header (EH) that is used for BPI-encrypted packets. • First bit = Enable bit. Set to 1 when BPI or BPI+ is enabled. • Second bit = Toggle bit. Matches the least-significant bit (LSB) of the key sequence number (KSN) in the EH. For example, a value of "0" indicates that BPI is not enabled. A value of "10" indicates that BPI is enabled and that the KSN is an even number. A value of "11" indicates that BPI is enabled and that the KSN is an odd number. **Note** For more information on these bits, see the DOCSIS Baseline Privacy Interface Plus Interface Specification (SP-BPI+-I08-020301 or later).

Related Commands

Command	Description
cable l2-vpn-service atm-vc	Enables the use of Layer 2 tunnels for the Customer Premises Equipment (CPE) traffic that is behind cable modems, so that individual CPE traffic can be routed to a particular PVC on an ATM interface.
cable vc-map	Maps a cable modem to a particular PVC on an ATM interface.
debug cable l2-vpn	Displays debugging messages for the Layer 2 mapping of cable modems to particular PVC on an ATM interface.

show cable l2-vpn xconnect

To display details about the mapping between a Multiprotocol Label Switching (MPLS) pseudowire and its virtual circuits, use the **show cable l2-vpn xconnect** command in privileged EXEC mode.

show cable l2-vpn xconnect {**dot1q-vc-map** | **mpls-vc-map**}**[customer** *customer-name* | *mac-address* | **vpn** *vpn-id* [**verbose**]

Syntax Description

dot1q-vc-map	Specifies the mapping of one or all cable modems to IEEE 802.1Q Virtual Local Area Networks (VLANs) on the Ethernet interfaces of a router.
mpls-vc-map	Specifies the mapping between an MPLS pseudowire and its virtual circuits.
mac-address	(Optional) MAC address for a cable modem.
customer *customer-name*	(Optional) Specifies the customer name.
state	(Optional) Specifies the state of all virtual circuits.
vpn *vpn-id*	(Optional) Displays Layer 2 VPN information on a cable modem with the specified MAC address, or for the specified VPN ID across all cable modems.
verbose	(Optional) Specifies verbose mode for the output, giving additional details about the mapping between an MPLS pseudowire and its virtual circuits.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
12.2(33)SCF	This command was modified. The verbose keyword option was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

Example of the show cable l2-vpn xconnect Command for the Mapping Between an MPLS Pseudowire and All Virtual Circuits

The following is a sample output of the **show cable l2-vpn xconnect** command that shows the mapping between an MPLS pseudowire and all virtual circuits on a Cisco uBR10012 router:

```
Router# show cable l2-vpn xconnect mpls-vc-map
MAC Address    Peer IP Address  VCID       CktID      Cable Intf  SID  Customer
Name/VPNID
0000.396e.6a68  101.1.0.2       221        Bu254:221    Cable7/0/0  1    customer1
```

```
0014.f8c1.fd66  10.76.1.1       2004       Bu254:5121   Cable7/0/0  8
0019.474a.d566  10.76.1.1       2001       Bu254:5122   Cable7/0/0  4    0234560002
0019.474a.d42e  10.76.1.1       2002       Bu254:2003   Cable7/0/0  5    0234560003
```

Example of the show cable l2-vpn xconnect Command for a Particular MAC Address

The following sample output displays the mapping between an MPLS pseudowire and the virtual circuit for a particular MAC address of a cable modem on a Cisco uBR10012 router:

```
Router# show cable l2-vpn xconnect mpls-vc-map 0000.396e.6a68
MAC Address    Peer IP Address  VCID       CktID      Cable Intf  SID  Customer
Name/VPNID
0000.396e.6a68  101.1.0.2       221        Bu254:221    Cable7/0/0  1    customer1
```

Example of the show cable l2-vpn xconnect Command for a Particular Customer

The following sample output displays the mapping between an MPLS pseudowire and all virtual circuits configured for a particular customer on a Cisco uBR10012 router:

```
Router# show cable l2-vpn xconnect mpls-vc-map customer1
MAC Address    Peer IP Address  VCID       CktID      Cable Intf  SID  Customer
Name/VPNID
0000.396e.6a68  101.1.0.2       221        Bu254:221    Cable7/0/0  1    customer1
```

Example of the show cable l2-vpn xconnect Command that Shows Information About the State of All Virtual Circuits

The following sample output displays the state of all virtual circuits associated with an MPLS pseudowire on a Cisco uBR10012 router:

```
Router# show cable l2-vpn xconnect mpls-vc-map state
Peer IP Address  VCID       STATE MAC Address    Customer Name/VPNID  STATE
101.1.0.2        22         DOWN  0000.396e.6a68  customer1            UP
10.76.1.1        2004       UP    0014.f8c1.fd66                       UP
10.76.1.1        2001       UP    0019.474a.d566  0234560002           UP
10.76.1.1        2002       UP    0019.474a.d42e  0234560003           UP
```

Example of the show cable l2-vpn xconnect Command for the Mapping Between an MPLS Pseudowire and All Virtual Circuits in Cisco IOS Release 12.2(33)SCF

The following is a sample output of the **show cable l2-vpn xconnect** command that shows the details of the mapping between an MPLS pseudowire and all virtual circuits on a Cisco uBR10012 router:

```
Router# show cable l2-vpn xconnect mpls-vc-map
54d4.6f88.7362 verbose
Load for five secs: 2%/0%; one minute: 1%; five minutes: 2%
Time source is hardware calendar, *16:46:29.139 pst Thu Mar 3 2011
MAC Address                    : 54d4.6f88.7362
Customer Name                  :
Prim Sid                       : 18
Cable Interface                : Cable5/0/1
MPLS-EXP                       : 0
```

```
PW TYPE                              : Ethernet
Backup enable delay                  : 0 seconds
Backup disable delay                 : 0 seconds
Primary peer
Peer IP Address (Active)             : 10.8.8.8
XConnect VCID                        : 97
Circuit  ID                          : Bu254:97
Local State                          : UP
Remote State                         : UP
Total US pkts                        : 418756
Total US bytes                       : 586227332
Total US pkts   discards             : 0
Total US bytes  discards             : 0
Total DS pkts                        : 417347
Total DS bytes                       : 591773612
Total DS pkts   discards             : 0
Total DS bytes  discards             : 0
```

The table describes the fields shown in the **show cable l2-vpn xconnect command display**.

Table 84: show cable l2-vpn xconnect Field Descriptions

Field	Description
MAC Address	MAC address of a cable modem.
Peer IP Address	IP address of the remote provider edge router.
VCID	Virtual circuit ID.
CktID	Circuit ID.
Cable Intf/Interface	Cable interface for the MPLS pseudowire.
SID	Service ID.
STATE	State of all virtual circuits.
Customer Name	Customer name.
Prim Sid	Primary service ID.
MPLS-EXP	Multiprotocol Label Switching experimental bit value.
PW TYPE	Pseudowire type.
Backup enable delay	Interval to enable backup.
Backup disable delay	Interval to disable backup.
Peer IP Adress (Active)	IP address of the active peer router.
XConnect VCID	Xconnect virtual circuit ID.
Circuit ID	Circuit ID.
Local State	Local state.
Remote State	Remote state.

Field	Description
Total US pkts	Total number of packets sent on the upstream.
Total US bytes	Total number of bytes sent on the upstream.
Total US pkts discards	Total number of packets discarded on the upstream.
Total US bytes discards	Total number of bytes discarded on the upstream.
Total DS pkts	Total number of packets received on the downstream.
Total DS bytes	Total number of bytes received on the downstream.
Total DS pkts discards	Total number of packets discarded on the downstream.
Total DS bytes discards	Total number of bytes discarded on the downstream.

The following examples show the output of the show cable l2-vpn xconnect command on the Cisco cBR router:

```
Router# show cable l2-vpn xconnect mpls-vc-map
MAC Address    Peer IP Address VCID Type  Prio CktID     Cable Intf SID Customer Name/VPNID
602a.d083.2e1c 123.1.1.1       60   Prim*      Bu254:4102 Cable3/0/0 5
38c8.5cac.4a62 123.1.1.1       20   Prim*      Bu254:4103 Cable3/0/0 4   000232303230
               156.1.3.1       30   Bkup  3    Bu254:4103
               123.1.1.1       50   Bkup  8    Bu254:4103
38c8.5cac.4a62 156.1.3.1       56   Prim*      Bu254:4104 Cable3/0/0 4   000232303231
               123.1.1.1       40   Bkup  1    Bu254:4104
```

This example shows the state of all virtual circuits associated with an MPLS pseudowire when pseudowire redundancy is not configured, using the **showcablel2-vpnxconnectmpls-vc-map state** command:

```
Router# show cable l2-vpn xconnect mpls-vc-map state
MAC Address      Peer IP Address VCID Type Prio State Customer Name/VPNID State
602a.d083.2e1c   123.1.1.1       60   Prim*     UP                        UP
38c8.5cac.4a62   123.1.1.1       20   Prim*     UP    000232303230        UP
38c8.5cac.4a62   156.1.3.1       56   Prim*     UP    000232303231        UP
```

This example shows the state of all virtual circuits associated with an MPLS pseudowire when pseudowire redundancy is configured, use the **showcablel2-vpnxconnectmpls-vc-map state** command :

```
Router# show cable l2-vpn xconnect mpls-vc-map state
MAC Address      Peer IP Address VCID Type   Prio State Customer Name/VPNID State
602a.d083.2e1c   123.1.1.1       60   Prim*       UP                        UP
38c8.5cac.4a62   123.1.1.1       20   Prim*       UP    000232303230        UP
                 156.1.3.1       30   Bkup   3    UP    000232303230        STDBY
                 123.1.1.1       50   Bkup   8    DOWN  000232303230        STDBY
38c8.5cac.4a62   156.1.3.1       56   Prim*       UP    000232303231        UP
                 123.1.1.1       40   Bkup   1    UP    000232303230        STDBY
```

The following example shows the information for a modem for which pseudowires were configured using backup peer command:

```
Router# show cable l2-vpn xconnect mpls-vc-map 0025.2e2d.7252 verbose
MAC Address                          : 0025.2e2d.7252
Customer Name                        :
Prim Sid                             : 1
Cable Interface                      : Cable8/0/3
MPLS-EXP                             : 0
PW TYPE                              : Ethernet
Backup enable delay                  : 0 seconds
Backup disable delay                 : 0 seconds
Primary peer
Peer IP Address (Active)             : 10.76.2.1
XConnect VCID                        : 400
Circuit  ID                          : Bu254:400
Local State                          : UP
Remote State                         : UP
Backup peers
Peer IP Address                      : 10.76.2.1
XConnect VCID                        : 600
Circuit  ID                          : Bu254:600
Local State                          : STDBY
Remote State                         : UP
Priority                             : 4
Total US pkts                        : 0
Total US bytes                       : 0
Total US pkts   discards             : 0
Total US bytes  discards             : 0
Total DS pkts                        : 0
Total DS bytes                       : 0
Total DS pkts   discards             : 0
Total DS bytes  discards             : 0
```

Related Commands

Command	Description
show xconnect	Displays information about attachment circuits and pseudowires.

show cable leasequery-filter

To display the number of Dynamic Host Configuration Protocol (DHCP) LEASEQUERY request messages that have been filtered for all cable modems (CMs) or for a particular cable interface, use the **show cable leasequery-filter** command in privileged EXEC mode.

show cable leasequery-filter [**cable** | {*slot/portslot/subslot/port* } | [**requests-filtered** [*minimum-requests*]]]

Cisco cBR Series Converged Broadband Router
show cable leasequery-filter cable *slot/subslot/cable-interface-index*[**requests-filtered** [*minimum-requests*]]

Syntax Description

cable *slot/port*	(Optional) Displays information for all CMs on the specified cable interface and downstream port on the Cisco uBR7200 series routers. • *slot* —3 to 6 • *port* —0 or 1 (depending on the cable interface)
cable *slot/subslot/port*	(Optional) Displays information for all CMs on the specified cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* —5 to 8 • *subslot* —0 or 1 • *port* —0 to 4 (depending on the cable interface)
cable*slot/subslot/cable-interface-index*	(Optional) Displays information for all CMs on the specified cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* —0 to 3 and 6 to 9 • *subslot* —0 • *cable-interface-index* — 0 to 15
requests-filtered	(Optional) Displays the number of DHCP LEASEQUERY requests that have been filtered for each particular cable modem on a cable interface. • *minimum-requests* —(Optional) Displays only those cable modems for which the router has filtered at least this minimum number of lease queries. The valid range is from 1 to 65535, with a default of 1.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1d, 12.2(15)BC2b	This command was introduced.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.

Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCF1	This command was modified. The command output has been augmented to display IPv6 data.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The *cable-interface-index* variable is added.

Usage Guidelines

The **show cable leasequery-filter** command displays the total number of DHCP LEASEQUERY requests that have been filtered on a Cisco Cable Modem Termination System (CMTS) router and on a particular cable interface. This command can also optionally display details for each particular cable modem on an interface that has had DHCP lease queries filtered.

Examples

The following examples show how to display the total number of DHCP LEASEQUERY requests that have been filtered on the router and on a particular cable interface:

```
Router# show cable leasequery-filter
Lease Query Filter statistics for Unknown Sid
 Requests Sent : 138 total. 41 unfiltered, 97 filtered
Router# show cable leasequery-filter cable 8/1/0

Lease Query Filter statistics for Cable8/1/0:
 Requests Sent : 35 total. 25 unfiltered, 10 filtered
```

The following examples show how to display the total number of DHCP LEASEQUERY requests that have been filtered on the router and on a particular cable interface in Cisco IOS Release 12.2(33)SCF1:

```
Router# show cable leasequery-filter
IPv4 Lease Query Filter statistics for Unknown Sid
  Requests Sent : 0 total. 0 unfiltered, 0 filtered
IPv6 Lease Query Filter statistics for Unknown Sid
  Requests Sent : 0 total. 0 unfiltered, 0 filtered
Router# show cable leasequery-filter cable 7/0/0

IPv4 Lease Query Filter statistics for Cable7/0/0:
  Requests Sent : 0 total. 0 unfiltered, 0 filtered
IPv6 Lease Query Filter statistics for Cable7/0/0:
  Requests Sent : 0 total. 0 unfiltered, 0 filtered
```

The following example shows how to display a list of cable modems on a cable interface and the number of DHCP LEASEQUERY messages that have been filtered for each interface:

```
Router# show cable leasequery-filter cable 8/1/0 requests-filtered

Sid  MAC Address    IP Address      Req-Filtered
1    0050.7366.1243 92.1.1.20       0
2    0007.0e06.953b 95.1.1.24       0
3    0007.0e06.97b5 93.1.1.24       2
4    00d0.ba45.4bd5 91.1.1.35       0
5    0007.0e06.9773 95.1.1.23       12
6    0001.42aa.737d 94.1.1.23       645
7    0001.42aa.738b 95.1.1.22       0
```

```
8    00d0.ba45.4955 92.1.1.23       0
9    0007.0e06.51ef 94.1.1.25       0
10   00d0.ba77.743b 91.1.1.36       3
11   0001.42aa.6e6f 93.1.1.22       2
12   0007.0e06.512f 91.1.1.23       2
13   0007.0e06.5137 92.1.1.25       0
14   0007.0e06.9be7 92.1.1.24       0
15   0002.b970.0027 92.1.1.22       1
16   0001.42aa.738d 91.1.1.21       10
```

The following example shows how to display a list of cable modems on a cable interface and the number of DHCP LEASEQUERY messages that have been filtered for each interface in Cisco IOS Release 12.2(33)SCF1:

```
Router# show cable leasequery-filter cable 8/1/0 requests-filtered

Sid  MAC Address    IP Address      Req-Filtered
1    0018.6835.2756 0.0.0.0         0
2    0025.2e2d.7440 0.0.0.0         0
Sid  MAC Address    IP Address              Req-Filtered
1    0018.6835.2756 2001:DB8:1::1            0
2    0025.2e2d.7440 2001:DB8:1::2            0
```

The following example shows how to display a list of cable modems on a cable interface that have had ten or more DHCP LEASEQUERY messages that have been filtered:

```
Router# show cable leasequery-filter cable 8/1/0 requests-filtered 10
Sid  MAC Address    IP Address      Req-Filtered
5    0007.0e06.9773 95.1.1.23       12
6    0001.42aa.737d 94.1.1.23       645
16   0001.42aa.738d 91.1.1.21       10
```

This example shows the output of the **show cable leasequery-filter** command for the Cisco cBR Series Converged Broadband Router:

```
Router#show cable leasequery-filter cable 1/0/0
IPv4 Lease Query Filter statistics for Cable1/0/0:
Requests Sent : 0 total. 0 unfiltered, 0 filtered
IPv6 Lease Query Filter statistics for Cable1/0/0:
Requests Sent : 0 total. 0 unfiltered, 0 filtered

Router#show cable leasequery-filter
IPv4 Lease Query Filter statistics for Unknown Sid
Requests Sent : 0 total. 0 unfiltered, 0 filtered
```

Table 85: show cable leasequery-filter Field Descriptions

Field	Description
Sid	Service ID (SID) of the device.
MAC Address	Hardware (MAC-layer) address of the cable modem or CPE device.
IP Address	IP address of the cable modem (CMs) or customer premises equipment (CPE).
Req-Filtered	Total number of Address Resolution Protocol (ARP) requests that the device has generated or forwarded.

Related Commands

Command	Description
cable arp	Activates the cable ARP.
cable arp filter	Controls the number of ARP requests and replies that are forwarded on a cable interface.
cable source-verify	Enables verification of IP addresses for CMs and CPE devices on the upstream.
cable source-verify leasequery-filter downstream	Controls the number of DHCP lease query messages that are sent for unknown IP addresses on all cable downstream interfaces on the Cisco CMTS router.
cable source-verify leasequery-filter upstream	Controls the number of DHCP lease query messages that are sent for unknown IP addresses for each SID on an upstream.

show cable leasequery-stats

To display the IPv4 cable leasequery packet processing statistics. Counters collect statistics and show the queries that are sent to the DHCP server and the replies received by the cBR-8 routers. Use the **show cable leasequery-stats** command in the privileged EXEC mode.

show cable leasequery-stats [**clear**]

Cisco cBR Series Converged Broadband Router
show cable leasequery-stats [**clear**]

Syntax Description

clear	(Optional) Resets all DHCPv4 counters on the cBR-8 router to zero.

Command Modes

Privileged EXEC (#)

Release	Modification
17.6.1z	This command was introduced.

Usage Guidelines

The **show cable leasequery-stats** command displays the IPv4 cable leasequery packet processing statistics. The counters are grouped by queries and replies.

Examples

The following example shows the IPv4 cable leasequery statistics output on the cBR-8 router:

```
Router# show cable leasequery-stats
IPv4 Source Verify LeaseQuery Statistics:
Queries: 1 sent, 0 timed out
Replies: 1 allowed, 0 rogues, 0 dropped
```

Table 86: show cable leasequery-stats Field Descriptions

Field	Description
Queries	
Sent	Number of leasequeries sent by cBR-8.
Timed out	Number of leasequeries timed out before receiving replies.
Replies	
Allowed	Number of replies that are valid, so that the CPE traffic is allowed.
Rogue	Number of replies that indicate a CPE is a rogue device, so that the CPE is added into the rogue list.
Dropped	No of replies that are invalid, so they are dropped without further processing.

show cable licenses all

To view license information as applied to RF channels on the CMTS chassis, use the show cable licenses all command in the privileged EXEC mode.

show cable licenses all

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

The following example indicates information about licenses applied to RF channels on the CMTS chassis.

```
Router# show cable licenses all
Load for five secs: 0%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *05:40:06.005 UTC Mon May 3 2010
Subslot 6/0 : License Configuration : 20X20
Subslot 7/0 : Downstream Licenses : Installed : 72  Consumed : 8   Available : 64
Subslot 7/0 : Upstream Licenses   : Installed : 60  Consumed : 52  Available : 8
Subslot 7/1 : Downstream Licenses : Installed : 72  Consumed : 0   Available : 72
Subslot 7/1 : Upstream Licenses   : Installed : 60  Consumed : 0   Available : 60
Subslot 8/0 : Downstream Licenses : Installed : 72  Consumed : 8   Available : 64
Subslot 8/0 : Upstream Licenses   : Installed : 60  Consumed : 52  Available : 8
Subslot 8/1 : Downstream Licenses : Installed : 0   Consumed : 0   Available : 0
Subslot 8/1 : Upstream Licenses   : Installed : 0   Consumed : 0   Available : 0
Router#
```

The following example indicates information about licenses that are loaded on the slot/subslot.

```
Router# show cable licenses 8/0
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *05:59:18.633 UTC Mon May 3 2010
Subslot 8/0 : Downstream Licenses : Installed : 72  Consumed : 8   Available : 64
Subslot 8/0 : Upstream Licenses   : Installed : 60  Consumed : 52  Available : 8
Router#
```

This example shows the output of the **show cable licenses all** command on the Cisco cBR Series Converged Broadband Router.

```
Router#show cable licenses all
```

```
-----------------------------------------
Entitlement:  Downstream License
Consumed count: 768
Consumed count reported to SmartAgent: 768
Forced-Shut count: 0
Enforced state: No Enforcement

License Shut Channels:

-----------------------------------------
Entitlement:  Upstream License
Consumed count: 64
Consumed count reported to SmartAgent: 64
Forced-Shut count: 0
Enforced state: No Enforcement

-----------------------------------------
Entitlement:  WAN License
Consumed count: 4
Consumed count reported to SmartAgent: 4
Forced-Shut count: 0
Enforced state: No Enforcement

-----------------------------------------
Entitlement:  LCHA License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Forced-Shut count: 0
Enforced state: No Enforcement

-----------------------------------------
Entitlement:  Video Narrowcast License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Forced-Shut count: 0
Enforced state: No Enforcement

-----------------------------------------
Entitlement:  Video Narrowcast Replicate License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Forced-Shut count: 0
Enforced state: No Enforcement

-----------------------------------------
Entitlement:  Video Narrowcast PKEY License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Forced-Shut count: 0
Enforced state: No Enforcement

-----------------------------------------
Entitlement:  Video Narrowcast PME License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Forced-Shut count: 0
Enforced state: No Enforcement

-----------------------------------------
Entitlement:  Video Narrowcast DVB License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Forced-Shut count: 0
Enforced state: No Enforcement
```

```
Router#
```

If you enable Core Peak Bandwidth (CPB), the **show cable licenses all** command displays only the CPB usage information.

```
show cable licenses all
Entitlement:  CPB License
Consumed count: 987
Consumed count reported to SmartAgent: 987
Enforced state: No Enforcement
Quarterly CPB is 987 (100Mbps) in the First quarter of 2018.
First  monthly CPB is:  103585495480 bps,    987 (100Mbps).
Second monthly CPB is:  103595095264 bps,    987 (100Mbps).
Third  monthly CPB is:  103595124064 bps,    987 (100Mbps).
```

Related Commands

Command	Description
show license call-home pak	Displays the stock keeping unit (SKU) list and features available in a product authorization key (PAK).
license call-home install pak	Installs a license by using the Cisco License Call Home feature.

show cable licenses cpb

To view the Core Peak Bandwidth (CPB) license information on the Cisco cBR Series Converged Broadband Router, use the **show cable licenses cpb** command in the privileged EXEC mode.

show cable licenses cpb

[show cable licenses cpb-records year <*year*> month <*month*> day <*day*>]

Syntax Description

cpb-records	Shows the history of CPB samples.
year <*year*>	Enter the year.
month <*month*>	Enter the month.
day <*day*>	Enter the date.

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS XE Fuji 16.9.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

show cable licenses cpb

This example shows the output of the **show cable licenses cpb** command on the Cisco cBR Series Converged Broadband Router.

```
show cable licenses cpb
Entitlement:  CPB License
Consumed count: 987
Consumed count reported to SmartAgent: 987
Enforced state: No Enforcement
Quarterly CPB is 987 (100Mbps) in the First quarter of 2018.
First  monthly CPB is:  103585495480 bps,    987 (100Mbps).
Second monthly CPB is:  103595095264 bps,    987 (100Mbps).
Third  monthly CPB is:  103595124064 bps,    987 (100Mbps).
```

This example shows the output of the **show cable licenses cpb-records year** <*year*> **month** <*month*> **day** <*day*> command on the Cisco cBR Series Converged Broadband Router.

```
show cable licenses cpb-records year 2018 month 4 day 28
index: 34626, timestamp: 28-April-2018 05:30:02 UTC, 5min rate:  105291741536 bps,   1004
(100Mbps)
index: 34627, timestamp: 28-April-2018 05:35:02 UTC, 5min rate:  104006310312 bps,    991
(100Mbps)
index: 34628, timestamp: 28-April-2018 05:40:02 UTC, 5min rate:  104006237736 bps,    991
(100Mbps)
index: 34629, timestamp: 28-April-2018 05:45:02 UTC, 5min rate:  104006156168 bps,    991
```

```
(100Mbps)
index: 34650, timestamp: 28-April-2018 07:30:03 UTC, 5min rate:   47644177216 bps,    454
(100Mbps)
index: 34651, timestamp: 28-April-2018 07:35:03 UTC, 5min rate:   83840688424 bps,    799
(100Mbps)
-----------------------------------------------
There are 6 cpb records in Apr 28 2018 UTC.
```

show cable license wan

To display the WAN license information for the 100G and 10G ports on a Supervisor 250G.

show cable license wan

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Privileged EXEC (#)

Release	Modification
IOS-XE 16.8.1	This command was introduced.

The command displays the following information, depending on the **cable license 100G-conversion** configuration.

- With the **cable license 100G-conversion**, the **show cable license wan** would display:

```
Router(config)# show cable licenses wan
-----------------------------------------
Entitlement: WAN License
Consumed count: 20
Consumed count reported to SmartAgent: 20
Enforced state: No Enforcement
```

- With the **no cable license 100G-conversion**, the **show cable license wan** would display:

```
Router(config)# show cable license wan
-----------------------------------------
Entitlement: WAN License
Consumed count: 0
Consumed count reported to SmartAgent: 0
Enforced state: No Enforcement
```

show cable load-balance

To display real-time configuration, statistical and operational information for load balancing operations on the router, use the **show cable load-balance** command in privileged EXEC mode.

show cable load-balance [[**group***n*] | **all** | **load** | **pending** | {**statistics error** [**detail** | **linecard** *slot* /*subslot* | **summary**]} | **target** | **fiber-node-validation** | **vdoc**]

Cisco cBR Series Converged Broadband Router
show cable load-balance [**all** | **fiber-node-validation** | **load** | **pending** | **statistics** | **target** | **move-history cable slot/subslot/controller-interface-index**]

Syntax Description

group *n*	(Optional) Specifies the number of the load balancing group to be displayed. In Cisco IOS Release 12.2(33)SCE3 and earlier, the valid range is from 1 to 336. The range from 1 to 80 is reserved for legacy load balancing groups (LBG). The range from 81 to 336 is reserved for DOCSIS LBGs. In Cisco IOS Release 12.2(33)SCE4 and later, the valid range is from 1 to 256. This range is reserved for legacy LBGs only. In the Cisco cBR Series Converged Broadband Router, this option is not supported.
all	(Optional) Displays all information about the LBG.
load	(Optional) Displays the current interface load and load balancing group assignments.
pending	(Optional) Displays the list of cable modems that are moved from one downstream or upstream to another.
statistics	(Optional) Displays cumulative statistics for load balancing operations.
error detail	(Optional) Displays the error statistics of all the active line card in detail. In the Cisco cBR Series Converged Broadband Router, this option is not supported.
error linecard *slot* /*subslot*	(Optional) Displays the error statistics of the line card, which is located in the specified *slot*/ *subslot*. In the Cisco cBR Series Converged Broadband Router, this option is not supported.
error summary	(Optional) Displays the error statistics summary for each of the active line cards. In the Cisco cBR Series Converged Broadband Router, this option is not supported.
target	(Optional) Displays the current and target interfaces (upstreams and downstreams) used for load balancing.
fiber-node-validation	(Optional) Displays DOCSIS LBG and channel information after checking if the channel configuration in load balancing fits in the fiber node configuration.
vdoc	(Optional) Displays information about all LBGs that have the rule "video-over-DOCSIS (vdoc)-enabled" configured. In the Cisco cBR Series Converged Broadband Router, this option is not supported.

Command Default

Displays information for all load balancing groups for each cable interface and its current load and load balancing status. Starting with Cisco IOS Release 12.2(33)SCE4, the **show cable load-balance** command supports only the legacy LBGs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 routers.
12.2(33)SCC	This command was modified. The f**iber-node-validation** parameter was added to the command.
12.2(33)SCF	This command was modified. The **vdoc** keyword was added to the command.
12.2(33)SCE4	The valid range for the load balance group was changed.
12.2(33)SCG	A new column in the output displays the group index for the legacy LBG.
12.2(33)SCH1	The output of this command (when used without any keyword) was modified.
12.2(33)SCI	This command was modified. The **error** keyword was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **group**, **error** (including **detail**, **linecard** and **summary** options), and **vdoc** keywords were removed
IOS-XE 17.6.1w	The option **move-history slot/subslot/controller-interface-index** was added.

Usage Guidelines

Use the **show cable load-balance** command to display the current, real-time statistics for load balancing operations.

Use this command to display the status of the **cable load-balance docsis30-enable downstream-only** command.

Examples

The following is a sample output from the **show cable load-balance** command:

```
Router# show cable load-balance

Group  Interval  Method        DCC Init   Threshold
                               Technique  Minimum  Static  Enforce  Ugs   PCMM
1      10        service-flows 1          1        2%      2%       ---   ---
2      10        modems        0          5        10%     ---      ---   ---

DOCSIS LB Enabled: No
```

Effective with Cisco IOS Release 12.2(33)SCG, a new column in the output for the **show cable load-balance** command also displays the group index for the legacy LBG. The Group Index column identifies the mapping between the legacy LBG ID and the internal group index of the legacy LBG.

```
Router# show cable load-balance
Legacy  Group  Interval  Method        DCC Init   Threshold
Group   Index                          Technique  Minimum  Static  Enforce  Ugs   PCMM
```

```
1       513    30        modems        0          5        10%     ---      ---   ---
2       514    30        modems        0          5        10%     ---      ---   ---
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Enabled: No
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
Group      Index                /UCC                DS/US  M/E/U/P/S
2          1     GE     30       0xF8(0)/N 0          m/m    5/10/70/70/50
70         2     RE     30       0xF8(0)/N 0          m/m    1/1/70/70/50
```

Effective with Cisco IOS Release 12.2(33)SCH1, the output of the **show cable load-balance** command was modified. This example shows the modified output:

```
Router#show cable load-balance
Load for five secs: 0%/0%; one minute: 0%; five minutes: 0%
Time source is NTP, 20:22:33.307 UTC Wed Jul 17 2013
Legacy  Group  Interval  Method        DCC Init   Threshold
Group   Index                          Technique  Minimum  Static  Enforce  Ugs
  PCMM
1       513    30        modems        0          5        10%     ---      ---
  ---
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Downstream Enabled: Yes DOCSIS 3.0 LB U
pstream Enabled: No
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
Group      Index                /UCC                DS/US  M/E/U/P/S
1          1     GE     30       0xF8(0)/N 5          m/m    5/10/70/70/50
2          2     RE     30       0x40(1)/N 1          m/m    2/2/70/70/50
DOCSIS 3.0 General LB
MD       FN  Group S Intv DCC mask  Policy     Mtd MD-CM-SG Threshold
             Index        /UCC                D/U          M/E/U/P/S
Ca5/0/0  1   32768 E 30   0xF8(0)/N 0          m/m 0x101    5/10/70/70/50
Router#
```

The following is a sample output from the **all** option of the **show cable load-balance** command. The all option displays information of all options available for this command except the **fiber-node-validation** option.

```
Router# show cable load-balance all

Group  Interval  Method        DCC Init   Threshold
                               Technique  Minimum  Static  Enforce  Ugs   PCMM
1      10        service-flows 1          1        2%      2%       ---   ---
2      10        modems        0          5        10%     ---      ---   ---

DOCSIS LB Enabled: No

Current load:

Interface            State      Group  Utilization  Reserved Modems Weight
                                Index
Cable5/0/3 (459 MHz) up         1      0%(0%/0%)       0%    7       37
Cable5/0/3/U0        up         1      0%              0%    2       1.2
Cable5/0/3/U1        up         1      0%              0%    3       1.2
Cable5/0/3/U2        up         1      0%              0%    1       1.2
Cable5/0/3/U3        up         1      0%              0%    1       1.2
Cable5/0/4 (465 MHz) up         1      0%(0%/0%)       0%    7       37
Cable5/0/4/U0        up         1      0%              0%    2       1.2
Cable5/0/4/U1        up         1      0%              0%    2       1.2
Cable5/0/4/U2        up         1      0%              0%    1       1.2
Cable5/0/4/U3        up         1      0%              0%    2       1.2
Mo1/0/0:0 (555 MHz)  down       1      0%(0%/0%)       0%    0       0
```

```
Target assignments:

Interface            State      Group   Target
                                Index
Cable5/0/3 (459 MHz) up         1       Cable5/0/4 (465 MHz) [enforce]
Cable5/0/3/U0        up         1       Cable5/0/3/U2
Cable5/0/3/U1        up         1       Cable5/0/3/U2 [enforce]
Cable5/0/3/U2        up         1
Cable5/0/3/U3        up         1
Cable5/0/4 (465 MHz) up         1
Cable5/0/4/U0        up         1       Cable5/0/4/U2
Cable5/0/4/U1        up         1       Cable5/0/4/U2 [enforce]
Cable5/0/4/U2        up         1
Cable5/0/4/U3        up         1       Cable5/0/4/U2
Mo1/0/0:0 (555 MHz)  down       1

Statistics:

Target interface       State      Transfers
                                  Complete  Pending   Retries   Failures
Cable5/0/3 (459 MHz)   up         3         1         0         0
Cable5/0/3/U0          up         0         0         0         0
Cable5/0/3/U1          up         0         0         0         0
Cable5/0/3/U2          up         0         0         0         0
Cable5/0/3/U3          up         0         0         0         0
Cable5/0/4 (465 MHz)   up         0         0         0         0
Cable5/0/4/U0          up         0         0         0         0
Cable5/0/4/U1          up         0         1         0         0
Cable5/0/4/U2          up         0         0         0         0
Cable5/0/4/U3          up         0         0         0         0
Mo1/0/0:0 (555 MHz)    down       0         0         0         0

Pending:

Modem          Grp Idx  Source interface  Target interface     Retries
001a.c30c.7e74 1        Cable5/0/4        Cable5/0/3 (459 MHz) 0
0000.ca45.9886 1        Cable5/0/4/U2     U1                   0
Router#
```

Starting with Cisco IOS Release 12.2(33)SCG, a new column in the output for the **show cable load-balance all** command also displays the group index for the legacy LBG.

The following is a sample output from the **all** option of the **show cable load-balance** command:

```
Router# show cable load-balance all
Legacy  Group  Interval  Method        DCC Init   Threshold
Group   Index                          Technique  Minimum  Static  Enforce  Ugs   PCMM
1       513    30        modems        0          5        10%     ---      ---   ---
2       514    30        modems        0          5        10%     ---      ---   ---
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Enabled: No
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
Group      Index                /UCC                DS/US  M/E/U/P/S
2          1     GE     30       0xF8(0)/N 0         m/m    5/10/70/70/50
70         2     RE     30       0xF8(0)/N 0         m/m    1/1/70/70/50
Current load:
DOCSIS load-balancing load
Interface            State   Group  Utilization Rsvd NBCM  WB/UB  Weight
                             Index                   Total Total
In7/0/0:0 (573 MHz)  up      2      0%(0%/0%)    0%   9     1      37
In7/0/0:0/U0         up      2      0%           0%   1     0      2.5
In7/0/0:0/U1         up      2      0%           0%   2     0      2.5
In7/0/0:0/U2         up      2      0%           0%   2     0      2.5
In7/0/0:0/U3         up      2      0%           0%   2     0      2.5
```

```
In7/0/0:0/U4          up      2       0%           0%   2      0       2.5
In7/0/0:0/U5          up      2       0%           0%   2      0       2.5
In7/0/0:1 (579 MHz)   down    2       0%(0%/0%)    0%   0             0
In7/0/0:2 (585 MHz)   up      2       0%(0%/0%)    0%   1      0       37
In7/0/0:2/U0          up      2       0%           0%   1      0       2.5
In7/0/0:2/U1          up      2       0%           0%   2      0       2.5
In7/0/0:2/U2          up      2       0%           0%   2      0       2.5
In7/0/0:2/U3          up      2       0%           0%   2      0       2.5
In7/0/0:2/U4          up      2       0%           0%   2      0       2.5
In7/0/0:2/U5          up      2       0%           0%   2      0       2.5
In7/0/0:3 (591 MHz)   down    2       0%(0%/0%)    0%   0             0
LEGACY load-balancing load
Interface             State   Group   Utilization  Rsvd Modem  Weight
                              Index                     Total
Cable7/1/0 (0 MHz)    down    513     0%(0%/0%)    0%   0       0
Cable7/1/0/U0         down    513     0%           0%   0       0.0
Cable7/1/0/U1         down    513     0%           0%   0       0.0
Cable7/1/0/U2         down    513     0%           0%   0       0.0
Cable7/1/0/U3         down    513     0%           0%   0       0.0
Cable7/1/1 (0 MHz)    down    514     0%(0%/0%)    0%   0       0
Cable7/1/1/U0         down    514     0%           0%   0       0.0
Cable7/1/1/U1         down    514     0%           0%   0       0.0
Cable7/1/1/U2         down    514     0%           0%   0       0.0
Cable7/1/1/U3         down    514     0%           0%   0       0.0
Target assignments:
Interface             State       Group   Target
                                  Index
In7/0/0:0 (573 MHz)   up          2       In7/0/0:2 (585 MHz) [enforce]
In7/0/0:0/U0          up          2
In7/0/0:0/U1          up          2       In7/0/0:0/U0
In7/0/0:0/U2          up          2       In7/0/0:0/U0
In7/0/0:0/U3          up          2       In7/0/0:0/U0
In7/0/0:0/U4          up          2       In7/0/0:0/U0
In7/0/0:0/U5          up          2       In7/0/0:0/U0
In7/0/0:1 (579 MHz)   down        2
In7/0/0:2 (585 MHz)   up          2
In7/0/0:2/U0          up          2
In7/0/0:2/U1          up          2       In7/0/0:2/U0
In7/0/0:2/U2          up          2       In7/0/0:2/U0
In7/0/0:2/U3          up          2       In7/0/0:2/U0
In7/0/0:2/U4          up          2       In7/0/0:2/U0
In7/0/0:2/U5          up          2       In7/0/0:2/U0
In7/0/0:3 (591 MHz)   down        2
Cable7/1/0 (0 MHz)    down        513
Cable7/1/0/U0         down        513
Cable7/1/0/U1         down        513
Cable7/1/0/U2         down        513
Cable7/1/0/U3         down        513
Cable7/1/1 (0 MHz)    down        514
Cable7/1/1/U0         down        514
Cable7/1/1/U1         down        514
Cable7/1/1/U2         down        514
Cable7/1/1/U3         down        514
Statistics:
Target interface        State       Transfers
                                    Complete  Pending   Retries   Failures
In7/0/0:0 (573 MHz)     up          1         0         0         0
In7/0/0:0/U0            up          0         0         0         0
In7/0/0:0/U1            up          0         0         0         0
In7/0/0:0/U2            up          0         0         0         0
In7/0/0:0/U3            up          0         0         0         0
In7/0/0:0/U4            up          0         0         0         0
In7/0/0:0/U5            up          0         0         0         0
In7/0/0:1 (579 MHz)     down        0         0         0         0
```

```
In7/0/0:2 (585 MHz)     up          14         1          0          0
In7/0/0:2/U0            up          0          0          0          0
In7/0/0:2/U1            up          0          0          0          0
In7/0/0:2/U2            up          0          0          0          0
In7/0/0:2/U3            up          0          0          0          0
In7/0/0:2/U4            up          0          0          0          0
In7/0/0:2/U5            up          0          0          0          0
In7/0/0:3 (591 MHz)     down        0          0          0          0
Cable7/1/0 (0 MHz)      down        0          0          0          0
Cable7/1/0/U0           down        0          0          0          0
Cable7/1/0/U1           down        0          0          0          0
Cable7/1/0/U2           down        0          0          0          0
Cable7/1/0/U3           down        0          0          0          0
Cable7/1/1 (0 MHz)      down        0          0          0          0
Cable7/1/1/U0           down        0          0          0          0
Cable7/1/1/U1           down        0          0          0          0
Cable7/1/1/U2           down        0          0          0          0
Cable7/1/1/U3           down        0          0          0          0
Pending:
Modem          Grp Idx Primary RF/RCC              MD/TCS             Action Active Retries
                       Src           Target        Src      Target           Time
54d4.6f88.659c 2       In7/0/0:0     In7/0/0:2 (585 MHz)                          0
```

The following is a sample output from the **fiber-node-validation** option of the **show cable load-balance** command:

```
Router# show cable load-balance fiber-node-validation
DOCSIS LBG ID    Match    Channel    Fiber-node list
1                match    Ca5/0/0/U0 {1}
                          Ca5/0/0/U1 {1}
                          Ca5/0/0/U2 {1}
                          Ca5/0/0/U3 {1}
                          Mo1/0/0:0  {1}
2                match    Ca5/0/0/U0 {1}
                          Ca5/0/0/U1 {1}
                          Ca5/0/0/U2 {1}
                          Mo1/0/0:0  {1}
```

Table 87: show cable load-balance Field Descriptions (default display)

Field	Description
Fields for the Default Displays and load Option	
Group Index	Identifies the mapping between the legacy LBG ID and the internal group index of the legacy LBG.
Interface	Cable interface (downstream or upstream) that belongs to a load balancing group.
Group	Number of the load balancing group to which the cable interface has been assigned.

Field	Description
Utilization	This field is a long-term average of the upstream utilization and displays current load usage of the cable interface expressed as a percentage of the total bandwidth. For upstreams, this field shows a single percentage value, which is the average percentage of bandwidth being used on the upstream. For downstreams, this field shows a set of three percentage values: • The percentage shows the load usage for the entire interface. • The first percentage, within the parentheses, shows the load for the downstream. • The second percentage, within the parentheses, shows the average load for all upstreams on the downstream. For example, if this field shows 18%(18%/12%), it indicates that downstream and upstream channels on the interface are running on an average load of 18 percent. The downstream is running on an average load of 18 percent and all upstreams for this downstream are running on an average load of 12 percent. **Note** To view the short-term average of the utilization, use the **show interface cable mac-scheduler** command.
State	Current state of the cable interface. The following states indicate normal operational states, depending on the configuration: • down—Interface is shut down. The CMTS cannot use the interface for load balancing in this state. • initial—Interface is currently in the initialization phase. The CMTS uses the interface for load balancing after the initialization completes. • up—Interface is up and passing traffic. The CMTS actively uses the interface for load balancing. • testing—Interface is currently under a load balancing test. The CMTS is unable to use the interface for normal load balancing operations until the test completes. The following states indicate abnormal states. The CMTS does not use interfaces in these states for load balancing operations, but continues to monitor and update the status every time the CMTS polls the interfaces for their current load usage: • suspicious—Interface is in an unknown state. The interface might be up and passing traffic, but is not consistent enough to support load balancing operations. The CMTS attempts to reinitialize the interface after a timeout period. If the interface has failed initialization more than 10 times, the CMTS moves the interface to the disabled state. • disabled—Interface has been disabled because a load balancing test is in-progress or because the interface reinitialization failed after 10 attempts. • unstable—Interface has failed repeated initialization attempts. The CMTS will attempt to reinitialize the interface after a timeout period. If a load balance test is not in-progress and if reinitialization fails, the CMTS moves it to the unstable state.
Reserved	Percentage of bandwidth that is currently reserved by unsolicited grant service (UGS) service flows.
Modems	Number of cable modems currently online on this cable interface.
Weight	Interface bandwidth, in megabits per second (mbps), for the downstream or upstream. The system uses this value in calculating whether the loads on the interfaces are balanced. Changing a channel parameter, such as modulation profile or channel width, affects the channel bandwidth and weight value.
Additional Fields When Displaying Load Balancing Groups	

Field	Description
Interval	Indicates in seconds, the current load on each cable interface in the LBG as configured using the **cable load-balance group interval** command.
Method	Load balancing method used for the LBG as configured using the **cable load-balance group (global configuration)** command.
Threshold	Thresholds configured for this load balancing group: • M = Minimum Minimum difference in the number of cable modems or service flows that can exist on two interfaces in the group before cable modems are moved between the interfaces. If the imbalance between interfaces is below this value, cable modems are not moved. This field contains a value only when the group is configured for the modems or service flows method of load balancing. (This value is configured using the **load minimum** option of the **cable load-balance group threshold** command.) • S = Static Minimum difference in the percentage of total load that must exist between interfaces in a load balancing group before the Cisco CMTS performs static load balancing. When the load between interfaces is greater than this value, cable modems that are in the process of registering with the CMTS are moved between interfaces until the load difference is again below this value. (This value is configured using the **load** option of the **cable load-balance group threshold** command.) • E = Enforce Minimum difference in the percentage of total load that must exist between interfaces in a load balancing group before the Cisco CMTS performs dynamic load balancing and begins moving cable modems that are currently online. When the difference in load between two interfaces falls below this value, the CMTS stops dynamic load balancing and performs static load balancing. (This value is configured using the **enforce** option of the **cable load-balance group threshold** command.) • U = Ugs Percentage of the bandwidth that is allocated for Unsolicited Grant Services (UGS) traffic, such as Voice-over-IP (VoIP), that is in use on an interface because the CMTS moves cable modems that are online with active UGS service flows. (This value is configured using the **ugs** option of the **cable load-balance group threshold** command.) • P = PacketCable MultiMedia (PCMM) • Percentage of the reserved bandwidth threshold. Above this level, cable modems with active PCMM service flows participate in load balancing. The default threshold is 70%.
Additional Fields for the target Option	
Interface	Source downstream or upstream interface that is part of a cable load balancing group. If the Target field contains a value, it indicates that the source interface is currently oversubscribed. To reduce the cable load, the CMTS moves cable modems from the source interface to the target interface.

Field	Description
Target	Downstream or upstream interface to which cable modems on the source interface are being moved as part of load balancing operations. This field indicates the following: • If it is a downstream interface, the display shows the center frequency of the downstream within parentheses. • If only a frequency is shown, it indicates that the CMTS is moving cable modems to a different center frequency on the same downstream interface. • When the display includes the words "enforce", it indicates that the CMTS is performing dynamic load balancing on the interfaces. • If this field is blank, it indicates that the source interface is not oversubscribed.
Additional Fields for the statistics Option	
Target interface	Downstream or upstream interface. If this is a downstream interface, the display shows the center frequency of the downstream within parentheses.

Transfers	The following information is tracked for the indicated target interface:
	• complete—Number of cable modems successfully moved to the target interface.
	• pending—Number of cable modems in the process of being moved to the target interface.
	• retries—Number of times that the CMTS unsuccessfully tried to move the same cable modem to the target interface. This occurs when one or more MAC layer messages to the cable modem are dropped due to radio frequency (RF) noise or because the modem is not DOCSIS-compliant. If the number of retries exceeds five for a particular cable modem, the CMTS counts this as a failure.
	• failures—Number of times that the CMTS exceeded the maximum number of allowable retries (5) when trying to move a particular cable modem to the target interface. A large number of failures could indicate one or more possible problems:
	  • The specific cable modems are not DOCSIS-compliant.
	  • One or both interfaces are having problems passing traffic.
	  • One or both interfaces are having persistent RF noise problems.
	  • The source and target interfaces are not combined in the same node and do not share the same physical connectivity (which is required when interfaces are part the same load balancing group).

Additional Fields for the pending Option	
Modem	Hardware (MAC) address of the cable modem that is moved as part of load balancing operations.
Source interface	Downstream or upstream cable interface on which the cable modem is currently online.
Target interface	Downstream or upstream cable interface to which the CMTS is trying to move the cable modem to load balance the interfaces in this load balancing group. If the CMTS is moving the cable modem to a different frequency on the same downstream interface, this field shows only the new center frequency.
Retries	Number of times that the CMTS has attempted to move this cable modem to the target interface. The CMTS attempts to move the cable modem 5 times before counting this load balancing move as a failure.
Additional Fields for the fiber-node-validation Option	

Field	Description
DOCSIS LBG ID	The DOCSIS LBG ID.
Channel	The upstream or downstream channel that is associated with the DOCSIS LBG.
Fiber-node list	The list of all fiber nodes that include the channel.
Additional Fields for the move-history option	
Modem	The mac address of the moved cable modem
Host Interface	The mac-domain of the cable modem.
Group ID	The load balance group ID of cable modem.
Primary RF/RCC Source	Old downstream information of the cable modem, including the primary downstream channel, RCC ID before moving.
Primary RF/RCC Target	New downstream information of the cable modem, including the new primary downstream channel, RCC ID after moving.
MD/TCS Source	Old upstream information of the cable modem including the index of mac-domain, the bitmap of the upstream channel before moving.
MD/TCS Target	New upstream information of the cable modem including the index of mac-domain, the bitmap of the upstream channel after moving.
Action	The action of the cable modem movement, such as DBC, DCC, UCC, REINIT(DCC with init-tech 0).
Trans-Start Time	The trigger of the cable modem movement, such as D2.0 LB, D3.0 static LB, D3.0 dynamic LB.
Elapse Time (ms)	The start time of the cable modem movement.
Client	The elapsed time - how long the cable modem movement spent.
Result	The result of the action on modem movement - success, faiure, and the internal confirmation code.

The following is a sample output from the **vdoc** keyword of the **show cable load-balance** command:

```
Router# show cable load-balance vdoc
Target interface      State Group Util Total      IGMP      CIR       High   Low
                            Index     Targeted   Rep       Init      Util   CIR
Cable7/0/0 (531 MHz)  down  81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:0 (453 MHz)   up    81    0    9(5)       7(5)      2(0)      0      0
Mo3/0/0:1 (459 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:10 (513 MHz)  initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:11 (519 MHz)  initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:2 (465 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:3 (471 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:4 (477 MHz)   initi 81    0    5(0)       0(0)      5(0)      0      0
Mo3/0/0:5 (483 MHz)   up    81    0    7(7)       7(7)      0(0)      0      0
Mo3/0/0:6 (489 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:7 (495 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:8 (501 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:9 (507 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
```

The following is a sample output of the **show cable load-balance error summary** command:

```
Router#  show cable load-balance statistics error summary
Load for five secs: 8%/0%; one minute: 9%; five minutes: 10%
Time source is NTP, 17:37:26.107 CST Thu Aug 14 2014
 Total error on linecard 5/1 is 0
 Total error on linecard 7/0 is 0
 Total error on linecard 8/1 is 0
```

The following is a sample output of the **show cable load-balance error linecard** command:

```
Router#  show cable load-balance statistics error linecard 5/1
Load for five secs: 8%/0%; one minute: 9%; five minutes: 10%
Time source is NTP, 17:37:11.844 CST Thu Aug 14 2014
Error counters for Wideband on linecard 5/1:
Unknown reason             :0
No CM can be found         :0
CM rejected the DBC-REQ    :0
CM is not reachable        :0
Invalid input parameters   :0
Too many request in queue  :0
Incompliance to D3.0 spec  :0
DCC failure                :0
Other                      :0
Total                     :0
Error counters for Narrowband on linecard 5/1:
Unknown reason             :0
CM seen on other target    :0
Candidate CM timeout       :0
LBG removed                :0
Target down                :0
Target not in LBG          :0
Total                     :0
```

The following is a sample output of the **show cable load-balance error detail** command:

```
Router#  show cable load-balance statistics error detail
Load for five secs: 9%/0%; one minute: 9%; five minutes: 10%
Time source is NTP, 17:35:47.530 CST Thu Aug 14 2014

Error counters for Wideband on linecard 5/1:

Unknown reason             :0
No CM can be found         :0
CM rejected the DBC-REQ    :0
CM is not reachable        :0
Invalid input parameters   :0
Too many request in queue  :0
Incompliance to D3.0 spec  :0
DCC failure                :0
Other                      :0

Total                     :0

Error counters for Narrowband on linecard 5/1:

Unknown reason             :0
CM seen on other target    :0
Candidate CM timeout       :0
LBG removed                :0
```

```
Target down               :0
Target not in LBG         :0

Total                    :0

Error counters for Wideband on linecard 7/0:

Unknown reason            :0
No CM can be found        :0
CM rejected the DBC-REQ   :0
CM is not reachable       :0
Invalid input parameters  :0
Too many request in queue :0
Incompliance to D3.0 spec :0
DCC failure               :0
Other                     :0

Total                    :0
```

The following is a sample output of the **show cable load-balance move-history cable slot/subslot/controller-interface-index** command:

```
Router# show cable load-balance move-history cable 3/0/1
Modem          Host       Grp Id     Primary RF/RCC                      MD/TCS
     Action Trans-Start      Elapse   Client          Result
                Interface              Src               Target            Src        Target
             Time             Time(ms)
c8fb.26a6.c4b4 Ca3/0/1    2147557888 Do3/0/0:1/0       Do3/0/0:4/0       145/0x2    145/0x2
    DCC    Aug 11 10:44:53  4727     D2.0 LB         Success(13)
c8fb.26a6.c412 Ca3/0/1    2147557888 Do3/0/0:0/0       Do3/0/0:4/0       145/0x2    145/0x2
    DCC    Aug 11 10:44:53  4720     D2.0 LB         Success(13)
c8fb.26a6.c53c Ca3/0/1    2147557888 Do3/0/0:0/0       Do3/0/0:0/0       145/0x2    145/0x1
    DCC    Aug 11 10:44:53  128        D2.0 LB         Success(13)
c8fb.26a6.c178 Ca3/0/1    2147557888 Do3/0/0:1/1       Do3/0/0:5/2       145/0xF    145/0xF
    DBC    Aug 11 10:24:08  19788    D3.0 STATIC LB  Success(1)
c8fb.26a6.c67c Ca3/0/1    2147557888 Do3/0/0:1/1       Do3/0/0:5/2       145/0xF    145/0xF
    DBC    Aug 11 10:23:55  17435    D3.0 STATIC LB  Success(1)
```

Related Commands

Command	Description
cable load-balance group policy ugs	Configures how the Cisco CMTS should load balance cable modems with active unsolicited grant service (UGS) service flows.
cable load-balance group threshold	Configures the threshold values that a load balancing group should use for load balancing operations.
show cable load-balance docsis-group	Displays real time configurational, statistical, and operational information of the load balancing operations on the router.

show cable load-balance docsis-group

To display real-time configurational, statistical, and operational information of the load balancing (LB) operations on the router, use the **show cable load-balance docsis-group** command in privileged EXEC mode.

Cisco uBR10012 Router
show cable load-balance docsis-group {*docsis-group-id* | **FN** *fn-id* **MD cable** *slot* / *subslot* / *controller-interface-index*} [**all** | **load** | **pending** | **restrict** | **statistics** | **target** | **modem-list** | **primary-load** | **rcs-cm-list**]

Cisco uBR7225VXR and Cisco uBR7246VXR Routers
show cable load-balance docsis-group {*docsis-group-id* | **FN** *fn-id* **MD cable** *slot* / *port*} [**all** | **init-tech-ovr** | **load** | **modem-list** | **pending** | **service-type-id** | **statistics** | **tag** | **target** | **vdoc**]

Cisco cBR Series Converged Broadband Router
show cable load-balance docsis-group { *docsis-group-id* | **FN** *fn-id* **MD cable** *slot* / *subslot* / *controller-interface-index* } [**all** | **pending** | **restrict** | **rfch-util** | **service-type-id** | **tag** | **move-history**]
show cable load-balance docsis-group { *docsis-group-id* } [**load** | **modem-list** | **statistics** | **target**] [**wideband** | **dbg**]

Syntax Description

docsis-group-id	DOCSIS load balancing group ID. The group ID is in the range of 1 to 2147483647.
FN *fn-id*	Specifies the fiber node (FN) where certain DOCSIS 3.0 GLBG parameters, such as **disable**, **docsis-policy**, **init-tech-list**, **interval**, **method**, **policy**, and **threshold**, can be configured.
MD cable *slot/subslot/cable-interface-index*	Specifies the MAC domain interface of the fiber node. • *slot*—Slot where the line card resides. The permitted range is from 5 to 8. • *subslot*—Subslot where the line card resides. The available slots are 0 or 1. • *cable-interface-index*—Downstream controller number on the line card. The permitted range is from 0 to 4. For Cisco cBR Series Converged Broadband Router, the valid range is 0 to 15.

MD cable *slot/port*	Specifies the MAC domain interface of the fiber node on the Cisco uBR7246VXR or Cisco uBR7225VXR routers.
	• *slot*—Slot where the line card resides.
	  • Cisco uBR7225VXR router—The valid range is from 1 to 2.
	  • Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• *port*—The downstream controller port on the line card. The permitted values are 0 or 1.

all	(Optional) Displays all load balancing group information.

init-tech-ovr	(Optional) Displays the initialization technique override rules associated with this DOCSIS load balancing group (LBG). Not supported on Cisco cBR Series Converged Broadband Router
load	(Optional) Displays current interface load and LBG assignments.
modem-list	(Optional) Displays cable modems assigned to the specified DOCSIS LBG.
move-history	(Optional) Displays detailed information for every cable modem movement triggered through load balance.
pending	(Optional) Displays a list of cable modems that are pending movement from one downstream or upstream to another.
primary-load	(Optional) Displays the primary channel load information for specified DOCSIS LBG. Not supported on Cisco cBR Series Converged Broadband Router
restrict	(Optional) Displays the restricted cable modem list associated with this DOCSIS LBG.
rfch-util	(Optional) Displays the RF channel utilization.
service-type-id	(Optional) Displays information about the service type ID list associated with this DOCSIS LBG.
statistics	(Optional) Displays cumulative statistics of load balancing operations for one group.
tag	(Optional) Displays the tag list associated with this DOCSIS LBG.
target	(Optional) Displays current and target interfaces (upstream and downstream) used for load balancing.
vdoc	(Optional) Displays information about the state of the video-over-DOCSIS (VDOC) LB for the particular LBG. Not supported on Cisco cBR Series Converged Broadband Router
rcs-cm-list	(Optional) Displays the cable modems used for load balancing within the RCS and the utilization of each wideband interface. Not supported on Cisco cBR Series Converged Broadband Router
wideband	(Optional) Displays the current wideband load, cable modem's associated to wideband interface in the DOCSIS 3.0 load balancing group, wideband target interface, and wideband interface statistics.
dbg	(Optional) Displays the potential target dynamic bonding group for each of the source bonding groups.

Command Default

Displays information of all load balancing groups for each cable interface with its current load and load balancing status.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCF	The output for this command is enhanced to include more load balancing statistics for cable modems (CMs) provisioned in the multiple receive channel (MRC) and multiple transmit channel (MTC) mode. The output for the **load** keyword includes information about narrowband and wideband CMs.
12.2(33)SCH	This command was modified. The **primary-load** keyword was added. The output for this command is enhanced to include a new field MUPFXLR that provides more status information for the **modem-list** keyword.
12.2(33)SCI	This command was modified. The **rcs-cm-list** keyword was added. The output for the **statistics** keyword was enhanced to support DOCSIS3.0 load balance.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **init-tech-ovr**, **primary-load** , **rcs-cm-list** and **vdoc** keywords are not supported
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **rfch-util** and **wideband** keyword was added.
IOS-XE 16.7.1	The command was modified. The **dbg** keyword was added.
IOS-XE 17.6.1w	The command was modified. The option **move-history** was added.

Usage Guidelines

Use the **show cable load-balance docsis-group** command to display the current, real-time statistics for load balancing operations.

In Cisco IOS Release 12.2(33)SCH, the **primary-load** keyword was added to to display the primary channel load information. The **primary-load** keyword is optional and is used with *docsis-group-id*.

The **show cable load-balance docsis-group primary-load** command is associated with Target RCS Selection for Static Load Balancing feature.

Effective with Cisco IOS Release 12.2(33) SCI, the output of the **statistics** keyword was modified to display the following additional parameters:

- Failure statistics for Dynamic Bonding Change (DBC).
- Load balancing total attempts

Examples

Target RCS Selection for Static Load Balancing

The following is a sample output of the **show cable load-balance docsis-group** command:

```
Router# show cable load-balance docsis-group 1
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Enabled: No
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
```

```
Group      Index                 /UCC                 DS/US  M/E/U/P/S
1          82    RE 10       0x40(1)/Y 0          m/m    5/10/70/70/50
```

The following is a sample output of the **show cable load-balance docsis-group load** command:

```
Router# show cable load-balance docsis-group 1 load
DOCSIS load-balancing load
Interface            State   Group  Utilization Rsvd NBCM  WB/UB Weight
                             Index                 Total Total
Cable7/0/0 (333 MHz) up      81     1%(0%/1%)   0%   3     8     37
Cable7/0/0/U0        up      81     1%          0%   21    2     7.6
Cable7/0/0/U1        up      81     1%          0%   19    3     7.6
Cable7/0/0/U2        up      81     1%          0%   20    1     7.6
Cable7/0/0/U3        up      81     1%          0%   21    1     7.6
Mo1/0/0:0 (501 MHz)  up      81     1%(0%/1%)   0%   2     48    36
Mo1/0/0:0/U0         up      81     1%          0%   21    2     7.6
Mo1/0/0:0/U1         up      81     1%          0%   19    3     7.6
Mo1/0/0:0/U2         up      81     1%          0%   20    1     7.6
Mo1/0/0:0/U3         up      81     1%          0%   21    1     7.6
Mo1/0/0:1 (507 MHz)  up      81     1%(0%/1%)   0%   2     47    36
Mo1/0/0:1/U0         up      81     1%          0%   21    2     7.6
Mo1/0/0:1/U1         up      81     1%          0%   19    3     7.6
Mo1/0/0:1/U2         up      81     1%          0%   20    1     7.6
Mo1/0/0:1/U3         up      81     1%          0%   21    1     7.6
Mo1/0/0:2 (513 MHz)  up      81     1%(0%/1%)   0%   3     40    36
Mo1/0/0:2/U0         up      81     1%          0%   21    2     7.6
Mo1/0/0:2/U1         up      81     1%          0%   19    3     7.6
Mo1/0/0:2/U2         up      81     1%          0%   20    1     7.6
Mo1/0/0:2/U3         up      81     1%          0%   21    1     7.6
Mo1/0/0:3 (519 MHz)  up      81     1%(0%/1%)   0%   2     47    36
Mo1/0/0:3/U0         up      81     1%          0%   21    2     7.6
Mo1/0/0:3/U1         up      81     1%          0%   19    3     7.6
Mo1/0/0:3/U2         up      81     1%          0%   20    1     7.6
Mo1/0/0:3/U3         up      81     1%          0%   21    1     7.6
```

The following is a sample output of the **show cable load-balance docsis-group load | in ln** command displaying the load of all primary channels:

```
Router# show cable load-balance docsis-group fn 1 md c3/0/1 load | in In
Interface           State   Group      Utilization Rsvd NBCM WB/UB Weight
In3/0/1:0(573 MHz)  initial 2147557888 0%(0%/0%)   0%   0    17    37
In3/0/1:4(597 MHz)  initial 2147557888 0%(0%/0%)   0%   0    17    37
In3/0/1:8(621 MHz)  initial 2147557888 0%(0%/0%)   0%   0    13    37
In3/0/1:12(645 MHz) initial 2147557888 0%(0%/0%)   0%   0    13    37
In3/0/1:16(669 MHz) initial 2147557888 0%(0%/0%)   0%   0    13    37
In3/0/1:20(693 MHz) initial 2147557888 0%(0%/0%)   0%   0    13    37
In3/0/1:24(717 MHz) initial 2147557888 0%(0%/0%)   0%   0    13    37
In3/0/1:28(741 MHz) initial 2147557888 0%(0%/0%)   0%   0    13    37
```

The following is a sample output of the **show cable load-balance docsis-group load** command in Cisco IOS Release 12.2(33)SCF and later releases displaying sample wideband (WB), narrowband (NB), or mixed cable modem details. The NBCM and WB/upstream bonding (UB) columns display information about DOCSIS 3.0 MRC-only and MTC CMs for DOCSIS static modem-count based load balancing:

```
Router# show cable load-balance docsis-group 60 load
DOCSIS load-balancing load
Interface            State   Group  Utilization Rsvd NBCM  WB/UB Weight
                             Index                 Total Total
Mo1/0/0:0 (423 MHz)  initial 81     0%(0%/0%)   0%   0     7     36
```

```
Mo1/0/0:0/U0          up       81     0%           0%   2     0     5.1
Mo1/0/0:0/U1          up       81     0%           0%   3     0     5.1
Mo1/0/0:0/U2          up       81     0%           0%   2     0     5.1
Mo1/0/0:0/U3          up       81     0%           0%   3     0     5.1
Mo1/0/0:4 (447 MHz)   initial  81     0%(0%/0%)    0%   0     3     36
Mo1/0/0:4/U0          up       81     0%           0%   2     0     5.1
Mo1/0/0:4/U1          up       81     0%           0%   3     0     5.1
Mo1/0/0:4/U2          up       81     0%           0%   2     0     5.1
Mo1/0/0:4/U3          up       81     0%           0%   3     0     5.1
```

Table 88: DOCSIS 3.0 Load Balancing Counter Definition

Modem Operating Mode	NBCM Total		WB/UB Total	
Downstream (DS)	Upstream (US)	DS	US	Not counted
Non-MRC mode (online, NB CM)	Count primary	Count single US	Not counted	
MRC mode only (w-online, WB CM)	Not counted	Count single US	Count primary and secondary	Count single US
MTC mode (UB online, UB CM)	Not counted	Not counted	Count primary and secondary	Count all TCS channels

The following is a sample output of the **show cable load-balance docsis-group pending** command in Cisco IOS Release 12.2(33)SCE and earlier releases.

```
Router# show cable load-balance docsis-group 70 pending
Modem          Grp Idx Primary RF/RCC              MD/TCS        Action Active Retries
                       Src           Target        Src    Target         Time
001c.ea37.9bda 81      Mo1/0/0:2/1   Mo1/0/0:3/0   60/4   60/4   REINIT 00:44  0    DOCSIS
 3.0 LB
001c.ea37.9ab0 81      Mo1/0/0:1/2   Mo1/0/0:2/0   60/4   60/2   REINIT 00:41  0    DOCSIS
 3.0 LB
001c.ea37.9aa6 81      Mo1/0/0:0/1   Mo1/0/0:1/0   60/1   60/4   REINIT 00:50  0    DOCSIS
 3.0 LB
001c.ea37.9b1e 81      Mo1/0/0:1/1   Mo1/0/0:0/0   60/2   60/2   REINIT 00:44  0    DOCSIS
 3.0 LB
001c.ea37.9a8c 81      Mo1/0/0:3/2   Mo1/0/0:2/0   60/4   60/2   REINIT 00:41  0    DOCSIS
 3.0 LB
001c.ea37.9aee 81      Mo1/0/0:3/2   Mo1/0/0:2/0   60/8   60/4   REINIT 00:52  0    DOCSIS
 3.0 LB
001c.ea37.9a8a 81      Mo1/0/0:0/1   Mo1/0/0:3/0   60/8   60/1   REINIT 00:55  0    DOCSIS
 3.0 LB
```

The following is a sample output of the **show cable load-balance docsis-group pending** command for DOCSIS 3.0 cable modems with MTC mode in Cisco IOS Release 12.2(33)SCF and later releases:

```
Router# show cable load-balance docsis-group 81 pending
Modem      GrpIdx Primary RF/RCC          MD/TCS      Action Active Retries
                  Src         Target      Src  Target         Time
0000.cad6.eece 81 In6/0/2:3/0 In6/0/0:0/0             DCC    00:01  0
```

The following is a sample output of the **show cable load-balance docsis-group statistics** command.

```
Router# show cable load-balance docsis-group 1 statistics
Target interface       State      Transfers
                                  Complete  Pending   Retries   Failures
Cable1/0 (453 MHz)     up         0         0         0         0
Cable1/0/U2            down       0         0         0         0
Cable1/1 (459 MHz)     initial    0         0         0         0
Cable1/1/U0            initial    0         0         0         0
Cable1/1/U1            initial    0         0         0         0
Cable1/1/U2            initial    0         0         0         0
Cable1/1/U3            initial    0         0         0         0
```

The following is a sample output of the **show cable load-balance docsis-group target** command.

```
Router# show cable load-balance docsis-group 1 target
Interface            State      Group   Target
                                Index
Cable1/0 (453 MHz)   up         82      Cable1/1 (459 MHz) [enforce]
Cable1/0/U2          down       82
Cable1/1 (459 MHz)   initial    82
Cable1/1/U0          initial    82
Cable1/1/U1          initial    82
Cable1/1/U2          initial    82
Cable1/1/U3          initial    82
```

The following is a sample output of the **show cable load-balance docsis-group modem-list** command on the integrated cable configuration:

```
Router# show cable load-balance docsis-group 1 modem-list
Primary DS     Grp Idx MAC Address    RCC-ID Bad RfId Priority
Cable7/0/0/U0  81      (1)
                       001c.ea37.9b3e 2              0
Cable7/0/0/U1  81      (1)
                       001c.ea37.9b28 2              0
Cable7/0/0/U2  81      (1)
                       001c.ea37.9bf4 2              0
Cable7/0/0/U3  81      (1)
                       001c.ea37.9b5e 2              0
In8/1/0:0/U0   81      (2)
                       0014.f82f.74f6                !
```



Note The priority for an excluded modem is displayed as "!".

Effective from Cisco IOS Release 12.2(33)SCH, the output of the **show cable load-balance docsis-group** command is modified to include an additional field MUPFXLR to display more status information.

The following is a sample output of the **show cable load-balance docsis-group rfch-util** command to verify QAM channel utilization:

```
Router# show cable load-balance docsis-group 1 rfch-util
Interface     Pstate    Pending-In    Pending-Out    Throughput(Kbps)    Util
In9/0/0:0     NA        No            No             0                   0
In9/0/0:1     up        No            No             10886               29
In9/0/0:2     initial   No            No             10470               27
In9/0/0:3     initial   No            No             10415               27
```

```
In9/0/0:4     initial   No           No           10791            28
In9/0/0:5     initial   No           No           12352            32
In9/0/0:6     initial   No           No           11883            31
In9/0/0:7     up        No           No           14402            38
In9/0/0:8     up        No           No           11336            30
In9/0/0:9     up        No           No           11233            29
In9/0/0:10    up        No           No           10601            28
In9/0/0:11    up        No           No           10652            28
In9/0/0:12    up        No           No           8363             22
In9/0/0:13    up        No           No           8165             21
In9/0/0:14    up        No           No           10128            27
In9/0/0:15    up        No           No           10637            28
```

Table 89: show cable load-balance docsis-group - Field Description for QAM channel utilization

Field	Description
Interface	Downstream channel interface name.
Pstate	For primary capable channel downstream, the following Pstate are present: • initial • up • down • disable • moving
Pending-In	The modem is moving in.
Pending-Out	The modem is moving out.
Throughput (Kbps)	The channel's current throughput.
Util	The channel's current utilization in percentage.

The following example shows the modified output of the **show cable load-balance docsis-group** command:

```
Router#show cable load-balance docsis-group
 fn 1 md c6/0/0 modem-list
Load for five secs: 1%/0%; one minute: 2%; five minutes: 1%
Time source is NTP, 13:39:31.300 PDT Thu Mar 28 2013
Codes: M - Multicast, U - UGS, P - PCMM, F - Max-Failures, X - eXcluded
       L - L2vpn, R - RSVP
Primary DS     Grp Idx MAC Address    RCC-ID Bad Rfid Priority MUPFXLR
In6/0/0:0/UB   40448   (6)
                       e448.c70c.98af 1               2        -------
                       e448.c70c.9b76 1               2        -------
                       e448.c70c.9c15 1               2        -------
                       e448.c70c.9a92 1               2        -------
                       e448.c70c.99e4 1               2        -------
                       e448.c70c.9a35 1               2        -------
In6/0/0:0/U0   40448   (0)
In6/0/0:0/U1   40448   (1)
                       e448.c70c.9915                 2        -------
In6/0/0:0/U2   40448   (0)
In6/0/0:0/U3   40448   (0)
In6/0/0:1/UB   40448   (5)
```

```
                    e448.c70c.9abc 1              2        -------
                    e448.c70c.993f 1              2        -------
                    e448.c70c.9927 1              2        -------
                    e448.c70c.9b82 1              2        -------
                    4458.2945.2cb8 1              2        -------
In6/0/0:1/U0   40448   (0)
In6/0/0:1/U1   40448   (0)
In6/0/0:1/U2   40448   (0)
In6/0/0:1/U3   40448   (0)
In6/0/0:2/UB   40448   (5)
                    e448.c70c.9759 1              2        -------
                    e448.c70c.9a0e 1              2        -------
                    e448.c70c.992d 1              2        -------
                    e448.c70c.9a38 1              2        -------
                    0025.2ed9.9984 1              2        -----L-
In6/0/0:2/U0   40448   (0)
In6/0/0:2/U1   40448   (0)
In6/0/0:2/U2   40448   (0)
In6/0/0:2/U3   40448   (0)
In6/0/0:3/UB   40448   (5)
                    e448.c70c.9c00 1              2        -------
                    e448.c70c.99a5 1              2        -------
                    e448.c70c.9a5f 1              2        -------
                    e448.c70c.9a3b 1              2        -------
                    e448.c70c.96b1 1              2        -------
In6/0/0:3/U0   40448   (0)
In6/0/0:3/U1   40448   (0)
In6/0/0:3/U2   40448   (0)
In6/0/0:3/U3   40448   (0)
```

Table 90: show cable load-balance docsis-group - Field Description for MUPFXLR status field

Field	Description
MUPFXLR field descriptions	
Multicast (M)	Multicast session operating on the modem. It indicates a host behind a cable modem that has joined an IGMP group. Verify this status using the show cable modem verbose | in Features Bitmask command.
UGS (U)	Indicates that a cable modem has UGS service flows. This configuration can be verified by show cable modem qos | in UGS
Packetcable (P)	Indicates that a cable modem has one or more Packetcable gate. This status can be verified by show packetcable gate summary and show cable modem cpe commands.
max-Failures (F)	Indicates that a cable modem has reached maximum failure threshold. This status can be verified by the show cable modem internal load command.
eXcluded (X)	Indicates that a cable modem is listed in the list of excluded modems. This status can be verified by the show running-config | begin load-balance exclude command.
L2VPN (L)	Indicates that a cable modem is provisioned in L2VPN service. This status can be verified by the show cable l2-vpn xconnect command.
RSVP (R)	Indicates that a cable modem has RSVP flows. This status can be verified by the show cable modem verbose | in Features Mask command.

The following is a sample output of the **show cable load-balance docsis-group modem-list** command on the modular cable configuration:

```
Router# show cable load-balance docsis-group 23 modem-list
Primary DS     Grp Idx MAC Address    RCC-ID Bad RfId Priority
Mo6/1/0:0/U0   81      (0)
Mo6/1/0:0/U8   81      (0)
Mo6/1/0:0/U1   81      (0)
Mo6/1/0:0/U2   81      (0)
Mo6/1/0:0/U3   81      (0)
Mo6/1/0:0/U4   81      (0)
Mo6/1/0:0/U5   81      (0)
Mo6/1/0:0/U6   81      (0)
Mo6/1/0:0/U7   81      (0)
Mo6/1/0:1/U0   81      (0)
Mo6/1/0:1/U8   81      (0)
Mo6/1/0:1/U1   81      (0)
Mo6/1/0:1/U2   81      (1)
                       001a.c30c.7e9a 5               0
Mo6/1/0:1/U3   81      (0)
Mo6/1/0:1/U4   81      (0)
Mo6/1/0:1/U5   81      (0)
Mo6/1/0:1/U6   81      (0)
Mo6/1/0:1/U7   81      (0)
```

The following is a sample output of the **show cable load-balance docsis-group modem-list** command on a fiber node topology configuration:

```
Router# show cable load-balance docsis-group fn 2 md cable 6/0/0 modem-list

CM List - LBG : 40449
Primary DS      MAC Address             RCC-ID
In6/0/0:2/UB (0)
In6/0/0:3/UB (1)
                0025.2e2d.7322          2
In6/0/1:0/UB (2)
                0025.2e2d.7326          1
                0025.2e2d.7338          1
```

The following is a sample output for the **show cable load-balance docsis-group modem-list** command for the DOCSIS 3.0 GLBG:

```
Router# show cable load-balance docsis-group fn 2 md cable 7/0/0 modem-list
Primary DS     Grp Idx MAC Address    RCC-ID Bad RfId Priority
Cable7/0/0/U0  48129   (0)
Cable7/0/0/U1  48129   (0)
Cable7/0/0/U2  48129   (0)
Cable7/0/0/U3  48129   (0)
Mo1/0/0:0/UB   48129   (6)
                       0025.2eaf.6bbc 1               0
                       001e.6bfb.000c 1               0
                       001a.c3ff.d354 1               0
                       0023.be50.e5aa 1               0
                       001e.6bfb.1a3a 1               0
Mo1/0/0:0/U0   48129   (0)
Mo1/0/0:0/U1   48129   (0)
Mo1/0/0:0/U2   48129   (0)
Mo1/0/0:0/U3   48129   (0)
Mo1/0/0:1/U0   48129   (0)
```

```
Mo1/0/0:1/U1   48129   (0)
Mo1/0/0:1/U2   48129   (0)
Mo1/0/0:1/U3   48129   (0)
Mo1/0/0:2/UB   48129   (2)
                       001a.c3ff.d87a 1               0
                       001e.6bfb.71b0 2               0
Mo1/0/0:2/U0   48129   (0)
Mo1/0/0:2/U1   48129   (0)
Mo1/0/0:2/U2   48129   (0)
Mo1/0/0:2/U3   48129   (0)
Mo1/0/0:3/UB   48129   (1)
                       001e.6bff.8af2 1               0
Mo1/0/0:3/U0   48129   (0)
Mo1/0/0:3/U1   48129   (0)
Mo1/0/0:3/U2   48129   (0)
Mo1/0/0:3/U3   48129   (0)
```

The following is a sample output for the **show cable load-balance docsis-group pending** command:

```
Router# show cable load-balance docsis-group fn 2 md cable 7/0/0 pending
Modem          Grp Idx Primary RF/RCC              MD/TCS        Action Active Retries
                       Src           Target        Src    Target         Time
001e.6bfb.000c 48129   Mo1/0/0:0/1   Mo1/0/0:3/2   60/12  60/12  REINIT    00:20  0
DOCSIS 3.0 LB
001e.6bfb.71b0 48129   Mo1/0/0:2/2   Mo1/0/0:2/1   60/12  60/5   REINIT    00:22  0
DOCSIS 3.0 LB
001e.6bfc.d030 48129   Mo1/0/0:0/1   Mo1/0/0:3/2   60/3   60/3   REINIT    00:03  0
DOCSIS 3.0 LB
```

The following is a sample output of the **show cable load-balance docsis-group all** command. This command displays information of all options in this command.

```
Router# show cable load-balance docsis-group 1 all
DOCSIS LB Enabled: Yes
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
Group      Index                /UCC                  DS/US  M/E/U/P/S
1          82    RE 10       0x40(1)/Y 0          m/m    5/10/70/70/50
Current load:
Interface            State      Group  Utilization  Reserved Modems Weight
                                Index
Cable1/0 (453 MHz)   up         82     0%(0%/0%)       0%    13     26
Cable1/0/U2          down       82     0%              0%    0      0.0
Cable1/1 (459 MHz)   initial    82     0%(0%/0%)       0%    0      26
Cable1/1/U0          initial    82     0%              0%    0      2.5
Cable1/1/U1          initial    82     0%              0%    0      2.5
Cable1/1/U2          initial    82     0%              0%    0      2.5
Cable1/1/U3          initial    82     0%              0%    0      2.5
Target assignments:
Interface            State      Group   Target
                                Index
Cable1/0 (453 MHz)   up         82      Cable1/1 (459 MHz) [enforce]
Cable1/0/U2          down       82
Cable1/1 (459 MHz)   initial    82
Cable1/1/U0          initial    82
Cable1/1/U1          initial    82
Cable1/1/U2          initial    82
Cable1/1/U3          initial    82
Statistics:
Target interface       State      Transfers
                                  Complete  Pending   Retries   Failures
Cable1/0 (453 MHz)     up         0         0         0         0
```

```
Cable1/0/U2             down       0          0          0          0
Cable1/1 (459 MHz)      initial    0          0          0          0
Cable1/1/U0             initial    0          0          0          0
Cable1/1/U1             initial    0          0          0          0
Cable1/1/U2             initial    0          0          0          0
Cable1/1/U3             initial    0          0          0          0
Pending:
Modem          Grp Idx  Source interface  Target interface     Retries
```

The following is a sample output of the **show cable load-balance docsis-group all** command in Cisco IOS Release 12.2(33)SCF and later releases:

```
Router# show cable load balance docsis-group 70 all
DOCSIS LB Enabled: Yes
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
Group      Index                /UCC                 DS/US  M/E/U/P/S
1          81    RE     30       0x78(1)/N 0          m/m    1/1/70/70/50
Current load:
DOCSIS load-balancing load
Interface            State   Group  Utilization Rsvd NBCM  WB/UB Weight
                             Index                    Total Total
Cable7/0/0 (333 MHz) up      81     0%(0%/0%)   0%   3     8     37
Cable7/0/0/U0        up      81     0%          0%   22    10    7.6
Cable7/0/0/U1        up      81     0%          0%   19    13    7.6
Cable7/0/0/U2        up      81     0%          0%   22    8     7.6
Cable7/0/0/U3        up      81     0%          0%   22    7     7.6
Mo1/0/0:0 (501 MHz)  up      81     0%(0%/0%)   0%   3     61    36
Mo1/0/0:0/U0         up      81     0%          0%   22    10    7.6
Mo1/0/0:0/U1         up      81     0%          0%   19    13    7.6
Mo1/0/0:0/U2         up      81     0%          0%   22    8     7.6
Mo1/0/0:0/U3         up      81     0%          0%   22    7     7.6
Mo1/0/0:1 (507 MHz)  up      81     0%(0%/0%)   0%   1     59    36
Mo1/0/0:1/U0         up      81     0%          0%   22    10    7.6
Mo1/0/0:1/U1         up      81     0%          0%   19    13    7.6
Mo1/0/0:1/U2         up      81     0%          0%   22    8     7.6
Mo1/0/0:1/U3         up      81     0%          0%   22    7     7.6
Mo1/0/0:2 (513 MHz)  up      81     0%(0%/0%)   0%   2     57    36
Mo1/0/0:2/U0         up      81     0%          0%   22    10    7.6
Mo1/0/0:2/U1         up      81     0%          0%   19    13    7.6
Mo1/0/0:2/U2         up      81     0%          0%   22    8     7.6
Mo1/0/0:2/U3         up      81     0%          0%   22    7     7.6
Mo1/0/0:3 (519 MHz)  up      81     0%(0%/0%)   0%   1     60    36
Mo1/0/0:3/U0         up      81     0%          0%   22    10    7.6
Mo1/0/0:3/U1         up      81     0%          0%   19    13    7.6
Mo1/0/0:3/U2         up      81     0%          0%   22    8     7.6
Mo1/0/0:3/U3         up      81     0%          0%   22    7     7.6
Target assignments:
Interface            State      Group   Target
                                Index
Cable7/0/0 (333 MHz) up         81      Mo1/0/0:1 (507 MHz) [enforce]
Cable7/0/0/U0        up         81      Cable7/0/0/U1 [enforce]
Cable7/0/0/U1        up         81
Cable7/0/0/U2        up         81      Cable7/0/0/U1 [enforce]
Cable7/0/0/U3        up         81      Cable7/0/0/U1 [enforce]
Mo1/0/0:0 (501 MHz)  up         81      Mo1/0/0:1 (507 MHz) [enforce]
Mo1/0/0:0/U0         up         81      Mo1/0/0:0/U1 [enforce]
Mo1/0/0:0/U1         up         81
Mo1/0/0:0/U2         up         81      Mo1/0/0:0/U1 [enforce]
Mo1/0/0:0/U3         up         81      Mo1/0/0:0/U1 [enforce]
Mo1/0/0:1 (507 MHz)  up         81
Mo1/0/0:1/U0         up         81      Mo1/0/0:1/U1 [enforce]
Mo1/0/0:1/U1         up         81
```

```
Mo1/0/0:1/U2          up          81      Mo1/0/0:1/U1 [enforce]
Mo1/0/0:1/U3          up          81      Mo1/0/0:1/U1 [enforce]
Mo1/0/0:2 (513 MHz)   up          81
Mo1/0/0:2/U0          up          81      Mo1/0/0:2/U1 [enforce]
Mo1/0/0:2/U1          up          81
Mo1/0/0:2/U2          up          81      Mo1/0/0:2/U1 [enforce]
Mo1/0/0:2/U3          up          81      Mo1/0/0:2/U1 [enforce]
Mo1/0/0:3 (519 MHz)   up          81
Mo1/0/0:3/U0          up          81      Mo1/0/0:3/U1 [enforce]
Mo1/0/0:3/U1          up          81
Mo1/0/0:3/U2          up          81      Mo1/0/0:3/U1 [enforce]
Mo1/0/0:3/U3          up          81      Mo1/0/0:3/U1 [enforce]
Statistics:
Target interface       State      Transfers
                                  Complete  Pending   Retries   Failures
Cable7/0/0 (333 MHz)   up         6         0         0         0
Cable7/0/0/U0          up         29        0         0         0
Cable7/0/0/U1          up         76        0         0         0
Cable7/0/0/U2          up         43        0         0         0
Cable7/0/0/U3          up         31        0         0         0
Mo1/0/0:0 (501 MHz)    up         18        0         0         0
Mo1/0/0:0/U0           up         30        0         0         0
Mo1/0/0:0/U1           up         42        0         0         0
Mo1/0/0:0/U2           up         21        0         0         0
Mo1/0/0:0/U3           up         21        0         0         0
Mo1/0/0:1 (507 MHz)    up         17        0         0         0
Mo1/0/0:1/U0           up         9         0         0         0
Mo1/0/0:1/U1           up         18        0         0         0
Mo1/0/0:1/U2           up         15        0         0         0
Mo1/0/0:1/U3           up         20        0         0         0
Mo1/0/0:2 (513 MHz)    up         19        0         0         0
Mo1/0/0:2/U0           up         4         0         0         0
Mo1/0/0:2/U1           up         3         0         0         0
Mo1/0/0:2/U2           up         6         0         0         0
Mo1/0/0:2/U3           up         6         0         0         0
Mo1/0/0:3 (519 MHz)    up         9         0         0         0
Mo1/0/0:3/U0           up         1         0         0         0
Mo1/0/0:3/U1           up         2         0         0         0
Mo1/0/0:3/U2           up         4         0         0         0
Mo1/0/0:3/U3           up         4         0         0         0
Pending:
Modem          Grp Idx Primary RF/RCC              MD/TCS        Action Active Retries
                       Src           Target       Src    Target         Time
```

The following is a sample output of the **show cable load-balance all** command for load balancing groups that belong to different cable line cards:

```
Router# show cable load-balance all
Group  Interval  Method        DCC Init   Threshold
                               Technique  Minimum  Static  Enforce  Ugs   PCMM
1      30        modems        0          5        10%     ---      ---   ---
41     30        utilization   4          ---      10%     20%      ---   ---
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Enabled: No
DOCSIS     Group Status Interval DCC mask  Policy     Method Threshold
Group      Index                /UCC                DS/US  M/E/U/P/S
1          81    RE     30       0x78(1)/N 0         m/m    1/1/70/70/50
3          82    RE     30       0x78(1)/N 0         m/m    1/1/70/70/50
5          83    RE     30       0x78(1)/N 0         m/m    1/1/70/70/50
23         84    GE     30       0xF8(0)/N 0         m/m    5/10/70/70/50
DOCSIS 2.0 LB Enabled: Yes DOCSIS 3.0 LB Enabled: No
MD       FN  Group S Intv DCC mask  Policy     Mtd MD-CM-SG Threshold
             Index        /UCC                D/U          M/E/U/P/S
Ca6/1/0  3   44290 E 30   0xF8(0)/N 0         m/m 0x2D0101 5/10/70/70/50
```

```
Ca7/0/0  2   48129 E 20   0xF8(0)/N 0          m/m 0x3C0101 5/10/70/70/50
Ca8/0/0  1   55808 E 30   0xF8(0)/N 0          m/m 0x5A0101 5/10/70/70/50
Current load:
DOCSIS load-balancing load
Interface            State   Group  Utilization Rsvd NBCM  WB/UB Weight
                             Index                    Total Total
Mo6/1/0:0 (405 MHz)  initial 82     0%(0%/0%)   0%   0     0     36
Mo6/1/0:0 (405 MHz)  initial 44290  0%(0%/0%)   0%   0     0     36
Mo6/1/0:0/U0         initial 82     0%          0%   0     0     7.6
Mo6/1/0:0/U0         initial 44290  0%          0%   0     0     7.6
Mo6/1/0:0/U1         initial 82     0%          0%   0     0     7.6
Mo6/1/0:0/U1         initial 44290  0%          0%   0     0     7.6
Mo6/1/0:0/U2         initial 82     0%          0%   0     0     7.6
Mo6/1/0:0/U2         initial 44290  0%          0%   0     0     7.6
Mo6/1/0:0/U3         initial 82     0%          0%   0     0     7.6
Mo6/1/0:0/U3         initial 44290  0%          0%   0     0     7.6
Mo6/1/0:1 (411 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/0:1 (411 MHz)  down    44290  0%(0%/0%)   0%   0           0
Mo6/1/0:2 (417 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/0:2 (417 MHz)  down    44290  0%(0%/0%)   0%   0           0
Mo6/1/0:3 (423 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/0:3 (423 MHz)  down    44290  0%(0%/0%)   0%   0           0
Mo6/1/0:4 (429 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/0:4 (429 MHz)  down    44290  0%(0%/0%)   0%   0           0
Mo6/1/0:5 (435 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/0:5 (435 MHz)  down    44290  0%(0%/0%)   0%   0           0
Mo6/1/0:6 (441 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/0:6 (441 MHz)  down    44290  0%(0%/0%)   0%   0           0
Mo6/1/0:7 (447 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/0:7 (447 MHz)  down    44290  0%(0%/0%)   0%   0           0
Mo6/1/1:0 (453 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:0 (453 MHz)  down    83     0%(0%/0%)   0%   0           0
Mo6/1/1:1 (459 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:1 (459 MHz)  down    83     0%(0%/0%)   0%   0           0
Mo6/1/1:2 (465 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:2 (465 MHz)  down    83     0%(0%/0%)   0%   0           0
Mo6/1/1:3 (471 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:3 (471 MHz)  down    83     0%(0%/0%)   0%   0           0
Mo6/1/1:4 (477 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:4 (477 MHz)  down    83     0%(0%/0%)   0%   0           0
Mo6/1/1:5 (483 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:5 (483 MHz)  down    83     0%(0%/0%)   0%   0           0
Mo6/1/1:6 (489 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:6 (489 MHz)  down    83     0%(0%/0%)   0%   0           0
Mo6/1/1:7 (495 MHz)  down    82     0%(0%/0%)   0%   0           0
Mo6/1/1:7 (495 MHz)  down    83     0%(0%/0%)   0%   0           0
DOCSIS load-balancing load
Interface            State   Group  Utilization Rsvd NBCM  WB/UB Weight
                             Index                    Total Total
Cable7/0/0 (333 MHz) up      81     0%(0%/0%)   0%   2     6     37
Cable7/0/0 (333 MHz) up      48129  0%(0%/0%)   0%   2     6     37
Cable7/0/0/U0        up      81     0%          0%   21    12    7.6
Cable7/0/0/U0        up      48129  0%          0%   21    12    7.6
Cable7/0/0/U1        up      81     0%          0%   21    11    7.6
Cable7/0/0/U1        up      48129  0%          0%   21    11    7.6
Cable7/0/0/U2        up      81     0%          0%   21    10    7.6
Cable7/0/0/U2        up      48129  0%          0%   21    10    7.6
Cable7/0/0/U3        up      81     0%          0%   21    9     7.6
Cable7/0/0/U3        up      48129  0%          0%   21    9     7.6
Mo1/0/0:0 (501 MHz)  up      81     0%(0%/0%)   0%   2     62    36
Mo1/0/0:0 (501 MHz)  up      48129  0%(0%/0%)   0%   2     62    36
Mo1/0/0:0/U0         up      81     0%          0%   21    12    7.6
Mo1/0/0:0/U0         up      48129  0%          0%   21    12    7.6
Mo1/0/0:0/U1         up      81     0%          0%   21    11    7.6
```

```
Mo1/0/0:0/U1          up      48129  0%           0%   21    11    7.6
Mo1/0/0:0/U2          up      81     0%           0%   21    10    7.6
Mo1/0/0:0/U2          up      48129  0%           0%   21    10    7.6
Mo1/0/0:0/U3          up      81     0%           0%   21    9     7.6
Mo1/0/0:0/U3          up      48129  0%           0%   21    9     7.6
Mo1/0/0:1 (507 MHz)   up      81     0%(0%/0%)    0%   1     57    36
Mo1/0/0:1 (507 MHz)   up      48129  0%(0%/0%)    0%   1     57    36
Mo1/0/0:1/U0          up      81     0%           0%   21    12    7.6
Mo1/0/0:1/U0          up      48129  0%           0%   21    12    7.6
Mo1/0/0:1/U1          up      81     0%           0%   21    11    7.6
Mo1/0/0:1/U1          up      48129  0%           0%   21    11    7.6
Mo1/0/0:1/U2          up      81     0%           0%   21    10    7.6
Mo1/0/0:1/U2          up      48129  0%           0%   21    10    7.6
Mo1/0/0:1/U3          up      81     0%           0%   21    9     7.6
Mo1/0/0:1/U3          up      48129  0%           0%   21    9     7.6
Mo1/0/0:2 (513 MHz)   up      81     0%(0%/0%)    0%   1     56    36
Mo1/0/0:2 (513 MHz)   up      48129  0%(0%/0%)    0%   1     56    36
Mo1/0/0:2/U0          up      81     0%           0%   21    12    7.6
Mo1/0/0:2/U0          up      48129  0%           0%   21    12    7.6
Mo1/0/0:2/U1          up      81     0%           0%   21    11    7.6
Mo1/0/0:2/U1          up      48129  0%           0%   21    11    7.6
Mo1/0/0:2/U2          up      81     0%           0%   21    10    7.6
Mo1/0/0:2/U2          up      48129  0%           0%   21    10    7.6
Mo1/0/0:2/U3          up      81     0%           0%   21    9     7.6
Mo1/0/0:2/U3          up      48129  0%           0%   21    9     7.6
Mo1/0/0:3 (519 MHz)   up      81     0%(0%/0%)    0%   2     62    36
Mo1/0/0:3 (519 MHz)   up      48129  0%(0%/0%)    0%   2     62    36
Mo1/0/0:3/U0          up      81     0%           0%   21    12    7.6
Mo1/0/0:3/U0          up      48129  0%           0%   21    12    7.6
Mo1/0/0:3/U1          up      81     0%           0%   21    11    7.6
Mo1/0/0:3/U1          up      48129  0%           0%   21    11    7.6
Mo1/0/0:3/U2          up      81     0%           0%   21    10    7.6
Mo1/0/0:3/U2          up      48129  0%           0%   21    10    7.6
Mo1/0/0:3/U3          up      81     0%           0%   21    9     7.6
Mo1/0/0:3/U3          up      48129  0%           0%   21    9     7.6
DOCSIS load-balancing load
Interface             State   Group  Utilization  Rsvd NBCM  WB/UB Weight
                              Index                    Total Total
In8/0/0:0 (555 MHz)   initial 55808  0%(0%/0%)    0%   0     0     37
In8/0/0:0/U0          initial 55808  0%           0%   0     0     7.6
In8/0/0:0/U1          initial 55808  0%           0%   0     0     7.6
In8/0/0:0/U2          initial 55808  0%           0%   0     0     7.6
In8/0/0:0/U3          initial 55808  0%           0%   0     0     7.6
In8/0/0:1 (561 MHz)   initial 55808  0%(0%/0%)    0%   0     0     37
In8/0/0:1/U0          initial 55808  0%           0%   0     0     7.6
In8/0/0:1/U1          initial 55808  0%           0%   0     0     7.6
In8/0/0:1/U2          initial 55808  0%           0%   0     0     7.6
In8/0/0:1/U3          initial 55808  0%           0%   0     0     7.6
In8/0/0:2 (567 MHz)   initial 55808  0%(0%/0%)    0%   0     0     37
In8/0/0:2/U0          initial 55808  0%           0%   0     0     7.6
In8/0/0:2/U1          initial 55808  0%           0%   0     0     7.6
In8/0/0:2/U2          initial 55808  0%           0%   0     0     7.6
In8/0/0:2/U3          initial 55808  0%           0%   0     0     7.6
In8/0/0:3 (573 MHz)   initial 55808  0%(0%/0%)    0%   0     0     37
In8/0/0:3/U0          initial 55808  0%           0%   0     0     7.6
In8/0/0:3/U1          initial 55808  0%           0%   0     0     7.6
In8/0/0:3/U2          initial 55808  0%           0%   0     0     7.6
In8/0/0:3/U3          initial 55808  0%           0%   0     0     7.6
In8/0/1:0 (579 MHz)   initial 55808  0%(0%/0%)    0%   0     0     37
In8/0/1:0/U0          initial 55808  0%           0%   0     0     7.6
In8/0/1:0/U1          initial 55808  0%           0%   0     0     7.6
In8/0/1:0/U2          initial 55808  0%           0%   0     0     7.6
In8/0/1:0/U3          initial 55808  0%           0%   0     0     7.6
In8/0/1:1 (585 MHz)   initial 55808  0%(0%/0%)    0%   0     0     37
```

```
In8/0/1:1/U0          initial 55808  0%           0%   0      0      7.6
In8/0/1:1/U1          initial 55808  0%           0%   0      0      7.6
In8/0/1:1/U2          initial 55808  0%           0%   0      0      7.6
In8/0/1:1/U3          initial 55808  0%           0%   0      0      7.6
In8/0/1:2 (591 MHz)   initial 55808  0%(0%/0%)    0%   0      0      37
In8/0/1:2/U0          initial 55808  0%           0%   0      0      7.6
In8/0/1:2/U1          initial 55808  0%           0%   0      0      7.6
In8/0/1:2/U2          initial 55808  0%           0%   0      0      7.6
In8/0/1:2/U3          initial 55808  0%           0%   0      0      7.6
In8/0/1:3 (597 MHz)   initial 55808  0%(0%/0%)    0%   0      0      37
In8/0/1:3/U0          initial 55808  0%           0%   0      0      7.6
In8/0/1:3/U1          initial 55808  0%           0%   0      0      7.6
In8/0/1:3/U2          initial 55808  0%           0%   0      0      7.6
In8/0/1:3/U3          initial 55808  0%           0%   0      0      7.6
Mo1/0/0:4 (525 MHz)   up      55808  0%(0%/0%)    0%   2      0      36
Mo1/0/0:4/U4          up      55808  0%           0%   1      0      7.6
Mo1/0/0:4/U5          up      55808  0%           0%   2      0      7.6
Mo1/0/0:4/U6          up      55808  0%           0%   1      0      7.6
Mo1/0/0:4/U7          initial 55808  0%           0%   0      0      7.6
Mo1/0/0:5 (531 MHz)   initial 55808  0%(0%/0%)    0%   0      0      36
Mo1/0/0:5/U4          up      55808  0%           0%   1      0      7.6
Mo1/0/0:5/U5          up      55808  0%           0%   2      0      7.6
Mo1/0/0:5/U6          up      55808  0%           0%   1      0      7.6
Mo1/0/0:5/U7          initial 55808  0%           0%   0      0      7.6
Mo1/0/0:6 (537 MHz)   up      55808  0%(0%/0%)    0%   1      0      36
Mo1/0/0:6/U4          up      55808  0%           0%   1      0      7.6
Mo1/0/0:6/U5          up      55808  0%           0%   2      0      7.6
Mo1/0/0:6/U6          up      55808  0%           0%   1      0      7.6
Mo1/0/0:6/U7          initial 55808  0%           0%   0      0      7.6
Mo1/0/0:7 (543 MHz)   up      55808  0%(0%/0%)    0%   1      0      36
Mo1/0/0:7/U4          up      55808  0%           0%   1      0      7.6
Mo1/0/0:7/U5          up      55808  0%           0%   2      0      7.6
Mo1/0/0:7/U6          up      55808  0%           0%   1      0      7.6
Mo1/0/0:7/U7          initial 55808  0%           0%   0      0      7.6
Target assignments:
Interface             State      Group   Target
                                 Index
Mo6/1/0:0 (405 MHz)   initial    82
Mo6/1/0:0 (405 MHz)   initial    44290
Mo6/1/0:0/U0          initial    82
Mo6/1/0:0/U0          initial    44290
Mo6/1/0:0/U1          initial    82
Mo6/1/0:0/U1          initial    44290
Mo6/1/0:0/U2          initial    82
Mo6/1/0:0/U2          initial    44290
Mo6/1/0:0/U3          initial    82
Mo6/1/0:0/U3          initial    44290
Mo6/1/0:1 (411 MHz)   down       82
Mo6/1/0:1 (411 MHz)   down       44290
Mo6/1/0:2 (417 MHz)   down       82
Mo6/1/0:2 (417 MHz)   down       44290
Mo6/1/0:3 (423 MHz)   down       82
Mo6/1/0:3 (423 MHz)   down       44290
Mo6/1/0:4 (429 MHz)   down       82
Mo6/1/0:4 (429 MHz)   down       44290
Mo6/1/0:5 (435 MHz)   down       82
Mo6/1/0:5 (435 MHz)   down       44290
Mo6/1/0:6 (441 MHz)   down       82
Mo6/1/0:6 (441 MHz)   down       44290
Mo6/1/0:7 (447 MHz)   down       82
Mo6/1/0:7 (447 MHz)   down       44290
Mo6/1/1:0 (453 MHz)   down       82
Mo6/1/1:0 (453 MHz)   down       83
Mo6/1/1:1 (459 MHz)   down       82
```

```
Mo6/1/1:1 (459 MHz)  down       83
Mo6/1/1:2 (465 MHz)  down       82
Mo6/1/1:2 (465 MHz)  down       83
Mo6/1/1:3 (471 MHz)  down       82
Mo6/1/1:3 (471 MHz)  down       83
Mo6/1/1:4 (477 MHz)  down       82
Mo6/1/1:4 (477 MHz)  down       83
Mo6/1/1:5 (483 MHz)  down       82
Mo6/1/1:5 (483 MHz)  down       83
Mo6/1/1:6 (489 MHz)  down       82
Mo6/1/1:6 (489 MHz)  down       83
Mo6/1/1:7 (495 MHz)  down       82
Mo6/1/1:7 (495 MHz)  down       83
Cable7/0/0 (333 MHz) up         81      Mo1/0/0:1 (507 MHz) [enforce]
Cable7/0/0 (333 MHz) up         48129   Mo1/0/0:1 (507 MHz)
Cable7/0/0/U0        up         81
Cable7/0/0/U0        up         48129
Cable7/0/0/U1        up         81      Cable7/0/0/U0
Cable7/0/0/U1        up         48129
Cable7/0/0/U2        up         81
Cable7/0/0/U2        up         48129
Cable7/0/0/U3        up         81
Cable7/0/0/U3        up         48129
Mo1/0/0:0 (501 MHz)  up         81
Mo1/0/0:0 (501 MHz)  up         48129
Mo1/0/0:0/U0         up         81
Mo1/0/0:0/U0         up         48129
Mo1/0/0:0/U1         up         81      Mo1/0/0:0/U0
Mo1/0/0:0/U1         up         48129
Mo1/0/0:0/U2         up         81
Mo1/0/0:0/U2         up         48129
Mo1/0/0:0/U3         up         81
Mo1/0/0:0/U3         up         48129
Mo1/0/0:1 (507 MHz)  up         81
Mo1/0/0:1 (507 MHz)  up         48129
Mo1/0/0:1/U0         up         81
Mo1/0/0:1/U0         up         48129
Mo1/0/0:1/U1         up         81      Mo1/0/0:1/U0
Mo1/0/0:1/U1         up         48129
Mo1/0/0:1/U2         up         81
Mo1/0/0:1/U2         up         48129
Mo1/0/0:1/U3         up         81
Mo1/0/0:1/U3         up         48129
Mo1/0/0:2 (513 MHz)  up         81
Mo1/0/0:2 (513 MHz)  up         48129
Mo1/0/0:2/U0         up         81
Mo1/0/0:2/U0         up         48129
Mo1/0/0:2/U1         up         81      Mo1/0/0:2/U0
Mo1/0/0:2/U1         up         48129
Mo1/0/0:2/U2         up         81
Mo1/0/0:2/U2         up         48129
Mo1/0/0:2/U3         up         81
Mo1/0/0:2/U3         up         48129
Mo1/0/0:3 (519 MHz)  up         81
Mo1/0/0:3 (519 MHz)  up         48129
Mo1/0/0:3/U0         up         81
Mo1/0/0:3/U0         up         48129
Mo1/0/0:3/U1         up         81      Mo1/0/0:3/U0
Mo1/0/0:3/U1         up         48129
Mo1/0/0:3/U2         up         81
Mo1/0/0:3/U2         up         48129
Mo1/0/0:3/U3         up         81
Mo1/0/0:3/U3         up         48129
In8/0/0:0 (555 MHz)  initial    55808
```

```
In8/0/0:0/U0          initial    55808
In8/0/0:0/U1          initial    55808
In8/0/0:0/U2          initial    55808
In8/0/0:0/U3          initial    55808
In8/0/0:1 (561 MHz)   initial    55808
In8/0/0:1/U0          initial    55808
In8/0/0:1/U1          initial    55808
In8/0/0:1/U2          initial    55808
In8/0/0:1/U3          initial    55808
In8/0/0:2 (567 MHz)   initial    55808
In8/0/0:2/U0          initial    55808
In8/0/0:2/U1          initial    55808
In8/0/0:2/U2          initial    55808
In8/0/0:2/U3          initial    55808
In8/0/0:3 (573 MHz)   initial    55808
In8/0/0:3/U0          initial    55808
In8/0/0:3/U1          initial    55808
In8/0/0:3/U2          initial    55808
In8/0/0:3/U3          initial    55808
In8/0/1:0 (579 MHz)   initial    55808
In8/0/1:0/U0          initial    55808
In8/0/1:0/U1          initial    55808
In8/0/1:0/U2          initial    55808
In8/0/1:0/U3          initial    55808
In8/0/1:1 (585 MHz)   initial    55808
In8/0/1:1/U0          initial    55808
In8/0/1:1/U1          initial    55808
In8/0/1:1/U2          initial    55808
In8/0/1:1/U3          initial    55808
In8/0/1:2 (591 MHz)   initial    55808
In8/0/1:2/U0          initial    55808
In8/0/1:2/U1          initial    55808
In8/0/1:2/U2          initial    55808
In8/0/1:2/U3          initial    55808
In8/0/1:3 (597 MHz)   initial    55808
In8/0/1:3/U0          initial    55808
In8/0/1:3/U1          initial    55808
In8/0/1:3/U2          initial    55808
In8/0/1:3/U3          initial    55808
Mo1/0/0:4 (525 MHz)   up         55808
Mo1/0/0:4/U4          up         55808
Mo1/0/0:4/U5          up         55808
Mo1/0/0:4/U6          up         55808
Mo1/0/0:4/U7          initial    55808
Mo1/0/0:5 (531 MHz)   initial    55808
Mo1/0/0:5/U4          up         55808
Mo1/0/0:5/U5          up         55808
Mo1/0/0:5/U6          up         55808
Mo1/0/0:5/U7          initial    55808
Mo1/0/0:6 (537 MHz)   up         55808
Mo1/0/0:6/U4          up         55808
Mo1/0/0:6/U5          up         55808
Mo1/0/0:6/U6          up         55808
Mo1/0/0:6/U7          initial    55808
Mo1/0/0:7 (543 MHz)   up         55808
Mo1/0/0:7/U4          up         55808
Mo1/0/0:7/U5          up         55808
Mo1/0/0:7/U6          up         55808
Mo1/0/0:7/U7          initial    55808
Statistics:
Target interface       State      Transfers
                                  Complete  Pending   Retries   Failures
Mo6/1/0:0 (405 MHz)    initial    0         0         0         0
Mo6/1/0:0/U0           initial    0         0         0         0
```

```
Mo6/1/0:0/U1           initial    0          0          0          0
Mo6/1/0:0/U2           initial    0          0          0          0
Mo6/1/0:0/U3           initial    0          0          0          0
Mo6/1/0:1 (411 MHz)    down       0          0          0          0
Mo6/1/0:2 (417 MHz)    down       0          0          0          0
Mo6/1/0:3 (423 MHz)    down       0          0          0          0
Mo6/1/0:4 (429 MHz)    down       0          0          0          0
Mo6/1/0:5 (435 MHz)    down       0          0          0          0
Mo6/1/0:6 (441 MHz)    down       0          0          0          0
Mo6/1/0:7 (447 MHz)    down       0          0          0          0
Mo6/1/1:0 (453 MHz)    down       0          0          0          0
Mo6/1/1:1 (459 MHz)    down       0          0          0          0
Mo6/1/1:2 (465 MHz)    down       0          0          0          0
Mo6/1/1:3 (471 MHz)    down       0          0          0          0
Mo6/1/1:4 (477 MHz)    down       0          0          0          0
Mo6/1/1:5 (483 MHz)    down       0          0          0          0
Mo6/1/1:6 (489 MHz)    down       0          0          0          0
Mo6/1/1:7 (495 MHz)    down       0          0          0          0
Cable7/0/0 (333 MHz)   up         10         0          0          0
Cable7/0/0/U0          up         33         0          0          0
Cable7/0/0/U1          up         84         0          0          0
Cable7/0/0/U2          up         48         0          0          0
Cable7/0/0/U3          up         34         0          0          0
Mo1/0/0:0 (501 MHz)    up         19         0          0          0
Mo1/0/0:0/U0           up         34         0          0          0
Mo1/0/0:0/U1           up         49         0          0          0
Mo1/0/0:0/U2           up         23         0          0          0
Mo1/0/0:0/U3           up         22         0          0          0
Mo1/0/0:1 (507 MHz)    up         23         0          0          0
Mo1/0/0:1/U0           up         10         0          0          0
Mo1/0/0:1/U1           up         21         0          0          0
Mo1/0/0:1/U2           up         16         0          0          0
Mo1/0/0:1/U3           up         21         0          0          0
Mo1/0/0:2 (513 MHz)    up         21         0          0          0
Mo1/0/0:2/U0           up         4          0          0          0
Mo1/0/0:2/U1           up         3          0          0          0
Mo1/0/0:2/U2           up         7          0          0          0
Mo1/0/0:2/U3           up         8          0          0          0
Mo1/0/0:3 (519 MHz)    up         10         0          0          0
Mo1/0/0:3/U0           up         1          0          0          0
Mo1/0/0:3/U1           up         2          0          0          0
Mo1/0/0:3/U2           up         4          0          0          0
Mo1/0/0:3/U3           up         4          0          0          0
In8/0/0:0 (555 MHz)    initial    0          0          0          0
In8/0/0:0/U0           initial    0          0          0          0
In8/0/0:0/U1           initial    0          0          0          0
In8/0/0:0/U2           initial    0          0          0          0
In8/0/0:0/U3           up         0          0          0          0
In8/0/0:0/U4           down       0          0          0          0
In8/0/0:0/U5           down       0          0          0          0
In8/0/0:0/U6           down       0          0          0          0
In8/0/0:0/U7           down       0          0          0          0
In8/0/0:1 (561 MHz)    initial    0          0          0          0
In8/0/0:1/U0           initial    0          0          0          0
In8/0/0:1/U1           initial    0          0          0          0
In8/0/0:1/U2           initial    0          0          0          0
In8/0/0:1/U3           up         0          0          0          0
In8/0/0:1/U4           down       0          0          0          0
In8/0/0:1/U5           down       0          0          0          0
In8/0/0:1/U6           down       0          0          0          0
In8/0/0:1/U7           down       0          0          0          0
In8/0/0:2 (567 MHz)    up         0          0          0          0
In8/0/0:2/U0           initial    0          0          0          0
In8/0/0:2/U1           initial    0          0          0          0
```

```
In8/0/0:2/U2           initial    0          0          0          0
In8/0/0:2/U3           up         0          0          0          0
In8/0/0:2/U4           down       0          0          0          0
In8/0/0:2/U5           down       0          0          0          0
In8/0/0:2/U6           down       0          0          0          0
In8/0/0:2/U7           down       0          0          0          0
In8/0/0:3 (573 MHz)    initial    0          0          0          0
In8/0/0:3/U0           initial    0          0          0          0
In8/0/0:3/U1           initial    0          0          0          0
In8/0/0:3/U2           initial    0          0          0          0
In8/0/0:3/U3           up         0          0          0          0
In8/0/0:3/U4           down       0          0          0          0
In8/0/0:3/U5           down       0          0          0          0
In8/0/0:3/U6           down       0          0          0          0
In8/0/0:3/U7           down       0          0          0          0
In8/0/1:0 (579 MHz)    initial    0          0          0          0
In8/0/1:0/U0           initial    0          0          0          0
In8/0/1:0/U1           initial    0          0          0          0
In8/0/1:0/U2           initial    0          0          0          0
In8/0/1:0/U3           up         0          0          0          0
In8/0/1:0/U4           down       0          0          0          0
In8/0/1:0/U5           down       0          0          0          0
In8/0/1:0/U6           down       0          0          0          0
In8/0/1:0/U7           down       0          0          0          0
In8/0/1:1 (585 MHz)    initial    0          0          0          0
In8/0/1:1/U0           initial    0          0          0          0
In8/0/1:1/U1           initial    0          0          0          0
In8/0/1:1/U2           initial    0          0          0          0
In8/0/1:1/U3           up         0          0          0          0
In8/0/1:1/U4           down       0          0          0          0
In8/0/1:1/U5           down       0          0          0          0
In8/0/1:1/U6           down       0          0          0          0
In8/0/1:1/U7           down       0          0          0          0
In8/0/1:2 (591 MHz)    initial    0          0          0          0
In8/0/1:2/U0           initial    0          0          0          0
In8/0/1:2/U1           initial    0          0          0          0
In8/0/1:2/U2           initial    0          0          0          0
In8/0/1:2/U3           up         0          0          0          0
In8/0/1:2/U4           down       0          0          0          0
In8/0/1:2/U5           down       0          0          0          0
In8/0/1:2/U6           down       0          0          0          0
In8/0/1:2/U7           down       0          0          0          0
In8/0/1:3 (597 MHz)    initial    0          0          0          0
In8/0/1:3/U0           initial    0          0          0          0
In8/0/1:3/U1           initial    0          0          0          0
In8/0/1:3/U2           initial    0          0          0          0
In8/0/1:3/U3           up         0          0          0          0
In8/0/1:3/U4           down       0          0          0          0
In8/0/1:3/U5           down       0          0          0          0
In8/0/1:3/U6           down       0          0          0          0
In8/0/1:3/U7           down       0          0          0          0
Mo1/0/0:4 (525 MHz)    up         0          0          0          0
Mo1/0/0:4/U0           down       0          0          0          0
Mo1/0/0:4/U1           down       0          0          0          0
Mo1/0/0:4/U2           down       0          0          0          0
Mo1/0/0:4/U3           down       0          0          0          0
Mo1/0/0:4/U4           up         0          0          0          0
Mo1/0/0:4/U5           up         0          0          0          0
Mo1/0/0:4/U6           up         0          0          0          0
Mo1/0/0:4/U7           initial    0          0          0          0
Mo1/0/0:5 (531 MHz)    initial    0          0          0          0
Mo1/0/0:5/U0           down       0          0          0          0
Mo1/0/0:5/U1           down       0          0          0          0
Mo1/0/0:5/U2           down       0          0          0          0
```

```
Mo1/0/0:5/U3           down       0          0          0          0
Mo1/0/0:5/U4           up         0          0          0          0
Mo1/0/0:5/U5           up         0          0          0          0
Mo1/0/0:5/U6           up         0          0          0          0
Mo1/0/0:5/U7           initial    0          0          0          0
Mo1/0/0:6 (537 MHz)    up         0          0          0          0
Mo1/0/0:6/U0           down       0          0          0          0
Mo1/0/0:6/U1           down       0          0          0          0
Mo1/0/0:6/U2           down       0          0          0          0
Mo1/0/0:6/U3           down       0          0          0          0
Mo1/0/0:6/U4           up         0          0          0          0
Mo1/0/0:6/U5           up         0          0          0          0
Mo1/0/0:6/U6           up         0          0          0          0
Mo1/0/0:6/U7           initial    0          0          0          0
Mo1/0/0:7 (543 MHz)    initial    0          0          0          0
Mo1/0/0:7/U0           down       0          0          0          0
Mo1/0/0:7/U1           down       0          0          0          0
Mo1/0/0:7/U2           down       0          0          0          0
Mo1/0/0:7/U3           down       0          0          0          0
Mo1/0/0:7/U4           up         0          0          0          0
Mo1/0/0:7/U5           up         0          0          0          0
Mo1/0/0:7/U6           up         0          0          0          0
Mo1/0/0:7/U7           initial    0          0          0          0
Pending:
Modem          Grp Idx Primary RF/RCC              MD/TCS        Action Active Retries
                       Src           Target        Src    Target         Time
001c.ea37.9aa0 81      Mo1/0/0:2/1   Mo1/0/0:1/0   60/1   60/1   REINIT 02:05  0    DOCSIS
 3.0 LB
001c.ea37.9b5e 81      Cable7/0/0/1  Mo1/0/0:1/0   60/4   60/8   REINIT 02:12  0    DOCSIS
 3.0 LB
001c.ea37.9bb0 81      Cable7/0/0/2  Mo1/0/0:2/0   60/2   60/2   REINIT 02:17  0    DOCSIS
 3.0 LB
```

The following is a sample output of the **show cable load-balance docsis-group vdoc** command:

```
Router# show cable load-balance docsis-group 1 vdoc
Target interface      State Group Util Total      IGMP      CIR       High   Low
                            Index      Targeted   Rep       Init      Util   CIR
Cable7/0/0 (531 MHz)  down  81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:0 (453 MHz)   up    81    0    9(5)       7(5)      2(0)      0      0
Mo3/0/0:1 (459 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:10 (513 MHz)  initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:11 (519 MHz)  initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:2 (465 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:3 (471 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:4 (477 MHz)   initi 81    0    5(0)       0(0)      5(0)      0      0
Mo3/0/0:5 (483 MHz)   up    81    0    7(7)       7(7)      0(0)      0      0
Mo3/0/0:6 (489 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:7 (495 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:8 (501 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
Mo3/0/0:9 (507 MHz)   initi 81    0    0(0)       0(0)      0(0)      0      0
```

The following example shows the output of the **show cable load-balance docsis-group docsis-group-id** with the **primary-load** command:

```
Router#show cable load-balance docsis-group fn
 2 md
 c7/0/0 primary-load
MD           RCC-ID Interface    In-RCC State      Pending NBCM   WBCM   Weight
Ca7/0/0      1      Mo7/0/0:0    Y      up         0       0      0      24.9
Ca7/0/0      1      Mo7/0/0:1    Y      initial    0       0      0      24.9
```

```
Ca7/0/0      1      Mo7/0/0:2    Y      up         0       0       0       24.9
Ca7/0/0      1      Mo7/0/0:3    Y      initial    0       0       0       24.9
```

Table 91: show cable load-balance docsis-group – Field Description

Field	Description
Fields for the Default Display and all Option	
DOCSIS Group	Current number of DOCSIS groups created on the CMTS.
Group Index	Number of the load balancing group to which the cable interface has been assigned.
Status	Information about the DOCSIS LBG: • R—Restricted load balancing group (RLBG). • G—General load balancing group (GLBG). • E—The DOCSIS LBG is enabled. • D—The DOCSIS LBG is disabled.
Interval	Minimum time period configured when cable modems can be moved to load balance the interfaces. In Cisco IOS Release 12.2(33)SCE and earlier releases, the valid range is 1 to 1000 seconds, with a default value of 10. In Cisco IOS Release 12.2(33)SCE1 and later releases, the default value of *interval* is 30.
DCC mask/UCC	Downstream and upstream channel change masks associated with the DOCSIS group. For example, in the output ‘0x40(1)/Y’, ‘0x40’ indicates that the user configured the dynamic channel change (DCC) technique 1 for the DOCSIS LBG. Similarly, '0x80' indicates configured DCC technique 0 and '0x20' indicates configured DCC technique 2. '(1)' indicates the DCC technique 1 is used to move the cable modem (CM). '/Y' indicates that load balancing sends upstream channel change (UCC) for movement of US channel only.
Policy	DOCSIS policy associated with the load balancing group.
Method	Load balancing method used for the load balancing group. The following indicates what method is used for DS and US modems: • m = modem Uses the number of active cable modems on an interface. • s = service flow Uses the number of active Service Flow IDs (SFIDs) on an interface. • u = utilization Uses the current percent of utilization of an interface.

Field	Description
Threshold	Thresholds configured for this load balancing group: • M = Minimum Minimum difference in the number of cable modems or service flows that can exist on two interfaces in the group before cable modems are moved between the interfaces. If the imbalance between interfaces is below this value, cable modems are not moved. This field contains a value only when the group is configured for the modems or service flows method of load balancing. (This value is configured using the **load minimum** option of the **cable load-balance group threshold** command.) • S = Stability. Minimum allowable percentage of good periodic ranging requests that is acceptable. When the channel has a lower percent of modems responding to the ranging requests in a one minute period, the Cisco CMTS begins moving modems. The valid range is 0 to 100 percent, with a default of 50 percent. • E = Enforce Minimum difference in the percentage of total load that must exist between interfaces in a load balancing group before the Cisco CMTS performs dynamic load balancing and begins moving cable modems that are currently online. When the difference in load between two interfaces falls below this value, the CMTS stops dynamic load balancing and performs static load balancing. (This value is configured using the **enforce** option of the **cable load-balance group threshold** command.) • U = Ugs Percentage of the bandwidth that is allocated for Unsolicited Grant Services (UGS) traffic, such as Voice-over-IP (VoIP), that is in use on an interface because the CMTS moves cable modems that are online with active UGS service flows. (This value is configured using the **ugs** option of the **cable load-balance group threshold** command.) • P = PacketCable MultiMedia (PCMM) Percentage of the reserved bandwidth threshold. Above this level, cable modems with active PCMM service flows participate in load balancing. The default threshold is 70%.
Interface	Cable interface (downstream or upstream) that belongs to a load balancing group.
Utilization	Long-term average of the upstream utilization. Displays the current load usage of the cable interface expressed as a percentage of the total bandwidth. For upstreams, this field shows a single percentage value, which is the average percentage of bandwidth being used on the upstream. For downstreams, this field shows a set of three percentage values: • The percentage shows the load usage for the entire interface. • The first percentage, within the parentheses, shows the load for the downstream. • The second percentage, within the parentheses, shows the average load for all upstreams on the downstream. For example, if this field shows " 18%(18%/12%) ", it indicates that downstream and upstream channels on the interface are running on an average load of 18 percent. The downstream is running on an average load of 18 percent and all upstreams for this downstream are running on an average load of 12 percent. **Note** To view the short-term average of the utilization, use the **show interface cable mac-scheduler** command.

Field	Description
State	Current state of the cable interface. The following states indicate normal operational states, depending on the configuration: • down—Interface is shut down. The CMTS cannot use the interface for load balancing in this state. • initial—Interface is currently in the initialization phase. The CMTS uses the interface for load balancing after the initialization completes. • up—Interface is up and passing traffic. The CMTS actively uses the interface for load balancing. • testing—Interface is currently under a load balancing test. The CMTS is unable to use the interface for normal load balancing operations until the test completes. The following states indicate abnormal states. The CMTS does not use interfaces in these states for load balancing operations, but continues to monitor and update the status every time the CMTS polls the interfaces for their current load usage: • suspicious—Interface is in an unknown state. The interface might be up and passing traffic, but is not consistent enough to support load balancing operations. The CMTS attempts to reinitialize the interface after a time-out period. If the interface has failed initialization more than 10 times, the CMTS moves the interface to the disabled state. • disabled—Interface has been disabled because a load balancing test is in-progress or because the interface reinitialization failed after 10 attempts. • unstable—Interface has failed repeated initialization attempts. The CMTS will attempt to reinitialize the interface after a time-out period. If a load balance test is not in-progress and if reinitialization fails, the CMTS moves it to the unstable state.
Reserved	Percentage of bandwidth that is currently reserved by unsolicited grant service (UGS) service flows.
Modems	Number of cable modems currently online on this cable interface.
Weight	Interface bandwidth, in megabits per second (mbps), for the downstream or upstream. The system uses this value in calculating whether the loads on the interfaces are balanced. Changing a channel parameter, such as modulation profile or channel width, affects the channel bandwidth and weight value.
Additional Fields for the target Option	
Interface	Source downstream or upstream interface that is part of a cable load balancing group. If the target field contains a value, it indicates that the source interface is currently oversubscribed. To reduce the cable load, the CMTS moves cable modems from the source interface to the target interface.
Target	Downstream or upstream interface to which cable modems on the source interface are being moved as part of load balancing operations. This field indicates the following: • If it is a downstream interface, the display shows the center frequency of the downstream within parentheses. • If only a frequency is shown, it indicates that the CMTS is moving cable modems to a different center frequency on the same downstream interface. • When the display includes the words “enforce”, it indicates that the CMTS is performing dynamic load balancing on the interfaces. • If this field is blank, it indicates that the source interface is not oversubscribed.
Additional Fields for the statistics Option	

Field	Description
Target interface	Downstream or upstream interface. If this is a downstream interface, the display shows the center frequency of the downstream within parentheses.

Transfers	The following information is tracked for the indicated target interface:
	• complete—Number of cable modems successfully moved to the target interface.
	• pending—Number of cable modems in the process of being moved to the target interface.
	• retries—Number of times that the CMTS unsuccessfully tried to move the same cable modem to the target interface. This occurs when one or more MAC layer messages to the cable modem are dropped due to radio frequency (RF) noise or because the modem is not DOCSIS-compliant. If the number of retries exceeds five for a particular cable modem, the CMTS counts this as a failure.
	• failures—Number of times that the CMTS exceeded the maximum number of allowable retries (5) when trying to move a particular cable modem to the target interface. A large number of failures could indicate one or more possible problems:
	  • The specific cable modems are not DOCSIS-compliant.
	  • One or both interfaces are having problems passing traffic.
	  • One or both interfaces are having persistent RF noise problems.
	  • The source and target interfaces are not combined in the same node and do not share the same physical connectivity (which is required when interfaces are part the same load balancing group).

Additional Fields for the pending Option	
Modem	Hardware (MAC) address of the cable modem that is moved as part of load balancing operations.
Source interface	Downstream or upstream cable interface on which the cable modem is currently online.
Target interface	Downstream or upstream cable interface to which the CMTS is trying to move the cable modem to load balance the interfaces in this load balancing group. If the CMTS is moving the cable modem to a different frequency on the same downstream interface, this field shows only the new center frequency.
Retries	Number of times that the CMTS has attempted to move this cable modem to the target interface. The CMTS attempts to move the cable modem 5 times before counting this load balancing move as a failure.
Additional Fields for the modem-list option	
US	Upstream channels in the DOCSIS LBG.
MAC Address	Total number (in parentheses) and MAC addresses of the modems connected to the upstream channels.
Additional fields for the primary-load option	
MD	MAC Domain.
RCC-ID	RCC index per MAC domain.
Pending	Number of pending modems on the channel.
Additional Fields for the move-history option	
Modem	The mac address of the moved cable modem

Field	Description
Host Interface	The mac-domain of the cable modem.
Group ID	The load balance group ID of cable modem.
Primary RF/RCC Source	Old downstream information of the cable modem, including the primary downstream channel, RCC ID before moving.
Primary RF/RCC Target	New downstream information of the cable modem, including the new primary downstream channel, RCC ID after moving.
MD/TCS Source	Old upstream information of the cable modem including the index of mac-domain, the bitmap of the upstream channel before moving.
MD/TCS Target	New upstream information of the cable modem including the index of mac-domain, the bitmap of the upstream channel after moving.
Action	The action of the cable modem movement, such as DBC, DCC, UCC, REINIT(DCC with init-tech 0).
Trans-Start Time	The trigger of the cable modem movement, such as D2.0 LB, D3.0 static LB, D3.0 dynamic LB.
Elapse Time (ms)	The start time of the cable modem movement.
Client	The elapsed time - how long the cable modem movement spent.
Result	The result of the action on modem movement - success, faiure, and the internal confirmation code.

The following is a sample output of the **show cable load-balance docsis-group rcs-cm-list** command in Cisco IOS Release 12.2(33)SCI and later releases:

```
Router# show cable load-balance docsis-group fn 11 md c7/0/0 rcs-cm-list

WB/RCC-TMPL(PRIM-IN) Size Util MAC Domain  MAC Address     Primary DS
Wi3/0/0:0     (Y)      4   96% Ca7/0/0     (13)
                                           602a.d001.f9c0  Mo3/0/0:2
                                           0025.2ed9.993e  Mo3/0/0:3
                                           0025.2eaf.7052  Mo3/0/0:2
                                           7cb2.1b9c.8c60  Mo3/0/0:2
                                           0025.2ed0.9288  Mo3/0/0:2
                                           0025.2ed9.93ca  Mo3/0/0:1
                                           4458.2945.2d98  Mo3/0/0:3
                                           7cb2.1b9c.8454  Mo3/0/0:2
                                           0023.be77.ecfe  Mo3/0/0:2
                                           0025.2eaf.6e50  Mo3/0/0:0
                                           0025.2eaf.6e98  Mo3/0/0:1
                                           4458.2945.1e60  Mo3/0/0:0
                                           7cb2.1b9c.8342  Mo3/0/0:0
```

The following is a sample output of the **show cable load-balance docsis-group staticstics** command in Cisco IOS Release 12.2(33)SCI and later releases:

```
Router# show cable load-balance docsis-group fn 11 md c7/0/0 statistics

Target interface      State     Trans             Fail  Fail  Total Max-
                                Cmple Pend  Retry (NB)  (WB)  Attem Fail
Mo3/0/0:0 (351 MHz)   initial   0     0     0     0     -     0     0
```

```
Mo3/0/0:0/U0          up        0     0     0     0     -     0     0
Mo3/0/0:0/U1          initial   0     0     0     0     -     0     0
Mo3/0/0:0/U2          initial   0     0     0     0     -     0     0
Mo3/0/0:0/U3          up        0     0     0     0     -     0     0
Mo3/0/0:1 (357 MHz)   initial   0     0     0     0     -     0     0
Mo3/0/0:1/U0          up        0     0     0     0     -     0     0
Mo3/0/0:1/U1          initial   0     0     0     0     -     0     0
Mo3/0/0:1/U2          initial   0     0     0     0     -     0     0
Mo3/0/0:1/U3          up        0     0     0     0     -     0     0
Mo3/0/0:2 (363 MHz)   up        0     0     0     0     -     0     0
Mo3/0/0:2/U0          up        0     0     0     0     -     0     0
Mo3/0/0:2/U1          initial   0     0     0     0     -     0     0
Mo3/0/0:2/U2          initial   0     0     0     0     -     0     0
Mo3/0/0:2/U3          up        0     0     0     0     -     0     0
Mo3/0/0:3 (369 MHz)   up        0     0     0     0     -     0     0
Mo3/0/0:3/U0          up        0     0     0     0     -     0     0
Mo3/0/0:3/U1          initial   0     0     0     0     -     0     0
Mo3/0/0:3/U2          initial   0     0     0     0     -     0     0
Mo3/0/0:3/U3          up        0     0     0     0     -     0     0

Wi3/0/0:0             up        0     0     -     -     0     0     0
```

The following example shows the output of the **show cable load-balance docsis-group target dbg** command:

```
Router# show cable load-balance docsis-group fn 320 md c3/0/0 target dbg
Interface    Bg-Id     Size     Group         Target
Wi3/0/0:0    24577     4        2147557695
Wi3/0/0:3    24580     4        2147557695
Wi3/0/0:4    24581     8        2147557695
Wi3/0/0:5    24582     8        2147557695
Wi3/0/0:6    24583     24       2147557695    33% [24576, 24584-24587, 24589-24607]
Wi3/0/0:7    24584     16       2147557695    30% [24576, 24586-24587, 24595-24607]
Wi3/0/0:8    24585     16       2147557695
Wi3/0/0:9    24586     32       2147557695
Wi3/0/0:10   24587     24       2147557695    33% [24576, 24584-24587, 24589-24607]
Wi3/0/0:11   24588     8        2147557695
Wi3/0/0:12   24589     8        2147557695    27% [24596-24603]
Wi3/0/0:13   24590     8        2147557695
Wi3/0/0:14   24591     4        2147557695
```

The following example shows the output of the **show cable load-balance docsis-group target wide** command:

```
Router# show cable load-balance docsis-group fn 5 md c1/0/4 target wide
Interface     Bg-Id     State     Group         Target
Wi1/0/4:2     9219      up        2147510276    Wi1/0/4:4
Wi1/0/4:3     9220      up        2147510276
Wi1/0/4:4     9221      up        2147510276
```

The following example shows the output of the **show cable load-balance docsis-group move-history cable slot/subslot/controller-interface** command:

```
Router# show cable load-balance docsis-group fn 1 md c3/0/1 move-history
Modem            Host         Grp Id       Primary RF/RCC                   MD/TCS
    Action   Trans-Start        Elapse    Client            Result
                Interface                Src             Target           Src       Target
             Time                Time(ms)
C8fb.26a6.c612   Ca3/0/1     2147557888   Do3/0/0:0/1     Do3/0/0:4/2      145/0xF   145/0xF
   DBC     Aug 10 16:04:38    13295     D3.0  STATIC LB   Success(1)
```

```
C8fb.26a6.bf68   Ca3/0/1     2147557888   Do3/0/0:0/1     Do3/0/0:5/2      145/0xF   145/0xF
   DBC     Aug 10 16:04:23    21941     D3.0  STATIC LB   Success(1)
C8fb.26a6.c5c8   Ca3/0/1     2147557888   Do3/0/0:1/1     Do3/0/0:5/2      145/0xF   145/0xF
   DBC     Aug 10 16:04:10    25330     D3.0  STATIC LB   Success(1)
```

The following example shows the output of the **show cable load-balance docsis-group fn n mdcable slot/subslot/controller-interfacestatisticswideband** command:

```
Router# show cable load-balance docsis-group fn 1 md c3/0/1 statistics wideband
Target interface             State                Transfers
                                                 Complete     Pending     Total     Failure
     Disabled
Wi3/0/0:0                    up                     0           0          0          0
       0
Wi3/0/0:1                    up                     3           0          3          0
       0
```

Note

- The **show cable load-balance docsis-group target wide** and **show cable load-balance docsis-group fn n md cable slot/subslot/controller-interface statistics wideband** CLIs does not support LCHA and LCPR.
- For the **show cable load-balance docsis-group target wide** and **show cable load-balance docsis-group fn n md cable slot/subslot/controller-interface statistics wideband** CLIs, the maximum number of modem movement entries per line card is 16000.

The following example shows the output of the **show cable modem x.x.x verbose** command in DCC|DBC:

```
Router# show cable modem c8fb.26a6.bf68 verbose |in DCC|DBC
DBC   req/rsp/ack    : 1/1/1
DCC   req/rsp/ack    : 0/0/0
```

Table 92: show cable load-balance docsis-group – Field Description

Field	Description
Fields for the Default Display and all Option	
DOCSIS Group	Current number of DOCSIS groups created on the CMTS.
Group Index	Number of the load balancing group to which the cable interface has been assigned.
Status	Information about the DOCSIS LBG: • R—Restricted load balancing group (RLBG). • G—General load balancing group (GLBG). • E—The DOCSIS LBG is enabled. • D—The DOCSIS LBG is disabled.

Field	Description
Interval	Minimum time period configured when cable modems can be moved to load balance the interfaces. In Cisco IOS Release 12.2(33)SCE and earlier releases, the valid range is 1 to 1000 seconds, with a default value of 10. In Cisco IOS Release 12.2(33)SCE1 and later releases, the default value of *interval* is 30.
DCC mask/UCC	Downstream and upstream channel change masks associated with the DOCSIS group. For example, in the output ‘0x40(1)/Y’, ‘0x40’ indicates that the user configured the dynamic channel change (DCC) technique 1 for the DOCSIS LBG. Similarly, '0x80' indicates configured DCC technique 0 and '0x20' indicates configured DCC technique 2. '(1)' indicates the DCC technique 1 is used to move the cable modem (CM). '/Y' indicates that load balancing sends upstream channel change (UCC) for movement of US channel only.
Policy	DOCSIS policy associated with the load balancing group.
Method	Load balancing method used for the load balancing group. The following indicates what method is used for DS and US modems: • m = modem Uses the number of active cable modems on an interface. • s = service flow Uses the number of active Service Flow IDs (SFIDs) on an interface. • u = utilization Uses the current percent of utilization of an interface.

Field	Description
Threshold	Thresholds configured for this load balancing group: • M = Minimum Minimum difference in the number of cable modems or service flows that can exist on two interfaces in the group before cable modems are moved between the interfaces. If the imbalance between interfaces is below this value, cable modems are not moved. This field contains a value only when the group is configured for the modems or service flows method of load balancing. (This value is configured using the **load minimum** option of the **cable load-balance group threshold** command.) • S = Stability. Minimum allowable percentage of good periodic ranging requests that is acceptable. When the channel has a lower percent of modems responding to the ranging requests in a one minute period, the Cisco CMTS begins moving modems. The valid range is 0 to 100 percent, with a default of 50 percent. • E = Enforce Minimum difference in the percentage of total load that must exist between interfaces in a load balancing group before the Cisco CMTS performs dynamic load balancing and begins moving cable modems that are currently online. When the difference in load between two interfaces falls below this value, the CMTS stops dynamic load balancing and performs static load balancing. (This value is configured using the **enforce** option of the **cable load-balance group threshold** command.) • U = Ugs Percentage of the bandwidth that is allocated for Unsolicited Grant Services (UGS) traffic, such as Voice-over-IP (VoIP), that is in use on an interface because the CMTS moves cable modems that are online with active UGS service flows. (This value is configured using the **ugs** option of the **cable load-balance group threshold** command.) • P = PacketCable MultiMedia (PCMM) Percentage of the reserved bandwidth threshold. Above this level, cable modems with active PCMM service flows participate in load balancing. The default threshold is 70%.
Interface	Cable interface (downstream or upstream) that belongs to a load balancing group.

Field	Description
Utilization	Long-term average of the upstream utilization. Displays the current load usage of the cable interface expressed as a percentage of the total bandwidth. For upstreams, this field shows a single percentage value, which is the average percentage of bandwidth being used on the upstream. For downstreams, this field shows a set of three percentage values: • The percentage shows the load usage for the entire interface. • The first percentage, within the parentheses, shows the load for the downstream. • The second percentage, within the parentheses, shows the average load for all upstreams on the downstream. For example, if this field shows " 18%(18%/12%) ", it indicates that downstream and upstream channels on the interface are running on an average load of 18 percent. The downstream is running on an average load of 18 percent and all upstreams for this downstream are running on an average load of 12 percent. **Note** To view the short-term average of the utilization, use the **show interface cable mac-scheduler** command.

Field	Description
State	Current state of the cable interface. The following states indicate normal operational states, depending on the configuration: • down—Interface is shut down. The CMTS cannot use the interface for load balancing in this state. • initial—Interface is currently in the initialization phase. The CMTS uses the interface for load balancing after the initialization completes. • up—Interface is up and passing traffic. The CMTS actively uses the interface for load balancing. • testing—Interface is currently under a load balancing test. The CMTS is unable to use the interface for normal load balancing operations until the test completes. The following states indicate abnormal states. The CMTS does not use interfaces in these states for load balancing operations, but continues to monitor and update the status every time the CMTS polls the interfaces for their current load usage: • suspicious—Interface is in an unknown state. The interface might be up and passing traffic, but is not consistent enough to support load balancing operations. The CMTS attempts to reinitialize the interface after a time-out period. If the interface has failed initialization more than 10 times, the CMTS moves the interface to the disabled state. • disabled—Interface has been disabled because a load balancing test is in-progress or because the interface reinitialization failed after 10 attempts. • unstable—Interface has failed repeated initialization attempts. The CMTS will attempt to reinitialize the interface after a time-out period. If a load balance test is not in-progress and if reinitialization fails, the CMTS moves it to the unstable state.
Reserved	Percentage of bandwidth that is currently reserved by unsolicited grant service (UGS) service flows.
Modems	Number of cable modems currently online on this cable interface.
Weight	Interface bandwidth, in megabits per second (mbps), for the downstream or upstream. The system uses this value in calculating whether the loads on the interfaces are balanced. Changing a channel parameter, such as modulation profile or channel width, affects the channel bandwidth and weight value.
Additional Fields for the target Option	
Interface	Source downstream or upstream interface that is part of a cable load balancing group. If the target field contains a value, it indicates that the source interface is currently oversubscribed. To reduce the cable load, the CMTS moves cable modems from the source interface to the target interface.

Field	Description
Target	Downstream or upstream interface to which cable modems on the source interface are being moved as part of load balancing operations. This field indicates the following: • If it is a downstream interface, the display shows the center frequency of the downstream within parentheses. • If only a frequency is shown, it indicates that the CMTS is moving cable modems to a different center frequency on the same downstream interface. • When the display includes the words "enforce", it indicates that the CMTS is performing dynamic load balancing on the interfaces. • If this field is blank, it indicates that the source interface is not oversubscribed.
Additional Fields for the statistics Option	
Target interface	Downstream or upstream interface. If this is a downstream interface, the display shows the center frequency of the downstream within parentheses.

Transfers	The following information is tracked for the indicated target interface:
	• Cmple—Number of cable modems successfully moved to the target interface.
	• Pend—Number of cable modems in the process of being moved to the target interface.
	• Retry—Number of times that the CMTS unsuccessfully tried to move the same cable modem to the target interface. This occurs when one or more MAC layer messages to the cable modem are dropped due to radio frequency (RF) noise or because the modem is not DOCSIS-compliant. If the number of retries exceeds five for a particular cable modem, the CMTS counts this as a failure.
	• Fail (NB)—Number of cable modems failed to move to narrow band interface.
	• Fail (WB)—Number of cable modems failed to move to wideband interface.
	• Total Attem—Number of times that the CMTS tried to move the same cable modem to the target interface.
	• Max Fail—Number of times that the CMTS exceeded the maximum number of allowable retries (3) when trying to move a cable modem to the particular target interface. A large number of failures could indicate one or more possible problems:
	  • The specific cable modems are not DOCSIS-compliant.
	  • One or both interfaces are having problems passing traffic.
	  • One or both interfaces are having persistent RF noise problems.
	  • The source and target interfaces are not combined in the same node and do not share the same physical connectivity (which is required when interfaces are part the same load balancing group).

Field	Description
Additional Fields for the pending Option	
Modem	Hardware (MAC) address of the cable modem that is moved as part of load balancing operations.
Source interface	Downstream or upstream cable interface on which the cable modem is currently online.
Target interface	Downstream or upstream cable interface to which the CMTS is trying to move the cable modem to load balance the interfaces in this load balancing group. If the CMTS is moving the cable modem to a different frequency on the same downstream interface, this field shows only the new center frequency.
Retries	Number of times that the CMTS has attempted to move this cable modem to the target interface. The CMTS attempts to move the cable modem 5 times before counting this load balancing move as a failure.
Additional Fields for the modem-list option	
US	Upstream channels in the DOCSIS LBG.
MAC Address	Total number (in parentheses) and MAC addresses of the modems connected to the upstream channels.
Additional fields for the primary-load option	
MD	MAC Domain.
RCC-ID	RCC index per MAC domain.
Pending	Number of pending modems on the channel.

Related Commands

Command	Description
cable load-balance docsis-group	Creates a DOCSIS LBG on the Cisco CMTS.
cable load-balance docsis-policy	Creates a DOCSIS policy and associates an existing rule and tag with the policy.
cable load-balance docsis-enable	Enables or disables DOCSIS load balancing on the Cisco CMTS.
cable load-balancedocsis30-dynamic-enable	Enables the DOCSIS 3.0 dynamic load balancing on the Cisco CMTS.
cable load-balance rule	Creates a rule to prevent the CM from disabling or enabling load balancing.
cable tag	Creates a tag to associate it with DOCSIS policies and groups.
clear cable load-balance count	Clears all of the load balance movement count statistics.

show cable logging

To display the log of messages about bad IP source addresses, downstream indexes, or DOCSIS-layer events on the cable interfaces, use the **show cable logging** command in user EXEC or privileged EXEC mode.

show cable logging [**badipsource** | **downstream-index** | **layer2events** | **summary**] [*slot*]

Cisco cBR Series Converged Broadband Router
show cable logging [**badipsource** | **downstream-index** | **layer2events** | **overlapip** | **summary**]

Syntax Description

badipsource	Displays the contents of the error log buffer containing the error messages for bad IP source addresses.
downstream-index	Displays the contents of the message log buffer for downstream indexes.
layer2events	Displays the contents of the message log buffer for DOCSIS-layer (Layer-2) events.
overlapip	Displays the Cable OVERLAPIP messages on the Cisco cBR router.
summary	Displays the status of the logging feature and its buffer.
slot	(Optional) Slot of a particular cable interface on the Cisco uBR7200 series router. The *slot* parameter can range from 3 to 6, depending on the cable interface. **Note** This option is supported only on the Cisco uBR-MC16U/X, Cisco uBR10-MC5X20U, Cisco uBR10-MC5X20H, and Cisco uBR-MC28U/X cable interface line card. This variable is not supported on the Cisco cBR router.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.1(13)EC	This command was introduced for the Cisco uBR7100 series and Cisco uBR7200 series universal broadband routers.
12.2(11)CY	Support was added for the Cisco uBR10012 universal broadband router.
12.2(11)BC2	Support was added to the Release 12.2 BC train for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
12.2(15)CX	Support was added to display the log buffer on an individual Cisco uBR-MC28U/X cable interface line card on the Cisco uBR7200 series router.
12.2(15)BC2	Support was added for the Cisco uBR-MC16U/X, Cisco uBR10-MC5X20U, and Cisco uBR10-MC5X20H cable interface line cards.

Release	Modification
12.3(9a)BC	The **layer2events** keyword was added.
12.3(21)BC	This command was enhanced to support logging events tracked with the Cable Duplicate MAC Address Reject feature on the Cisco CMTS, when configured. This supports the detection of cloned cable modems.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.3(23)BC5	The command output was modified to display the CPU revision number of the line card.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.
12.2(33)SCG	The **downstream-index keyword was added.**
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

For additional information about the Cable Duplicate MAC Address Reject feature on the Cisco CMTS, or enforced DOCSIS 1.1 security, see the *Cable Duplicate MAC Address Reject for the Cisco CMTS.*

The **cable logging badipsource** command creates a circular buffer that contains the BADIPSOURCE error messages, which the Cisco CMTS generates when it discovers a CM or CPE device using an unauthorized IP address. Similarly, the **cable logging layer2events** command creates a buffer to contain the system messages that are generated for DOCSIS-layer (Layer2) events. If the BADIPSOURCE or DOCSIS-layer buffer becomes full, the oldest messages are deleted to make room for the newer messages.

Use the **show cable logging** command to display the current contents of the BADIPSOURCE, downstream-index, or DOCSIS-layer buffer. After you have viewed all of the error messages in the current buffer, use the **clear cable logging** command to clear out the buffer to make room for newer messages.

Use the **show cable logging summary** command to check if the logging feature is enabled and also to view the status of the logging buffer.

The Broadband Processing Engine (BPE) cable interface line cards (such as the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X) contain an onboard processor that also maintains its own log buffer. To display the contents of this log, add the card slot number after the **show cable logging** command.



Note The BADIPSOURCE, downstream-index, and DOCSIS-layer messages are stored in separate buffers. Enabling, clearing, or displaying one buffer does not affect the other buffer.

Examples

This example shows the output of the **show cable logging badipsource** command. The oldest messages are displayed first.

```
Router# show cable logging badipsource
00:01:19: %UBR10000-3-BADIPSOURCE: Interface Cable6/1/1, IP packet from invalid source.
IP=10.44.50.13, MAC=0050.0f02.1d15, Expected SID=1, Actual SID=1
00:01:26: %UBR10000-3-BADIPSOURCE: Interface Cable6/1/1, IP packet from invalid source.
IP=10.44.50.13, MAC=0050.0f02.1d15, Expected SID=1, Actual SID=1
01:49:33: %UBR10000-3-BADIPSOURCE: Interface Cable6/1/0, IP packet from invalid source.
IP=0.0.0.44, MAC=0030.eb00.029d, Expected Interface=Cable6/1/0 SID=2833
```

```
02:12:03: %UBR10000-3-BADIPSOURCE: Interface Cable6/1/0, IP packet from invalid source.
IP=0.0.0.44, MAC=0030.eb15.73bd, Expected Interface=Cable6/1/0 SID=2800
02:12:43: %UBR10000-3-BADIPSOURCE: Interface Cable6/1/0, IP packet from invalid source.
IP=0.0.0.44, MAC=00e0.ca01.287a, Expected Interface=Cable6/1/0 SID=3299
02:22:50: %UBR10000-3-BADIPSOURCE: Interface Cable6/1/0, IP packet from invalid source.
IP=0.0.0.44, MAC=0030.eb00.02a2, Expected Interface=Cable6/1/0 SID=394
```

This example shows the output of the **show cable logging badipsource** command when logging has not been enabled with the **cable logging badipsource** command:

```
Router# show cable logging badipsource

Cable logging: BADIPSOURCE Disabled
```

This example shows the output for the **downstream-index** option, showing whether logging is enabled, the total size of the buffer, how many bytes are currently used, and how many error messages have been logged since the buffer was last cleared.

```
Router# show cable logging summary

Cable logging: Enabled
               Total buffer size (bytes): 1000000
               Used buffer size (bytes) : 36968
               Logged messages          : 231
```

This example shows the output for the **summary** option, showing whether logging is enabled, the total size of the buffer, how many bytes are currently used, and how many error messages have been logged since the buffer was last cleared.

```
Router# show cable logging summary

Cable logging: BADIPSOURCE Enabled
               Total buffer size (bytes): 1000000
               Used buffer size (bytes) : 36968
               Logged messages          : 231
```

This example shows the output for the summary option, indicating the CPU revision number of the line card. The display given below is specific to the uBR7200 series routers.

```
Router# show cable logging summary slot 6
Current LC State Info for slot 6
CLC CPU: BCM1250(Rev A8/A10)
 - Status - NO NPE/CLC OIR Timeout detected
Last Process Executed = Per-minute Jobs (4 ms count = 0ms)
Intr Busy Count = 0
Sched Flag Count = 2076
Status = 0x0
Late Poll Etime = 0
LC IPC Reply Status = 0
Interrupted PC/Level Trace
60475E5C/0x0        60475D98/0x0        60406D60/0x0        60406D70/0x0
604754E4/0x0        60335188/0x0        60406D38/0x0        60475E50/0x0
604761DC/0x0        60406D70/0x0        604761DC/0x0        60476994/0x0
60407810/0x0        6047101C/0x0        60470EFC/0x0        60475E5C/0x0
604759C0/0x0        60471014/0x0        60337F04/0x0        60406D4C/0x0
60475E50/0x0        60473EB0/0x0        60475E54/0x0        60476150/0x0
604761D4/0x0        604756FC/0x0        60407810/0x0        60337F80/0x0
60335230/0x0        60475E94/0x0        60406D60/0x0        604756FC/0x0
604761DC/0x0        60475694/0x0        60406CD4/0x0        60470EF0/0x0
60475DBC/0x0        60406D38/0x0        60476954/0x0        604077D0/0x0
```

```
60406CDC/0x0        60406CE0/0x0        609FA0C0/0x0        60470EFC/0x0
604754DC/0x0        604077F0/0x0        60475E1C/0x0        60471018/0x0
60337F58/0x0        60406D38/0x0        60475694/0x0        60475E3C/0x0
60406D68/0x0        60337F50/0x0        60470EF0/0x0        60406D60/0x0
604756A8/0x0        60406D38/0x0        60475DC4/0x0        60406D48/0x0

Cable logging: BADIPSOURCE Disabled  Slot 6
 Cable logging: LAYER2EVENTS Disabled  Slot 6
 Cable logging: OVERLAPIP Disabled  Slot 6
```

This example shows the output from the DOCSIS-layer buffer. This example shows the log buffer on a BPE cable interface line card that is in slot 4:

```
Router# show cable logging layer2events slot 4

 Cable logging: LAYER2EVENTS Enabled  Slot 4
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 567
                Logged messages          : 3
SLOT 4/0: 02:11:42: %UBR7200-4-REG_REJ_AUTH_FAIL_CMTS_MIC_INVALID: <133>CMTS[DOC
SIS]:<73000500> Registration rejected authentication failure: CMTS MIC invalid.
CM Mac Addr <0002.b96f.ff05>
SLOT 4/0: 02:11:53: %UBR7200-4-REG_REJ_AUTH_FAIL_CMTS_MIC_INVALID: <133>CMTS[DOC
SIS]:<73000500> Registration rejected authentication failure: CMTS MIC invalid.
CM Mac Addr <0002.b96f.ff05>
SLOT 4/0: 02:12:05: %UBR7200-4-REG_REJ_AUTH_FAIL_CMTS_MIC_INVALID: <133>CMTS[DOC
SIS]:<73000500> Registration rejected authentication failure: CMTS MIC invalid.
CM Mac Addr <0002.b96f.ff05>
```

Examples for the Cisco cBR Series Converged Broadband Router

This example shows the output for the **show cable logging badipsource** command on the Cisco cBR router:

```
Router#show cable logging badipsource
 Cable logging: BADIPSOURCE Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: BADIPSOURCE Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
Router#
```

This example shows the output for the **show cable logging downstream-index** command on the Cisco cBR router:

```
Router#show cable logging downstream-index
 Cable logging: DS_IDX Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: DS_IDX Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
```

```
Router#
```

This example shows the output for the **show cable logging layer2events** command on the Cisco cBR router:

```
Router#show cable logging layer2events
 Cable logging: LAYER2EVENTS Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: LAYER2EVENTS Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 4096
                Logged messages          : 2380
T: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE: <133>CMTS[DOCSIS]:<73000403> Service unavailable
 - Perman
ent. CM Mac Addr <c8fb.26a5.5866>
CLC 3/0: May 26 14:23:31.493 EDT: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.5866>
CLC 3/0: May 26 10:23:33.080 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.56ca>
CLC 3/0: May 26 10:23:33.080 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.56ca>
CLC 3/0: May 26 10:23:33.472 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.5580>
CLC 3/0: May 26 10:23:33.472 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.5580>
CLC 3/0: May 26 10:23:36.647 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.5792>
CLC 3/0: May 26 10:23:36.648 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.5792>
CLC 3/0: May 26 10:23:36.652 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.572e>
CLC 3/0: May 26 10:23:36.652 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.572e>
CLC 3/0: May 26 10:23:37.075 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.54e0>
CLC 3/0: May 26 10:23:37.075 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.54e0>
CLC 3/0: May 26 10:23:37.518 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.52f2>
CLC 3/0: May 26 10:23:37.518 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.52f2>
CLC 3/0: May 26 10:23:39.833 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.5400>
CLC 3/0: May 26 10:23:39.834 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.5400>
```

```
CLC 3/0: May 26 10:23:40.564 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.5624>
CLC 3/0: May 26 10:23:40.564 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.5624>
CLC 3/0: May 26 10:23:41.032 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.5814>
CLC 3/0: May 26 10:23:41.032 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.5814>
CLC 3/0: May 26 10:23:41.993 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.56b6>
CLC 3/0: May 26 10:23:41.993 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.56b6>
CLC 3/0: May 26 10:23:42.755 PST: %CBR-4-SERVICE_PERMANENTLY_UNAVAILABLE:
<133>CMTS[DOCSIS]:<7300040
3> Service unavailable - Permanent. CM Mac Addr <c8fb.26a5.5384>
CLC 3/0: May 26 10:23:42.756 PST: %CBR-4-REG_REQ_PERMANENT_ADMINISTRATIVE:
<133>CMTS[DOCSIS]:<730201
03> REG REQ rejected - Permanent administrative . CM Mac Addr <c8fb.26a5.5384>
Router#
```

This example shows the output for the **show cable logging overlapip** command on the Cisco cBR router:

```
Router#show cable logging overlapip
 Cable logging: OVERLAPIP Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: OVERLAPIP Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
Router#
```

This example shows the output for the **show cable logging overlapip** command on the Cisco cBR router:

```
Router#show cable logging overlapip
 Cable logging: OVERLAPIP Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: OVERLAPIP Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
bruschi#sh cable logging summary
 Cable logging: BADIPSOURCE Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: LAYER2EVENTS Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
```

```
 Cable logging: OVERLAPIP Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: DS_IDX Enabled
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: BADIPSOURCE Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: LAYER2EVENTS Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 4096
                Logged messages          : 2508
 Cable logging: OVERLAPIP Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
 Cable logging: DS_IDX Enabled  Slot 3 Subslot 0
                Total buffer size (bytes): 4096
                Used buffer size (bytes) : 0
                Logged messages          : 0
Router#
```

Related Commands

cable logging badipsource	Logs error messages about bad IP source addresses on the cable interfaces.
cable logging downstream-index	Logs messages about the downstream indexes.
cable logging layer2events	Logs system messages about DOCSIS-layer events on the Cisco CMTS router.
cable source-verify	Enables verification of IP addresses for CMs and CPE devices on the upstream.
clear cable logging	Removes all error and buffer messages on the cable interfaces from the corresponding logs.



Cable Commands: show cable m to show cable u

- show cable mac-domain cable forwarding, on page 1816
- show cable mac-domain cable cgd-associations, on page 1818
- show cable mac-domain cable downstream-service-group, on page 1821
- show cable mac-domain cable dpd ocd, on page 1825
- show cable mac-domain cable rcc, on page 1827
- show cable mac-domain cable rcc simplified, on page 1830
- show cable mac-domain cable upstream-service-group, on page 1832
- show cable mac-domain fiber-node , on page 1834
- show cable mac-domain docsis-mode, on page 1836
- show cable mcast-shadow, on page 1838
- show cable metering-status, on page 1840
- show cable modem, on page 1844
- show cable modem access-group, on page 1904
- show cable modem asf, on page 1908
- show cable modem asf sup, on page 1910
- show cable modem auth-profile, on page 1911
- show cable modem calls, on page 1913
- show cable modem classifiers, on page 1916
- show cable modem cnr, on page 1919
- show cable modem connectivity, on page 1928
- show cable modem counters, on page 1933
- show cable modem cpe, on page 1938
- show cable modem docsis device-class, on page 1942
- show cable modem docsis version, on page 1951
- show cable modem docsis version d31-capable, on page 1963
- show cable modem docsis version d40-capable, on page 1965
- show cable modem domain-name, on page 1967
- show cable modem errors, on page 1970
- show cable modem extended-power, on page 1974
- show cable modem fiber-node mac-domain, on page 1976
- show cable modem flap, on page 1977

- show cable modem internal load-balance, on page 1983
- show cable modem ipv6, on page 1985
- show cable modem ipv6 summary, on page 1995
- show cable load-balance move-history cable x/y/z, on page 1996
- show cable modem low-latency-capable, on page 1998
- show cable modem mac, on page 1999
- show cable modem maintenance, on page 2011
- show cable modem offline, on page 2017
- show cable modem partial-mode, on page 2027
- show cable modem partial-service, on page 2030
- show cable modem path-sel, on page 2033
- show cable modem phy normalized, on page 2036
- show cable modem phy, on page 2047
- show cable modem phy us-pwr, on page 2058
- show cable modem phy ofdm, on page 2064
- show cable modem phy ofdm-profile, on page 2065
- show cable modem primary-channel, on page 2068
- show cable modem primary-channel summary total, on page 2070
- show cable modem privacy, on page 2073
- show cable modem prof-mgmt, on page 2079
- show cable modem qos, on page 2109
- show cable modem reduction-mode energy-management-mode, on page 2116
- show cable modem reduction-mode energy-management-param, on page 2117
- show cable modem reduction-mode energy-management-status, on page 2118
- show cable modem reduction-mode mta-battery , on page 2119
- show cable modem registered, on page 2120
- show cable modem remote-query, on page 2127
- show cable modem resiliency, on page 2132
- show cable modem rogue, on page 2134
- show cable modem rbg-activity, on page 2138
- show cable modem rpd, on page 2140
- show cable modem rpd all summary, on page 2184
- show cable modem select, on page 2185
- show cable modem service-type-id, on page 2191
- show cable modem service-flow, on page 2193
- show cable modem smp, on page 2208
- show cable modem subscriber, on page 2209
- show cable modem summary, on page 2211
- show cable modem summary scn, on page 2218
- show cable modem summary wb-rf, on page 2219
- show cable modem sysDescr, on page 2222
- show cable modem tcs summary, on page 2225
- show cable modem tftp, on page 2228
- show cable modem timeline, on page 2230
- show cable modem type, on page 2233
- show cable modem unregistered, on page 2237

- show cable modem vendor, on page 2248
- show cable modem verbose, on page 2255
- show cable modem voice, on page 2269
- show cable modem wideband, on page 2270
- show cable modem wideband phy, on page 2282
- show cable modem wideband primary-channel, on page 2285
- show cable modem wideband rcs-status, on page 2286
- show cable modulation-profile, on page 2291
- show cable multicast authorization, on page 2300
- show cable multicast db, on page 2304
- show cable multicast debug, on page 2310
- show cable multicast dsid, on page 2313
- show cable multicast qos, on page 2318
- show cable multicast ses-cache, on page 2321
- show cable multicast statistics, on page 2326
- show cable noise, on page 2331
- show cable ofdm-chan-profiles, on page 2332
- show cable ofdm-modulation-profiles, on page 2334
- show cable privacy, on page 2336
- show cable profile, on page 2338
- show cable qam-profile, on page 2340
- show cable qos enforce-rule, on page 2342
- show cable qos permission, on page 2347
- show cable qos profile, on page 2349
- show cable rate-adapt, on page 2352
- show cable rate-limit-ccf, on page 2354
- show cable rcp-id, on page 2356
- show cable rcps, on page 2357
- show cable redundancy, on page 2358
- show cable resil-rf-status, on page 2360
- show cable resiliency, on page 2362
- show cable resiliency counts, on page 2364
- show cable resiliency exclude, on page 2365
- show cable resiliency throttled-cm, on page 2366
- show cable rf-adapt, on page 2368
- show cable rf-status, on page 2371
- show cable rpd, on page 2373
- **show cable rpd 55d1-us cpp-cache**, on page 2377
- show cable rpd alloc-chan-resources, on page 2378
- show cable rpd auxiliary, on page 2379
- show cable rpd capability, on page 2381
- show cable rpd config, on page 2383
- show cable rpd core-ident, on page 2385
- show cable rpd depi, on page 2387
- show cable rpd depi session, on page 2392
- show cable rpd depi tunnel, on page 2396

- show cable rpd event, on page 2399
- show cable rpd gcp-session, on page 2400
- show cable rpd gcp-state, on page 2402
- show cable rpd gcp-transaction, on page 2404
- show cable rpd group, on page 2407
- show cable rpd host-resources, on page 2411
- show cable rpd lcce-chan-reach, on page 2413
- show cable rpd identification, on page 2414
- show cable rpd info, on page 2415
- show cable rpd ipv6, on page 2416
- show cable rpd lcha-cores, on page 2417
- show cable rpd location, on page 2419
- show cable rpd md-association, on page 2420
- show cable rpd name, on page 2422
- show cable rpd online, on page 2424
- show cable rpd offline, on page 2426
- show cable rpd pilot-tone, on page 2428
- show cable rpd principal, on page 2430
- show cable rpd sbfd-session, on page 2432
- show cable rpd spectrum-capture-capabilities, on page 2433
- show cable rpd slot, on page 2435
- show cable rpd summary, on page 2436
- show cable rpd tengigabitethernet, on page 2437
- show cable rpd topology, on page 2438
- show cable rpd us-phy channel, on page 2439
- show cable rpd verbose, on page 2441
- show cable rpd version, on page 2443
- show cable rpd sw-version, on page 2444
- show cable rsvp flow-db, on page 2445
- show cable service-class, on page 2447
- show cable service-voice downstream-type, on page 2451
- show cable service-flow summary, on page 2452
- show cable service-flow summary detail, on page 2456
- show cable signal-quality, on page 2458
- show cable snmp cache-status, on page 2462
- show cable spectrum-analysis, on page 2463
- show cable spectrum-group, on page 2466
- show cable subscriber-usage, on page 2469
- show cable tech-support, on page 2473
- show cable throttle-modem, on page 2477
- show cable upstream controller-profile, on page 2479
- show cable upstream service-flow summary, on page 2480
- show cable upstream ofdma mer-fec, on page 2482
- show cable upstream ofdma chan-util, on page 2483
- show cable urm, on page 2484
- show cable us-sg, on page 2490

- show cable video announce-event-profile, on page 2492
- show cable video encryption, on page 2493
- **show cable video encryption dvb**, on page 2494
- show cable video encryption linecard, on page 2497
- show cable video encryption pme, on page 2499
- show cable video gqi connections, on page 2501
- show cable video jitter, on page 2502
- show cable video integrated-cable, on page 2503
- show cable video logical-edge-device, on page 2505
- show cable video low-latency linecard, on page 2507
- show cable video output-port, on page 2508
- show cable video scg, on page 2509
- show cable video service-distribution-group, on page 2511
- show cable video session all, on page 2512
- show cable video session logical-edge-device, on page 2514
- show cable video snmp-alarms, on page 2520
- show cable video snmp-alarm-config, on page 2522
- show cable video vei-bundle, on page 2523
- show cable video virtual-carrier-group, on page 2524

show cable mac-domain cable forwarding

To display all the interfaces (wideband and modular) and statistics belonging to the Mac domain, use the **show cable mac-domain cable forwarding** command in privileged EXEC mode.

show cable mac-domain cable *slot*/*subslot*/*port* **forwarding**

Syntax Description

slot	Specifies the chassis slot number of the cable interface line card. The range is from 5 to 8.
subslot	Specifies the secondary slot number of the cable interface line card. The range is from 0 or 1.
port	Specifies the port number. The range is from 0 to 4 (depending on the cable interface).
forwarding	Displays the forwarding statistics for the cable line cards.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced.
12.2(33)SCA	This command is integrated in Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show cable mac-domain cable forwarding** command does not support wideband and modular interfaces. However, if wideband and modular interfaces belong to the Mac domain, the interfaces are listed in the output with the interface state.

Starting with Cisco IOS Release 12.2(33)SCF, for a chassis loaded with the UBR-MC20X20V or uBR-MC3GX60V line cards, and legacy uBR-MC5X20 line cards, the **show cable mac-domain cable forwarding** command shall not display the legacy downstream information for the UBR-MC20X20V and the uBR-MC3GX60V line cards.

Examples

The following is sample output of the **show cable mac-domain cable forwarding** command on the cable interface at 1/0/0:

```
Router# show cable mac-domain cable 1/0/0 forwarding
Interface            Output            Interface     Reserved/    Interface
Name           Packets   Rate          Bandwidth     Reservable   State
               (bytes)   (bits/sec)     (Kbps)       Bandwidth
-------------------------------------------------------------------------------
Ca1/0/0         201358            0        26000     6500/19500         UP
Mo1/0/0:0       344340            0         4160     1040/3120          UP
Mo1/0/0:1       252132            0         7800     1950/5850          UP
Mo1/0/0:2       252132            0         7800     1950/5850          UP
Wi1/0/0:0       198916            0         7803     1951/5852          UP
Wi1/0/0:1         1152            0        10404     2601/7803          UP
```

Table below describes the significant fields shown in the display.

Table 93: show cable mac-domain cable forwarding Field Descriptions

Field	Description
Interface Name	The name of the interface belonging to Mac domain.
Output Packets/Rate	The cumulative packets output and output rate.
Interface Bandwidth	The total interface bandwidth allocated.
Reserved/Reservable Bandwidth	The total reserved and available bandwidth.
Interface State	Indicates whether the interface is up or down.

show cable mac-domain cable cgd-associations

To display a summary of the Channel Grouping Domain (CGD) associations for all cable MAC domains, use the **show cable mac-domain cgd-associations** command in privileged EXEC mode.

Cisco uBR10012 Router
show cable mac-domain cable *slot* / *subslot* / *port* **cgd-associations**

Cisco uBR7225VXR and Cisco uBR7246VXR Routers
show cable mac-domain cable *slot* / *port* **cgd-associations**

Cisco cBR Series Converged Broadband Router
show cable mac-domain cable *slot* / *port* **cgd-associations**

Syntax Description

cable *slot* /*subslot* /*port*	Identifies the cable interface on the Cisco uBR10012 router. • *slot* —Slot where the line card resides. The range is from 5 to 8. • *subslot* —Subslot where the line card resides. The range is from0 or 1. • *port* —Downstream controller number on the line card. The range is from 0 to 4.
cable *slot* /*port*	Identifies the cable interface on the Cisco uBR7246VXR or Cisco uBR7225VXR router. • *slot* —Slot where the line card resides. • Cisco uBR7246VXR router: The range is from 3 to 6. • Cisco uBR7225VXR router: The range is from 1 to 2. • *port* —Downstream port number on the line card. The range is from 0 or 1.
cable *slot* /*subslot* /*cable-interface-index*	Identifies the cable interface on the Cisco cBR-8 router. • *slot* —Slot where the line card resides. The range is from 0 to 3 and 6 to 9. • *subslot* —Subslot where the line card resides. The value is 0. • *cable-interface-index* —Downstream cable interface index number on the line card. The range is from 0 to 15.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Added support for Cisco uBR7246VXR and Cisco uBR7225VXR routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show cable mac-domain cgd-associations** command displays the following information for each cable MAC domain:

- Shared port adapter (SPA) downstream channels that have been added to each MAC domain.
- Upstream channels associated with each SPA downstream channel and the downstream channels of the integrated cable interface line card.

If the All column in the command output indicates Y, then this indicates that all upstream channels associated with the line card downstream channels or SPA downstream channels are configured using the **upstream cable connector** command. If all upstream channels are not configured, then this column will not be displayed.

- The SPA downstream channels that are currently active.

A SPA downstream channel is active when the corresponding modular cable interface, which represents the SPA downstream channel, and its line protocol are up. A SPA downstream channel that is considered active is an operational primary downstream channel in the cable MAC domain.

Note For more information on Channel Grouping Domains, refer to the *Cisco DOCSIS 3.0 Downstream Solution Design and Implementation Guide, Release 2.0* .

Cisco IOS Release 12.3(23)BC

This example shows the output of the **show cable mac-domain cgd-associations** command for the cable interface line card at slot 6, subslot 0, and port 0:

```
Router# show cable mac-domain cable 6/0/0 cgd-associations
CGD Host  SPA    DS Channels             Upstreams (All)   Active Remote DS
Ca6/0/0          Local                   1            Y
          1/0/0 0-1                      0
```

Cisco IOS Release 12.2(33)SCB

This example shows the output of the **show cable mac-domain cgd-associations** command for the cable interface line card at slot 7, subslot 0, and port 0:

```
Router# show
 cable mac-domain Cable7/0/0 cgd-associations
CGD Host  Resource  DS Channels            Upstreams (AllUS)   Active Remote DS
Ca7/0/0   7/0/0     0                      0
          3/1/0     0-2                    0
                                                               0-2
```

Cisco IOS Release 12.2(33)SCG

This example shows the output of the **show cable mac-domain cgd-associations** command for the Cisco uBR-MC3GX60V cable interface line card sharing downstreams with the Cisco Wideband SPA, in Cisco IOS Release 12.2(33)SCG:

```
Router# show cable mac-domain cable 8/0/0 cgd-associations
```

```
CGD Host  Resource  DS Channels            Upstreams (AllUS)   Active Remote DS
Ca8/0/0   1/1/0     0                      0-3                    Yes
```

Table below describes the fields shown in the **show cable mac-domain cgd-associations command** display.

Table 94: show cable cgd-associations Field Descriptions

Field	Description
CGD Host	MAC domain interface for CGD.
Resource	Downstream cable interface line card.
DS Channels	Downstream RF channels.
Upstreams (AllUS)	Upstream channels in the MAC domain.
Active Remote DS	Active downstream channels.

Cisco cBR Series Converged Broadband Router

This example shows the output of the Cisco cBR-8 router

```
Router#show cable mac-domain c1/0/0 cgd-associations
CGD Host  Resource  DS Channels            Upstreams    (ALLUS)   Active DS
Ca1/0/0   1/0/0     8                      0-1          Yes        8
                    16                     0-1          Yes        16
                    24                     0-1          Yes        24
                    32-33                  0-1          Yes        32-33
                    40                     0-1          Yes        40


MD US binding:
Host MD           Controller  US channel    State
Ca1/0/0   U0         1/0/0         0          UP
Ca1/0/0   U1         1/0/0         1          UP
```

Related Commands

Command	Description
show cable mac-domain downstream-service-group	Displays MAC Domain Downstream Service Group information for the primary downstream channel.

show cable mac-domain cable downstream-service-group

To display MAC Domain Downstream Service Group information for a primary downstream channel, use the **show cable mac-domain downstream-service-group** command in privileged EXEC mode.

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers
show cable mac-domain cable *slot* / *port* **downstream-service-group**

Cisco uBR10012 Universal Broadband Router
show cable mac-domain cable *slot* / *subslot* / *port* **downstream-service-group**

Cisco cBR Series Converged Broadband Router
show cable mac-domain cable *slot* / *subslot* / *cable-interface-index* **downstream-service-group**

Syntax Description

slot	Slot where the line card resides. Cisco uBR7246VXR router—The range is from 3 to 6. Cisco uBR7225VXR router—The range is from 1 to 2. Cisco uBR10012 router—The range is from 5 to 8. Cisco cBR-8 router— The range is from 0 to 3 and 6 to 9
subslot	The subslot used for the cable interface line card. Cisco uBR10012 router—The range is from 0 or 1. Cisco cBR-8 router—The value is 0.
port	The downstream port used as a primary downstream channel. Valid values are from 0 to 4 (depending on the cable interface).
cable-interface-index	*cable-interface-index* —Downstream cable interface index number on the line card. Cisco cBR-8 router—The range is from 0 to 15.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.3(23)BC	This command displays the MAC Domain Downstream Service Group information for primary downstream channels from the SPA as well as the Cisco uBR10-MC5X20 line card.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.

Release	Modification
12.2(33)SCD	This command was modified. Support was added for Cisco uBR7225VXR and Cisco uBR7246VXR routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Use the **show cable mac-domain downstream-service-group** command to display MAC Domain Downstream Service Group (MD-DS-SG) information for the specified primary downstream channel.

For each fiber node, a traditional DOCSIS downstream channel on a Cisco uBR10-MC5X20 cable interface line card is used to carry MAC management and signaling messages, and the associated traditional DOCSIS upstream channel is used for return data traffic and signaling. The traditional DOCSIS downstream channel used in this way for a MAC domain is called the *primary downstream channel* .



Note Beginning in Cisco IOS Release 12.3(23)BC, either an RF channel from the SPA or a Cisco uBR10-MC5X20 downstream channel can serve as a primary channel in a fiber node. Changes in Cisco IOS Release 12.3(23)BC apply to Cisco IOS Release 12.2(33)SCB but do not apply to Cisco IOS Release 12.2(33)SCA.

Examples

The following two examples display **show cable mac-domain downstream-service-group** output for the primary downstream channel on the cable interface at slot/subslot/port 5/0/0:

Cisco IOS Release 12.3(21)BC

```
Router# show cable mac-domain cable5/0/0 downstream-service-group
Primary  MD-DS-SG         RF
IF       Id        SPA    Chan
C5/0/0   1         1/0/0  0 - 1
```

Cisco IOS Release 12.3(23)BC

```
Router# show cable mac-domain cable5/0/0 downstream-service-group
Cable    MD-DS-SG         RF       Local         Remote
IF       Id        SPA    Chan     Primary Chan  Primary Chan
C5/0/0   1         1/0/0  00-01    Yes
```

In the preceding examples, the MD-DS-SG with ID 1 is used for RF channels 0 and 1 on the Wideband SPA located in slot/subslot/bay 1/0/0.

Cisco IOS Release 12.2(33)SCB

This example shows the output of the **show cable mac-domain downstream-service-group** command for the primary downstream channel on the cable interface at slot/subslot/port 7/0/0:

```
Router# show cable mac-domain Cable7/0/0 downstream-service-group
Cable    MD-DS-SG             RF
IF       Id        Resource   Chan     Primary Chan
```

```
C7/0/0   1         3/1/0       00-02    0 1 2
                   7/0/0       00       0
```

Cisco IOS Release 12.2(33)SCD

This example shows the output of the **show cable mac-domain downstream-service-group** command for the primary downstream channel on the cable interface at slot/port 5/0:

```
Router# show cable mac-domain cable 5/0 downstream-service-group
Cable    MD-DS-SG             RF
IF       Id        Resource   Chan     Primary Chan
C5/0     1         5/0        00-03    0
```

Cisco IOS Release 12.2(33)SCG

This example shows the output of the **show cable mac-domain downstream-service-group** command for the Cisco uBR-MC3GX60V cable interface line card with primary downstream channel hosted on the Cisco Wideband SPA, in Cisco IOS Release 12.2(33)SCG:

```
Router# show cable mac-domain cable 8/0/0 downstream-service-group
Cable    MD-DS-SG             RF
IF       Id        Resource   Chan     Primary Chan
C8/0/0   1         1/1/0      00-03    0
                   1/3/0      00-03
                   7/0/0      00-03
                   8/0/2      00-03
```

Table below describes the fields shown in the **show cable mac-domain downstream-service-group command** display.

Table 95: show cable mac-domain downstream-service-group Field Descriptions

Field	Description
Cable IF	Cable interface.
MD-DS-SG	MAC Domain Downstream Service Group.
Resource	Downstream cable interface line card.
RF Chan	Downstream RF channel.
Primary Chan	Primary downstream channel.

Cisco cBR Series Converged Broadband Router

This example shows the output of the **show cable mac-domain downstream-service-group** command for the Cisco cBR Series Converged Broadband Router:

```
Router#show cable mac-domain c1/0/0 downstream-service-group
Cable    MD-DS-SG             RF
IF       Id        Resource   Chan     Primary Chan
C1/0/0
```

Related Commands

Command	Description
show cable modem	Displays information for registered and unregistered cable modems (including wideband cable modems).
show cable modem wideband	Displays information for registered and unregistered wideband cable modems.

show cable mac-domain cable dpd ocd

To display the MAC domain's OCD or DPD messages, use the **show cable mac-domain dpd | ocd** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable mac-domain cable *slot /subslot /cable-interface-index* {**dpd | ocd**} [**integrated-cable** *slot/card/port ofdm_channel*]

Syntax Description

slot/subslot/cable-interface-index	Identifies the cable interface on the Cisco cBR Series Converged Broadband Router.
slot/card/port	Specifies the integrated-cable interface.
ofdm_channel	Specifies the OFDM channel number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output of the **show cable mac-domain dpd** command:

```
Router# show cable mac-domain cable 3/0/0 dpd integrated-cable 3/0/0 158

DPD Message
  MAC Header
    Frame Control                  : 0xC2   (MAC specific, MAC msg, EHDR Off)
    MAC Parameters                 : 0x0
    Length                         : 34
    Header Check Sequence          : 0x61FC (25084)
  MAC Management Header
    Destination MAC ADDR           : 01e0.2f00.0001
    Source MAC ADDR                : c414.3c17.d1cb
    Length                         : 16
    Destination SAP                : 0
    Source SAP                     : 0
    Control                        : 3
    Version                        : 5
    Type                           : 50
    Multipart                      : 0    (Sequence number 0, Fragments 0)
  DPD fields
    DCID                           : 159
    Profile ID                     : 0
    CCC                            : 2
    TLV 5 Subcarrier Range/List    : Range (continuous)
      Modulation                   : 1024 (default value)
                                   : 0000 - 4095
DPD Message
```

```
  MAC Header
    Frame Control                  : 0xC2   (MAC specific, MAC msg, EHDR Off)
    MAC Parameters                 : 0x0
    Length                         : 34
    Header Check Sequence          : 0x61FC (25084)
  MAC Management Header
    Destination MAC ADDR           : 01e0.2f00.0001
    Source MAC ADDR                : c414.3c17.d1cb
    Length                         : 16
    Destination SAP                : 0
    Source SAP                     : 0
    Control                        : 3
    Version                        : 5
    Type                           : 50
    Multipart                      : 0    (Sequence number 0, Fragments 0)
  DPD fields
    DCID                           : 159
    Profile ID                     : 255
    CCC                            : 2
    TLV 5 Subcarrier Range/List    : Range (continuous)
      Modulation                   : 16 (default value)
                                   : 0000 - 4095
```

The following is a sample output of the **show cable mac-domain ocd** command:

```
Router# show cable mac-domain cable 3/0/0 dpd integrated-cable 3/0/0 158

OCD Message
  MAC Header
    Frame Control                  : 0xC2   (MAC specific, MAC msg, EHDR Off)
    MAC Parameters                 : 0x0
    Length                         : 132
    Header Check Sequence          : 0x5D3C (23868)
  MAC Management Header
    Destination MAC ADDR           : 01e0.2f00.0001
    Source MAC ADDR                : c414.3c17.d1cb
    Length                         : 114
    Destination SAP                : 0
    Source SAP                     : 0
    Control                        : 3
    Version                        : 5
    Type                           : 49
    Multipart                      : 0    (Sequence number 0, Fragments 0)
  OCD fields
    DCID                           : 159
    CCC                            : 2
    TLV 0 Spacing                  : 50 KHz
    TLV 1 Cyclic Prefix            : 1024 samples
    TLV 2 Rolloff                  : 128 samples
    TLV 3 Spectrum Location        : 572600000 Hz
    TLV 4 Interleave Depth         : 16
    TLV 5 Subcarrier Assignment    : Continuous Pilots (list)
      1164  1236  1308  1380  1452  1524  1596  1668  1740  1817
      1829  1840  1849  1886  1895  1906  1918  1932  2004  2076
      2148  2220  2292  2364  2436  2508  2580  2652  2724  2796
      2868  2940
    TLV 5 Subcarrier Assignment    : Excluded Subcarriers (range)
                                   : 0000 - 1127
    TLV 5 Subcarrier Assignment    : Excluded Subcarriers (range)
                                   : 2969 - 4095
    TLV 5 Subcarrier Assignment    : PLC Subcarriers (range)
                                   : 1864 - 1871
```

show cable mac-domain cable rcc

To display runtime receive channel configuration (RCC) on a cable line card interface, use the **show cable mac-domain rcc** command in privileged EXEC mode.

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers
show cable mac-domain cable *slot* / *port* **rcc**

Cisco uBR10012 Universal Broadband Router
show cable mac-domain cable *slot* / *subslot* / *port* **rcc**

Cisco cBR Series Converged Broadband Router
show cable mac-domain cable *slot* / *subslot* / *cable-interface-index* **rcc**

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR7225VXR router—The valid range is from 1 to 2. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is 0 to 3 and 6 to 9.
subslot	Specifies the secondary slot number of the cable interface line card. Cisco uBR Series router—Valid subslots are 0 or 1. Cisco cBR-8 router—The valid value is 0.
port	Specifies the port number. Cisco uBR Series router—Valid values are 0 to 4 (depending on the cable interface). Cisco cBR-8 router—The valid range is 0 to 7.
cable-interface-index	Downstream port on the Cisco cBR router. The valid range is 0 to 15.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCD	This command was modified. Support was added for Cisco uBR7225VXR and Cisco uBR7246VXR routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Release	Modification
IOS-XE 3.18.0SP	This command was modified to show which RCC encoding formats are supported by a particular RCC.

Examples

The following is a sample output of the **show cable mac-domain rcc** command on the cable interface with the DOCSIS 3.0 encoding support and DOCSIS 3.1 simplified encoding support columns:

```
Router# show cable mac-domain cable 7/0/0 rcc

RCC-ID   RCP               RCs MD-DS-SG CMs   WB/RCC-TMPL      D3.0 D3.1
4        00 00 00 00 00    16  0        1     WB (Wi7/0/0:0)   Y    Y
5        00 00 00 00 00    25  0        2     WB (Wi7/0/0:1)   N    Y
6        00 10 00 00 08    8   0        0     RCC-TMPL(3:1)    Y    N
7        00 00 00 00 00    4   0        0     WB (Wi7/0/0:4)   Y    Y
```

The following is a sample output of the **show cable mac-domain rcc** command on the cable interface of the cBR-8 router:

```
Router# show cable mac-domain cable 8/0/0 rcc
RCC-ID   RCP               RCs MD-DS-SG CMs   WB/RCC-TMPL
1        00 00 00 00 00    2   0        0     WB (101)
2        00 10 00 00 03    3   2        0     RCC-TMPL (1)
```

The following is a sample output of the **show cable mac-domain rcc** command on the cable interface of the uBR10012 router:

```
Router# show cable mac-domain cable 1/0 rcc
RCC-ID   RCP               RCs MD-DS-SG CMs   WB/RCC-TMPL
1        00 00 00 00 00    3   0        3     WB (25)
```

Table below describes the significant fields shown in the display.

Table 96: Field Descriptions for show cable mac-domain rcc Command

Field	Description
RCC-ID	RCC index per MAC domain. The RCC ID refers to the RCC ID output from the **show cable modem wideband** command.
RCP	The receive channel profile associated with the RCC object.
RCs	Total number of DS channels.
MD-DS-SG	Indicates the MAC domain DS service group for which the RCC is generated.
CM	Total number of CMs associated with the RCC object.
WB/RCC-TMPL	Indicates the wideband interface or the RCC template.
D3.0	DOCSIS 3.0 encoding support details.
D3.1	DOCSIS 3.1 simplified encoding support

Note A zero value in the RCP or MD-DS-SG field indicates that the RCC is generated directly through a wideband interface configuration and not through any RCC templates.

Note The channels in this command output are the subset of channels in the REG-RSP-MP.

Related Commands

Command	Description
show interface resil-rf-status	(On the Cisco cBR-8 router) Displays the logical up and down state for each of the configured RF channels for a wideband interface.
show controller integrated-Cable rf-channel	Displays the RF channel information.
show interface rf-status	(Cisco uBR Series router) Displays the logical up and down state for each of the configured RF channels for a wideband interface.
show cable modem path-sel	Displays the path selection status of a cable modem.
clear cable modem path-sel	Clears the path selection status of a cable modem.
show cable mac domain rcc simplified	Shows detailed information for DOCSIS 3.1 capable RCC.

show cable mac-domain cable rcc simplified

To view a detailed information for only DOCSIS 3.1 capable RCC, use the **show cable mac-domain rcc simplified** command, in privileged EXEC mode.

show cable mac-domain cable *slot* / *subslot* / *cable-interface-index* **rcc** *rcc id* **simplified**

Syntax Description

slot	Slot where the line card resides. The valid range is 0 to 3 and 6 to 9.
subslot	Specifies the secondary slot number of the cable interface line card. The valid value is 0.
cable-interface-index	Downstream port on the Cisco cBR-8 router. The valid range is 0 to 15.
rcc id	RCC ID.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to view a detailed information for only DOCSIS 3.1 capable RCC. If you attempt to display the details of an RCC that is not DOCSIS 3.1 capable, an error message is displayed.

The following is a sample output of the **show cable mac-domain rcc simplified** command.

```
router#show cable mac-domain cable 7/0/0 rcc 5 simplified

RCC ID                  : 5
Created Via             : Wideband - Wi7/0/0:1
CM attribute mask       : 0x80000000

Primary Receive Channel List:
  Chan Idx   RF Chan         DCID  Freq
  1          In7/0/0:0       1     453000000

Non-Primary Receive Channel List:
  Chan Idx   RF Chan         DCID  Freq
  2          In7/0/0:1       2     459000000
  3          In7/0/0:2       3     465000000
  4          In7/0/0:3       4     471000000
  5          In7/0/0:4       5     477000000
  6          In7/0/0:5       6     483000000
  7          In7/0/0:6       7     489000000
  8          In7/0/0:7       8     495000000
  9          In7/0/0:8       9     501000000
  10         In7/0/0:9       10    507000000
  11         In7/0/0:10      11    513000000
  12         In7/0/0:11      12    519000000
  13         In7/0/0:12      13    525000000
```

```
  14          In7/0/0:13      14    531000000
  15          In7/0/0:14      15    537000000
  16          In7/0/0:15      16    543000000
  17          In7/0/0:16      17    549000000
  18          In7/0/0:17      18    555000000
  19          In7/0/0:18      19    561000000
  20          In7/0/0:19      20    567000000
  21          In7/0/0:20      21    573000000
  22          In7/0/0:21      22    579000000
  23          In7/0/0:22      23    585000000
  24          In7/0/0:23      24    591000000
  25          In7/0/0:158     159   663000000

OFDM Receive Channel List:
  Chan Idx    RF Chan         DCID  PLC-Freq        Profiles
  25          In7/0/0:158     159   663000000       0 1 2
```

The following is an example of the error message received when you attempt to display the details of an RCC that is not DOCSIS 3.1 capable

```
router#show cable mac-domain cable 7/0/0 rcc 6 simplified

% RCC ID 6 is not DOCSIS 3.1 applicable.
% Only legacy format is available for this RCC
```

Related Commands

Command	Description
clear cable modem path-sel	Clears the path selection status of a cable modem.
show cable mac-domain rcc	Displays runtime receive channel configuration (RCC) on a cable line card interface.
show cable modem path-sel	Displays the path selection status of a cable modem.

show cable mac-domain cable upstream-service-group

To display runtime statistics of the MAC domain upstream service group on a cable interface line card, use the **show cable mac-domain upstream-service-group** command in privileged EXEC mode.

show cable mac-domain cable *slot* / *subslot* / *port* **upstream-service-group**

Syntax Description

slot	Chassis slot number of the cable interface line card. Cisco uBR10012 router—The range is from 0 to 8. Cisco cBR-8 router— The range is from 0 to 3 and 6 to 9
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 router—The range is from 0 or 1. Cisco cBR-8 router—The value is 0.
port	Port number. The range is from 0 to 4 (depending on the cable interface).
cable-interface-index	*cable-interface-index* —Downstream cable interface index number on the line card. Cisco cBR-8 router—The range is from 0 to 15.
upstream-service-group	Specifies the upstream service group number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays privacy information of a particular CM, identified by its IP address or MAC address.

Examples

The example shows the output of the **show cable mac-domain upstream-service-group** command on the cable interface line card at slot/subslot/port 7/1/0:

```
Router# show cable mac-domain cable 7/1/0 upstream-service-group
Cable MD 7/1/0
US-SG-ID  : 1         US-Chan : U0,1,2,3,4
Primary-DS: 5/1/0:0   US-SG-ID: 1
  MDD US-List   : U0,1,2,3
  MDD Ambiguity : U0,1,2,3
Primary-DS: 3/0/0:0   US-SG-ID: 1
  MDD US-List   : U0,1,2,3,4
  MDD Ambiguity : U0,1,2,3,4
Primary-DS: 3/0/0:1   US-SG-ID: 1
  MDD US-List   : U0,1,2,3,4
```

```
  MDD Ambiguity : U0,1,2,3,4
Primary-DS: 3/0/0:2   US-SG-ID: 1
  MDD US-List   : U0,1,2,3,4
  MDD Ambiguity : U0,1,2,3,4
Primary-DS: 3/0/0:3   US-SG-ID: 1
  MDD US-List   : U0,1,2,3,4
  MDD Ambiguity : U0,1,2,3,4
```

Table below describes the significant fields shown in the display.

Table 97: show cable mac-domain upstream-service-group Field Descriptions

Field	Description
US-SG-ID	Upstream service group ID.
US-chan	Total number of upstream channels on the cable interface line card.
Primary-DS	The primary downstream interface.
MDD US-List	MAC management message: MDD TLV type 7 content, upstream active channel list.
MDD Ambiguity	MAC management message: MDD TLV type 8 content, upstream ambiguity resolution channel list.

This example shows the output of the **show cable mac-domain upstream-service-group** command for the Cisco cBR Series Converged Broadband Router:

```
Router#show cable mac-domain c1/0/0 upstream-service-group
Cable MD 1/0/0
```

Related Commands

Command	Description
show interface rf-status	Displays the logical up and down states for each of the configured RF channels on a wideband interface.

show cable mac-domain fiber-node

To verify the interface associations, use the **show cable mac-domain fiber-node** command.

show cable mac-domain fiber-node *fiber-node id* **md** *mac-domain id* {**downstream-service-group** | **upstream-service-group**}

Syntax Description

fiber-node id	Fiber node ID.
mac-domain id	MAC Domain ID in SG profile.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 3.17.0S	This command was introduced.

Usage Guidelines

Use this command to verify the interface associations of a fiber node and MAC domain downstream or upstream service group.

```
Router#show cable mac-domain fiber-node 1 md 0 downstream-service-group
Cable    MD-DS-SG              RF
IF       Id        Resource    Chan     Primary Chan
C2/0/0   1         2/0/6       0-31     0-15
Router#
```

```
Router#show cable mac-domain fiber-node 1 md 0 upstream-service-group
Cable MD 2/0/0
  US-SG-ID  : 8         US-Chan : U0,1,2,3
  Primary-DS: 2/0/6:0   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:1   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:2   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:3   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:4   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:5   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:6   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:7   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:8   US-SG-ID: 8
```

```
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:9   US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:10  US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:11  US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:12  US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:13  US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:14  US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 2/0/6:15  US-SG-ID: 8
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
Router#
```

show cable mac-domain docsis-mode

To view detailed information about the DOCSIS mode on cBR-8 routers, use the **show cable mac-domain docsis-mode** command, in privileged EXEC mode.

show cable mac-domain { **cable** *slot / subslot / cable-interface-index* | **all** }

Syntax Description

docsis-mode	DOCSIS Mode Information
cable	CMTS Interface
slot	Slot where the line card resides. The valid range is 0 to 3 and 6 to 9.
subslot	Specifies the secondary slot number of the cable interface line card. The valid value is 0.
cable-interface-index	Downstream port on the Cisco cBR-8 router. The valid range is 0 to 31.
all	Displays DOCSIS Mode for all MAC Domains

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1y	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to view detailed information about the DOCSIS mode.

The following is a sample output of the **show cable mac-domain docsis-mode C1/0/0** command. This command displays the DOCSIS mode for the specified interface *C1/0/0*.

```
router#show cable mac-domain docsis-mode C1/0/0
Interface    MRC Mode    MTC Mode         D31 Config   D31 Mode    D40 Config   D40 Mode
Cable1/0/0   enabled     MTC_PERMIT_ALL   enabled      enabled     disabled     disabled
```

The following is a sample output of the **show cable mac-domain docsis-mode all** command which displays DOCSIS mode for all the interfaces.

```
router#show cable mac-domain docsis-mode all
Interface    MRC Mode    MTC Mode         D31 Config   D31 Mode    D40 Config   D40 Mode
Cable0/0/0   enabled     MTC_PERMIT_ALL   enabled      enabled     enabled      enabled

Cable0/0/1   enabled     MTC_PERMIT_ALL   enabled      enabled     enabled      enabled

Cable0/0/2   enabled     MTC_PERMIT_ALL   enabled      enabled     enabled      enabled

Cable0/0/3   enabled     MTC_PERMIT_ALL   enabled      enabled     enabled      enabled

Cable0/0/4   enabled     MTC_PERMIT_ALL   enabled      enabled     enabled      enabled
```

```
Cable0/0/5   enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/6   enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/7   enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/8   enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/9   enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/10  enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/11  enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/12  enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/13  enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/14  enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable0/0/15  enabled     MTC_PERMIT_ALL   enabled     enabled     enabled     enabled
Cable1/0/0   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/1   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/2   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/3   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/4   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/5   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/6   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/7   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/8   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/9   enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
Cable1/0/10  enabled     MTC_PERMIT_ALL   enabled     enabled     disabled    disabled
```

Related Commands

Command	Description
show cable mac-domain fiber-node	Displays interface associations of a fiber node and MAC domain downstream or upstream service group.

show cable mcast-shadow

To display information about multicast dataplane shadow, use the **show cable mcast-shadow** command in privileged EXEC mode.

show cable mcast-shadow [{**bundle** *bundle interface number* {*source ipv4 address group ipv4 address* }} | {*source ipv6 address group ipv6 address* }}]

Syntax Description

bundle *bundle interface number*	Specifies bundle interface number. The value ranges from 1 to 255.
source ipv4 address	The source ipv4 address.
group ipv4 address	The group ipv4 address.
source ipv6 address	The source ipv6 address.
group ipv6 address	The group ipv6 address.

Command Default

none

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on Cisco cBR8 Series Converged Broadband Routers.

Usage Guidelines

The **show cable mcast-shadow** command is used to display the contents of the multicast data plane shadow.

Examples

The following example shows a typical display for the **show cable mcast-shadowbundle** *bundle interface number* command for all cable interfaces:

```
Router#  show cable mcast-shadow bundle 1 0.0.0.0 225.1.1.1
 Load for five secs: 2%/0%; one minute: 3%; five minutes: 3%
Time source is NTP, 15:49:24.928 CST Mon Mar 16 2015

Source          Group           Interface    VRF PathSetId  Adj-id
-----------------------------------------------------------------
0.0.0.0         225.1.1.1       Bu1          0   2          0x20000099
0x20000011
                000000060EE4E000000000000000000 (00 00 00 0)
                000000060EE4E000000000000000000 (00 00 00 2204106752)
                000000060EE4E400000000000000000 (00 00 00 2204350777)
                                In6/0/0:1    0              0x20000012
                000000060EE4E800000000000000000 (00 00 00 0)
                000000060EE4E800000000000000000 (00 00 00 2204106753)
                000000060EE4EC00000000000000000 (00 00 00 2204350779)
```

Related Commands

Command	Description
show cable multicast db	Displays the contents of the multicast explicit tracking database.

Command	Description
show interface IC multicast-sessions	Displays the contents of multicast sessions created on the interface.
show policy-map target	Displays the contents of policy-map for this multicast session..

show cable metering-status

To display information about the most recent successful usage-based billing operation, use the **show cable metering-status** command in privileged EXEC mode.

show cable metering-status [**verbose**]

Syntax Description

verbose	(Optional) Displays the information in a more readable format.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(9a)BC	This command was introduced.
12.2(33)SCB	SAMIS over Internet Protocol Detail Record (IPDR) was introduced.

Usage Guidelines

The **show cable metering-status** command displays information about the most recent successful usage-based billing operation. If usage-based billing is configured for File mode, this command displays the device and file name for the record that was last written. If usage-based billing is configured for Streaming mode, this command displays the IP address and port number for the external server to which the billing record was sent.

Note This command displays the status of the last successful billing record operation. If a failure occurred, the CMTS sends an SNMP trap to the SNMP manager with that information.

Examples

This example shows a typical output for the **show cable metering-status** command when usage-based billing is configured to write the billing records to a local file system:

```
Router# show cable metering-status
destination                       complete-time   flow cpe  status
                                                  aggr supp
disk0:R7519-UBR7246-200308-004428 Jun 12 09:33:05  No    No  success
```

This example shows a typical output for the **show cable metering-status** command when usage-based billing is configured to stream the billing records to an external server:

```
Router# show cable metering-status

destination                       complete-time   flow cpe  status
                                                  aggr supp
10.11.37.2 :1234                  Jun 12 09:33:05  No   No  success
```

This example shows a typical output for the verbose form of the **show cable metering-status** command:

```
Router# show cable metering-status verbose
```

```
Destination            : disk0:R7519-UBR7246-20000308-004428
Complete Time          : Jun 12 09:33:05
Flow Aggregate         : Yes
Cpe list suppression   : Yes
Status of last export  : success
```

This example shows a typical output for the **show cable metering-status** command when usage-based billing is configured to use the Internet Protocol Detail Record (IPDR) Exporter to stream the billing records to an external server:

```
Router# show cable metering-status
destination                       complete-time   flow cpe  status
                                                  aggr supp
IPDR_Session1         Jun 12 09:33:05  N/A N/A success
```

This example shows a typical output for the verbose form of the **show cable metering-status** command when usage-based billing is configured to use the IPDR Exporter to stream the billing records to an external server:

```
Router# show cable metering-status
 verbose

Last export status
Destination            : IPDR_Session1
Complete Time          : Jun 12 09:36:05
Status of last export  : success
```

This example shows the error message that is displayed when you enter the **show cable metering-status** command but not have enabled usage-based billing:

```
Router# show cable metering-status
CMTS Metering collection not enabled
```

This example shows if the SAMIS report failed, the output displays the details of the failure:

```
Router# show cable metering-status
 verbose
Load for five secs: 0%/0%; one minute: 1%; five minutes: 0%
Time source is NTP, .19:24:53.955 PDT Fri Jun 11 2010
Last export status
Destination            : 20.1.0.2:5959
Complete Time          : Jun11 19:24:40
Flow Aggregate         : No
Full records           : Yes
Cpe list suppression   : No
Source interface       : GigabitEthernet0/1
Status of last export  : write-error (bulk-data)
```

Table below describes the fields displayed by the **show cable metering-status** command.

Table 98: show cable metering-status Field Descriptions

Field	Description
destination, Destination	Destination for the billing records. This is a file system device name and file name, if records are being written to a local file system, or an IP address and TCP port number, if records are being streamed to an external server.

Field	Description
complete_time, Complete Time	Date and time when the last billing record was written to a local file or streamed to an external server.
flow aggr, Flow Aggregate	Indicates whether traffic counters are aggregated in the billing records, so that one total is recorded for the upstream service flows and downstream service flows for each CM.
cpe suppress, CPE list suppression	Indicates whether CPE IP addresses are included or suppressed in the billing records: • Yes — CPE addresses are suppressed and are not included in the billing records. • No— CPE addresses are included in the billing records.
status, Status of last export	Indicates the status of the last billing operation: • success—The billing records were successfully written to the filesystem (file mode) or transferred to the billing collection server (streaming mode). • connect-failed—The CMTS was able to open the proper socket connection to the server but could not connect to the server. • data-incomplete—A failure occurred during the file write or the streaming to the collection server, and the records that were written might be incomplete. • disk-full—The billing records could not be written because the filesystem does not have sufficient free space. • no-memory—The processor had insufficient memory to collect the billing records. • open-failure—The transfer failed because the CMTS could not open a new file on the filesystem (file mode) or open a socket to the destination IP address and port (streaming mode). • unknown—An unknown error occurred. • write-error (*data-type*)—The operating system reported an error when attempting to write the billing records (file mode), or the send to the destination socket failed (streaming mode). • The value of data-type could be *file-header* , *file-end* , *bulk-data* , *sflog* , *bulk-data* , *ipdr-data* , *ipdr-sflog* , or *ipdr-file* .

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show cable metering-status** command on the Cisco cBR router for Collector configuration—ipdr-d3, session 1, type 1 collecting full-records, as follows:

```
Router#show cable metering-status
destination                       complete-time   flow  cpe   full  status
                                                  aggr  supp  rec
IPDR_Session1                     May21 13:27:04  No    N/A   Yes  connect-failed

Router#
```

Related Commands

Command	Description
cable metering destination	Enables usage-based billing and streams the billing records to an external server.
cable metering filesystem	Enables usage-based billing and writes the billing records to a file on a local file system.
cable metering source-interface	Enables debugging of usage-based billing operations.
snmp-server enable traps cable	Enables the sending of Simple Network Management Protocol (SNMP) traps for cable-related events.

show cable modem

To display information for the registered and unregistered cable modems, use the **show cable modem** command in privileged EXEC mode.

show cable modem [*ip-addressmac-address* | **cable** {*slot* /*port* | *slot* /*subslot*/*port* } [**upstream** *port*]] **queue** [**verbose**] [**cm-status**]

Cisco IOS Release 12.2(33)SCE and later releases
show cable modem [**ip-address** | **mac-address** | **cable** {*slot* /*cable-interface-index* | *slot* /*subslot* /*cable-interface-index*} [**upstream** *port*]] [**verbose**] [**cm-status**]

Cisco cBR Series Converged Broadband Router
show cable modem [**ip-address** | **mac-address** | **cable** {*slot* /*subslot* /*cable-interface-index*} [**upstream** *port*]] [**verbose**] [**cm-status**]

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific cable modem to be displayed. If you specify the IP address for a CPE device behind a cable modem, information for that cable modem is displayed.
mac-address	(Optional) MAC address of a specific cable modem to be displayed. If you specify the MAC address for a CPE device behind a cable modem, information for that cable modem is displayed.
cable	(Optional) Displays the modems on a specific cable interface.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR router—The valid range is 0 to 15.
upstream *port*	(Optional) Displays information for all cable modems using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. Cisco cBR router—The valid range of *port* is 0 to 7.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This keyword is not supported on the Cisco cBR router.
verbose	Displays detailed information of the cable modems.
cm-status	Displays cable modem status events.
cm-status ack	Displays the modems to which cable modem status acknowledgement messages are sent.
queue	Displays the downstream hierarchical queueing framework (HQF) queue information for a cable modem. This keyword is not supported on the Cisco cBR router.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This keyword is not supported on the Cisco cBR router.

Command Modes

Privileged EXEC (#)

Command History

BC Release	Modification
12.2(15)BC1	Additional lines were added to the **show cable modem verbose** displays, for one or all cable modems, to show information about the dynamic shared-secret feature. Cable modems that fail the dynamic secret authentication checks and then come online are marked with an exclamation point (!), so that this situation can be investigated.
12.2(4)BC1	Support was added for the Cisco uBR10012 router.

BC Release	Modification
12.2(8)BC2	The output for the Online State field was updated for the **cable tftp-enforce** command. A pound sign (#) appears next to the state value when a cable modem was allowed to come online without attempting to download a DOCSIS configuration file through the cable interface with the Cisco CMTS.
12.2(15)BC1c	The **verbose** option displays whether dynamic service change requests (DSX) are allowed from cable modems.
12.2(15)BC2	Two new states—cc(r1) and cc(r2)—have been added to the cable modem MAC state field to indicate the cable modem status when it has been instructed to change channels and is ranging to obtain a new downstream or upstream channel. Also, three new states—online(pkd), online(ptd), and expire(pkd)—were added to clarify the BPI state when network access has been disabled in the cable modem's DOCSIS configuration file. In addition, the **show cable modem verbose** command now displays the total amount of time that a cable modem has been online since last registering.
12.3(13a)BC	New initialization states were added for the MAC State Field: • init(d)—The Cisco CMTS has seen DHCPDISCOVER • init(io)—The Cisco CMTS has seen DHCPOFFER • init(dr)—The Cisco CMTS has seen DHCPREQUEST • init(i)—The Cisco CMTS has seen DHCPACK • init(o)—The Cisco CMTS has seen first TFTP packet for TFTP request for cable modem configuration file • init(t)—The Cisco CMTS has seen the TOD request
12.3(21)BC	All cable bundles are now automatically converted and configured to be in a virtual bundle, and standalone cable interfaces must be manually configured to be in a virtual bundle to operate properly. Previously, new virtual interface bundles and bundle members required reconfiguration, and there could also be standalone interfaces not part of a bundle at all.
12.3(23)BC	The **verbose** option displays additional information about the cable modem. The following fields have been added to the output of this option: • Host Interface • Primary Downstream • Wideband Capable • Voice Enabled • DS Change Times
C Release	Modification

BC Release	Modification
12.1(4)CX	Support was added for the Cisco uBR10012 router.
12.2(15)CX	The **verbose** option displays the sysDescr field for each cable modem, when the **cable modem remote-query** command has been configured. Other fields have also been added to support DOCSIS 2.0 (ATDMA) operation.
E Release	Modification
12.1(10)EC1	Adds an exclamation point to cable modems that have exceeded the maximum delay/timing offset specified by the **cable map-advance** command.
12.1(11b)EC1	The output for the Online State field was updated for the **cable tftp-enforce** command. A pound sign (#) appears next to the state value when a cable modem was allowed to come online without attempting to download a DOCSIS configuration file through the cable interface with the Cisco CMTS.
12.1(20)EC1	The three new states—online(pkd), online(ptd), and expire(pkd)—were added to the Cisco IOS Release 12.1 EC train.
N Release	Modification
11.3(5)NA	The output was reorganized and the Receive Power field was added.
T Release	Modification
2.1(1a)T1	The output of this command was enhanced to show that the Cisco CMTS has detected an unstable return path for a particular cable modem and has compensated with a power adjustment. An asterisk (*) appears in the power adjustment field for a modem when a power adjustment has been made; an exclamation point (!) appears when the cable modem has reached its maximum power transmit level and cannot increase its power level further.
12.0(7)T	The **detail** option was replaced with the **verbose** option.
X Release	Modification
11.3XA	This command was introduced.
12.0(4)XI	The output was expanded to show the primary service identifier (SID) and the customer premises equipment (CPE) count.
12.0(7)XR	The output of this command was enhanced to show that the Cisco CMTS has detected an unstable return path for a particular cable modem and has compensated with a power adjustment. An asterisk (*) appears in the power adjustment field for a modem when a power adjustment has been made; an exclamation point (!) appears when the cable modem has reached its maximum power transmit level and cannot increase its power level further.
SC Release	Modification

BC Release	Modification

12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes:
	• Support for the Cisco uBR7225VXR router was added.
	• Support for specifying the IPv6 address of a cable modem or CPE device was added.
	• The **name** keyword option was added for specifying the fully-qualified domain name of a cable modem.
	• The output column spacing and headings were changed, including some of the following changes:
	  • "BPI Enb" has been changed to "BPI"
	  • "DIP" output field was added to indicate support of dual IP for both IPv4 and IPv6 addressing.
	• The following new initialization states were added to show initialization of cable modems and CPEs supporting IPv6:
	  • init6(s)—CMTS router has seen SOLICIT message.
	  • init6(a)—CMTS router has seen ADVERTISE message.
	  • init6(r)—CMTS router has seen REQUEST message.
	  • init6(i)—CMTS router has seen REPLY message.
	  • init6(o)—CMTS router has seen version 6 TFTP request.
	  • init6(t)—CMTS router has seen version 6 TOD request.

12.2(33)SCB	A new keyword, **cm-status**, was added to display cable modem status events.
12.2(33)SCC	This command was modified with the following changes: • The command output displays the cable modem attribute bitmasks. • The command output provides basic receive-statistics for all event code types of the specified cable modem.
12.2(33)SCD	This command was modified. The cm-status keyword was added to display the cable modem status events and the queue keyword was added to display downstream HQF queue information on the Cisco uBR7225VXR and Cisco uBR7246VXR routers.
12.2(33)SCD2	This command was modified. The command output was modified to display the cable modems that are in upstream and downstream partial service mode.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCE4	This command was modified. The command output displays online time of the modem since the last counter reset, along with the total time online.

BC Release	Modification
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added. The **show cable modem verbose** command output was modified to display the downstream channel information for the cable modems.
12.2(33)SCH	The **show cable modem verbose** command output was modified to display the ranging class ID of a cable modem.
12.2(33)SCG5	The output of the command with the **verbose** keyword was modified to display the status of the Upstream Drop Classifier (UDC) feature. The field "UDC Enabled" was added in the output.
12.2(33)SCH1	The output of the command with the **verbose** keyword was modified to display the following: • The channel IDs for 16 downstream channels and channel information for 4 upstream channels on the Cisco uBR10012 routers using PRE4 or versions later than PRE4, and Cisco uBR7200 series routers using NPE-G2. • The number of IPv6 addresses per cable modem and the maximum values.
12.2(33)SCH2	The output of the command with the **verbose** keyword was modified to display the channel IDs for 24 downstream channels and the channel information for 8 upstream channels on the Cisco uBR10012 routers using PRE4 or versions later than PRE4, and Cisco uBR7200 series routers using NPE-G2.
12.2(33)SCI2	This command was integrated into Cisco IOS Release 12.2(33)SCI2.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **name**, **queue** keyword and the *logical-channel-index* variable were removed.
IOS-XE 3.16.0S	The output of the command was modified to display the battery backup mode for MAC state. The output of the command with **verbose** keyword was modified to display battery mode and battery mode status.
IOS-XE 3.18.0S	The output of the command was modified to display the energy management mode for MAC state. The output of the command with **verbose** keyword was modified to display energy management mode and energy management mode status.
IOS-XE 3.18.0SP	The output of the command with the **verbose** keyword was modified to display the new DOCSIS 3.1 Commanded Power levels per upstream.
IOS-XE 16.6.1	The output of the command with the **verbose** keyword was modified to display the cable modem's CM-STATS-ACK capability. A new keyword, **ack**, was added to display cable modems to which cable modem status acknowledgement messages are sent.
IOS XE Amsterdam 17.3.1w	The output of the command was updated to include the partial mode description.
IOS XE Bengaluru 17.6.1x	The output of the command was updated to display more detailed CM-STATUS event history.

Usage Guidelines

This command displays information for all cable modems, for all cable modems attached to a specific CMTS cable interface, or for a particular cable modem, identified by its IP address, MAC address, or its domain name. The output is sorted by the cable interface and the cable modem's MAC address.

Note The upstream channel list displayed by **show cable modem** *ip-address/mac-address* [**verbose**]command is the subset of upstream service flow forwarding interface channel set of the cable modem.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Tip Several options in the **show cable modem** command do not pause the screen to display the information page by page, even if the **terminal length** command has been used to set the page size of your terminal. Paging and pausing the display could result in outdated or stale information for cable modems, and thus produce an incorrect snapshot of the current cable modem state of the system. To capture or review this information, use your terminal program's capture buffer to save the information to a file, and then review it offline.

Tip You can also specify the MAC address or IP address for a CPE device, and the Cisco CMTS will display the information for the cable modem that is associated with that CPE device in its internal database.

Note If the CPE IP address is no longer associated with a cable modem, the **show cable modem** command might not display information about the cable modem. To display the IP address of the CPE device for the cable modem, use the **clear cable host** *ip-address* command to clear the IP address of the modem from the router database, and then enter the **ping docsis** *mac-address* command, which resolves the MAC address by sending the DOCSIS ping to the CM.

Note When an IPv4 CPE is moved from one bundle interface to another bundle interface, the **show cable modem** command displays duplicate CPE device under the original modem and new modem. CPE ping may also fail. To prevent duplication, use the **clear cable host** command to manually remove the old CPE device entry before moving the IPv4 CPE from one bundle interface to another. Reload the CPE after moving it to another bundle interface.

Refer to the following document on Cisco.com for additional information about cable interface bundling and virtual interface bundling on the Cisco CMTS:

- *Cable Interface Bundling and Virtual Interface Bundling on the Cisco CMTS*

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Operation of the show cable modem Commands with Different Cable Interface Line Cards

The **show cable modem** commands display the most current information for standard cable interface line cards. If the card itself is down, the **show cable modem** commands still show whatever information is appropriate (such as offline cable modems and flap list information).

The **show cable modem** commands function slightly different when used on routers that are using Broadband Processing Engine (BPE) cable interface line cards (such as the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, or Cisco uBR10-MC5X20S/U/H). When BPE cards are the only cable interface cards installed, the **show cable modem** commands do not display any output until at least one BPE card is up and communicating with the router processor. If the BPE cards are not yet up, the **show cable modem** command does not display any output.



Note The **hccp** commands are not supported on the Cisco cBR router for Cisco IOS-XE 3.15.0S.

Example of the show cable modem Command Output for all cable modems

The following sample output from the **show cable modem** command shows the default cable modem displays for individual cable modems.

```
Router# show cable modem

MAC Address    IP Address      I/F     MAC         Prim RxPwr Timing Num  BPI
                                       State       Sid  (db)  Offset CPEs Enbld
0010.7b6b.58c1 0.0.0.0         C4/0/U5 offline     5   -0.25  2285   0    yes
0010.7bed.9dc9 0.0.0.0         C4/0/U5 offline     6   -0.75  2290   0    yes
0010.7bed.9dbb 0.0.0.0         C4/0/U5 offline     7    0.50  2289   0    yes
0010.7b6b.58bb 0.0.0.0         C4/0/U5 offline     8    0.00  2290   0    yes
0010.7bb3.fcd1 10.20.113.2     C5/0/U5 online      1    0.00  1624   0    yes
0010.7bb3.fcdd 0.0.0.0         C5/0/U5 init(r1)    2   -20.00 1624   0    no
0010.7b43.aa7f 0.0.0.0         C5/0/U5 init(r2)    3    7.25  1623   0    no
```

Example of the show cable modem Command for a Specified MAC Address

```
Router# show cable modem 0010.7bb3.fcd1

MAC Address    IP Address      I/F     MAC         Prim RxPwr Timing Num  BPI
                                       State       Sid  (db)  Offset CPEs Enbld
0010.7bb3.fcd1 10.20.113.2     C5/0/U5 online      1    0.00  1624   0    Y
```

Example of the show cable modem Command for all cable modems on a Cisco uBR10012 Router

The following shows a typical display for a Cisco uBR10012 router:

Note The asterisk(*) in the Primary SID (Prim Sid) field indicates that the modem has service flows with zero blaze index in Cisco IOS Release 12.3(23)BC. In Cisco IOS Release 12.2(33)SCB and later, the asterisk that may appear in the Primary SID field does not signify anything.

```
Router# show cable modem
MAC Address    IP Address      I/F       MAC         Prim RxPwr  Timing  Num BPI
                                         State       Sid  (db)   Offset  CPE Enb
0010.9507.01db 144.205.151.130 C5/1/0/U5 online(pt)  1     0.25    938   1    N
0080.37b8.e99b 144.205.151.131 C5/1/0/U5 online      2    -0.25   1268   0    N
0002.fdfa.12ef 144.205.151.232 C6/1/0/U0 online(pt)  13   -0.25   1920   1    N
0002.fdfa.137d 144.205.151.160 C6/1/0/U0 online      *16   -0.50   1920   1    N
0003.e38f.e9ab 144.205.151.237 C6/1/0/U0 online      3    -0.50   1926   1    N
0003.e3a6.8173 144.205.151.179 C6/1/1/U2 offline     *4    0.50    1929   0    N
0003.e3a6.8195 144.205.151.219 C6/1/1/U2 online(pt)  22   -0.50   1929   1    N
0006.28dc.37fd 144.205.151.244 C6/1/1/U2 online(pt)  61    0.00    1925   2    N
0006.28e9.81c9 144.205.151.138 C6/1/1/U2 online(pt)  2    !0.75    1925   1    N
0006.28f9.8bbd 144.205.151.134 C6/1/1/U2 #online     25   -0.25   1924   1    N
0006.28f9.9d19 144.205.151.144 C6/1/1/U2 online(pt)  28    0.25    1924   1    N
0010.7bed.9b6d 144.205.151.228 C6/1/1/U2 online(pt)  59    0.25    1554   1    N
0002.fdfa.12db 144.205.151.234 C7/0/0/U0 online      15   -0.75   1914   1    N
0002.fdfa.138d 144.205.151.140 C7/0/0/U5 online      4     0.00    1917   1    N
0003.e38f.e85b 144.205.151.214 C7/0/0/U5 online      17   *0.25    1919   1    N
0003.e38f.f4cb 144.205.151.238 C7/0/0/U5 online(pt)  16    0.00   !2750   1    N
0003.e3a6.7fd9 144.205.151.151 C7/0/0/U5 online      1     0.25    1922   0    N
0020.4005.3f06 144.205.151.145 C7/0/0/U0 online(pt)  2     0.00    1901   1    N
0020.4006.b010 144.205.151.164 C7/0/0/U5 online(pt)  3     0.00    1901   1    N
0050.7302.3d83 144.205.151.240 C7/0/0/U0 online(pt)  18   -0.25   1543   1    N
00b0.6478.ae8d 144.205.151.254 C7/0/0/U5 online(pt)  44    0.25    1920   21   N
00d0.bad3.c0cd 144.205.151.149 C7/0/0/U5 online      19    0.25    1543   1    N
00d0.bad3.c0cf 144.205.151.194 C7/0/0/U0 online      13    0.00    1546   1    N
00d0.bad3.c0d5 144.205.151.133 C7/0/0/U0 online      12   *0.50    1546   1    N
```

Example of show cable modem Command When no cable modems are Online

The following example shows sample output when the cable interface line cards are up, but no cable modems are yet online:

```
Router# show cable modem
```

```
MAC Address    IP Address      I/F       MAC         Prim RxPwr  Timing  Num BPI
                                         State       Sid  (db)   Offset  CPE Enb
```

Example of show cable modem Command When no Cable Interface Line Cards are Up

The following example shows sample output when the Cisco CMTS router contains only Broadband Processing Engine (BPE) cable interface line cards and none of the cable interface line cards are up:

```
Router# show cable modem
```

Example of the show cable modem Command for all cable modems on a Cisco cBR Series Converged Broadband Router

The following shows a typical display on a Cisco cBR Series Converged Broadband Router:

```
Router#show cable modem
                                                                                 D
MAC Address    IP Address      I/F           MAC             Prim  RxPwr  Timing Num I
                                             State           Sid   (dBmv) Offset CPE P
0025.2eaf.82f4 100.1.2.9       C1/0/0/U1     online          37    -1.00  1802   0   Y
0025.2eaf.82e4 100.1.2.8       C1/0/0/U0     online          38    -1.50  1803   0   Y
0025.2eaf.8302 100.1.2.6       C1/0/0/U1     online          39    -1.00  1817   0   Y
0025.2e2d.74f8 100.1.2.110     C1/0/0/U0     online          40    -1.50  1806   0   Y
0025.2e2d.75be 100.1.2.4       C1/0/0/U0     online          41    -1.00  1806   0   Y
0025.2eaf.7f38 100.1.2.7       C1/0/0/U1     online          42    -1.00  1808   1   Y
c8fb.26a5.5580 100.1.3.28      C1/0/1/U0     online          1     -1.00  1804   0   Y
c8fb.26a5.5814 100.1.3.3       C1/0/1/U0     online          2     -1.00  1803   0   Y
c8fb.26a5.5792 100.1.3.39      C1/0/1/U3     online          3     -1.00  1806   0   Y
c8fb.26a5.5574 100.1.3.40      C1/0/1/U3     online          4     -1.00  1808   0   Y
c8fb.26a5.5936 100.1.3.35      C1/0/1/U3     online          5     -2.00  1806   0   Y
c8fb.26a5.54e0 100.1.3.32      C1/0/1/U0     online          6     -1.00  1808   0   Y
c8fb.26a5.56b6 100.1.3.31      C1/0/1/U0     online          7     -1.00  1804   0   Y
c8fb.26a5.5810 100.1.3.2       C1/0/1/U3     online          8     -1.00  1802   0   Y
c8fb.26a5.52f2 100.1.3.34      C1/0/1/U2     online          9     -1.00  1804   0   Y
c8fb.26a5.57a6 100.1.3.4       C1/0/1/U3     online          10    -1.00  1808   0   Y
c8fb.26a5.56ca 100.1.3.29      C1/0/1/U0     online          11    -1.00  1808   0   Y
c8fb.26a5.5400 100.1.3.36      C1/0/1/U3     online          12    -1.00  1805   0   Y
c8fb.26a5.57f4 100.1.3.33      C1/0/1/U3     online          13    -1.00  1809   0   Y
c8fb.26a5.55ac 100.1.3.38      C1/0/1/U2     online          14    -1.50  1802   0   Y
c8fb.26a5.5866 100.1.3.30      C1/0/1/U3     online          15    -1.00  1804   0   Y
c8fb.26a5.572e 100.1.3.37      C1/0/1/U2     online          16    -1.00  1802   0   Y
c8fb.26a5.5376 100.1.2.37      C1/0/3/U0     online          79    -1.00  1806   0   Y
c8fb.26a5.5428 100.1.2.25      C1/0/3/U3     online          80    -1.00  1809   0   Y
c8fb.26a5.52c8 100.1.2.35      C1/0/3/U2     online          81    -1.00  1809   0   Y
c8fb.26a5.5346 100.1.2.34      C1/0/3/U0     online          82    -1.00  1806   0   Y
c8fb.26a5.5598 100.1.2.27      C1/0/3/U0     online          83    -1.00  1808   0   Y
c8fb.26a5.560a 100.1.2.23      C1/0/3/U0     online          84    -1.00  1809   0   Y
c8fb.26a5.56d8 100.1.2.31      C1/0/3/U0     online          85    -1.00  1808   0   Y
c8fb.26a5.5474 100.1.2.42      C1/0/3/U3     online          86    -1.00  1809   0   Y
c8fb.26a5.54e4 100.1.2.39      C1/0/3/U0     online          87    -1.00  1811   0   Y
c8fb.26a5.5624 100.1.2.38      C1/0/3/U1     online          88    -1.00  1811   0   Y
c8fb.26a5.52fe 100.1.2.28      C1/0/3/U2     online          89    -1.00  1805   0   Y
c8fb.26a5.5384 100.1.2.24      C1/0/3/U0     online          90    -1.00  1807   0   Y
c8fb.26a5.5742 100.1.2.33      C1/0/3/U1     online          91    -1.00  1808   0   Y
c8fb.26a5.52ca 100.1.2.26      C1/0/3/U0     online          92    -1.00  1805   0   Y
c8fb.26a5.56b2 100.1.2.41      C1/0/3/U0     online          93    -1.00  1809   0   Y
```

```
c8fb.26a5.53f6 100.1.2.36      C1/0/3/U1     online            94    -1.00  1806   0    Y
```

Example of show cable modem verbose Command for a Specified MAC Address

The following example shows sample output for the **verbose** option for a particular CM:

```
Router# show cable modem 0010.7bb3.fcd1 verbose

MAC Address                     : 00C0.7bb3.fcd1
IP Address                      : 10.20.113.2
Prim Sid                        : 1
QoS Profile Index               : 6
Interface                       : C5/0/U5
sysDescr                        : Vendor ABC DOCSIS 2.0 Cable Modem
Upstream Power                  : 0 dBmV (SNR = 33.25 dBmV)
Downstream Power                : 0 dBmV (SNR = ----- dBmV)
Timing Offset                   : 1624
Initial Timing Offset           : 2812
Received Power                  : 0.25
MAC Version                     : DOC1.0
Qos Provisioned Mode            : DOC1.0
Enable DOCSIS2.0 Mode           : Y
Phy Operating Mode              : atdma
Capabilities                    : {Frag=N, Concat=N, PHS=N, Priv=BPI}
Sid/Said Limit                  : {Max Us Sids=0, Max Ds Saids=0}
Optional Filtering Support      : {802.1P=N, 802.1Q=N}
Transmit Equalizer Support      : {Taps/Symbol= 0, Num of Taps= 0}
Number of CPE IPs               : 0(Max CPEs = 1)
CFG Max-CPE                     : 1
Flaps                           : 373(Jun 1  13:11:01)
Errors                          : 0 CRCs, 0 HCSes
Stn Mtn Failures                : 0 aborts, 3 exhausted
Total US Flows                  : 1(1 active)
Total DS Flows                  : 1(1 active)
Total US Data                   : 1452082 packets, 171344434 bytes
Total US Throughput             : 0 bits/sec, 0 packets/sec
Total DS Data                   : 1452073 packets, 171343858 bytes
Total DS Throughput             : 0 bits/sec, 0 packets/sec
Active Classifiers              : 0 (Max = NO LIMIT)
DSA/DSX messages                : reject all
Dynamic Secret                  : A3D1028F36EBD54FDCC2F74719664D3F
Total Time Online               : 16:16
```

Note When a DCC occurs, the cable modem US and DS counters are reset. The US and DS counters include counters such as data and throughput seen in the **show cable modem** (**mac-address**) **verbose** command output and packets and bytes seen in the **show cable modem (mac-address) counters** command output.

Note The “Number of CPES” field shows the value set for the CM, not the value for the CMTS that is set by the **cable modem max-cpe** command. In Cisco IOS Release 12.2(15)BC1 and later releases, the **verbose** display also includes information about the dynamic shared-secret feature (see the **cable dynamic-secret** command).

Note An asterisk (*) in the Receive Power column indicates that a power adjustment has been made for that CM. An exclamation point (!) in the Receive Power column indicates that the cable modem has reached its maximum power transmit level and cannot increase its power level further. An exclamation point (!) in the Timing Offset column indicates that the cable modem has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. A pound sign (#) in the MAC State column indicates that the **cable tftp-enforce mark-only** command has been used for the cable modem to attempt a TFTP download of the DOCSIS configuration file before registering, but the cable modem did not do so (Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases).

Tip The **show cable modem** command displays the cable modem timing offset in DOCSIS ticks, while other commands, such as **cable map-advance**, display the offset in microseconds. Use the following method to convert microseconds to DOCSIS ticks: ticks = microseconds*64/6.25 .

Example of the Updated show cable modem verbose Command for a Specified MAC Address in Cisco IOS Release 12.3(23)BC

The following example shows sample output for the **verbose** option for a particular cable modem for the Cisco IOS Release 12.3(23)BC with new output fields:

```
Router# show cable modem 0000.39b9.ac51 verbose
MAC Address                          : 0000.39b9.ac51
IP Address                           : 55.1.176.11
Prim Sid                             : 7
QoS Profile Index                    : 5
Host Interface                       : C8/0/0/U5
Primary Downstream                   : Mo3/0/1:3 (RfId : 27)
Wideband Capable                     : N
sysDescr                             : Toshiba PacketCable 1.0 EMTA ; <<HW_REV: 13.0.0;
VENDOR: Toshiba Corporation; BOOTR: 2.2; SW_REV: 6.1.318; MODEL: PCX3000>>
Upstream Power                       : 29.00 dBmV (SNR = 16.07 dB)
Downstream Power                     : 14.90 dBmV (SNR = 34.30 dB)
Timing Offset                        : 1774
Initial Timing Offset                : 1774
Curr US Timing Adjust                : 272
Prev US Timing Adjust                : 0
Received Power                       :  0.00 dBmV
MAC Version                          : DOC1.1
QoS Provisioned Mode                 : DOC1.0
Enable DOCSIS2.0 Mode                : Y
Phy Operating Mode                   : tdma
Capabilities                         : {Frag=N, Concat=Y, PHS=N, Priv=}
Sid/Said Limit                       : {Max US Sids=0, Max DS Saids=0}
Optional Filtering Support           : {802.1P=N, 802.1Q=N}
Transmit Equalizer Support           : {Taps/Symbol= 0, Num of Taps= 0}
Number of CPE IPs                    : 0(Max CPE IPs = 17)
CFG Max-CPE                          : 3
Flaps                                : 7(Sep 16 20:04:13)
Errors                               : 0 CRCs, 0 HCSes
Stn Mtn Failures                     : 0 aborts, 0 exhausted
Total US Flows                       : 1(1 active)
```

```
Total DS Flows                      : 1(1 active)
Total US Data                       : 3399 packets, 1956063 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 125 packets, 10704 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
Active Classifiers                  : 0 (Max = NO LIMIT)
CM Upstream Filter Group            : 10
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
DS Change Times                     : 0
Total Time Online                   : 7d22h
```

Note In Cisco IOS Release 12.3(23)BC, the output for this command does not display information about dynamic shared secret.

Example of show cable modem Command for a cable modem or CPE With a Specified IPv6 Address

The following example shows sample output for the **show cable modem** command for a cable modem with the IPv6 address of 2001:ODBA:4321:600:980D:E743:174F:1E48.

Note The IP Address field shows "---" because the IPv6 address is too long for the size of the output field. To view a complete IPv6 address for a device, use the **verbose** form of the command.

```
Router# show cable modem 2001:ODBA:4321:600:980D:E743:174F:1E48
                                                                    B D
MAC Address    IP Address      I/F       MAC         Prim  RxPwr  Timing Num P I
                                         State       Sid   (dBmv) Offset CPE I P
0019.474a.ccd0 ---            C5/0/1/U0 w-online     38    0.00  1580    0   N
```

Example of the show cable modem verbose Command Output That Shows cable modem Attribute Masks in Cisco IOS Release 12.2(33)SCC

The following example shows the sample output for the **verbose** option for a particular cable modem in Cisco IOS Release 12.2(33)SCC:

```
Router# show cable modem 001a.c3ff.ce9e verbose
MAC Address                     : 0019.474a.d396
IP Address                      : 10.10.2.4
IPv6 Address                    : ---
Dual IP                         : N
Prim Sid                        : 1
Host Interface                  : C5/0/0/U2
MD-DS-SG / MD-US-SG             : 1 / N/A
MD-CM-SG                        : 0x100
Primary Downstream              : C5/0/0 (RfId : 240)
Wideband Capable                : Y
RCP Index                       : 2
RCP ID                          : 00 10 18 33 81
Multi-Transmit Channel Mode     : N
Upstream Channel                : US2
Ranging Status                  : sta
```

```
Upstream Power (dBmV)              : 0.00
Upstream SNR (dB)                  : 36.12
Received Power (dBmV)              : 0.00
Timing Offset             (97.6 ns): 1018
Initial Timing Offset              : 1018
Rng Timing Adj Moving Avg(0.381 ns): 0
Rng Timing Adj Lt Moving Avg       : 0
Rng Timing Adj Minimum             : 0
Rng Timing Adj Maximum             : 0
Pre-EQ Good                        : 0
Pre-EQ Scaled                      : 0
Pre-EQ Impulse                     : 0
Pre-EQ Direct Loads                : 0
Good Codewords rx                  : 457865
Corrected Codewords rx             : 0
Uncorrectable Codewords rx         : 0
Phy Operating Mode                 : tdma
sysDescr                           :
Downstream Power                   : 0.00 dBmV (SNR = ----- dB)
MAC Version                        : DOC2.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= online(pt), Security=assign(tek)}
Capabilities                       : {Frag=Y, Concat=Y, PHS=Y}
Security Capabilities              : {Priv=BPI+, EAE=N, Key_len=56}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
Sid/Said Limit                     : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                  : 0(Max CPE IPs = 16)
CFG Max-CPE                        : 1
Flaps                              : 0()
Errors                             : 0 CRCs, 0 HCSes
Stn Mtn Failures                   : 0 aborts, 0 exhausted
Total US Flows                     : 1(1 active)
Total DS Flows                     : 1(1 active)
Total US Data                      : 12937 packets, 1079852 bytes
Total US Throughput                : 0 bits/sec, 0 packets/sec
Total DS Data                      : 6226 packets, 459372 bytes
Total DS Throughput                : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)       : N/A (N/A)
LB group ID in config file (index) : N/A (N/A)
LB policy ID                       : 0
LB policy ID in config file        : 0
LB priority                        : 0
Tag                                :
Required DS Attribute Mask         : 0x0
Forbidden DS Attribute Mask        : 0x0
Required US Attribute Mask         : 0x0
Forbidden US Attribute Mask        : 0x0
Service Type ID                    :
Service Type ID in config file     :
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
DS Change Times                    : 0
Boolean Services                   : 2
Number of Multicast DSIDs Support  : 16
MDF Capability Mode                : 0
IGMP/MLD Version                   : IGMPv2
```

```
FCType10 Forwarding Support        : N
Features Bitmask                   : 0x0
Total Time Online                  : 7d4h18m
CFG Max IPv6 CPE Prefix             : 1024 (-1 used)
```

Example of the show cable modem Command Output for a Cable Modem Operating in the MTC Mode

The following example shows the sample output for the **verbose** option for a particular cable modem operating in the MTC mode in Cisco IOS Release 12.2(33)SCC:

Router# **show cable modem 0014.f831.d596 verbose**

```
MAC Address                        : 001e.6bfa.f02e
IP Address                         : 30.10.0.6
IPv6 Address                       : ---
Dual IP                            : N
Prim Sid                           : 5
Host Interface                     : C5/1/0/UB
MD-DS-SG / MD-US-SG                : 1 / 1
MD-CM-SG                           : 0xF0101
Primary Wideband Channel ID        : 48
Primary Downstream                 : Mo3/0/0:0 (RfId : 120)
Wideband Capable                   : Y
RCP Index                          : 3
RCP ID                             : 00 10 00 00 04
Multi-Transmit Channel Mode        : Y
Upstream Channel                   : US1        US2        US3        US4
Ranging Status                     : sta        sta        sta        sta
Upstream Power (dBmV)              : 0.00       0.00       0.00       0.00
Upstream SNR (dB)                  : 36.12      36.12      36.12      33.1
Received Power (dBmV)              : 0.00       1.00       0.00       -0.75
Reported Transmit Power (dBmV)     : 45.00      45.00      45.00      54.75
Peak Transmit Power (dBmV)         : 51.00      51.00      56.00      56.00
Minimum Transmit Power (dBmV)      : 24.00      24.00      21.00      18.00
Timing Offset             (97.6 ns): 2312       2281       2282       2282
Initial Timing Offset              : 2314       2058       2058       2058
Rng Timing Adj Moving Avg(0.381 ns): 7          4          0          -94
Rng Timing Adj Lt Moving Avg       : 63         30         11         -144
Rng Timing Adj Minimum             : -512       -256       -256       -512
Rng Timing Adj Maximum             : 256        57088      57344      57344
Pre-EQ Good                        : 0          0          0          0
Pre-EQ Scaled                      : 0          0          0          0
Pre-EQ Impulse                     : 0          0          0          0
Pre-EQ Direct Loads                : 0          0          0          0
Good Codewords rx                  : 5012       4996       4992       4990
Corrected Codewords rx             : 0          0          0          0
Uncorrectable Codewords rx         : 0          0          0          0
Phy Operating Mode                 : atdma*     atdma*     tdma*      tdma*
sysDescr                           :
Downstream Power                   : 0.00 dBmV (SNR = ----- dB)
MAC Version                        : DOC3.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= w-online, Security=disabled}
Capabilities                       : {Frag=N, Concat=N, PHS=Y}
Security Capabilities              : {Priv=, EAE=Y, Key_len=}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
Sid/Said Limit                     : {Max US Sids=8, Max DS Saids=24}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                  : 0(Max CPE IPs = 16)
```

```
CFG Max-CPE                          : 4
Flaps                                : 0()
Errors                               : 0 CRCs, 0 HCSes
Stn Mtn Failures                     : 0 aborts, 0 exhausted
Total US Flows                       : 2(2 active)
Total DS Flows                       : 1(1 active)
Total US Data                        : 6 packets, 1557 bytes
Total US Throughput                  : 0 bits/sec, 0 packets/sec
Total DS Data                        : 0 packets, 0 bytes
Total DS Throughput                  : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)         : N/A (N/A)
LB group ID in config file (index) : N/A (N/A)
LB policy ID                         : 0
LB policy ID in config file          : 0
LB priority                          : 0
Tag                                  :
Required DS Attribute Mask           : 0x0
Forbidden DS Attribute Mask          : 0x0
Required US Attribute Mask           : 0x0
Forbidden US Attribute Mask          : 0x0
Service Type ID                      :
Service Type ID in config file       :
Active Classifiers                   : 0 (Max = NO LIMIT)
CM Upstream Filter Group             : 0
CM Downstream Filter Group           : 0
CPE Upstream Filter Group            : 0
CPE Downstream Filter Group          : 0
DSA/DSX messages                     : permit all
Voice Enabled                        : NO
DS Change Times                      : 0
Boolean Services                     : 2
Number of Multicast DSIDs Support  : 24
MDF Capability Mode                  : 2
IGMP/MLD Version                     : IGMPv3
FCType10 Forwarding Support          : Y
Features Bitmask                     : 0x0
Total Time Online                    : 1d16h
CM Initialization Reason             : NO_PRIM_SF_USCHAN
CFG Max IPv6 CPE Prefix               : 16 (-1 used)
```

Note An asterisk (*) in the Phy Operating Mode row indicates the type of PHY-layer modulation that the cable modem (operating in the MTC mode) is using: tdma or atdma.

Example of the show cable modem verbose Command Output in Cisco IOS Release 12.2(33)SCE4

The following example shows the sample output for the **verbose** option for a particular cable modem in Cisco IOS Release 12.2(33)SCE4:

```
Router# show cable modem 001a.c3ff.ce9e verbose
MAC Address                          : 0014.e84f.1630
IP Address                           : 50.6.9.4
IPv6 Address                         : ---
Dual IP                              : N
Prim Sid                             : 1
Host Interface                       : C6/1/0/U0
MD-DS-SG / MD-US-SG                  : N/A / N/A
MD-CM-SG                             : 0x2D0000
Primary Downstream                   : C6/1/0 (RfId : 600)
```

```
Wideband Capable                    : N
RCP Index                           : 0
RCP ID                              : 00 00 00 00 00
Downstream Channel DCID RF Channel : 73    6/1/0
Multi-Transmit Channel Mode         : N
Upstream Channel                    : US0
Ranging Status                      : sta
Upstream Power (dBmV)               : 0.00
Upstream SNR (dB)                   : 31.26
Received Power (dBmV)               : 0.50
Timing Offset             (97.6 ns): 1237
Initial Timing Offset               : 1237
Rng Timing Adj Moving Avg(0.381 ns): 503
Rng Timing Adj Lt Moving Avg        : 402
Rng Timing Adj Minimum              : 0
Rng Timing Adj Maximum              : 1024
Pre-EQ Good                         : 0
Pre-EQ Scaled                       : 0
Pre-EQ Impulse                      : 0
Pre-EQ Direct Loads                 : 0
Good Codewords rx                   : 429
Corrected Codewords rx              : 0
Uncorrectable Codewords rx          : 0
Phy Operating Mode                  : tdma
sysDescr                            :
Downstream Power                    : 0.00 dBmV (SNR = ----- dB)
MAC Version                         : DOC2.0
QoS Provisioned Mode                : DOC1.1
Enable DOCSIS2.0 Mode               : Y
Modem Status                        : {Modem= online, Security=disabled}
Capabilities                        : {Frag=Y, Concat=Y, PHS=Y}
Security Capabilities               : {Priv=, EAE=N, Key_len=}
L2VPN Capabilities                  : {L2VPN=N, eSAFE=N}
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                   : 0(Max CPE IPs = 16)
CFG Max-CPE                         : 1
Flaps                               : 0()
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 0 exhausted
Total US Flows                      : 2(2 active)
Total DS Flows                      : 2(2 active)
Total US Data                       : 20 packets, 6786 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 11255 packets, 720320 bytes
Total DS Throughput                 : 5119 bits/sec, 9 packets/sec
LB group ID assigned (index)        : N/A (N/A)
LB group ID in config file (index)  : N/A (N/A)
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 :
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
Service Type ID                     :
Service Type ID in config file      :
Active Classifiers                  : 0 (Max = NO LIMIT)
CM Upstream Filter Group            : 30
CM Downstream Filter Group          : 29
CPE Upstream Filter Group           : 1
CPE Downstream Filter Group         : 1
```

```
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 0
Number of Multicast DSIDs Support   : 0
MDF Capability Mode                 : 0
IGMP/MLD Version                    : IGMPv2
FCType10 Forwarding Support         : N
Features Bitmask                    : 0x0
Total Time Online                   : 18:53   (18:53    since last counter reset)
!From Cisco IOS Release 12.2(33)SCE4 onwards, the command output shows online time of the
!modem since the last counter reset.
CFG Max IPv6 CPE Prefix             : 16 (-1 used)
```

Example of the show cable modem verbose Command in Cisco IOS Release 12.2(33)SCF

The following is a sample output of the **show cable modem verbose** command in Cisco IOS Release 12.2(33)SCF:

```
Router# show cable modem 10.1.0.2 verbose
MAC Address                         : 001e.6bfb.0a60
IP Address                          : 10.1.0.2
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 43
Host Interface                      : C7/0/0/UB
MD-DS-SG / MD-US-SG                 : 1 / 1
MD-CM-SG                            : 0x3C0101
Primary Wideband Channel ID         : 897 (Wi7/0/0:0)
Primary Downstream                  : In7/0/0:0 (RfId : 720)
Wideband Capable                    : Y
RCP Index                           : 3
RCP ID                              : 00 10 00 00 04
Multi-Transmit Channel Mode         : Y
Upstream Channel                    : US0        US1        US2
Ranging Status                      : sta        sta        sta
Upstream SNR (dB)                   : 33.1       33.1       33.1
Upstream Data SNR (dB)              : 22.78      22.78      22.78
Received Power (dBmV)               : 0.50       0.00       0.00
Reported Transmit Power (dBmV)      : 51.00      51.00      51.00
Peak Transmit Power (dBmV)          : 51.00      51.00      51.00
Minimum Transmit Power (dBmV)       : 24.00      24.00      24.00
Timing Offset              (97.6 ns): 1302       1303       1303
```

The following example is a sample output of the show cable modem verbose command that displays the downstream channel information for a specific cable modem identified by its IP address:

```
Router# show cable modem 80.62.0.4 verbose
MAC Address                         : 0018.6832.0eb2
IP Address                          : 80.62.0.4
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 13
Host Interface                      : C6/1/0/U0
MD-DS-SG / MD-US-SG                 : 3 / N/A
MD-CM-SG                            : 0x2D0300
Primary Downstream                  : In6/1/0:0 (RfId : 600)
Wideband Capable                    : N
RCP Index                           : 0
RCP ID                              : 00 00 00 00 00
```

```
Downstream Channel DCID RF Channel : 193   6/1/0:0
Multi-Transmit Channel Mode        : N
Upstream Channel                   : US0
Ranging Status                     : sta
Upstream Power (dBmV)              : 0.00
Upstream SNR (dB)                  : 36.12
Upstream Data SNR (dB)             : --
Received Power (dBmV)              : 0.00
Timing Offset             (97.6 ns): 1192
Initial Timing Offset              : 1192
Rng Timing Adj Moving Avg(0.381 ns): -1
Rng Timing Adj Lt Moving Avg       : -7
Rng Timing Adj Minimum             : -256
Rng Timing Adj Maximum             : 0
Pre-EQ Good                        : 0
Pre-EQ Scaled                      : 0
Pre-EQ Impulse                     : 0
Pre-EQ Direct Loads                : 0
Good Codewords rx                  : 42
Corrected Codewords rx             : 0
Uncorrectable Codewords rx         : 0
Phy Operating Mode                 : tdma
sysDescr                           :
Downstream Power                   : 0.00 dBmV (SNR = ----- dB)
MAC Version                        : DOC2.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= online, Security=disabled}
Flaps                              : 0()
Errors                             : 0 CRCs, 0 HCSes
Capabilities                       : {Frag=Y, Concat=Y, PHS=Y}
Security Capabilities              : {Priv=, EAE=N, Key_len=}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
Sid/Said Limit                     : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                  : 0(Max CPE IPs = 16)
CFG Max-CPE                        : 1
Stn Mtn Failures                   : 0 aborts, 0 exhausted
Total US Flows                     : 2(2 active)
Total DS Flows                     : 2(2 active)
Total US Data                      : 9 packets, 4545 bytes
Total US Throughput                : 0 bits/sec, 0 packets/sec
Total DS Data                      : 9 packets, 3114 bytes
Total DS Throughput                : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)       : N/A (N/A)
LB group ID in config file (index) : N/A (N/A)
LB policy ID                       : 0
LB policy ID in config file        : 0
LB priority                        : 0
Tag                                :
Required DS Attribute Mask         : 0x0
Forbidden DS Attribute Mask        : 0x0
Required US Attribute Mask         : 0x0
Forbidden US Attribute Mask        : 0x0
Service Type ID                    :
Service Type ID in config file     :
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
```

```
DS Change Times                     : 0
Boolean Services                    : 0
Number of Multicast DSIDs Support   : 0
MDF Capability Mode                 : 0
IGMP/MLD Version                    : IGMPv2
FCType10 Forwarding Support         : N
Features Bitmask                    : 0x0
Total Time Online                   : 4d14h
CFG Max IPv6 CPE Prefix             : 16 (-1 used)
```

The following example is a sample output of the show cable modem verbose command that displays the downstream channel information for a specific cable interface:

```
Router# show cable modem Cable 6/1/0 verbose
MAC Address                         : 0018.6832.0eb2
IP Address                          : 80.62.0.4
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 13
Host Interface                      : C6/1/0/U0
MD-DS-SG / MD-US-SG                 : 3 / N/A
MD-CM-SG                            : 0x2D0300
Primary Downstream                  : In6/1/0:0 (RfId : 600)
Wideband Capable                    : N
RCP Index                           : 0
RCP ID                              : 00 00 00 00 00
Downstream Channel DCID RF Channel : 193   6/1/0:0
Multi-Transmit Channel Mode         : N
Upstream Channel                    : US0
Ranging Status                      : sta
Upstream Power (dBmV)               : 0.00
Upstream SNR (dB)                   : 36.12
Upstream Data SNR (dB)              : --
Received Power (dBmV)               : 0.00
Timing Offset              (97.6 ns): 1192
Initial Timing Offset               : 1192
Rng Timing Adj Moving Avg(0.381 ns): 0
Rng Timing Adj Lt Moving Avg        : 0
Rng Timing Adj Minimum              : 0
Rng Timing Adj Maximum              : 256
Pre-EQ Good                         : 0
Pre-EQ Scaled                       : 0
Pre-EQ Impulse                      : 0
Pre-EQ Direct Loads                 : 0
Good Codewords rx                   : 66
Corrected Codewords rx              : 0
Uncorrectable Codewords rx          : 0
Phy Operating Mode                  : tdma
sysDescr                            :
Downstream Power                    : 0.00 dBmV (SNR = ----- dB)
MAC Version                         : DOC2.0
QoS Provisioned Mode                : DOC1.1
Enable DOCSIS2.0 Mode               : Y
Modem Status                        : {Modem= online, Security=disabled}
Capabilities                        : {Frag=Y, Concat=Y, PHS=Y}
Security Capabilities               : {Priv=, EAE=N, Key_len=}
L2VPN Capabilities                  : {L2VPN=N, eSAFE=N}
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                   : 0(Max CPE IPs = 16)
CFG Max-CPE                         : 1
Flaps                               : 1(Mar 22 22:39:59)
```

```
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 1 exhausted
Total US Flows                      : 2(2 active)
Total DS Flows                      : 2(2 active)
Total US Data                       : 2 packets, 1010 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 2 packets, 692 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)        : N/A (N/A)
LB group ID in config file (index)  : N/A (N/A)
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 :
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
Service Type ID                     :
Service Type ID in config file      :
Active Classifiers                  : 0 (Max = NO LIMIT)
CM Upstream Filter Group            : 0
CM Downstream Filter Group          : 0
CPE Upstream Filter Group           : 0
CPE Downstream Filter Group         : 0
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 0
Number of Multicast DSIDs Support   : 0
MDF Capability Mode                 : 0
IGMP/MLD Version                    : IGMPv2
FCType10 Forwarding Support         : N
Features Bitmask                    : 0x0
Total Time Online                   : 1d2h33m
CFG Max IPv6 CPE Prefix             : 16 (-1 used)
MAC Address                         : 0018.6832.069e
IP Address                          : 80.62.0.3
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 15
Host Interface                      : C6/1/0/U0
MD-DS-SG / MD-US-SG                 : 3 / N/A
MD-CM-SG                            : 0x2D0300
Primary Downstream                  : In6/1/0:0 (RfId : 600)
Wideband Capable                    : N
RCP Index                           : 0
RCP ID                              : 00 00 00 00 00
Downstream Channel DCID RF Channel  : 193   6/1/0:0
Multi-Transmit Channel Mode         : N
Upstream Channel                    : US0
Ranging Status                      : sta
Upstream Power (dBmV)               : 0.00
Upstream SNR (dB)                   : 36.12
Upstream Data SNR (dB)              : --
Received Power (dBmV)               : 0.50
Timing Offset             (97.6 ns): 1196
Initial Timing Offset               : 1196
Rng Timing Adj Moving Avg(0.381 ns): -39
Rng Timing Adj Lt Moving Avg        : -92
Rng Timing Adj Minimum              : -256
Rng Timing Adj Maximum              : 0
Pre-EQ Good                         : 0
Pre-EQ Scaled                       : 0
```

```
Pre-EQ Impulse                     : 0
Pre-EQ Direct Loads                : 0
Good Codewords rx                  : 54
Corrected Codewords rx             : 0
Uncorrectable Codewords rx         : 0
Phy Operating Mode                 : tdma
sysDescr                           :
Downstream Power                   : 0.00 dBmV (SNR = ----- dB)
MAC Version                        : DOC2.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= online, Security=disabled}
Capabilities                       : {Frag=Y, Concat=Y, PHS=Y}
Security Capabilities              : {Priv=, EAE=N, Key_len=}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
Sid/Said Limit                     : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                  : 0(Max CPE IPs = 16)
CFG Max-CPE                        : 1
Flaps                              : 3(Mar 20 09:22:20)
Errors                             : 0 CRCs, 0 HCSes
Stn Mtn Failures                   : 0 aborts, 1 exhausted
Total US Flows                     : 2(2 active)
Total DS Flows                     : 2(2 active)
Total US Data                      : 13 packets, 6565 bytes
Total US Throughput                : 0 bits/sec, 0 packets/sec
Total DS Data                      : 13 packets, 4498 bytes
Total DS Throughput                : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)       : N/A (N/A)
LB group ID in config file (index) : N/A (N/A)
LB policy ID                       : 0
LB policy ID in config file        : 0
LB priority                        : 0
Tag                                :
Required DS Attribute Mask         : 0x0
Forbidden DS Attribute Mask        : 0x0
Required US Attribute Mask         : 0x0
Forbidden US Attribute Mask        : 0x0
Service Type ID                    :
Service Type ID in config file     :
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
DS Change Times                    : 0
Boolean Services                   : 0
Number of Multicast DSIDs Support  : 0
MDF Capability Mode                : 0
IGMP/MLD Version                   : IGMPv2
FCType10 Forwarding Support        : N
Features Bitmask                   : 0x0
Total Time Online                  : 6d12h
CFG Max IPv6 CPE Prefix            : 16 (-1 used)
```

The following example is a sample output of the show cable modem verbose command that displays the downstream channel information for all cable modems:

```
Router# show cable modem verbose
MAC Address                        : 0006.2854.740b
```

```
IP Address                          : 0.0.0.0
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 12
QoS Profile Index                   : 2
Host Interface                      : C6/1/0/U0
MD-DS-SG / MD-US-SG                 : 3 / N/A
MD-CM-SG                            : 0x2D0300
Primary Downstream                  : In6/1/0:0 (RfId : 600)
Wideband Capable                    : N
RCP Index                           : 0
RCP ID                              : 00 00 00 00 00
Downstream Channel DCID RF Channel : 193   6/1/0:0
Multi-Transmit Channel Mode         : N
Upstream Channel                    :
Ranging Status                      :
Upstream Power (dBmV)               :
Upstream SNR (dB)                   :
Upstream Data SNR (dB)              :
Received Power (dBmV)               :
Timing Offset             (97.6 ns):
Initial Timing Offset               :
Rng Timing Adj Moving Avg(0.381 ns):
Rng Timing Adj Lt Moving Avg        :
Rng Timing Adj Minimum              :
Rng Timing Adj Maximum              :
Pre-EQ Good                         :
Pre-EQ Scaled                       :
Pre-EQ Impulse                      :
Pre-EQ Direct Loads                 :
Good Codewords rx                   :
Corrected Codewords rx              :
Uncorrectable Codewords rx          :
Phy Operating Mode                  :
sysDescr                            :
Downstream Power                    : 0.00 dBmV (SNR = ----- dB)
MAC Version                         : DOC1.0
QoS Provisioned Mode                : DOC1.0
Enable DOCSIS2.0 Mode               : Y
Modem Status                        : {Modem= offline, Security=disabled}
Capabilities                        : {Frag=N, Concat=N, PHS=N}
Security Capabilities               : {Priv=, EAE=N, Key_len=}
L2VPN Capabilities                  : {L2VPN=N, eSAFE=N}
Sid/Said Limit                      : {Max US Sids=0, Max DS Saids=0}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 0, Num of Taps= 0}
Number of CPE IPs                   : 0(Max CPE IPs = 16)
CFG Max-CPE                         : 16
Flaps                               : 8218(Mar 22 03:17:15)
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 222 exhausted
Total US Flows                      : 1(1 active)
Total DS Flows                      : 1(1 active)
Total US Data                       : 454 packets, 32291 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 0 packets, 0 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)        : N/A (N/A)
LB group ID in config file (index)  : N/A (N/A)
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 :
Required DS Attribute Mask          : 0x0
```

```
Forbidden DS Attribute Mask        : 0x0
Required US Attribute Mask         : 0x0
Forbidden US Attribute Mask        : 0x0
Service Type ID                    :
Service Type ID in config file     :
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
DS Change Times                    : 0
Boolean Services                   : 0
Number of Multicast DSIDs Support  : 0
MDF Capability Mode                : 0
IGMP/MLD Version                   : IGMPv2
FCType10 Forwarding Support        : N
Features Bitmask                   : 0x0
Total Time Online                  : 00:00
CFG Max IPv6 CPE Prefix            : 16 (-1 used)
MAC Address                        : 0018.6832.0eb2
IP Address                         : 80.62.0.4
IPv6 Address                       : ---
Dual IP                            : N
Prim Sid                           : 13
Host Interface                     : C6/1/0/U0
MD-DS-SG / MD-US-SG                : 3 / N/A
MD-CM-SG                           : 0x2D0300
Primary Downstream                 : In6/1/0:0 (RfId : 600)
Wideband Capable                   : N
RCP Index                          : 0
RCP ID                             : 00 00 00 00 00
Downstream Channel DCID RF Channel : 193   6/1/0:0
Multi-Transmit Channel Mode        : N
Upstream Channel                   : US0
Ranging Status                     : sta
Upstream Power (dBmV)              : 0.00
Upstream SNR (dB)                  : 36.12
Upstream Data SNR (dB)             : --
Received Power (dBmV)              : 0.00
Timing Offset             (97.6 ns): 1192
Initial Timing Offset              : 1192
Rng Timing Adj Moving Avg(0.381 ns): -1
Rng Timing Adj Lt Moving Avg       : -7
Rng Timing Adj Minimum             : -256
Rng Timing Adj Maximum             : 0
Pre-EQ Good                        : 0
Pre-EQ Scaled                      : 0
Pre-EQ Impulse                     : 0
Pre-EQ Direct Loads                : 0
Good Codewords rx                  : 42
Corrected Codewords rx             : 0
Uncorrectable Codewords rx         : 0
Phy Operating Mode                 : tdma
sysDescr                           :
Downstream Power                   : 0.00 dBmV (SNR = ----- dB)
MAC Version                        : DOC2.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= online, Security=disabled}
Capabilities                       : {Frag=Y, Concat=Y, PHS=Y}
Security Capabilities              : {Priv=, EAE=N, Key_len=}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
```

```
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                   : 0(Max CPE IPs = 16)
CFG Max-CPE                         : 1
Flaps                               : 0()
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 0 exhausted
Total US Flows                      : 2(2 active)
Total DS Flows                      : 2(2 active)
Total US Data                       : 9 packets, 4545 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 9 packets, 3114 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)        : N/A (N/A)
LB group ID in config file (index)  : N/A (N/A)
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 :
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
Service Type ID                     :
Service Type ID in config file      :
Active Classifiers                  : 0 (Max = NO LIMIT)
CM Upstream Filter Group            : 0
CM Downstream Filter Group          : 0
CPE Upstream Filter Group           : 0
CPE Downstream Filter Group         : 0
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 0
Number of Multicast DSIDs Support   : 0
MDF Capability Mode                 : 0
IGMP/MLD Version                    : IGMPv2
FCType10 Forwarding Support         : N
Features Bitmask                    : 0x0
Total Time Online                   : 4d14h
CFG Max IPv6 CPE Prefix             : 16 (-1 used)
```

Example of the show cable modem Command Output on the Cisco uBR7225VXR and Cisco uBR7246VXR Routers

The following example shows the sample output for the **cm-status** option in Cisco IOS Release 12.2(33)SCD on a Cisco uBR7246VXR router:

Router# **show cable modem cm-status**

I/F MAC Address Event TID Count Error Dups Time

C5/0 001e.6bfb.29a6 Seq out-of-range 1 1 0 1 Jan 18 09:00:19

```
C7/0   001c.ea2b.79b2 MDD timeout      0     0     1     0     Jan 11 11:29:22
                      QAM failure      0     0     1     0     Jan 11 11:29:02
                      MDD recovery     0     0     1     0     Jan 11 11:30:20
                      QAM recovery     0     0     1     0     Jan 11 11:30:13
C7/0   001c.ea2b.78b0 MDD timeout      0     0     1     0     Jan 11 11:29:16
                      QAM failure      0     0     1     0     Jan 11 11:28:53
```

```
                    MDD recovery     0     0     1     0     Jan 11 11:29:59
                    QAM recovery     0     0     1     0     Jan 11 11:29:46
```

The following example shows the sample output of the **queue** option for a particular cable modem in Cisco IOS Release 12.2(33)SCD:

```
Router# show cable modem
40.3.192.2 queue
* idx/gqid Len/Limit Deqs      Drops     CIR       MIR/PR     ForwInt  SFID
            pkts    pkts      pkts      kbps       kbps
BE Queues:
    3/43     0/128   103       0         0           0/0      In5/1:1 Ca5/1:22
CIR Queues:
Low Latency Queues:
```

Example of the show cable modem Command Output for Partial Service Mode

The following example shows the sample output of the show cable modem command that displays the cable modems that are in upstream (indicated by “p” under I/F) and downstream partial service mode (indicated by “p-online” under MAC State):

```
Router# show cable modem
                                                                                D
MAC Address    IP Address     I/F          MAC            Prim RxPwr  Timing Num I
                                           State          Sid  (dBmv) Offset CPE P
0016.9252.9ac0 2.99.81.4      C7/0/0/U0    online(pt)     1    0.00   1332   0   N
000f.2172.229d 2.99.81.36     C7/0/0/U3    online(pt)     2    0.50   1778   0   N
001e.6bfb.33a0 2.99.81.14     C7/0/0/p     p-online(pt)   3    -0.50  1424   0   N
0022.cef4.3d9a 2.99.81.23     C7/0/0/p     p-online(pt)   4    0.00   1438   0   N
0019.474a.c456 2.99.81.18     C7/0/0/U3    online(pt)     5    0.00   1336   0   N
001e.6bfb.194e 2.99.81.32     C7/0/0/p     p-online(pt)   6    -0.50  1422   0   N
00e0.6f8b.a888 2.99.81.31     C7/0/0/U3    online(pt)     7    0.50   1427   0   N
001e.6bfb.1538 2.99.81.38     C7/0/0/p     p-online(pt)   8    0.00   1423   0   N
001e.6bfb.0d22 2.99.81.29     C7/0/0/p     p-online(pt)   9    0.00   1738   0   N
001e.6bfb.1a7e 2.99.81.30     C7/0/0/p     p-online(pt)   10   0.00   1738   0   N
0019.474a.c418 2.99.81.75     C7/0/0/U1    online(pt)     11   0.00   1335   0   N
001e.6bfa.f58a 2.99.81.9      C7/0/0/p     p-online(pt)   12   0.00   1737   0   N
0022.cef4.3fa2 2.99.81.24     C7/0/0/p     p-online(pt)   13   0.00   1438   0   N
001e.6bfb.1b72 2.99.81.10     C7/0/0/p     p-online(pt)   14   -0.50  1425   0   N
0019.474a.c330 2.99.81.34     C7/0/0/U0    online(pt)     15   0.00   1028   0   N
0023.be50.e578 2.99.81.17     C7/0/0/UB    p-online(pt)   16   0.00   1805   0   N
0025.2e2d.784a 2.99.81.28     C7/0/0/UB    p-online(pt)   17   0.50   1798   0   N
0025.2e2d.748c 2.99.81.26     C7/0/0/UB    p-online(pt)   18   0.00   1798   0   N
001e.6bfa.f070 2.99.81.37     C7/0/0/U3    online(pt)     20   0.50   1735   0   N
0019.474a.c422 2.99.81.20     C8/0/0/U1    online(pt)     1    0.50   1340   0   N
0019.474a.c466 2.99.81.21     C8/0/0/U1    online(pt)     2    0.00   1334   0   N
001e.6bfb.2e96 2.99.81.33     C8/0/0/UB    w-online(pt)   3    0.00   1738   0   N
```

Example of the show cable modem Command Output with a Cable Modem Ranging Class ID

The following example shows the sample output for the **verbose** option that displays the ranging class ID of a cable modem in Cisco IOS Release 12.2(33)SCH:

```
Router# show cable modem 001c.eaa4.b5aa verbose

MAC Address                     : 001c.eaa4.b5aa
IP Address                      : 192.168.0.5
IPv6 Address                    : ---
```

```
Dual IP                              : N
Prim Sid                             : 53
Host Interface                       : C5/1/0/UB
MD-DS-SG / MD-US-SG                  : 1 / 71
MD-CM-SG                             : 0xF0147
Primary Wideband Channel ID          : 417 (Wi5/1/0:0)
Primary Downstream                   : In5/1/0:0 (RfId : 360)
Wideband Capable                     : Y
RCP Index                            : 3
RCP ID                               : 00 10 00 10 04
Downstream Channel DCID RF Channel : 25    5/1/0:0
Downstream Channel DCID RF Channel : 26    5/1/0:1
Downstream Channel DCID RF Channel : 27    5/1/0:2
Downstream Channel DCID RF Channel : 28    5/1/0:3
Multi-Transmit Channel Mode          : Y
Extended Upstream Transmit Power     : 0dB
Upstream Channel                     : US0        US1        US2        US3
Ranging Status                       : sta        sta        sta        sta
Upstream SNR (dB)                    : 36.12      36.12      36.12      36.12
Upstream Data SNR (dB)               : --         --         --         --
Received Power (dBmV)                : 0.50       0.50       0.50       0.50
Reported Transmit Power (dBmV)       : 35.00      35.00      35.00      35.00
Peak Transmit Power (dBmV)           : 53.00      53.00      53.00      53.00
Phy Max Power (dBmV)                 : 53.00      53.00      53.00      53.00
Minimum Transmit Power (dBmV)        : 32.50      32.50      32.50      32.50
Timing Offset              (97.6 ns): 372        372        372        371
Initial Timing Offset                : 372        116        116        116
Rng Timing Adj Moving Avg(0.381 ns): -1         -1         0          -1
Rng Timing Adj Lt Moving Avg         : -4         -3         -3         -4
Rng Timing Adj Minimum               : -4         -4         -4         -4
Rng Timing Adj Maximum               : 164        65671      65600      65516
Pre-EQ Good                          : 0          0          0          0
Pre-EQ Scaled                        : 0          0          0          0
Pre-EQ Impulse                       : 0          0          0          0
Pre-EQ Direct Loads                  : 0          0          0          0
Good Codewords rx                    : 648        515        617        564
Corrected Codewords rx               : 0          0          0          0
Uncorrectable Codewords rx           : 0          0          0          0
Phy Operating Mode                   : scdma*     scdma*     scdma*     scdma*
sysDescr                             : Cisco DPC3000 DOCSIS 3.0 Cable Modem <<HW_REV: 1.1;
VENDOR: Cisco; BOOTR: 1.0.0.4; SW_REV: dpc3000-v303r2392-110520h; MODEL: DPC3000>>
Downstream Power                     : 1.70 dBmV (SNR = 38.90 dB)
MAC Version                          : DOC3.0
QoS Provisioned Mode                 : DOC1.1
Enable DOCSIS2.0 Mode                : Y
Modem Status                         : {Modem= w-online, Security=disabled}
Capabilities                         : {Frag=N, Concat=N, PHS=Y}
Security Capabilities                : {Priv=, EAE=Y, Key_len=}
L2VPN Capabilities                   : {L2VPN=Y, eSAFE=N}
Sid/Said Limit                       : {Max US Sids=8, Max DS Saids=24}
Optional Filtering Support           : {802.1P=N, 802.1Q=N, DUT=Y}
Transmit Equalizer Support           : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                    : 0(Max CPE IPs = 16)
CFG Max-CPE                          : 16
Flaps                                : 0()
Errors                               : 0 CRCs, 0 HCSes
Stn Mtn Failures                     : 0 aborts, 0 exhausted
Total US Flows                       : 1(1 active)
Total DS Flows                       : 1(1 active)
Total US Data                        : 2131 packets, 249036 bytes
Total US Throughput                  : 0 bits/sec, 0 packets/sec
Total DS Data                        : 2137 packets, 197622 bytes
Total DS Throughput                  : 304 bits/sec, 0 packets/sec
LB group ID assigned (index)         : 2148467015 (36608)
```

```
LB group ID in config file (index) : N/A (N/A)
LB policy ID                       : 0
LB policy ID in config file        : 0
LB priority                        : 0
Tag                                :
Required DS Attribute Mask         : 0x0
Forbidden DS Attribute Mask        : 0x0
Required US Attribute Mask         : 0x0
Forbidden US Attribute Mask        : 0x0
Service Type ID                    :
Service Type ID in config file     :
Ranging Class ID                   : 0x2
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
DS Change Times                    : 0
Boolean Services                   : 2
Number of Multicast DSIDs Support  : 24
MDF Capability Mode                : 2
IGMP/MLD Version                   : IGMPv3
FCType10 Forwarding Support        : Y
Features Bitmask                   : 0x0
Total Time Online                  : 1h13m   (1h13m    since last counter reset)
CM Initialization Reason           : NO_PRIM_SF_USCHAN
CFG Max IPv6 CPE Prefix            : 16 (-1 used)
```

Example of the show cable modem Command Output for upstream drop classifier (UDC) feature

Effective from Cisco IOS Release 12.2(33)SCG5, the **verbose** keyword displays the status of the Upstream Drop Classifier (UDC) feature for a specific cable modem. The “UDC Enabled” field displays ‘Y’ if it is enabled.

The following example shows the output of the **show cable modem** command with the **verbose** keyword for the UDC feature:

```
Router# show cable modem 4458.2945.3004 verbose

MAC Address                        : 4458.2945.3004
IP Address                         : 40.101.0.2
IPv6 Address                       : ---
Dual IP                            : N
Prim Sid                           : 2
Host Interface                     : C7/1/0/UB
MD-DS-SG / MD-US-SG                : 1 / 1
MD-CM-SG                           : 0x4B0101
Primary Wideband Channel ID        : 1057 (Wi7/1/0:0)
Primary Downstream                 : In7/1/0:2 (RfId : 842)
Wideband Capable                   : Y
RCP Index                          : 3
RCP ID                             : 00 10 00 00 08
Downstream Channel DCID RF Channel : 147   7/1/0:2
Downstream Channel DCID RF Channel : 145   7/1/0:0
Downstream Channel DCID RF Channel : 146   7/1/0:1
UDC Enabled                        : Y
Multi-Transmit Channel Mode        : Y
Extended Upstream Transmit Power   : 0dB
Upstream Channel                   : US2
Ranging Status                     : sta
```

```
Upstream SNR (dB)                  : 36.12
Upstream Data SNR (dB)             : --
Received Power (dBmV)              : -0.50
Reported Transmit Power (dBmV)     : 36.00
Peak Transmit Power (dBmV)         : 58.00
Phy Max Power (dBmV)               : 58.00
Minimum Transmit Power (dBmV)      : 18.00
Timing Offset             (97.6 ns): 1209
Initial Timing Offset              : 1209
Rng Timing Adj Moving Avg(0.381 ns): 255
Rng Timing Adj Lt Moving Avg       : 238
Rng Timing Adj Minimum             : -256
Rng Timing Adj Maximum             : 256
Pre-EQ Good                        : 0
Pre-EQ Scaled                      : 0
Pre-EQ Impulse                     : 0
Pre-EQ Direct Loads                : 0
Good Codewords rx                  : 665
Corrected Codewords rx             : 0
Uncorrectable Codewords rx         : 0
Phy Operating Mode                 : tdma*
sysDescr                           :
sysDescr                           :
Downstream Power                   : 0.00 dBmV (SNR = ----- dB)
MAC Version                        : DOC3.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= w-online(pt), Security=assign(tek)}
Capabilities                       : {Frag=N, Concat=N, PHS=Y}
Security Capabilities              : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
Sid/Said Limit                     : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE IPs                  : 0(Max CPE IPs = 5)
CFG Max-CPE                        : 10
Flaps                              : 1(Jun 4  22:05:34)
Errors                             : 0 CRCs, 0 HCSes
Stn Mtn Failures                   : 0 aborts, 1 exhausted
Total US Flows                     : 1(1 active)
Total DS Flows                     : 1(1 active)
Total US Data                      : 4 packets, 2502 bytes
Total US Throughput                : 0 bits/sec, 0 packets/sec
Total DS Data                      : 0 packets, 0 bytes
Total DS Throughput                : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)       : 2152399105 (51969)
LB group ID in config file (index) : N/A (N/A)
LB policy ID                       : 0
LB policy ID in config file        : 0
LB priority                        : 0
Tag                                :
Required DS Attribute Mask         : 0x0
Forbidden DS Attribute Mask        : 0x0
Required US Attribute Mask         : 0x0
Forbidden US Attribute Mask        : 0x0
Service Type ID                    :
Service Type ID in config file     :
Ranging Class ID                   : 0x1
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
```

```
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 2
Number of Multicast DSIDs Support   : 16
MDF Capability Mode                 : 2
IGMP/MLD Version                    : IGMPv3
FCType10 Forwarding Support         : Y
Features Bitmask                    : 0x0
Total Time Online                   : 1h29m   (1h29m    since last counter reset)
CM Initialization Reason            : NO_PRIM_SF_USCHAN
CFG Max IPv6 CPE Prefix             : 16 (-1 used)
```



Note When the **verbose** keyword is used without a specific MAC address, the UDC Enabled status of each cable modem on the interface is displayed.

Example of show cable modem verbose Command in the Cisco IOS Release 12.2(33)SCH1

The following is a sample output for the **verbose** option that displays the channel IDs for 16 downstream channels and channel information for 4 upstream channels of a cable modem:

```
Router# show cable modem 68b6.fcfe.22e5 verbose
Router# show cable modem 68b6.fcfe.2285 verbose

MAC Address                         : 68b6.fcfe.2285
IP Address                          : 192.168.0.8
IPv6 Address                        : 2001:DB8:10:1:9951:1972:33F9:9867
Dual IP                             : Y
Prim Sid                            : 235
Host Interface                      : C7/0/1/UB
MD-DS-SG / MD-US-SG                 : 1 / 1
MD-CM-SG                            : 0x3D0101
Primary Wideband Channel ID         : 2305 (Wi7/0/0:0)
Primary Downstream                  : In7/0/0:3 (RfId : 1731)
Wideband Capable                    : Y
RCP Index                           : 3
RCP ID                              : 00 10 00 00 18
Downstream Channel DCID RF Channel  : 117   7/0/0:0
Downstream Channel DCID RF Channel  : 118   7/0/0:1
Downstream Channel DCID RF Channel  : 119   7/0/0:2
Downstream Channel DCID RF Channel  : 120   7/0/0:3
Downstream Channel DCID RF Channel  : 121   7/0/1:0
Downstream Channel DCID RF Channel  : 122   7/0/1:1
Downstream Channel DCID RF Channel  : 123   7/0/1:2
Downstream Channel DCID RF Channel  : 124   7/0/1:3
Downstream Channel DCID RF Channel  : 125   7/0/2:0
Downstream Channel DCID RF Channel  : 126   7/0/2:1
Downstream Channel DCID RF Channel  : 127   7/0/2:2
Downstream Channel DCID RF Channel  : 128   7/0/2:3
Downstream Channel DCID RF Channel  : 129   7/0/3:0
Downstream Channel DCID RF Channel  : 130   7/0/3:1
Downstream Channel DCID RF Channel  : 131   7/0/3:2
Downstream Channel DCID RF Channel  : 132   7/0/3:3
Extended Upstream Transmit Power    : 61dB
Multi-Transmit Channel Mode         : Y
Number of US in UBG                 : 4
Upstream Channel                    : US0        US1        US2        US3
Ranging Status                      : sta        sta        sta        sta
Upstream SNR (dB)                   : 36.12      36.12      36.12      36.12
```

```
Upstream Data SNR (dB)              : --          --          --          --
Received Power (dBmV)               : -0.50       -0.50       0.00        -0.50
Reported Transmit Power (dBmV)      : 38.25       38.25       38.25       38.25
Peak Transmit Power (dBmV)          : 61.00       61.00       61.00       61.00
Phy Max Power (dBmV)                : 51.00       51.00       51.00       51.00
Minimum Transmit Power (dBmV)       : 24.00       24.00       24.00       24.00
Timing Offset              (97.6 ns): 1348        1348        1348        1348
Initial Timing Offset               : 1092        1092        1092        1348
Rng Timing Adj Moving Avg(0.381 ns): 0           0           -1          0
Rng Timing Adj Lt Moving Avg        : 644         737         644         0
Rng Timing Adj Minimum              : 0           0           -256        0
Rng Timing Adj Maximum              : 65536       65536       65536       256
Pre-EQ Good                         : 0           0           0           0
Pre-EQ Scaled                       : 0           0           0           0
Pre-EQ Impulse                      : 0           0           0           0
Pre-EQ Direct Loads                 : 0           0           0           0
Good Codewords rx                   : 25          30          36          67
Corrected Codewords rx              : 0           0           0           0
Uncorrectable Codewords rx          : 0           0           0           0
Phy Operating Mode                  : atdma*      atdma*      atdma*      atdma*
sysDescr                            :
Downstream Power                    : 0.00 dBmV (SNR = ----- dB)
MAC Version                         : DOC3.0
QoS Provisioned Mode                : DOC1.1
Enable DOCSIS2.0 Mode               : Y
Modem Status                        : {Modem= w-online, Security=disabled}
Capabilities                        : {Frag=N, Concat=N, PHS=Y}
Security Capabilities               : {Priv=, EAE=Y, Key_len=}
L2VPN Capabilities                  : {L2VPN=Y, eSAFE=Y}
Sid/Said Limit                      : {Max US Sids=8, Max DS Saids=64}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=Y}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE                       : 1(Max CPE = 16)
Number of CPE IPs                   : 0(Max CPE IPs = 16)
CFG Max-CPE                         : 16
Flaps                               : 0()
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 0 exhausted
Total US Flows                      : 1(1 active)
Total DS Flows                      : 1(1 active)
Total US Data                       : 29 packets, 8048 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 1 packets, 275 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)        : 2151481601 (48385)
LB group ID in config file (index)  : N/A (N/A)
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 :
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
Service Type ID                     :
Service Type ID in config file      :
Ranging Class ID                    : 0x2
Active Classifiers                  : 0 (Max = NO LIMIT)
CM Upstream Filter Group            : 0
CM Downstream Filter Group          : 0
CPE Upstream Filter Group           : 0
CPE Downstream Filter Group         : 0
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
```

```
DS Change Times                    : 0
Boolean Services                   : 2
Number of Multicast DSIDs Support  : 63
MDF Capability Mode                : 2
IGMP/MLD Version                   : MLDv2
FCType10 Forwarding Support        : Y
Features Bitmask                   : 0x0
Total Time Online                  : 08:06   (08:06    since last counter reset)
CM Initialization Reason           : T4_EXPIRED
CFG Max IPv6 CPE Prefix            : 16 (-1 used)
```

Example of show cable modem verbose Command in the Cisco IOS Release 12.2(33)SCH2

The following is a sample output for the **verbose** option that displays the channel IDs for 24 downstream channels and channel information for 8 upstream channels of a cable modem:

```
Router# show cable modem 68b6.fcfe.22e5 verbose
MAC Address                        : 68b6.fcfe.2285
IP Address                         : 192.168.0.8
IPv6 Address                       : 2001:DB8:10:1:9951:1972:33F9:9867
Dual IP                            : Y
Prim Sid                           : 8
Host Interface                     : C8/0/0/UB
MD-DS-SG / MD-US-SG                : 1 / 2
MD-CM-SG                           : 0x5A0102
Primary Wideband Channel ID        : 3073 (Wi8/0/0:0)
Primary Downstream                 : Mo8/0/0:0 (RfId : 2304)
Wideband Capable                   : Y
RCP Index                          : 3
RCP ID                             : 00 10 00 00 18
Downstream Channel DCID RF Channel : 45    8/0/0:0
Downstream Channel DCID RF Channel : 46    8/0/0:1
Downstream Channel DCID RF Channel : 47    8/0/0:2
Downstream Channel DCID RF Channel : 48    8/0/0:3
Downstream Channel DCID RF Channel : 49    8/0/0:4
Downstream Channel DCID RF Channel : 50    8/0/0:5
Downstream Channel DCID RF Channel : 51    8/0/0:6
Downstream Channel DCID RF Channel : 52    8/0/0:7
Downstream Channel DCID RF Channel : 53    8/0/0:8
Downstream Channel DCID RF Channel : 54    8/0/0:9
Downstream Channel DCID RF Channel : 55    8/0/0:10
Downstream Channel DCID RF Channel : 56    8/0/0:11
Downstream Channel DCID RF Channel : 57    8/0/0:12
Downstream Channel DCID RF Channel : 58    8/0/0:13
Downstream Channel DCID RF Channel : 59    8/0/0:14
Downstream Channel DCID RF Channel : 60    8/0/0:15
Downstream Channel DCID RF Channel : 61    8/0/0:16
Downstream Channel DCID RF Channel : 62    8/0/0:17
Downstream Channel DCID RF Channel : 63    8/0/0:18
Downstream Channel DCID RF Channel : 64    8/0/0:19
Downstream Channel DCID RF Channel : 65    8/0/0:20
Downstream Channel DCID RF Channel : 66    8/0/0:21
Downstream Channel DCID RF Channel : 67    8/0/0:22
Downstream Channel DCID RF Channel : 68    8/0/0:23
UDC Enabled                        : N
Extended Upstream Transmit Power   : 61dB
Multi-Transmit Channel Mode        : Y
Number of US in UBG                : 8
Upstream Channel                   : US0        US1        US2        US3
Ranging Status                     : sta        sta        sta        sta
```

```
Upstream SNR (dB)                  : 30.62      32.32      18.25      24.26
Upstream Data SNR (dB)             : --         --         --         --
Received Power (dBmV)              : 0.50       0.00       -0.50      -0.50
Reported Transmit Power (dBmV)     : 30.75      30.75      29.25      29.25
Peak Transmit Power (dBmV)         : 61.00      61.00      61.00      61.00
Phy Max Power (dBmV)               : 48.00      48.00      48.00      48.00
Minimum Transmit Power (dBmV)      : 21.00      21.00      21.00      21.00
Timing Offset             (97.6 ns): 1800       1800       1800       1800
Initial Timing Offset              : 1544       1544       1544       1544
Rng Timing Adj Moving Avg(0.381 ns): -1         0          -1         -1
Rng Timing Adj Lt Moving Avg       : -7         0          -7         -7
Rng Timing Adj Minimum             : -256       0          -256       -256
Rng Timing Adj Maximum             : 65536      65536      65536      65536
Pre-EQ Good                        : 0          0          0          0
Pre-EQ Scaled                      : 0          0          0          0
Pre-EQ Impulse                     : 0          0          0          0
Pre-EQ Direct Loads                : 0          0          0          0
Good Codewords rx                  : 1201       1262       833        656
Corrected Codewords rx             : 0          0          169        117
Uncorrectable Codewords rx         : 0          0          205        335
Phy Operating Mode                 : atdma*     atdma*     atdma*     atdma*
Upstream Channel                   : US4        US5        US6        US7
Ranging Status                     : sta        sta        sta        sta
Upstream SNR (dB)                  : 15.53      31.62      31.1       31.87
Upstream Data SNR (dB)             : --         --         --         --
Received Power (dBmV)              : 0.00       0.00       -0.50      0.50
Reported Transmit Power (dBmV)     : 29.25      30.75      30.75      30.75
Peak Transmit Power (dBmV)         : 61.00      61.00      61.00      61.00
Phy Max Power (dBmV)               : 48.00      48.00      48.00      48.00
Minimum Transmit Power (dBmV)      : 21.00      21.00      21.00      21.00
Timing Offset             (97.6 ns): 1800       1800       1800       1800
Initial Timing Offset              : 1544       1800       1544       1544
Rng Timing Adj Moving Avg(0.381 ns): -1         -1         46         0
Rng Timing Adj Lt Moving Avg       : -7         -7         104        0
Rng Timing Adj Minimum             : -256       -256       0          0
Rng Timing Adj Maximum             : 65536      256        65536      65536
Pre-EQ Good                        : 0          0          0          0
Pre-EQ Scaled                      : 0          0          0          0
Pre-EQ Impulse                     : 0          0          0          0
Pre-EQ Direct Loads                : 0          0          0          0
Good Codewords rx                  : 718        1328       1173       1252
Corrected Codewords rx             : 110        0          0          0
Uncorrectable Codewords rx         : 298        0          0          0
Phy Operating Mode                 : atdma*     atdma*     atdma*     atdma*
sysDescr                           : DOCSIS 3.0 Cable Modem Router
Downstream Power                   : 7.40 dBmV (SNR = 43.30 dB)
MAC Version                        : DOC3.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= w-online, Security=disabled}
Capabilities                       : {Frag=N, Concat=N, PHS=Y}
Security Capabilities              : {Priv=, EAE=Y, Key_len=}
L2VPN Capabilities                 : {L2VPN=Y, eSAFE=Y}
Sid/Said Limit                     : {Max US Sids=8, Max DS Saids=64}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=Y}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
Number of CPE                      : 0(Max CPE = 16)
Number of CPE IPs                  : 0(Max CPE IPs = 16)
Number of CPE IPv6                 : 0(Max CPE IPv6 = 16)
CFG Max-CPE                        : 16
Flaps                              : 19(Oct 11 04:00:25)
Errors                             : 0 CRCs, 0 HCSes
Stn Mtn Failures                   : 0 aborts, 12 exhausted
Total US Flows                     : 1(1 active)
```

```
Total DS Flows                      : 1(1 active)
Total US Data                       : 3294 packets, 577031 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 2263 packets, 200777 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned (index)        : 2153382146 (55810)
LB group ID in config file (index) : N/A (N/A)
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 :
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
Service Type ID                     :
Service Type ID in config file      :
Ranging Class ID                    : 0x2
Active Classifiers                  : 0 (Max = NO LIMIT)
CM Upstream Filter Group            : 0
CM Downstream Filter Group          : 0
CPE Upstream Filter Group           : 0
CPE Downstream Filter Group         : 0
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 2
Number of Multicast DSIDs Support  : 63
MDF Capability Mode                 : 2
IGMP/MLD Version                    : MLDv2
FCType10 Forwarding Support         : Y
Features Bitmask                    : 0x0
Total Time Online                   : 9h27m   (9h27m    since last counter reset)
CM Initialization Reason            : BAD_DHCP_ACK
CFG Max IPv6 CPE Prefix             : 16 (-1 used)
```

Example of show cable modem verbose Command for Displaying the Number of IPv4, IPv6 Addresses and the Maximum Value for a Cable Modem in the Cisco IOS Release 12.2(33)SCH1

The following is a sample output for the **verbose** option that displays the number of IPv4, IPv6 with the maximum value per cable modem:

```
Router# show cable modem 00C0.7bb3.fcd1 verbose | include Max
Phy Max Power (dBmV)                : 57.00
Rng Timing Adj Maximum              : 0
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=15}
Number of CPE                       : 6(Max CPE = 16)
Number of CPE IPs                   : 4(Max CPE IPs = 16)
Number of CPE IPv6                  : 4(Max CPE IPv6 = 10)
CFG Max-CPE                         : 16
Active Classifiers                  : 0 (Max = NO LIMIT)
CFG Max IPv6 CPE Prefix             : 10 (-1 used)
```

Example of show cable modem verbose Command for a Cable Modem on the Cisco cBR Series Converged Broadband Router

The following shows sample output for the **verbose** option for a particular cable modem on a Cisco cBR Series Converged Broadband Router:

```
Router#show cable modem c1/0/0 upstream 0 verbose


MAC Address                          : 0025.2eaf.82e4
IP Address                           : ---
IPv6 Address                         : 2001:DBB:4400:1:D3:BC06:33E9:F77F
Dual IP                              : N
Prim Sid                             : 50
Host Interface                       : C3/0/0/U0
MD-DS-SG / MD-US-SG                  : N/A / N/A
MD-CM-SG                             : 0x900000
Primary Downstream                   : In3/0/0:33 (RfId : 12321)
Wideband Capable                     : Y
RCP Index                            : 5
RCP ID                               : 00 00 00 00 00
Downstream Channel DCID RF Channel : 34    3/0/0:33
UDC Enabled                          : N
US Frequency Range Capability        : Standard (5-42 MHz)
Extended Upstream Transmit Power     : 0dB
Multi-Transmit Channel Mode          : N
Upstream Channel                     : US0
Ranging Status                       : sta
Upstream SNR (dB)                    : 36.12
Upstream Data SNR (dB)               : 36.12
Received Power (dBmV)                : -1.00
Timing Offset              (97.6 ns): 1806
Initial Timing Offset                : 1806
Rng Timing Adj Moving Avg(0.381 ns): 0
Rng Timing Adj Lt Moving Avg         : 0
Rng Timing Adj Minimum               : 0
Rng Timing Adj Maximum               : 0
Pre-EQ Good                          : 0
Pre-EQ Scaled                        : 0
Pre-EQ Impulse                       : 0
Pre-EQ Direct Loads                  : 0
Good Codewords rx                    : 241
Corrected Codewords rx               : 0
Uncorrectable Codewords rx           : 0
Phy Operating Mode                   : atdma
sysDescr                             :
Downstream Power                     : 0.00 dBmV (SNR = ----- dB)
MAC Version                          : DOC3.0
QoS Provisioned Mode                 : DOC1.1
Enable DOCSIS2.0 Mode                : Y
Modem Status                         : {Modem= online, Security=disabled}
Capabilities                         : {Frag=Y, Concat=Y, PHS=Y}
Security Capabilities                : {Priv=, EAE=N, Key_len=}
L2VPN Capabilities                   : {L2VPN=N, eSAFE=N}
L2VPN type                           : {CLI=N, DOCSIS=N}
Sid/Said Limit                       : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support           : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support           : {Taps/Symbol= 1, Num of Taps= 24}
Flaps                                : 3(May 21 10:02:22)
Errors                               : 0 CRCs, 0 HCSes
Stn Mtn Failures                     : 0 aborts, 2 exhausted
Total US Flows                       : 1(1 active)
Total DS Flows                       : 1(1 active)
Total US Data                        : 31 packets, 6084 bytes
Total US Throughput                  : 0 bits/sec, 0 packets/sec
Total DS Data                        : 8 packets, 912 bytes
Total DS Throughput                  : 0 bits/sec, 0 packets/sec
LB group ID assigned                 : 1
LB group ID in config file           : N/A
```

```
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 : d30
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
Service Type ID                     :
Service Type ID in config file      :
Active Classifiers                  : 0 (Max = 5)
CM Upstream Filter Group            : 0
CM Downstream Filter Group          : 0
CPE Upstream Filter Group           : 0
CPE Downstream Filter Group         : 0
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 0
CM Energy Management Capable        : N
CM Enable Energy Management         : N
CM Enter Energy Management          : NO
Battery Mode                        : N
Battery Mode Status                 :
Number of Multicast DSIDs Support   : 16
MDF Capability Mode                 : 2
IGMP/MLD Version                    : MLDv2
FCType10 Forwarding Support         : Y
Features Bitmask                    : 0x0
Total Time Online                   : 07:24   (07:24    since last counter reset)
CM Initialization Reason            : POWER_ON
```

Example of show cable modem verbose Command in Cisco IOS-XE Release 3.16.0S

The following is a sample output for the **verbose** option that displays the battery mode and battery mode status per cable modem in Cisco IOS Release 3.16.0S:

```
Security Capabilities               : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                  : {L2VPN=N, eSAFE=N}
L2VPN type                          : {CLI=N, DOCSIS=N}
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
Flaps                               : 0()
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 0 exhausted
Total US Flows                      : 1(1 active)
Total DS Flows                      : 1(1 active)
Total US Data                       : 33 packets, 11496 bytes
Total US Throughput                 : 363 bits/sec, 0 packets/sec
Total DS Data                       : 7 packets, 798 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned                : 2147631104
LB group ID in config file          : N/A
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 : D30
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
```

```
Service Type ID                    :
Service Type ID in config file     :
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
DS Change Times                    : 0
Boolean Services                   : 2
CM Energy Management Capable       : N
CM Enable Energy Management        : N
CM Enter Energy Management         : NO
Battery Mode                       : N
Battery Mode Status                : done
Number of Multicast DSIDs Support  : 16
```

Example of show cable modem verbose Command in Cisco IOS-XE Release 3.17.0S

The following is a sample output for the **verbose** option that displays the information after the service flow priority in downstream extended header is enabled in Cisco IOS-XE Release 3.17.0S:

```
Router# show cable modem 80.80.0.12 verbose

MAC Address                        : 5039.558a.69b2
IP Address                         : 80.80.0.12
IPv6 Address                       : ---
Dual IP                            : N
Prim Sid                           : 6
Host Interface                     : C1/0/0/UB
MD-DS-SG / MD-US-SG                : 2 / 1
MD-CM-SG                           : 0x300201
Primary Wideband Channel ID        : 4097 (Wi1/0/0:0)
Primary Downstream                 : In1/0/0:1 (RfId : 4097)
Wideband Capable                   : Y
RCP Index                          : 3
RCP ID                             : 00 10 00 00 04
Downstream Channel DCID RF Channel : 2     1/0/0:1
Downstream Channel DCID RF Channel : 1     1/0/0:0
UDC Enabled                        : N
US Frequency Range Capability      : Standard (5-42 MHz)
Extended Upstream Transmit Power   : 0dB
Multi-Transmit Channel Mode        : Y
Number of US in UBG                : 4
Minimum power load in DRW          : 0.00dB
Upstream Channel                   : US0        US1        US2        US3
Ranging Status                     : sta        sta        sta        sta
Upstream SNR (dB)                  : 38.12      38.12      38.12      36.62
Upstream Data SNR (dB)             : 36.12      36.12      36.12      36.12
Received Power (dBmV)              : -0.50      0.00       -0.50      -0.50
Reported Transmit Power (dBmV)     : 45.50      45.50      45.50      45.50
Peak Transmit Power (dBmV)         : 56.00      56.00      56.00      56.00
Phy Max Power (dBmV)               : 56.00      56.00      56.00      56.00
Max Dynamic ranging window (dBmV)  : 56.00      56.00      56.00      56.00
Min Dynamic ranging window (dBmV)  : 44.00      44.00      44.00      44.00
Minimum Transmit Power (dBmV)      : 21.00      21.00      21.00      21.00
Timing Offset              (97.6 ns): 1792      1792       1792       1792
Initial Timing Offset              : 1536       1792       1536       1536
Rng Timing Adj Moving Avg(0.381 ns): 0          0          0          0
Rng Timing Adj Lt Moving Avg       : 0          0          0          0
```

```
Rng Timing Adj Minimum              : 0          0          0          0
Rng Timing Adj Maximum              : 0          0          0          0
Pre-EQ Good                         : 0          0          0          0
Pre-EQ Scaled                       : 0          0          0          0
Pre-EQ Impulse                      : 0          0          0          0
Pre-EQ Direct Loads                 : 0          0          0          0
Good Codewords rx                   : 46         1007       1          1
Corrected Codewords rx              : 0          0          0          0
Uncorrectable Codewords rx          : 0          0          0          0
Phy Operating Mode                  : tdma*      tdma*      tdma*      tdma*
sysDescr                            :
Downstream Power                    : 0.00 dBmV (SNR = ----- dB)
MAC Version                         : DOC3.0
QoS Provisioned Mode                : DOC1.1
Enable DOCSIS2.0 Mode               : Y
Service Flow Priority               : Y
Modem Status                        : {Modem= init(o), Security=disabled}
Capabilities                        : {Frag=N, Concat=N, PHS=Y}
Security Capabilities               : {Priv=, EAE=Y, Key_len=}
L2VPN Capabilities                  : {L2VPN=N, eSAFE=N}
L2VPN type                          : {CLI=N, DOCSIS=N}
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=15}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
Flaps                               : 31(Oct 12 14:02:08)
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 10 exhausted
Total US Flows                      : 1(1 active)
Total DS Flows                      : 1(1 active)
Total US Data                       : 0 packets, 0 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 0 packets, 0 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned                : 2147508230
LB group ID in config file          : N/A
LB policy ID                        : 0
LB policy ID in config file         : 0
LB priority                         : 0
Tag                                 :
Required DS Attribute Mask          : 0x0
Forbidden DS Attribute Mask         : 0x0
Required US Attribute Mask          : 0x0
Forbidden US Attribute Mask         : 0x0
Service Type ID                     :
Service Type ID in config file      :
Active Classifiers                  : 0 (Max = NO LIMIT)
CM Upstream Filter Group            : 0
CM Downstream Filter Group          : 0
CPE Upstream Filter Group           : 0
CPE Downstream Filter Group         : 0
DSA/DSX messages                    : permit all
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 2
CM Energy Management Capable        : N
CM Enable Energy Management         : N
CM Enter Energy Management          : NO
Battery Mode                        : N
Battery Mode Status                 : done
Number of Multicast DSIDs Support   : 16
MDF Capability Mode                 : 2
IGMP/MLD Version                    : IGMPv3
FCType10 Forwarding Support         : Y
Features Bitmask                    : 0x0
```

```
Total Time Online                  : 00:00   (00:00    since last counter reset)
CM Initialization Reason           : REG_RSP_NOT_OK
```



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Example of show cable modem verbose command in Cisco IOS-XE Release 3.18.0SP

The following is a sample output for the **verbose** that displays the DOCSIS 3.1 Commanded Power levels per upstream and data burst resiliency suspended information in Cisco IOS-XE Release 3.18.0SP:

```
Router# show cable modem fc52.8d5e.8c5e verbose
Load for five secs: 9%/1%; one minute: 13%; five minutes: 13%
Time source is NTP, 09:32:29.200 PDT Wed Jun 1 2016

MAC Address                        : fc52.8d5e.8c5e
IP Address                         : 5.67.32.13
IPv6 Address                       : 2001:420:4:EF00::543:25BB
Dual IP                            : Y
Prim Sid                           : 1
Host Interface                     : C3/0/0/UB
MD-DS-SG / MD-US-SG                : 2 / 16
MD-CM-SG                           : 0x900210
Primary Wideband Channel ID        : 12335 (Wi3/0/0:46)
Primary Downstream                 : In3/0/0:4 (RfId : 12292, SC-QAM)
Wideband Capable                   : Y
DS Tuner Capability                : 32
Downstream Channel DCID RF Channel : 5     3/0/0:4 (SC-QAM)
Downstream Channel DCID RF Channel : 1     3/0/0:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     3/0/0:1 (SC-QAM)
Downstream Channel DCID RF Channel : 3     3/0/0:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     3/0/0:3 (SC-QAM)
Downstream Channel DCID RF Channel : 6     3/0/0:5 (SC-QAM)
Downstream Channel DCID RF Channel : 7     3/0/0:6 (SC-QAM)
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
Downstream Channel DCID RF Channel : 9     3/0/0:8 (SC-QAM)
Downstream Channel DCID RF Channel : 10    3/0/0:9 (SC-QAM)
Downstream Channel DCID RF Channel : 11    3/0/0:10 (SC-QAM)
Downstream Channel DCID RF Channel : 12    3/0/0:11 (SC-QAM)
Downstream Channel DCID RF Channel : 13    3/0/0:12 (SC-QAM)
Downstream Channel DCID RF Channel : 14    3/0/0:13 (SC-QAM)
Downstream Channel DCID RF Channel : 15    3/0/0:14 (SC-QAM)
Downstream Channel DCID RF Channel : 16    3/0/0:15 (SC-QAM)
Downstream Channel DCID RF Channel : 17    3/0/0:16 (SC-QAM)
Downstream Channel DCID RF Channel : 18    3/0/0:17 (SC-QAM)
Downstream Channel DCID RF Channel : 19    3/0/0:18 (SC-QAM)
Downstream Channel DCID RF Channel : 20    3/0/0:19 (SC-QAM)
Downstream Channel DCID RF Channel : 21    3/0/0:20 (SC-QAM)
Downstream Channel DCID RF Channel : 22    3/0/0:21 (SC-QAM)
Downstream Channel DCID RF Channel : 23    3/0/0:22 (SC-QAM)
Downstream Channel DCID RF Channel : 24    3/0/0:23 (SC-QAM)
Downstream Channel DCID RF Channel : 25    3/0/0:24 (SC-QAM)
Downstream Channel DCID RF Channel : 26    3/0/0:25 (SC-QAM)
Downstream Channel DCID RF Channel : 27    3/0/0:26 (SC-QAM)
Downstream Channel DCID RF Channel : 28    3/0/0:27 (SC-QAM)
Downstream Channel DCID RF Channel : 29    3/0/0:28 (SC-QAM)
Downstream Channel DCID RF Channel : 30    3/0/0:29 (SC-QAM)
Downstream Channel DCID RF Channel : 31    3/0/0:30 (SC-QAM)
```

```
Downstream Channel DCID RF Channel : 32    3/0/0:31 (SC-QAM)
Downstream Channel DCID RF Channel : 159   3/0/0:158 (OFDM)
Downstream OFDM DCID               : 159
Downstream OFDM Profile (in-use)   : 0
Downstream OFDM Profile (dwngrd)   : 0
Downstream OFDM Profile (recomm)   : 0
Downstream OFDM Profile (unfit)    : N/A
UDC Enabled                        : N
US Frequency Range Capability      : Extended (5-85 MHz)
Extended Upstream Transmit Power   : 61dB
Max CM Transmit Power (dBmV)       : 65.00
Neq 1.6MHz Transmit Channels       : 16
Max Transmit Channel Power (dBmV)  : 52.96
Multi-Transmit Channel Mode        : Y
Max US SC-QAMs Supported           : 8
Number of US in UBG                : 8
Minimum power load in DRW (dB)     : 3.75
Max Dynamic ranging window (dBmV)  : 49.00
Min Dynamic ranging window (dBmV)  : 37.00
Upstream Channel                   : US8        US9        US10       US11
Ranging Status                     : sta        sta        sta        sta
Upstream SNR (dB)                  : 42.4       42.4       42.4       42.4
Upstream Data SNR (dB)             : 38.12      38.12      40.0       38.12
Received Power (dBmV)              : 3.00       3.00       3.00       3.00
Data Burst resiliency suspended    : N          N          N          N
Reported Transmit Power (dBmV)     : 42.00      42.25      42.25      42.75
Commanded Transmit Power (dBmV)    : 42.00      42.25      42.25      42.75
Minimum Transmit Power (dBmV)      : 17.00      17.00      17.00      17.00
Power Load (dB)                    : 10.96      10.71      10.71      10.21
Timing Offset            (97.6 ns): 2124       2122       2122       2122
Initial Timing Offset              : 1866       1866       1866       1866
Rng Timing Adj Moving Avg(0.381 ns): -512      -1         0          -69
Rng Timing Adj Lt Moving Avg       : -502       -7         0          -71
Rng Timing Adj Minimum             : -512       -256       0          -768
Rng Timing Adj Maximum             : 512        0          0          1024
Pre-EQ Good                        : 386        386        381        381
Pre-EQ Scaled                      : 0          0          0          0
Pre-EQ Impulse                     : 0          0          0          0
Pre-EQ Direct Loads                : 0          0          0          0
Good Codewords rx                  : 409641     244847     111430     77463
Corrected Codewords rx             : 0          0          0          0
Uncorrectable Codewords rx         : 0          0          0          0
Phy Operating Mode                 : atdma*     atdma*     atdma*     atdma*
Upstream Channel                   : US12       US13       US14       US15
Ranging Status                     : sta        sta        sta        sta
Upstream SNR (dB)                  : 42.4       42.4       42.4       42.4
Upstream Data SNR (dB)             : 40.0       39.8       39.8       40.0
Received Power (dBmV)              : 3.00       3.00       3.00       3.00
Data Burst resiliency suspended    : N          N          N          N
Reported Transmit Power (dBmV)     : 46.75      46.50      46.75      47.50
Commanded Transmit Power (dBmV)    : 46.75      46.50      46.75      47.50
Minimum Transmit Power (dBmV)      : 17.00      17.00      17.00      17.00
Power Load (dB)                    : 6.21       6.46       6.21       5.46
Timing Offset            (97.6 ns): 2121       2122       2123       2122
Initial Timing Offset              : 1866       1866       1866       1866
Rng Timing Adj Moving Avg(0.381 ns): 288      0          -119       9
Rng Timing Adj Lt Moving Avg       : 172        0          -169       42
Rng Timing Adj Minimum             : -1024      0          -768       -1024
Rng Timing Adj Maximum             : 1024       0          768        1024
Pre-EQ Good                        : 381        382        381        386
Pre-EQ Scaled                      : 0          0          0          0
Pre-EQ Impulse                     : 0          0          0          0
Pre-EQ Direct Loads                : 0          0          0          0
Good Codewords rx                  : 71496      74165      69571      72989
```

```
Corrected Codewords rx             : 0          0          0          0
Uncorrectable Codewords rx         : 0          0          0          0
Phy Operating Mode                 : atdma*     atdma*     atdma*     atdma*
sysDescr                           : Technicolor DOCSIS Cable Modem <<HW_REV: 1.4; VENDOR:
 Technicolor; BOOTR: 5.0.0; SW_REV: SR01.F3.09.02.01_Git_e9f9c12_DEV; MODEL: ECMXM6>>
Downstream Power                   : -8.70 dBmV (SNR = 42.60 dB)
MAC Version                        : DOC3.1
Operational Version                : DOC3.1
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Service Flow Priority              : Y
Modem Status                       : {Modem= w-online(pt), Security=assign(tek)}
Capabilities                       : {Frag=N, Concat=N, PHS=N}
Security Capabilities              : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
L2VPN type                         : {CLI=N, DOCSIS=N}
Sid/Said Limit                     : {Max US Sids=16, Max DS Saids=63}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
Extended Pkt Len Capability        : Max len of PDU = 2000 bytes, CMTS sent 2000
OFDM MRC Support                   : Max num of DS OFDM channels = 2
OFDM MTC Support                   : Max num of US OFDM channels = 2
DS OFDM Profile Support            : Max num of DS OFDM profile per channel = 5
DS OFDM QAM Modulation Support     : 0x1FD4{|QPSK|16|64|128|256|512|1024|2048|4096 QAM}
US OFDM QAM Modulation Support     : 0x1FFC{|QPSK|8|16|32|64|128|256|512|1024|2048|4096
QAM}
DS Lower Band Edge                 : 0x2{258 MHz}
DS Upper Band Edge                 : 0x1{1218 MHz}
Diplex Upper Band Edge             : 1081(-)
DTP mode                           : 0(DTP Op not supported)
DTP performance                    : 0(DTP mode not supported)
CM Capability Reject               : {1,3,15,22,23,35,36,38,44,46,47}
Flaps                              : 18(May 31 16:50:45)
Errors                             : 0 CRCs, 0 HCSes
Stn Mtn Failures                   : 0 aborts, 8 exhausted
Total US Flows                     : 8(8 active)
Total DS Flows                     : 8(8 active)
Total US Data                      : 128993 packets, 242458955 bytes
Total US Throughput                : 943 bits/sec, 0 packets/sec
Total DS Data                      : 8607907 packets, 17215304030 bytes
Total DS Throughput                : 0 bits/sec, 0 packets/sec
LB group ID assigned               : N/A
LB group ID in config file         : N/A
LB policy ID                       : 0
LB policy ID in config file        : 0
LB priority                        : 0
Tag                                :
Required DS Attribute Mask         : 0x0
Forbidden DS Attribute Mask        : 0x0
Required US Attribute Mask         : 0xF1
Forbidden US Attribute Mask        : 0x0

Service Type ID                    :
Service Type ID in config file     :
Ranging Class ID                   : 0x6
Active Classifiers                 : 14 (Max = NO LIMIT)
CM Upstream Filter Group           : 4
CM Downstream Filter Group         : 3
CPE Upstream Filter Group          : 2
CPE Downstream Filter Group        : 1
MTA Upstream Filter Group          : 10
MTA Downstream Filter Group        : 9
PS Upstream Filter Group          : 2
PS Downstream Filter Group        : 1
```

```
DSA/DSX messages                    : permit all
Dynamic Secret                      : 8F34CBD44A227651856599EEAB907D42
Voice Enabled                       : NO
DS Change Times                     : 0
Boolean Services                    : 22
CM Energy Management Capable        : Y
CM Enable Energy Management         : N
CM Enter Energy Management          : NO
Battery Mode                        : N

Battery Mode Status                 : AC_POWER_MODE
Number of Multicast DSIDs Support   : 32
MDF Capability Mode                 : 2
IGMP/MLD Version                    : MLDv2
FCType10 Forwarding Support         : Y
Features Bitmask                    : 0x0
Total Time Online                   : 16h41m  (16h41m   since last counter reset)
CM Initialization Reason            : TCS_FAILED_ON_ALL_US
```

Example of show cable modem verbose command in Cisco IOS-XE Release 16.6.1

The following is a sample output for the **verbose** option that displays the cable modem's CM-STATS-ACK capability in Cisco IOS-XE Release 16.6.1:

```
Router# show cable modem 0895.2a9b.2fb2 verbose
Security Capabilities               : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                  : {L2VPN=N, eSAFE=N}
L2VPN type                          : {CLI=N, DOCSIS=N}
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=63}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
Extended Pkt Len Capability         : Max len of PDU = 2000 bytes, CMTS sent 2000
OFDM MRC Support                    : Max num of DS OFDM channels = 2
OFDM MTC Support                    : Max num of US OFDM channels = 2
DS OFDM Profile Support             : Max num of DS OFDM profile per channel = 5
DS OFDM QAM Modulation Support      : 0x1FD4{|QPSK|16|64|128|256|512|1024|2048|4096 QAM}
US OFDM QAM Modulation Support      : 0x1FFC{|QPSK|8|16|32|64|128|256|512|1024|2048|4096
QAM}
DS Lower Band Edge                  : 0x1{108 MHz}
DS Upper Band Edge                  : 0x1{1218 MHz}
Diplex Upper Band Edge              : 569(-)
DTP mode                            : 0(DTP Op not supported)
DTP performance                     : 0(DTP mode not supported)
CM Capability Reject                : {1,3,15,22,23,35,36,38,44,47}
CM STATUS ACK Support               : Y
Flaps                               : 0()
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 0 exhausted
Total US Flows                      : 1(1 active)
Total DS Flows                      : 1(1 active)
Total US Data                       : 10 packets, 7192 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 0 packets, 0 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
```

Example of show cable modem cm-status command in Cisco IOS-XE Release 16.6.1

The following is a sample output for the **ack** option that displays the cable modems to which CM-STATUS-ACK messages are sent in Cisco IOS XE Everest 16.6.1:

```
Router# show cable modem cm-status ack
I/F     MAC Address    Event            TID   Acks  Time
C3/0/0  0895.2a9b.2f61 MDD timeout      2     1     Jan 18 11:30:46
                       QAM failure      6     1     Jan 18 11:30:41
                       MDD recovery     2     1     Jan 18 11:31:58
                       QAM recovery     2     1     Jan 18 11:31:55
C3/0/0  0895.2a9b.2fb2 MDD timeout      2     1     Jan 18 11:30:44
                       QAM failure      2     1     Jan 18 11:30:41
                       MDD recovery     2     1     Jan 18 11:32:05
                       QAM recovery     2     1     Jan 18 11:32:03
```

Example of show cable modem cm-status command in Cisco IOS XE Amsterdam 17.3.1w

The following is a sample output that displays the partial mode description:

```
Router#show cable modem ver | inc Partial
Partial-Mode Information          : reason 0x21  failed-tcs 0x20 db-tcs 0x20  (RNG, RxMER)
Partial-Mode Information           : reason 0x20  db-tcs 0x20  (RxMER)
```

Example of show cable modem cm-status command in Cisco IOS XE Bengaluru 17.6.1x

```
Router#show cable modem 4800.33ef.1dde cm-status verbose
Load for five secs: 6%/0%; one minute: 5%; five minutes: 5%
Time source is NTP, 14:40:51.438 CST Thu Nov 4 2021
I/F     MAC Address    Event            TID   Time             Description
C1/0/1  4800.33ef.1dde MDD timeout      7     Nov 4  14:40:37  DS Ch ID: 1 2 3
                       QAM failure      6     Nov 4  14:33:22  DS Ch ID: 2
                       QAM failure      5     Nov 4  14:33:18  DS Ch ID: 2
                       QAM failure      4     Nov 4  14:33:14  DS Ch ID: 2
                       QAM failure      3     Nov 4  14:32:01  DS Ch ID: 2
                       MDD timeout      2     Nov 4  14:31:48  DS Ch ID: 1
```

Table 99: show cable modem Field Descriptions

Field	Description
MAC Address	MAC address for the CM.
IP Address	IP address that the DHCP server has assigned to the CM.
IPv6 Address	IPv6 address that the DHCP server has assigned to the CM.
Dual IP	Support of dual IP for both IPv4 and IPv6 addressing.
I/F, Interface	Cable interface line card providing the upstream for this CM.
sysDescr	Vendor and model of the cable modem, as reported by the cable modem. This field displays a value only when the **cable modem remote-query** command is configured.

Field	Description
Upstream Power Downstream Power	Upstream and Downstream Power fields are displayed only if the CM remote-query feature has been enabled using the **cable modem remote-query** command. Upstream Power displays the cable modem transmit level in dBmV, and Downstream Power displays the dBmV level received at the CM, as measured by the CMTS.
MAC State	Current state of the MAC layer.
Prim SID	Primary SID assigned to this CM.
Host Interface	Host interface name.
Primary Wideband Channel ID	Bonding group ID of the wideband interface assigned to the CM.
MD-DS-SG	MAC Domain Downstream Service Group, the downstream channels of a single MAC domain that reach the cable modem.
DSID	Downstream Service Identifier.
Primary Downstream	Primary downstream channel assigned to the CM.
Wideband Capable	Cable modem is wideband-capable or not.
Downstream Channel DCID RF Channel	Downstream channel and channel ID used by a CM.
Multi-Transmit Channel Mode	Cable modem is in MTC mode or not.
UDC Enabled	Upstream Drop Classifier enabled or disabled. Displays ‘Y’ for enabled state and ‘N’ for disabled.
Upstream SNR	Upstream signal-to-noise ratio (SNR) for a particular cable modem (CM), in decibels (dB).
Upstream SM MER (dB)	Upstream station maintenance (SM) modulation error ratio (MER) for a particular cable modem, in decibels (dB).
Upstream Data MER (dB)	Upstream modulation error ratio (MER) for a particular cable modem, in decibels (dB). This field is displayed only when RF adaptation is enabled.

Field	Description
RxPwr, Received Power	Average power in dBmV for the upstream channel symbol rate for the CM. With default settings, 0 dBmV is considered optimal, but a range of -1 to 1 dBmV is allowable. When cable modems exceed this range, older Cisco IOS releases supported a drop to as low as -2 dBmV. Recent Cisco IOS releases support a drop to as low as -4 dBmV. This field supports a resolution of 0.25 dBmV, but the dB resolution level for cable modems and for the Cisco CMTS are slightly higher—approximately 1.0 and 1.4 dB. **Note** An asterisk (*) in the RxPwr column indicates that a power adjustment has been made for that CM. An exclamation point (!) indicates that the cable modem has reached its maximum power transmit level and cannot increase its power level further.
Timing Offset and Initial Timing Offset	Timing offset for the CM, in ticks, as recognized on the CMTS. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. **Note** An exclamation point (!) in the Timing Offset column indicates that the cable modem has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. **Note** The timing offset shown here is typically smaller than the TX Time Offset value shown by the **show cable modem remote-query** command, because the latter value is the offset as recognized on the cable modem (which will include any internal delay between when the cable modem software begins the transmission and when the bits actually appear on the local cable interface).
Reported Transmit Power (dBmV)	Reported Transmit Power level by the cable modem for each upstream channel. This applies only to the cable modems operating in the MTC mode.
Peak Transmit Power (dBmV)	This is the maximum transmit power level that the cable modem in the MTC mode could transmit at for the upstream channel.
Minimum Transmit Power (dBmV)	This is the minimum transmit power level that the cable modem in the MTC mode could transmit at for the upstream channel.
Rng Timing Adj Moving Avg(0.381 ns): Rng Timing Adj Lt Moving Avg: Rng Timing Adj Minimum: Rng Timing Adj Maximum:	A Cisco CMTS router tracking variables to see relative timing offset adjustments.
Pre-EQ Good : Pre-EQ Scaled : Pre-EQ Impulse: Pre-EQ Direct Loads	Equalizer statistics counter.

Field	Description
Good Codewords rx	Good code words for a particular upstream channel. This counter is reset during interface reset.
Corrected Codewords rx	Correctable code words for a particular upstream channel. This counter is reset during interface reset.
Uncorrectable Codewords rx	Uncorrectable code words for a particular upstream channel. This counter is reset during interface reset.
sysDescr	Identifies the vendor and model of the cable modem, as reported by the cable modem. This field displays a value only when the cable modem remote-query.
Num CPEs, CFG Max-CPE	Indicates the number of CPE devices for which the cable modem is providing services.
Number of CPE IPs	Indicates the maximum number of IP addresses assigned to CPE devices behind this CM, as configured by the **cable max-hosts** command.
Ver, MAC Version	Displays the maximum supported version of DOCSIS that the cable modem supports (DOCSIS 1.0, DOCSIS 1.1, DOCSIS 2.0).
QoS Prov, QoS Provisioned Mode	Displays the version of DOCSIS that the cable modem currently is provisioned for (DOCSIS 1.0, DOCSIS 1.1, DOCSIS 2.0).
Enable DOCSIS 2.0 Mode	Indicates that the cable modems are allowed to come online when in mixed-mode environments such as DOCSIS 1.0 TDMA, DOCSIS 1.1 TDMA and DOCSIS 2.0 ATDMA. This value is set to Y by default, unless the TLV 39 has been set to disabled (0) in the CM's Registration Request message or in the DOCSIS configuration file.
Phy Operating Mode	Indicates the type of PHY-layer modulation that the cable modem is using: tdma or atdma. Also indicates the TDMA/ATDMA/SCDA mode that the cable modem is operating on a specific channel.
Modem Status	Indicates the overall modem state and the security state of the primary SID.
BPI Enbld, BPI	Indicates whether or not Baseline Privacy Interface (BPI) or BPI Plus (BPI+) encryption is enabled for the CM.
DIP	Dual IP flag. Identifies whether or not ("Y" or "N") the cable modem or CPE supports both IPv4 and IPv6 addressing.
Capabilities	Indicates what the cable modem reported as its capabilities in its Registration Request message: DOCSIS fragmentation, concatenation, packet header suppression (PHS), and BPI encryption.
Security Capabilities	Indicates the privacy mode used by the cable modem (BPI or BPI+), early authentication and encryption (EAE) support, and the Key Length.

Field	Description
Optional Filtering Support	Indicates whether 802.1P or 802.1Q packet filtering is enabled for this CM.
Transmit Equalizer Support	Number of taps being used for transmit equalization.
Flaps	Number of flaps reported by this CM, with the date and time of the last flap within the parentheses.
Errors	Number of frame CRC and HCS errors reported for this CM.
Stn Mtn Failures	Number of station maintenance (cable keepalive) messages that the CMTS sent to this cable modem but did not receive any reply.
Total US Flows	Total number of upstream service flows, with the number of active service flows within the parentheses.
Total DS Flows	Total number of downstream service flows, with the number of active service flows within the parentheses.
Total US Data	Total data this cable modem has transmitted on the upstream, in packets and bytes.
Total US Throughput	Calculated throughput for this cable modem on the upstream, if available.
Total DS Data	Total data this cable modem has received on the downstream, in packets and bytes.
Total DS Throughput	Calculated throughput for this cable modem on the downstream, if available.
Active Classifiers	Current number of active classifiers for this CM, with the maximum number of allowable classifiers for this cable modem within the parentheses.
CM Required Attribute	Indicates the current required attribute-mask value.
CM Forbidden Attribute	Indicates the current forbidden attribute-mask value.
DSA/DSX messages	Indicates whether dynamic service changes (DSX) from the cable modem are permitted (permit all) or disallowed (reject all).
Voice Enabled	Indicates whether the cable modem is voice-enabled.
Number of Multicast DSIDs Support	Indicates the total number of supported multicast DSIDs.
FCType10 Forwarding Support	Indicates FCType10 Forwarding Support.

Field	Description
Dynamic Secret	Dynamically-generated shared secret (a 16-byte hexadecimal value) that was used in the cable modem's previous registration cycle. If the cable modem is currently offline, this field shows all zeroes. If a cable modem has been excluded from being processed by the dynamic shared secret feature, using the **cable dynamic-secret exclude** command, this field shows "Excluded". **Note** This field displays a value only when the **cable dynamic-secret** command has been used on the CMTS interface.
Total Time Online	Amount of time in days, hours, and minutes that this cable modem has been continuously online since it last registered with the CMTS. This field begins incrementing whenever the cable modem enters one of the online(x) MAC states, and is reset to 0 whenever the cable modem enters any other MAC state.
Event	Event type.
TID	Transaction identifier.
Count	Number of valid messages received.
Dups	Number of duplicate messages received.
Time	Time when last valid event was received.
Len/Limit Pkts	Queue length and limit in packets.
Deqs Pkts	Dequeue packets.
Drops Pkts	Dropped packets.
CIR Kbps	Committed information rate.
MIR/PR Kbps	Maximum information and peak rate.
Forwint	Forwarding interface.
SFID	Service flow identifier.
BE Queues	Best effort queues.
CIR Queues	Committed information rate queues.
Low Latency Queues	Low latency queues.
Ranging Class ID	Upstream ranging class ID.
Upstream SNR	Signal-to-noise ratio of the upstream signal (station maintenance).
Upstream Data SNR	Signal-to-noise ratio for actual data bursts.

The table below shows the possible values for the MAC state field.

Note The CM MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtscable modemstatusValue object in the CISCO-DOCS-EXT-MIB. The following symbols appended to the modem state indicate a special condition:An exclamation mark (!) indicates that the cable dynamic-secret command is used with either the mark or reject keyword and the cable modem has failed the dynamic secret authentication check.An ampersand (and) indicates that the cable modem has registered using a self-signed certificate. This is inherently not secure and can be avoided by negating the cable privacy accept-self-signed-certificate command.The asterisk () indicates that the cable modem does not satisfy the BPI+ policy and the data traffic is blocked. The cable privacy bpi-plus-policy command enforces this requirement.A hash sign () indicates that the cable modem is using an unknown configuration file. To solve this problem, use the cable dynamic-secret command with the reject keyword. This will reject registration for cable modems with DOCSIS configuration files. In Cisco IOS Releases 12.1(20)EC, 12.2(15)BC1, and earlier releases, when network access is disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) even if BPI encryption fails.

Table 100: Descriptions for the MAC State Field

MAC State Value	Description
Ranging Status Conditions for Devices Using IPv4 Addressing	
init(r1)	The cable modem sent initial ranging.
init(r2)	The cable modem is ranging. The CMTS received initial ranging from the cable modem and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed. **Note** If a cable modem appears to be stuck in this state, it could be that the cable modem is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the cable modem to finish registration and come online. Either manually move one or more cable modems to other upstreams, or enable load balancing on the upstream using the **cable load-balance group** commands.
Registration and Provisioning Status Conditions for Devices Using IPv4 Addressing If early authentication and encryption is used, the letter ‘s’ is appended to these states to indicate secure registration.	
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.

MAC State Value	Description
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a cable modem appears to be stuck in this state, the cable modem has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
init(o)	The cable modem has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the cable modem remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
Registration and Provisioning Status Conditions for Devices Using IPv6 Addressing If early authentication and encryption is used, the letter 's' is appended to these states to indicate secure registration.	
init6(s)	The Cisco CMTS router has seen the DHCPv6 SOLICIT message from the CM.
init6(a)	The Cisco CMTS router has seen the ADVERTISE message from the DHCPv6 server to the CM.
init6(r)	The Cisco CMTS router has seen the REQUEST response from the cable modem to the DHCPv6 server.
init6(i)	The Cisco CMTS router has seen the REPLY message from the DHCPv6 server to the CM.
init6(o)	The Cisco CMTS router has seen the REQEST message from the cable modem to the TFTP server.
init6(t)	The Cisco CMTS router has seen the REQUEST message from the cable modem to the TOD server.
Non-error Status Conditions	
cc(r1)	The cable modem had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The cable modem has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the cable modem is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.

MAC State Value	Description
cc(r2)	This state should normally follow cc(r1) and indicates that the cable modem has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the cable modem is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	The cable modem is considered offline (disconnected or powered down).
resetting	The cable modem is being reset and will shortly restart the ranging and registration process.
online	The cable modem has registered and is enabled to pass data on the network.
online(d)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. The cable modem does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the cable modem using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the cable modem is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.
online(ptd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	The cable modem registered, BPI is enabled and KEK is assigned.
online(pt)	The cable modem registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.
expire(pk)	The cable modem registered, BPI is enabled, KEK was assigned, but the current KEK expired before the cable modem could successfully renew a new KEK value.

MAC State Value	Description
expire(pkd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the cable modem could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	The cable modem registered, BPI is enabled, TEK was assigned, but the current TEK expired before the cable modem could successfully renew a new KEK value.
expire(ptd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the cable modem could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	
reject(m)	The cable modem attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the **cable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a cable modem attempt a TFTP download of the DOCSIS configuration file before registering, but the cable modem did not do so.
reject(c)	The cable modem attempted to register, but registration was refused due to a a number of possible errors: • The cable modem attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • The cable modem has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The cable modem attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The cable modem failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the cable modem and CMTS.)
reject(pk)	KEK key assignment is rejected, and the modem has not been authenticated.

MAC State Value	Description
reject(pkd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
reject(ts)	The cable modem attempted to register, but registration failed because the TFTP server timestamp in the cable modem registration request did not match the timestamp maintained by the CMTS. This might indicate that the cable modem attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	The cable modem attempted to register, but registration failed because the IP address in the cable modem request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
reject(na)	The cable modem attempted to register, but registration failed because the cable modem did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.
Early Authentication and Encryption is Enabled	
assign(epk)	BPI is enabled and KEK is assigned.
assign(ept)	BPI is enabled and TEK is assigned. The registration messages will be encrypted.
expire(epk)	Early authentication and encryption is enabled, KEK was assigned, but the current KEK expired before the cable modem could successfully renew a new KEK value.
expire(ept)	Early authentication and encryption is enabled, TEK was assigned, but the current TEK expired before the cable modem could successfully renew a new KEK value.
reject(epk)	Early authentication and encryption is enabled, KEK key assignment is rejected, and the modem has not been authenticated.
reject(ept)	Early authentication and encryption is enabled, TEK key assignment is rejected, and BPI encryption has not been established.
sinit(d)	Early authentication and encryption is enabled, the DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.

MAC State Value	Description
sinit6(s)	Early authentication and encryption is enabled, the Cisco CMTS router has seen the DHCPv6 SOLICIT message from the CM.
sinit(io)	Early authentication and encryption is enabled, the Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
sinit6(a)	Early authentication and encryption is enabled, the Cisco CMTS router has seen the ADVERTISE message from the DHCPv6 server to the CM.
sinit(dr)	Early authentication and encryption is enabled, the DHCP request has been sent to the cable modem.
sinit6(r)	Early authentication and encryption is enabled, the Cisco CMTS router has seen the REQUEST response from the cable modem to the DHCPv6 server.
sinit(i)	Early authentication and encryption is enabled, the cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address.
sinit6(i)	Early authentication and encryption is enabled, the Cisco CMTS router has seen the REPLY message from the DHCPv6 server to the CM.
sinit(o)	Early authentication and encryption is enabled, the cable modem has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the cable modem remains in this state, it indicates that the download has failed.
sinit6(o)	Early authentication and encryption is enabled, the Cisco CMTS router has seen the REQEST message from the cable modem to the TFTP server.
sinit(t)	Early authentication and encryption is enabled, time-of-day (TOD) exchange has started.
sinit6(t)	Early authentication and encryption is enabled, the Cisco CMTS router has seen the REQUEST message from the cable modem to the TOD server.
sreject(m)	Early authentication and encryption is enabled, the cable modem attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the cable shared-secret command.
sreject(ts)	Early authentication and encryption is enabled, the cable modem attempted to register, but registration failed because the TFTP server timestamp in the cable modem registration request did not match the timestamp maintained by the CMTS. This might indicate that the cable modem attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.

MAC State Value	Description
sreject(ip)	Early authentication and encryption is enabled, the cable modem attempted to register, but registration failed because the IP address in the cable modem request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
sreject(c)	Early authentication and encryption is enabled, the cable modem attempted to register, but registration was refused due to a a number of possible errors: • The CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the cable upstream admission-control command. • The CM has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The CM attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and CMTS.)
sreject(na)	Early authentication and encryption is enabled, the cable modem attempted to register, but registration failed because the cable modem did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.
Wideband Cable Modem	
w-online	The wideband cable modem has registered and is enabled to pass data on the network.
w-online(d)	The wideband cable modem is registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the WCMTS can continue to communicate with the WCM using DOCSIS messages and IP traffic (such as SNMP commands).
w-online(pkd)	The wideband cable modem is registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned.
w-online(pt)	The wideband cable modem is registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed.
w-online(ptd)	The wideband cable modem is registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed.
w-online(pk)	The wideband cable modem is registered, BPI is enabled and KEK is assigned.

MAC State Value	Description
w-expire(pk)	The wideband cable modem is registered, BPI is enabled, KEK was assigned, but the current KEK expired before the WCM could successfully renew a new KEK value.
w-expire(pkd)	The wideband cable modem is registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.
w-expire(pt)	The wideband cable modem is registered, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value.
w-expire(ptd)	The wideband cable modem is registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value.
w-reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
w-reject(pkd)	The wideband cable modem is registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected.
w-reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
w-reject(ptd)	The wideband cable modem is registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected.
Cable Modem is in DS Resiliency	
p-online	The cable modem is in DS resiliency, has registered and is enabled to pass data on the network.
p-reject(pk)	The cable modem is in DS resiliency, KEK key assignment is rejected, BPI encryption has not been established.
p-expire(pk)	The cable modem is in DS resiliency, has registered, BPI is enabled, KEK was assigned, but the current KEK expired before the cable modem could successfully renew a new KEK value.
p-online(pk)	The cable modem is in DS resiliency, has registered, BPI is enabled and KEK is assigned.
p-reject(pt)	The cable modem is in DS resiliency, TEK key assignment is rejected, BPI encryption has not been established.
p-expire(pt)	The cable modem is in DS resiliency, has registered, BPI is enabled, TEK was assigned, but the current TEK expired before the cable modem could successfully renew a new KEK value.
p-online(pt)	The cable modem is in DS resiliency, has registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed.

MAC State Value	Description
p-online(d)	The cable modem is in DS resiliency, has registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. The cable modem does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the cable modem using DOCSIS messages and IP traffic (such as SNMP commands).
p-reject(pkd)	The cable modem is in DS resiliency, has registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected.
p-expire(pkd)	The cable modem is in DS resiliency, has registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the cable modem could successfully renew a new KEK value.
p-online(pkd)	The cable modem is in DS resiliency, has registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned.
p-reject(ptd)	The cable modem is in DS resiliency, has registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected.
p-expire(ptd)	The cable modem is in DS resiliency, has registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the cable modem could successfully renew a new KEK value.
p-online(ptd)	The cable modem is in DS resiliency, has registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed.
Cable Modem is in Energy Management 1x1 mode	
w-online(em)	The cable modem is in energy management 1x1 mode, has registered and is enabled to pass data on the network.
w-reject(pk)(em)	The cable modem is in energy management 1x1 mode, KEK key assignment is rejected, BPI encryption has not been established.
w-expire(pk)(em)	The cable modem is in energy management 1x1 mode, has registered, BPI is enabled, KEK was assigned, but the current KEK expired before the WCM could successfully renew a new KEK value.
w-online(pk)(em)	The cable modem is in energy management 1x1 mode, has registered, BPI is enabled and KEK is assigned.
w-reject(pt)(em)	The cable modem is in energy management 1x1 mode, TEK key assignment is rejected, BPI encryption has not been established.

MAC State Value	Description
w-expire(pt)(em)	The cable modem is in energy management 1x1 mode, has registered, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value.
w-online(pt)(em)	The cable modem is in energy management 1x1 mode, has registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed.
w-online(d)(em)	The cable modem is in energy management 1x1 mode, has registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the WCMTS can continue to communicate with the WCM using DOCSIS messages and IP traffic (such as SNMP commands).
w-reject(pkd)(em)	The cable modem is in energy management 1x1 mode, has registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected.
w-expire(pkd)(em)	The cable modem is in energy management 1x1 mode, has registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.
w-online(pkd)(em)	The cable modem is in energy management 1x1 mode, has registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned.
w-reject(ptd)(em)	The cable modem is in energy management 1x1 mode, has registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected.
w-expire(ptd)(em)	The cable modem is in energy management 1x1 mode, has registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value.
w-online(ptd)(em)	The cable modem is in energy management 1x1 mode, has registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem access-group	Displays the access groups for the cable modems on a particular cable interface.

Command	Description
show cable modem calls	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more cable modems.
show cable modem counters	Displays downstream and upstream traffic counters for one or more cable modems.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem domain-name	Updates the cable-specific DNS cache and display the domain name for specified cable modems and CPE behind a cable modem on a Cisco CMTS router.
show cable modem errors	Displays error statistics for one or more cable modems.
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem ipv6	Displays IPv6 information for specified cable modems and CPE behind a cable modem on a Cisco CMTS router.
show cable modem mac	Displays MAC layer information for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem offline	Displays a list of the cable modems that are marked as offline with the Cisco CMTS.
show cable modem partial-mode	Displays information about the cable modems that are in upstream and downstream partial service mode.
show cable modem phy	Displays the DOCSIS PHY layer information for one or more cable modems.
show cable modem qos	Displays quality of service (QoS) and service flow information for a particular CM.
show cable modem registered	Displays a list of the cable modems that are marked as registered with the Cisco CMTS.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modem summary	Displays a summary of cable modems on one or more cable interfaces.
show cable modem unregistered	Displays a list of the cable modems that are marked as unregistered with the Cisco CMTS.

Command	Description
show cable modem vendor	Displays the vendor name or Organizational Unique Identifier (OUI) for the cable modems on each cable interface.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the cable modems connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem access-group

To display the access groups for the CMs on a particular cable interface, use the **show cable modem access-group** command in privileged EXEC mode.

Cisco uBR7100 series and Cisco uBR7200 series routers:
show cable modem [*ip-address* | **cable** {*slot* / *subslot* | *slot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]]*mac-address*] **access-group**

Cisco uBR10012 routers:
show cable modem cable {*slot* / *subslot* / *subslot* | *slot* / *subslot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] **access-group**

Syntax Description

ip-address	(Optional) Access-group information displayed for the CM with the specified IP address. (Cisco uBR7100 series and Cisco uBR7200 series routers only.)
mac-address	(Optional) Access-group information displayed for the CM with the specified MAC address. (Cisco uBR7100 series and Cisco uBR7200 series routers only.)
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
upstream *port*	(Optional) Displays information for all CMs using this specific upstream. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports on the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.

access-group	Displays the access groups for the CMs and their associated hosts and other customer premises equipment (CPE) devices.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3XA	This command was introduced.
12.2(4)BC1	Support for this command was added for the Cisco uBR10012 router, but only to display access groups on a per-interface basis.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.

Usage Guidelines

This command displays information only for CMs. To display information for both CMs and their associated hosts and other customer premises equipment (CPE) devices, use the **show cable device access-group** command. To display information only for hosts, use the **show cable host access-group** command.

If an SNMP manager is requesting information about CM or CPE devices at the same time that this command is given, the command displays the following error message:

```
No information is available, please try later.
```

Wait until the SNMP retrieval is done and retry the CLI command.



Note Also see the information about this command's behavior in a Hot Standby Connection-to-Connection Protocol (HCCP) configuration.

Examples

The following example shows sample output for the show cable modem access-group command on a Cisco uBR7200 series router for a particular CM:

```
Router# show cable modem 0010.7bb3.fcd1 access-group

MAC Address    IP Address      Access-group
0010.7bb3.fcd1 10.20.113.2     34
Upstream Power     : 42 dBmV (SNR = 10 dBmV)
Downstream Power   : 15 dBmV (SNR = 15 dBmV)
Router#
```



Note The upstream and downstream power fields will be displayed only if the CM remote-query feature has been enabled using the **cable modem remote-query** command.

The following example shows sample output for the **show cable modem access-group** command for a particular cable interface on a Cisco uBR10012 router:

```
Router# show cable modem c8/1/0 access-group

MAC Address    IP Address      Access-group
0050.7366.1243 22.1.1.11       1
0002.b970.0027 23.1.1.10       1
0006.5314.858d 22.1.1.10       N/A
Router#
```

Table below describes the fields that are shown in the **show cable modem access-group** display:

Table 101: Descriptions for the show cable modem access-group Fields

Field	Description
MAC Address	The MAC address for the CM.
IP Address	The IP address that the DHCP server has assigned to the CM.
Access-group	Displays the access group name or number in use (if any) for this CM.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable device access-group	Displays a list of CMs and their CPE devices, along with their access groups.
show cable host access-group	Displays a list of hosts and other CPE devices, along with their access groups.
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem calls	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem errors	Displays error statistics for one or more CMs.

Command	Description
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem asf

To display the Aggregate SF details, use the **show cable modem** *mac-address* **asf** command in privileged EXEC mode.

show cable modem *mac-address* **asf**

Syntax Description

mac-address	(Optional) MAC address of a CM that is displayed. You can also specify the MAC address for a CPE device behind a CM, and information for that CM will be displayed.
asf	Displays the Aggregate SF details.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced.

Examples

The following is a sample output of the **show cable modem** *mac-address* **asf** command.

```
Router# show cable modem 206a.9454.30a4 asf

DOWNSTREAM AGGREGATE SERVICE FLOW DETAIL:


  Aggregate SF
            ASFID:    00049
            ASF Ref:  00101
       / \
                /   \
               /     \
              /       \
   Classic SF          Low Latency SF
   SFID: 0047          SFID: 0048
   SF Ref: 00003       SF Ref: 00005

ASFID                               : 49
ASE Reference                       : 101
Priority                            : 0
Max Rate                            : 0
Max Burst                           : 3044
Min Rate                       : 0
Minimum Reserved Rate Packet Size   : 0
Peak Rate                           : 0
Low Latency SFID                    : 48
Low Latency SF Reference            : 5
Low Latency SF SCN                  :
Classic SFID                        : 47
Classic SF Reference                : 3
Classic SF SCN                      :
```

```
AOM Coupling Factor                : 0
Scheduling Weight                  : 0
Queue Protection Enable            : 0
QP Latency Threshold               : 0
QP Score Threshold                 : 0
QP Drain Rate Exponent             : 0
```

show cable modem asf sup

To display the Aggregate SF details, use the **show cable modem** *mac-address* **asf** command in privileged EXEC mode.

show cable modem *mac-address* **asf sup**

Syntax Description

mac-address	(Optional) MAC address of a CM that is displayed. You can also specify the MAC address for a CPE device behind a CM, and information for that CM will be displayed.
asf	Displays the Aggregate SF details.
asf sup	Displays the Aggregate SF details on Sup.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced.

Examples

The following is a sample output of the **show cable modem** *mac-address* **asf sup** command.

```
Router# show cable modem 206a.9454.30a4 asf sup

DOWNSTREAM AGGREGATE SERVICE FLOW DETAIL:

ASFID                              : 49
Priority                           : 0
Max Rate                           : 0
Max Burst                          : 3044
Low Latency SFID                   : 48
AOM Coupling Factor                : 0
Scheduling Weight                  : 0
Queue Protection Enable            : 0
QP Latency Threshold               : 0
QP Score Threshold                 : 0
QP Drain Rate Exponent             : 0
```

show cable modem auth-profile

To display the multicast authorization profile, and profile group information for a particular IP address or MAC address, use the **show cable modem auth-profile** command in privileged EXEC mode.

show cable modem [*ip-addressmac-address*] [**auth-profile**]

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a CM that is displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a CM that is displayed. You can also specify the MAC address for a CPE device behind a CM, and information for that CM will be displayed.
auth-profile	(Optional) Displays the multicast authorization profile, and profile group information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Use this command to display the multicast authorization profile, and the profile group information.

Examples

The following sample output of the **show cable modem auth-profile** command shows the multicast authorization profile and profile group display for a particular ip-address or mac-address.

```
Router# show cable modem 30.17.2.23 auth-profile
 Multicast Profile Information for 0025.2e34.4377
IP: 30.17.2.121
Multicast Profile Group #           : default
Router#
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show cable modem auth-profile** command:

```
Router#show cable modem 209.165.200.225 auth-profile
Multicast Profile Information for 0025.2eaf.8302
IP: 100.1.2.6
Multicast Profile Group #           : default

Router#
```

Related Commands

Command	Description
show cable multicast authorization	Displays the list of defined multicast authorization profiles and all CMs associated with corresponding profiles.
show cable multicast dsid	Displays the entire multicast downstream service identifier (DSID) database content.
show cable multicast qos	Displays the configuration information for MQoS (Group-Config, Group-QoS-Config, Group-Encryption-Config).

show cable modem calls

To display voice call information for a particular CM, use the **show cable modem calls** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *port* | *slot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **calls**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **calls**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot* / *subslot* / *cable-interface-index*] **calls**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR router—The valid range is 0 to 15.

upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. This keyword is not supported on the Cisco cBR router.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This keyword is not supported on the Cisco cBR router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This keyword is not supported on the Cisco cBR router.
calls	Display voice call information for a CM.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(13a)BC1	Support for voice call information was added to the **show cable modem** command.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **upstreamname**, **queue** keyword and the *logical-channel-index* variable were removed.

Usage Guidelines

Using the keyword options, you can display IPv6 information by IP address (IPv4 or IPv6) of a particular CM, for all CMs associated with a specified cable interface, by MAC address of a CM, or by domain name of a CM.



Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

This command supports PacketCable and PacketCable MultiMedia (PCMM) information. Additional information for voice call support with PacketCable and PacketCable MultiMedia (PCMM) is available in

the feature document PacketCable and PacketCable Multimedia for the Cisco CMTS available on Cisco.com. See the Cisco cBR Series Converged Broadband Routers PacketCable and PacketCable Multimedia Configuration Guide for Cisco cBR Series Converged Broadband Router.

Examples

This example shows the output for the default **calls** option for a particular CM:

```
Router# show cable modem calls

Cable Modem Call Status Flags:
H: Active high priority calls
R: Recent high priority calls
V: Active voice calls (including high priority)
MAC Address    IP Address      I/F       Prim  CMCallStatus  LatestHiPriCall
                                         Sid                    (min:sec)
000f.66f8.a121 10.8.130.63     C1/0/U0   175   HV                   -
```

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable calls	Displays voice call history information and status for the PacketCable Emergency 911 Services Listing and History feature.
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem errors	Displays error statistics for one or more CMs.
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem classifiers

To display information about the classifiers for a particular CM, use the **show cable modem classifiers** command in privileged EXEC mode.

Cisco uBR Series Router
show cable modem {*ip-addressmac-address*} [**name** *fqdn*] **classifiers** [**cache** | **verbose**]

Cisco cBR Series Router
show cable modem {*ip-addressmac-address*} **classifiers** [**cache** | **verbose**]

Syntax Description

ip-address	Specifies the IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, classifier information for that CM is displayed.
mac-address	Displays classifier information for the CM with the specified MAC address. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
name *fqdn*	(Optional) For Cisco uBR series router, specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.
cache	(Optional) Displays the classifiers in the cache maintained for each CM. (This cache is based on IP header field values and speeds up classifier lookups and reduces per-packet processing overhead.)
verbose	(Optional) Displays detailed information for the CM classifiers.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.1(4)CX and 12.2(4)BC1	The number of matches field was added to this command, and the command was restricted to display information for a single CM at a time.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **name** keyword was removed.

Release	Modification
cBR 17.3.1z	From Cisco IOS XE Amsterdam 17.3.1z, support for static classifiers increased from 16 downstream and 16 upstream per modem to 32 downstream and 32 upstream per modem. You can view information about the classifiers for a particular Cable Modem, using the show cable modem classifiers command in privileged EXEC mode.

Usage Guidelines

This command displays classifier information for a particular CM, identified either by its IP address, MAC address, or domain name.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Note For information about this command's behavior in a Hot Standby Connection-to-Connection Protocol (HCCP) configuration, see the "Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration" section of the **show cable modem** command.

Note From Cisco IOS XE Amsterdam 17.3.1z and later, support for static classifiers increased from 16 downstream and 16 upstream per modem to 32 downstream and 32 upstream per modem. However, there are no changes to the *static service flows* per modem or the *dynamic classifiers* per modem.

For a full configuration, there are 32 service flows (16 downstream and 16 upstream) and 64 classifiers (32 downstream and 32 upstream). The registration request (REG-REQ) size would exceed 1518 bytes. For *wideband modems*, there would not be issues as they will send REG-REQ-MP fragments. However, for *narrowband modems*, they will be stuck at init(t) because the REG-REQ size is large, and no REG-REQ is received by CMTS. Hence, when increasing the classifiers in modem configuration file of narrowband modems, you need to ensure that the REG-REQ size does not exceed 1518 bytes.

Examples

The following example shows sample output for the default **classifiers** option for a particular CM:

```
Router# show cable modem 10.4.0.81 classifiers

CfrId  SFID     CM Mac Address  Direction  State    Priority  Matches
6431   26120    0000.399f.a44f  upstream   active   128       -
6429   26054    0000.399f.a44f  upstream   active   128       -
6432   26121    0000.399f.a44f  downstream active   128       1182
6430   26055    0000.399f.a44f  downstream active   128       3934
Router#
```

Table below describes the fields that are shown in the **show cable modem classifiers** display:

Table 102: Descriptions for the show cable modem classifiers Fields

Field	Description
CfrID	Classifier ID for the classifier that is being displayed.
SFID	Service flow ID (SFID) for this classifier.
CM MAC Address	MAC address for the CM.
Direction	Identifies whether this classifier applies to the downstream or the upstream direction.
State	Classifier activation state: active or inactive.
Priority	Classifier rule priority value for this classifier.
Matches	Number of packets that have been matched to this service flow.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem calls	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem errors	Displays error statistics for one or more CMs.
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem cnr

To display information about the upstream carrier-to-noise ratio (CNR) or signal-to-noise ratio (SNR) for a particular cable modem (CM), use the **show cable modem** command in privileged EXEC mode.

show cable modem {*ip-addressmac-address* | **name** *fqdn*} **cnr**

Cisco cBR Series Converged Broadband Router
show cable modem {*ip-addressmac-address*} **cnr**

Syntax Description

ip-address	IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a customer premise equipment (CPE) device behind a CM, classifier information for that CM is displayed.
mac-address	Classifier information for the CM with the specified MAC address. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
name *fqdn*	Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable domain name system (DNS) cache on the Cisco CMTS router. This keyword is not supported on the Cisco cBR-8 router.

router

Command Modes

Privileged EXEC (#)

Command History

BC Release	Modification
12.2(4)BC2	The command was changed to its current form of **show cable modem cnr**.
12.2(8)BC2	Support was added for the Cisco uBR-LCP2-MC16S cable interface line card on the Cisco uBR10012 router.
12.2(11)BC3	Support was added for the Cisco uBR10-MC5X20S cable interface line cards on the Cisco uBR10012 router.
12.2(15)BC1	If a cable modem is offline, its CNR value is now shown as "-----".
12.2(15)BC2	Support was added for the Cisco uBR-MC16U/X and Cisco uBR-MC5X20U cable interface line cards.
12.3(17a)BC2	Support was added for the Cisco uBR-MC5X20H cable interface line card.
CX Release	Modification
12.1(7)CX1	This command was introduced (in the form of **show cable modem snr**) for Cisco uBR7200 series routers using the Cisco uBR-MC16S cable interface line card.
12.2(15)CX	Support was added for the Cisco uBR-MC28U/X cable interface line cards on the Cisco uBR7246VXR router.

BC Release	Modification
SC Release	Modification

12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes:
	• Support for the Cisco uBR7225VXR router was added.
	• Support for specifying the IPv6 address of a CM or CPE device was added.
	• The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
	• The following new initialization states were added to show initialization of CMs and CPEs supporting IPv6:
	  • init6(s)—Cisco CMTS router has seen SOLICIT message.
	  • init6(a)—Cisco CMTS router has seen ADVERTISE message.
	  • init6(r)—Cisco CMTS router has seen REQUEST message.
	  • init6(i)—Cisco CMTS router has seen REPLY message.
	  • init6(o)—Cisco CMTS router has seen version 6 TFTP request.
	  • init6(t)—Cisco CMTS router has seen version 6 TOD request.

12.2(33)SCC	The output of this command was modified to show the CNR and SNR information for multiple upstream connections providing service to a single CM.
12.2(33)SCF	The output of this command was modified to show expected power level, received carrier power level, and CNR information for all the upstream channels providing services to a CM. The SNR information is no longer displayed in the output of this command.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **name** is removed.

Usage Guidelines

The **show cable modem cnr** command displays information on the current CNR value for cable modems that are using interfaces on the following cable line cards:

- Cisco uBR-MC16U/X
- Cisco uBR-MC28U/X
- Cisco uBR10-MC5X20S/U/H
- Cisco uBR-E-28U
- Cisco uBR-E-16U
- Cisco cBR-8 CCAP line cards

For cable modems on all other interfaces, this command displays information about the current SNR value of the modem.

In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the Cisco CMTS router before any domain name can be used as part of a cable command.

Starting Cisco IOS Release 12.2(33)SCF, carrier-to-noise plus interference ratio (CNiR [CNR]) can be measured for all upstream channels irrespective of whether spectrum management is enabled or not for the upstream channels. Therefore, the output of the **show cable modem cnr** command displays only the CNR (CNiR) values for all the upstream channels for a specific cable modem.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* **cnr** command might not show a particular cable modem until the Cisco CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* **cnr** command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when the HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond with a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.



Tip In Cisco IOS Release 12.1(12)EC, Cisco IOS Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

This example shows the output of the **show cable modem cnr** command for a CM:

```
Router# show cable modem 10.20.114.34 cnr

MAC Address    IP Address      I/F         MAC         Prim  snr/cnr
                                           State       Sid   (db)
00d0.ba77.7595 10.20.114.34    Cable3/0/U5 online      1     45.00
```

This example shows the output of the **show cable modem cnr** command after an HCCP switchover. The CNR value is missing until traffic is sent to the cable modem (in this case using the **ping** command).

```
Router# show cable modem 10.10.10.46 cnr

MAC Address    IP Address      I/F         MAC         Prim  snr/cnr
                                           State       Sid   (db)
0002.fd22.aadf 10.10.10.46     C5/1/0/U5   online      1970  -----
Router# ping 10.10.10.46

Router# show cable modem 10.10.10.46 cnr

MAC Address    IP Address      I/F         MAC         Prim  snr/cnr
                                           State       Sid   (db)
0002.fd22.aadf 10.10.10.46     C5/1/0/U5   online      1970  42.00
```

This example shows the output of the **show cable modem cnr** command for all upstream ports providing service to a specified cable modem in Cisco IOS Release 12.2(33)SCC:

```
Router# show cable modem 0014.f8c1.fd1a cnr
MAC Address    IP Address      I/F         MAC         SID   snr/cnr
```

```
                                          State             (dB)
0014.f8c1.fd1a 10.10.4.1       C5/0/1/U0  online        1         33
001e.6bfb.119a 9.9.9.2         C5/0/1/U1  online        2         33
001e.6bfb.0f9e 9.9.9.3         C5/0/1/U2  online        3         33
0019.474a.d4c4 9.9.9.4         C5/0/1/U3  online        4         33
```

This example shows the output of the **show cable modem cnr** command for an upstream port providing service to a specified cable modem in Cisco IOS Release 12.2(33)SCF:

```
Router# show cable modem 0022.cea4.f0fa cnr
MAC Address    IP Address     I/F         MAC          Prim ExPwr  RxPwr  cnr
                                          State        Sid  (dBmv) (dBmv) (dB)
0022.cea4.f0fa 10.10.1.62     C8/1/14/U3  w-online     78   0.0    -0.50  23
```

Table below describes the significant fields shown in the display:

Table 103: show cable modem cnr Field Descriptions

Field	Description
MAC Address	MAC address of the CM.
IP Address	IP address that the DHCP server has assigned to the CM.
I/F	Cable interface line card providing the upstream for this CM.
MAC State	Current state of the MAC layer.
Prim Sid	Primary Sid assigned to this CM. In Cisco IOS Release 12.2(33)SCC, this field is renamed to SID and represents multiple upstream connections with unique SIDs providing service to a single CM.
ExPwr (dBmv)	Expected carrier power level, in decibel millivolts (dBmv).
RxPwr (dBmv)	Received carrier power level, in decibel millivolts (dBmv).
snr/cnr (db)	The current upstream CNR or SNR for this particular CM, in decibels (dB). In Cisco IOS Release 12.2(15)BC1 and later releases, this field shows "-----" for offline cable modems. **Note** You can also use the **show controllers cable** command to display the SNR or CNR for a cable interface line card, but this value is only an estimate because it uses a random sampling of modems to determine the average for the card at any particular time. The CNR value shown by the **show controllers cable** command can therefore appear to fluctuate compared to the individual values shown by the **show cable modem cnr** command.

Table below shows the possible values for the MAC state field.

Table 104: MAC State Field Descriptions

MAC State Value[13]	Description
Registration and Provisioning Status Conditions for Devices Using IPv4 Addressing	
init(r1)	CM sent initial ranging.

MAC State Value[13]	Description
init(r2)	CM is ranging. The Cisco CMTS received initial ranging from the CM and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed. **Note** If a CM appears to be stuck in this state, it could be that the CM is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the CM to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the **cable load-balance group** commands.
init(d)	DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	Cable modem has broadcast a DHCP REQUEST packet back to the DHCP server.
init(i)	Cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a CM appears to be stuck in this state, the CM has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	Cisco CMTS learns the DHCP offer that is sent to the cable modem from the DHCP server, which has assigned an IP address to the modem.
init(o)	CM has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the CM remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (ToD) exchange has started.
resetting	CM is being reset and will shortly restart the registration process.
Registration and Provisioning Status Conditions for Devices Using IPv6 Addressing	
init6(s)	Cisco CMTS router learns the DHCPv6 SOLICIT message from the CM.
init6(a)	Cisco CMTS router learns the ADVERTISE message from the DHCPv6 server to the CM.
init6(r)	Cisco CMTS router learns the REQUEST response from the CM to the DHCPv6 server.
init6(i)	Cisco CMTS router learns the REPLY message from the DHCPv6 server to the CM.

MAC State Value[13]	Description
init6(o)	Cisco CMTS router learns the REQUEST message from the CM to the TFTP server.
init6(t)	Cisco CMTS router learns the REQUEST message from the CM to the ToD server.
Non-error Status Conditions	
cc(r1)	CM had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the Cisco CMTS. The CM has begun moving to the new channel, and the Cisco CMTS has received the initial ranging of the CM on the new downstream or upstream channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
cc(r2)	This state should normally follow cc(r1) and indicates that the CM has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	CM is considered offline (disconnected or powered down).
online	CM has registered and is enabled to pass data on the network.
online(d)	CM is registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the Cisco CMTS can continue to communicate with the CM using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the CM is using BPI encryption unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	CM is registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.
online(ptd)	CM is registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	CM is registered, BPI is enabled and KEK is assigned.

MAC State Value[13]	Description
online(pt)	CM is registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.
Note If an exclamation point (!) appears in front of one of the online states, it indicates that the **cable dynamic-secret** command has been used with either the **mark** or **reject** option, and that the cable modem has failed the dynamic secret authentication check.	
expire(pk)	CM is registered, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.
expire(pkd)	CM is registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	CM is registered, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.
expire(ptd)	CM is registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	
reject(m)	CM attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the Cisco CMTS with the **cable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so.

MAC State Value[13]	Description
reject(c)	CM attempted to register, but registration was refused due to a a number of possible errors: • CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • CM has been disabled because of a security violation. • Bad class of service (CoS) value in the DOCSIS configuration file. • CM attempted to create a new CoS configuration but the Cisco CMTS is configured to not permit such changes. • CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and Cisco CMTS.)
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
reject(pkd)	CM is registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	CM is registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
Note In Cisco IOS Release 12.1(20)EC, Cisco IOS Release 12.2(15)BC1, and earlier releases, when network access is disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) even if BPI encryption fails. Use the **show cable modem** *mac-address* command to confirm whether BPI is enabled or disabled for a particular cable modem.	
reject(ts)	CM attempted to register, but registration failed because the TFTP server timestamp in the CM registration request did not match the timestamp maintained by the CMTS. This might indicate that the CM attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	CM attempted to register, but registration failed because the IP address in the CM request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
reject(na)	CM attempted to register, but registration failed because the CM did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the Cisco CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.

[13] The CM MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtsCmStatusValue object in the CISCO-DOCS-EXT-MIB.

Note For the complete list of the cable modem status, see Table 100: Descriptions for the MAC State Field , on page 1892.

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show cable modem cnr** command on the Cisco cBR-8 router:

```
Router#show cable modem 10.10.2.8 cnr
MAC Address    IP Address     I/F          MAC          Prim ExPwr  RxPwr  cnr
                                           State        Sid  (dBmv) (dBmv) (dB)
0025.2eaf.82e4 100.1.2.8      C1/0/0/U0    online       50   -1.0   -1.00  40

Router#
```

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modulation-profile	Displays modulation profile group information.
show cable modem remote-query	Displays information collected by the remote-query feature.
show controllers cable	Displays information about the interface controllers for a cable interface on the Cisco CMTS router.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem connectivity

To display connectivity statistics for one or more cable modems , use the **show cable modem connectivity** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *port* | *slot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **connectivity**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **connectivity**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot* / *subslot* / *cable-interface-index*] **connectivity**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. (Cisco cBR-8 router—) The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router— The valid range is from 0 to 15.

upstream *port*	(Optional) Displays information for all cable modems using this specific upstream. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports on the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX and 12.2(4)BC1	This command was introduced (and the **connectivity** option was removed from the **show interface cable sid** command).
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **upstream** and **name** keywords and *logical-channel-index* variable were removed.

Usage Guidelines

This command displays connectivity information for all cable modems , for all cable modems attached to a specific CMTS cable interface, or for a particular CM, as identified by its IP address or MAC address.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time

a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Note The **show cable modem connectivity** command replaces the **connectivity** option for the **show interface cable sid** command, because the connectivity statistics are better managed on a per-modem basis than on a per-SID basis.

Examples

The following example shows sample output for the **show cable modem connectivity** command for all online cable modems :

```
Router# show cable modem connectivity

Prim  1st time    Times  %online     Online time            Offline time
Sid   online      Online          min     avg     max     min     avg     max
1     Apr 28 2003 1      99.67   00:00   1d1h9m  1d1h9m  05:38   04:58   05:38
2     Apr 28 2003 1      99.66   00:00   1d1h8m  1d1h8m  05:46   05:02   05:46
3     Apr 28 2003 1      99.69   00:00   1d1h7m  1d1h7m  05:18   04:34   05:18
```

The following example shows sample output for the **show cable modem connectivity** command for all online cable modems for a particular cable interface:

```
Router# show cable modem c8/1/0 connectivity

Prim  1st time    Times  %online     Online time            Offline time
Sid   online      Online          min     avg     max     min     avg     max
1     Apr 28 2003 1      99.67   00:00   1d1h12m 1d1h12m 05:38   04:58   05:38
2     Apr 28 2003 1      99.66   00:00   1d1h11m 1d1h11m 05:46   05:02   05:46
3     Apr 28 2003 1      99.69   00:00   1d1h11m 1d1h11m 05:18   04:34   05:18
```

The following example shows sample output for the **show cable modem connectivity** command for a particular CM:

```
Router# show cable modem 0010.7bb3.fcd1 connectivity

Prim  1st time    Times  %online     Online time            Offline time
Sid   online      Online          min     avg     max     min     avg     max
1     May 30 2000 4      99.85   48:20   11h34m  1d2h23m 00:01   00:59   03:00
```

Table below describes the information shown in the **show cable modem connectivity** displays:

Table 105: Descriptions for the show cable modem connectivity Fields

Field	Description
Prim SID	The primary SID assigned to this CM.
1st time online	First time at which the modem with this SID connected.
Times online	Number of times the modem with this SID connected.
% online	Percentage of time the modem with this SID has been connected.
Online time	The minimum, average, and maximum number of days, hours, and minutes the modem with this SID has been connected. **Note** A CM is considered online when it has completed the registration process and has communicated with the DHCP, TFTP, and TOD servers.
Offline time	The minimum, average, and maximum number of days, hours, and minutes the modem with this SID has been disconnected. **Note** A CM is considered offline after it has missed 16 consecutive station maintenance messages.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered cable modems .
show cable modem calls	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.

Command	Description
show interface cable modem	Displays information about the cable modems connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem counters

To display downstream and upstream traffic counters for one or more cable modems (CMs), use the **show cable modem counters** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers

show cable modem [*ip-addressmac-address* | **cable** {*slot /port* | *slot /cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **counters**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot /subslot /port* | *slot /subslot /cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **counters**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot /subslot/cable-interface-index*] **counters**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. (Cisco cBR-8 router—) The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router— The valid range is from 0 to 15.

upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.
counters	Displays downstream and upstream traffic counters for one or more cable modems.

Command Default

Displays counter information for all CMs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX and 12.2(4)BC1	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **upstream** and **name** keywords and *logical-channel-index* variable were removed.

Usage Guidelines

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time

a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Examples

The following example shows sample output for the **show cable modems counters** command for all CMs:

```
Router# show cable modem counters
MAC Address    US Packets   US Bytes   DS Packets   DS Bytes
0050.7366.1243 29           2126       29           2126
0002.b970.0027 1811         116174     29           2126
0006.5314.858d 329154       21071059   134607       9961268
Router#
```

The following example shows sample output for the **show cable modems counters** command for all CMs on a particular cable interface:

```
Router# show cable modem c8/1/0 counters

MAC Address    US Packets   US Bytes   DS Packets   DS Bytes
0050.7366.1243 29           2126       29           2126
0002.b970.0027 1811         116174     29           2126
0006.5314.858d 329154       21071059   134607       9961268
Router#
```

The following example shows sample output for the **show cable modems counters** command for a particular CM, as identified by its MAC address:

```
Router# show cable modem 0010.7bb3.fcd1 counters

MAC Address    US Packets   US Bytes   DS Packets   DS Bytes
0010.7bb3.fcd1 1452082      171344434  1452073      171343858
Router#
```

The following example shows sample output for the **show cable modems counters** command for a particular CM, as identified by its IP address:

```
Router# show cable modem 23.1.1.10 counters

MAC Address    US Packets   US Bytes   DS Packets   DS Bytes
0002.b970.0027 1811         116174     29           2126
Router#
```

Note When a DCC occurs, the cable modem US and DS counters are reset. The US and DS counters include counters such as data and throughput seen in the **show cable modem** (**mac-address**) verbose command output and packets and bytes seen in the **show cable modem** (**mac-address**) **counters** command output.

Table below describes the fields shown in the **show cable modem counters** displays:

Table 106: Descriptions for the show cable modem counters Fields

Field	Description
MAC Address	MAC address for the CM.
US Packets	Number of packets this CM has transmitted on the upstream.
US Bytes	Number of bytes this CM has transmitted on the upstream.
DS Packets	Number of packets this CM has received on the downstream.
DS Bytes	Number of byte this CM has received on the downstream.

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.
show cable modem calls	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem qos	Displays quality of service (QoS) and service flow information for a particular CM.
show cable modem registered	Displays a list of the CMs that are marked as registered with the Cisco CMTS.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modem unregistered	Displays a list of the CMs that are marked as unregistered with the Cisco CMTS.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.

Command	Description
show interface cable sid	Displays cable interface information.

show cable modem cpe

To display the customer premise equipment (CPE) devices accessing the cable interface through a particular cable modem (CM), use the **show cable modem cpe** command in privileged EXEC mode.

show cable modem {*ip-addressmac-address* | **name** *fqdn*} **cpe**

Cisco cBR Series Converged Broadband Router
show cable modem {*ip-addressmac-address*} **cpe**

Syntax Description

ip-address	Displays the CPE devices for the CM with the specified IPv4 or IPv6 address.
mac-address	Displays the CPE devices for the CM with the specified MAC address.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This keyword is not supported on the Cisco cBR-8 router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3XA	This command was introduced.
12.1(4)CX and 12.2(4)BC1	The command was simplified to display only the IP and MAC addresses for the CPE devices.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCI1	The output of the command is modified. The command output displays the device class information for IPv6 devices.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **name** is removed.

Usage Guidelines

This command lists the CPE devices that are accessing the cable network through a particular CM. You can identify the CM either by its IP address or by its MAC address.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

This example shows sample output for the **show cable modem cpe**command, listing the CPE devices by their MAC and IP addresses:

```
Router# show cable modem 0019.474a.c14a cpe

IP address         MAC address      Dual IP
50.3.37.3         0005.0052.2c1d      Y
```

Table 107: show cable modem cpe Field Descriptions

Field	Description
IP Address	IP address acquired by the CPE.
MAC Address	MAC address of the CPE.
Dual IP	Dual IP flag. Identifies whether or not (“Y” or “N”) the CPE supports both IPv4 and IPv6 addressing.

Effective with Cisco IOS Release 12.2(33)SCI1, the output for the **show cable modem cpe**command lists the device class details as shown by this example:

```
Router#show cable modem 54d4.6ffb.2ddf cpe
IP address        MAC address      Dual IP     Device Class
---               0000.0475.1702     N          MTA
---               0000.0475.1701     N          Host
---               0000.0475.1703     N          Host
```

This example shows the output of the **show cable modem cpe** on the Cisco cBR-8 router:

```
Router#show cable modem 0025.2eaf.7f38 cpe
MAC address       IP address       Dual IP     Device Class
b8c7.5dcd.04cd    192.0.2.10       Y           Host
```

Table 108: show cable modem cpe Field Descriptions

Field	Description
IP Address	IP address acquired by the CPE.
MAC Address	MAC address of the CPE.
Dual IP	Dual IP flag. Identifies whether or not (“Y” or “N”) the CPE supports both IPv4 and IPv6 addressing.
Device Class	Device class of the CPE.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem calls	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem errors	Displays error statistics for one or more CMs.
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.

Command	Description
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem docsis device-class

To display the DOCSIS device-class information for cable modems (CMs) on all or specified cable interfaces and upstreams, use the **show cable modem docsis device-class** command in privileged EXEC configuration mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem docsis device-class [**summary** [**cable** *slot/subslot* [**cable** *slot/subslot*] [**upstream** *port1 port2*]]] [**total**]
show cable modem cable *slot/subslot* **docsis device-class summary**

Cisco uBR10012 Router
show cable modem docsis device-class [**summary** [**cable** *slot/subslot /port* [**cable** *slot/subslot /port*] [**upstream** *port1 port2*]]] [**total**]
show cable modem cable *slot/subslot /port* **docsis device-class summary**

Cisco cBR Series Converged Broadband Router
show cable modem docsis device-class [**summary** [**cable** *slot/subslot /cable-interface-index* [**cable** *slot/subslot /cable-interface-index*]]] [**total**]
show cable modem docsis device-class {*withip*}
show cable modem cable *slot /subslot /cable-interface-index* **docsis device-class** [**summary**]

Syntax Description

summary	(Optional) Displays a summary of DOCSIS device class information for cable modems on all or specified cable interfaces on the CMTS router.
cable *slot/subslot* [**cable** *slot /subslot*]	(Optional) Specifies a single cable interface, or a range of cable interfaces on a Cisco uBR7100 or Cisco uBR7200 series router, whose cable modems you want to display information about, where: • *slot* —Specifies the chassis slot number of the cable interface line card. • *subslot* —Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot /subslot /port* [**cable** *slot /subslot /port*]	(Optional) Specifies a single cable interface, or a range of cable interfaces on a Cisco uBR10012 router, whose cable modems you want to display information about, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port*—Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.

cable *slot /subslot /cable-interface-index*	(Optional) Specifies a single cable interface, or a range of cable interfaces on a Cisco cBR Series Converged Broadband Router, whose cable modems you want to display information about, where: • *slot*—Specifies the chassis slot number of the cable interface line card. Valid slots are 0 to 3 and 6 to 9. • *subslot*—Specifies the secondary slot number of the cable interface line card. Valid subslots is 0. • *cable-interface-index*—Specifies the MAC domain index . Valid index numbers are 0 to 15.
upstream *port1 port2*	(Optional) Specifies a specific upstream port, or a range of upstream ports on the specified cable interface(s), whose cable modems you want to display information about, where: • *port1*—Specify only *port1* if you want to display information about a single upstream. When used with the *port2* argument, specifies the beginning of a range of upstream ports, and *port1* must be a lower-numbered port than *port2*. • *port2*—Specifies the end of a range of upstream ports, and *port2* must be a higher-numbered port than *port1*.
upstream *chan1 chan2*	(Optional for Cisco cBR-8router) Specifies a specific upstream channel, or a range of upstream channels on the specified cable interface(s), whose cable modems you want to display information about, for a Cisco cBR Series Converged Broadband Router where: • *chan1*—Specify only *chan1* if you want to display information about a single upstream. When used with the *chan2* argument, specifies the beginning of a range of upstream ports, and *chan1* must be a lower-numbered port than *chan2*. • *chan2*—Specifies the end of a range of upstream channels, and *chan2* must be a higher-numbered channel than *chan1*.
total	(Optional) Displays a total of DOCSIS device-class information for the cable modems connected to all interfaces, or to the specified cable interfaces.

withip	(Optional) Displays docsis device-class with IP addresses of the cable modems. The following two columns are displayed in the output:
	• DIP—Displays whether the CM is configured with IPv6 and IPv4
	  • Y—CM is configured to dual IP
	  • N—CM is configured with either IPv4 or IPv6
	• IP Address—Displays the IPv6 address if the CM is configured with only IPv6. Otherwise, it displays IPv4 address.

Command Default None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCI1	The output of this command is modified. The output displays the device class of IPv6 single stack cable modems.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.
IOS-XE 3.18.1SP	This command was modified. The *withip* keyword argument was added in this release.

Usage Guidelines

This command displays a summary of DOCSIS device-class information for all cable modems for a single cable interface, or for a range of cable interfaces, and optionally specified upstreams on those cable interfaces.

Examples

The following example shows typical output for the default form of the **show cable modem docsis device-class** command on a Cisco uBR100012 router:

```
Router# show cable modem docsis device-class
MAC Address    I/F       MAC            Prim  Reg      Device Class     Reg
                         State          Sid   Ver  -------------------- Priv
0030.80bc.22b9 C3/0/U0   online(pt)     1     1.0  CM                    BPI
0000.cadb.04b2 C3/0/U0   online(pt)     2     1.1  eCM eMTA              BPI+
0000.cadb.0512 C3/0/U0   online(pt)     3     1.1  eCM eMTA eSTB         BPI+
0003.e38f.f5c7 C3/0/U1   online(pt)     4     1.0  CM                    BPI
0000.cadb.0bae C3/0/U1   online(pt)     5     1.1  eCM           ePS     BPI+
0010.7b6b.77ed C3/0/U2   online         6     1.0  CM
0000.cadb.0356 C4/0/U0   online(pt)     1     1.1  eCM eMTA              BPI+
0000.cadb.02a6 C4/0/U0   init(d)        2     n/a  <unavailable>
0000.cadb.2f7a C4/0/U1   online(pt)     3     2.0  eCM      eSTB         BPI+
0000.cadb.2952 C4/0/U2   online(pt)     4     1.1  eCM      eSTB ePS     BPI+
0000.cadb.0236 C4/0/U2   init(d)        6     n/a  <unavailable>
0003.e3a6.850d C4/0/U3   online(pt)     7     1.1  eCM eMTA      ePS     BPI+
0003.e3a6.85ad C4/0/U3   online(pt)     8     1.0  CM                    BPI
```

The following example shows a typical output of the **show cable modem docsis device-class** *withip* command on a Cisco cBR Series Converged Broadband Router:

```
Router# show cable modem docsis device-class withip
                                                                                D

MAC Address    I/F           MAC               Prim Reg      Device Class      Reg  I IP
Address
                             State             Sid  Ver  --------------------  Priv P

c8fb.26a3.c694 C8/0/0/UB     w-online(pt)      1    3.0  CM                    BPI+ Y
88.22.0.8
c8fb.26a3.bc1e C8/0/0/UB     w-online(pt)      2    3.0  CM                    BPI+ Y
88.22.0.11
c8fb.26a3.c160 C8/0/0/UB     w-online(pt)      3    3.0  CM                    BPI+ Y
88.22.0.37
```

```
c8fb.26a3.c18c C8/0/0/UB      w-online(pt)      4    3.0  CM                   BPI+ Y
88.22.0.134
c8fb.26a3.c6ee C8/0/0/UB      w-online(pt)      14   3.0  CM                   BPI+ Y
88.22.0.38
c8fb.26a3.c25c C8/0/0/UB      w-online(pt)      15   3.0  CM                   BPI+ Y
88.22.0.41
c8fb.26a3.7fd6 C8/0/0/UB      w-online(pt)      16   3.0  CM                   BPI+ Y
88.22.0.15
c8fb.26a3.b8e8 C8/0/0/UB      w-online(pt)      17   3.0  CM                   BPI+ Y
88.22.0.29
c8fb.26a3.c510 C8/0/0/UB      w-online(pt)      18   3.0  CM                   BPI+ Y
88.22.0.10
c8fb.26a3.c524 C8/0/0/UB      w-online(pt)      19   3.0  CM                   BPI+ Y
88.22.0.40
c8fb.26a3.c1ac C8/0/0/UB      w-online(pt)      20   3.0  CM                   BPI+ Y
88.22.0.43
c8fb.26a3.e158 C8/0/0/UB      w-online(pt)      39   3.0  CM                   BPI+ Y
88.22.0.27
c8fb.26a3.c452 C8/0/0/UB      w-online(pt)      76   3.0  CM                   BPI+ Y
88.22.0.7
c8fb.26a3.c722 C8/0/0/UB      w-online(pt)      77   3.0  CM                   BPI+ Y
88.22.0.12
c8fb.26a3.c68a C8/0/0/UB      w-online(pt)      78   3.0  CM                   BPI+ Y
88.22.0.30
c8fb.26a3.c528 C8/0/0/UB      w-online(pt)      151  3.0  CM                   BPI+ Y
88.22.0.45
c8fb.26a3.c6ec C8/0/1/UB      w-online(pt)      1    3.0  CM                   BPI+ Y
88.22.0.95
```

The following example shows sample output for the **show cable modem docsis device-class** command for a particular cable interface, in chassis slot 3 and subslot 0:

```
Router# show cable modem cable3/0 docsis device-class
MAC Address    I/F       MAC            Prim  Reg      Device Class     Reg
                         State          Sid   Ver  -------------------- Priv
0030.80bc.22b9 C3/0/U0   online(pt)     1     1.0  CM                   BPI
0000.cadb.04b2 C3/0/U0   online(pt)     2     1.1  eCM eMTA             BPI+
0000.cadb.0512 C3/0/U0   online(pt)     3     1.1  eCM eMTA eSTB        BPI+
0003.e38f.f5c7 C3/0/U1   online(pt)     4     1.0  CM                   BPI
0000.cadb.0bae C3/0/U1   online(pt)     5     1.1  eCM           ePS    BPI+
0010.7b6b.77ed C3/0/U2   online         6     1.0  CM
```

Table 109: show cable modem docsis device-class Field Descriptions

Field	Description
MAC Address	The MAC address of the CM.
I/F	The cable interface line card providing the upstream for this CM.
MAC State	The current state of the MAC layer.
Prim Sid	The primary SID assigned to this CM.
Reg Ver	Displays the maximum supported version of DOCSIS that the CM supports. The possible values are: DOCSIS 1.0, DOCSIS 1.1, DOCSIS 2.0, and DOCSIS 3.0. Shows “n/a” if the modem is not online.

Field	Description
Device Class	Displays the device-class information for the PacketCable device. The modem can report its device-class type during registration. The possible values are: • CM or eCM—A standalone cable modem or embedded CM. • ePS—Embedded Portal Services • eMTA—Embedded Multimedia Terminal Adapter • eSTB—Embedded Set Top Box • unavailable—The CM has not reported its device class.
Reg Priv	Indicates whether Baseline Privacy Interface (BPI) or BPI Plus (BPI+) encryption is enabled for the CM.

Examples for Summary and Total Options

The following example shows the corresponding display for the **show cable modem docsis device-class total** command:

```
Router# show cable modem docsis device-class total

             Online  unrep CM    eCM   eMTA  eSTB  ePS
Total:       13      2     4     7     4     3     3
```

The following example shows sample output for the **show cable modem docsis device-class summary** form of the command on a Cisco CMTS router:

```
Router# show cable modem docsis device-class summary
                        DOCSIS Device Class
                      ----------------------------
Interface     Online  unrep CM    eCM   eMTA  eSTB  ePS
Cable3/0/U0   3       0     1     2     2     1     0
Cable3/0/U1   2       0     1     1     0     0     1
Cable3/0/U2   1       0     1     0     0     0     0
Cable4/0/U0   2       1     0     1     1     0     0
Cable4/0/U1   1       0     0     1     0     1     0
Cable4/0/U2   2       1     0     1     0     1     1
Cable4/0/U3   2       0     1     1     1     0     1
```

The following example shows sample output for the **show cable modem docsis device-class summary** command with the **total** option on a Cisco CMTS router:

```
Router# show cable modem docsis device-class summary total
                        DOCSIS Device Class
                      ----------------------------
Interface     Online  unrep CM    eCM   eMTA  eSTB  ePS
Cable3/0/U0   3       0     1     2     2     1     0
Cable3/0/U1   2       0     1     1     0     0     1
Cable3/0/U2   1       0     1     0     0     0     0
Cable4/0/U0   2       1     0     1     1     0     0
Cable4/0/U1   1       0     0     1     0     1     0
Cable4/0/U2   2       1     0     1     0     1     1
Cable4/0/U3   2       0     1     1     1     0     1
```

```
Total:        13      2     4     7     4     3     3
```

The following example shows sample output for the **show cable modem docsis device-class summary total** command for all enabled upstreams on a specific cable interface line card on a Cisco CMTS router:

```
Router# show cable modem docsis device-class summary cable 3/0 total
                        DOCSIS Device Class
                       ----------------------------
Interface     Online  unrep CM    eCM   eMTA  eSTB  ePS
Cable3/0/U0   3       0     1     2     2     1     0
Cable3/0/U1   2       0     1     1     0     0     1
Cable3/0/U2   1       0     1     0     0     0     0
Total:        6       0     3     3     2     1     1
```

The following example shows sample output for the **show cable modem docsis device-class summary total** command for a range of interfaces on a Cisco CMTS router:

```
Router# show cable modem docsis device-class summary cable 3/0 cable 4/0 total
                        DOCSIS Device Class
                       ----------------------------
Interface     Online  unrep CM    eCM   eMTA  eSTB  ePS
Cable3/0/U0   3       0     1     2     2     1     0
Cable3/0/U1   2       0     1     1     0     0     1
Cable3/0/U2   1       0     1     0     0     0     0
Cable4/0/U0   2       1     0     1     1     0     0
Cable4/0/U1   1       0     0     1     0     1     0
Cable4/0/U2   2       1     0     1     0     1     1
Cable4/0/U3   2       0     1     1     1     0     1
Total:        13      2     4     7     4     3     3
```

The following example shows sample output for the **show cable modem docsis device-class summary total** command for a range of interfaces and upstreams on a CMTS router:

```
Router# show cable modem docsis device-class summary cable 3/0 cable 4/0 upstream 0 2 total

                        DOCSIS Device Class
                       ----------------------------
Interface     Online  unrep CM    eCM   eMTA  eSTB  ePS
Cable3/0/U0   3       0     1     2     2     1     0
Cable3/0/U1   2       0     1     1     0     0     1
Cable3/0/U2   1       0     1     0     0     0     0
Cable4/0/U0   2       1     0     1     1     0     0
Cable4/0/U1   1       0     0     1     0     1     0
Cable4/0/U2   2       1     0     1     0     1     1
Total:        11      2     3     6     3     3     2
```

The following example shows sample output for the **show cable modem docsis device-class summary total** command for a range of upstreams on an interface:

```
Router# show cable modem docsis device-class summary cable3/0 upstream 0 1 total

                        DOCSIS Device Class
                       ----------------------------
Interface     Online  unrep CM    eCM   eMTA  eSTB  ePS
Cable3/0/U0   3       0     1     2     2     1     0
Cable3/0/U1   2       0     1     1     0     0     1
```

```
Total:        5       0     2     3     2     1     1
```

The following example shows sample output for the **show cable modem docsis device-class summary** command for all enabled upstreams on a specific cable interface line card:

```
Router# show cable modem cable3/0 docsis device-class summary
                         DOCSIS Device Class
                        ----------------------------
Interface     Online  unrep CM    eCM   eMTA  eSTB  ePS
Cable3/0/U0   3       0     1     2     2     1     0
Cable3/0/U1   2       0     1     1     0     0     1
Cable3/0/U2   1       0     1     0     0     0     0
Total:        6       0     3     3     2     1     1
```

Table 110: show cable modem docsis device-class summary Field Descriptions

Field	Description
Interface	Name of the cable interface and associated upstreams on the Cisco CMTS router.
Online	Total number of cable modems currently online on this cable interface.
unrep	Total number of cable modems on this interface for which the device-class information is unreported or unavailable.
CM	Total number of cable modems on this interface that have a reported device class as a standalone cable modem.
eCM	Total number of cable modems on this interface that have reported the device class as an embedded cable modem.
eMTA	Total number of cable modems on this interface that have reported the device class as an embedded multimedia terminal adapter.
eSTB	Total number of cable modems on this interface that have reported the device class as an embedded set-top box.
ePS	Total number of cable modems on this interface that have reported the device class as embedded portal services.
eRTR	Total number of cable modems on this interface that have reported the device class as an embedded router.
Total	The total number of all cable modems reported online and for a given DOCSIS device class across all cable interfaces on the Cisco CMTS router.

Effective from Cisco IOS Release 12.2(33)SCI1, the output of the **show cable modem docsis device-class** command displays the device class details for IPv6 single stack cable modems as shown by this example:

```
Router#show cable modem docsis device-class
MAC Address    I/F           MAC             Prim Reg      Device Class     Reg
                             State           Sid  Ver  -------------------- Priv
```

```
e448.c70c.98fd C5/0/0/U1      online(pt)       1    3.0  CM MTA               BPI+
38c8.5cb2.6e3e C5/0/0/U2      online(pt)       2    3.0  CM MTA     PS        BPI+
4458.2945.357e C5/0/0/U2      online(pt)       3    3.0  CM                   BPI+
54d4.6ffb.307f C5/0/1/U3      w-online(pt)     1    3.0  CM MTA               BPI+
4458.2945.48e8 C6/1/0/U3      online(pt)       1    3.0  CM                   BPI+
68ee.96d9.499b C6/1/0/U2      online(pt)       2    3.0  CM            RTR    BPI+
38c8.5cc1.623a C6/1/0/U3      online(pt)       3    2.0  CM                   BPI+
54d4.6ffb.2ddf C6/1/0/U3      online(pt)       4    3.0  CM MTA               BPI+
1859.3356.8578 C6/1/0/U3      online(pt)       5    3.0  CM                   BPI+
```

This example shows the output for a specific IPv6 cable modem, using the **| include** option for extracting specific parts of the output.

```
Router#show cable modem docsis device-class | include 54d4.6ffb.2ddf
MAC Address    I/F            MAC              Prim Reg      Device Class     Reg
                              State            Sid  Ver  -------------------- Priv
54d4.6ffb.2ddf C6/1/0/U3      online(pt)       4    3.0  CM MTA               BPI+
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the the output of the **show cable modem docsis device-class** command on the Cisco cBR-8router:

```
Router#show cable modem docsis device-class
MAC Address    I/F            MAC          Prim Reg      Device Class     Reg
                              State        Sid  Ver  -------------------- Priv
0025.2e2d.75be C3/0/0         online       42   3.0  CM
0025.2eaf.82f4 C3/0/0         online       43   3.0  CM
0025.2e2d.74f8 C3/0/0         online       44   3.0  CM
0025.2eaf.82e4 C3/0/0         online       45   3.0  CM
0025.2eaf.7f38 C3/0/0         online       46   3.0  CM
0025.2eaf.8302 C3/0/0         online       47   3.0  CM
c8fb.26a5.56ca C3/0/1         online       17   3.0  CM
c8fb.26a5.54e0 C3/0/1         online       18   3.0  CM
c8fb.26a5.5792 C3/0/1         online       19   3.0  CM
c8fb.26a5.5866 C3/0/1         online       20   3.0  CM
c8fb.26a5.52f2 C3/0/1         online       21   3.0  CM
c8fb.26a5.57a6 C3/0/1         online       22   3.0  CM
c8fb.26a5.57f4 C3/0/1         online       23   3.0  CM
c8fb.26a5.55ac C3/0/1         online       24   3.0  CM
c8fb.26a5.572e C3/0/1         online       25   3.0  CM
c8fb.26a5.5936 C3/0/1         online       26   3.0  CM
c8fb.26a5.5400 C3/0/1         online       27   3.0  CM
c8fb.26a5.5814 C3/0/1         online       28   3.0  CM
c8fb.26a5.5574 C3/0/1         online       29   3.0  CM
c8fb.26a5.5810 C3/0/1         online       30   3.0  CM
c8fb.26a5.56b6 C3/0/1         online       31   3.0  CM
c8fb.26a5.5580 C3/0/1         online       32   3.0  CM
c8fb.26a5.5376 C3/0/3         online       105  3.0  CM
c8fb.26a5.5624 C3/0/3         online       106  3.0  CM
c8fb.26a5.560a C3/0/3         online       107  3.0  CM
c8fb.26a5.53f6 C3/0/3         online       108  3.0  CM
c8fb.26a5.5384 C3/0/3         online       109  3.0  CM
c8fb.26a5.5742 C3/0/3         online       110  3.0  CM
c8fb.26a5.5598 C3/0/3         online       111  3.0  CM
c8fb.26a5.56d8 C3/0/3         online       112  3.0  CM
c8fb.26a5.56b2 C3/0/3         online       113  3.0  CM
```

```
c8fb.26a5.52c8 C3/0/3         online       114  3.0  CM
c8fb.26a5.5346 C3/0/3         online       115  3.0  CM
c8fb.26a5.5428 C3/0/3         online       116  3.0  CM
c8fb.26a5.52ca C3/0/3         online       117  3.0  CM
c8fb.26a5.52fe C3/0/3         online       118  3.0  CM
c8fb.26a5.54e4 C3/0/3         online       119  3.0  CM
c8fb.26a5.5474 C3/0/3         online       120  3.0  CM
```

This example shows the output of the the output of the **show cable modem docsis device-class** command with the **summary total** option on the Cisco cBR-8router:

```
Router#show cable modem docsis device-class summary c3/0/0 total
                          DOCSIS Device Class
                         ----------------------------
Interface       Online  unrep CM    eRTR  eMTA  eSTB  ePS
Cable3/0/0      6       0     6     0     0     0     0

Total:          6       0     6     0     0     0     0
```

Related Commands

Command	Description
show cable modem docsis version	Displays the DOCSIS version information for cable modems on one or more cable interfaces and upstreams.

show cable modem docsis version

To display the DOCSIS version information for cable modems (CMs) on one or more cable interfaces and upstreams, use the **show cable modem docsis version** command in privileged EXEC configuration mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem docsis version [**summary** [**cable** {*slot* / *port* | *slot* / *cable-interface-index*} [**cable** {*slot* / *port* | *slot* / *cable-interface-index*}] [**upstream** *port1* *port2* [*logical-channel-index*]]]] [**total**]
show cable modem cable {*slot* / *port* | *slot* / *cable-interface-index*} **docsis version summary**

Cisco uBR10012 Router
show cable modem docsis version [**summary** [**cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index*} [**cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index*}] [**upstream** *port1* *port2* [*logical-channel-index*]]]] [**total**]
show cable modem cable {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index*} **docsis version summary**

Cisco cBR Series Converged Broadband Routers
show cable modem docsis version [**summary** [**cable** *slot* / *subslot* / *cable-interface-index*] [**upstream** *chan1* *chan2*]] [**total**]
show cable modem cable *slot* / *subslot* / *cable-interface-index* **docsis version** [**summary**]

Syntax Description

summary	(Optional) Displays a summary of DOCSIS device class information for CMs on all or specified cable interfaces on the CMTS router.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. (Cisco cBR-8) The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8—The valid range is 0 to 15.
upstream *port1 port2*	(Optional) Specifies a specific upstream port, or a range of upstream ports on the specified cable interface(s), whose cable modems you want to display information about, where: • *port1*—Specify only *port1* if you want to display information about a single upstream. When used with the *port2* argument, specifies the beginning of a range of upstream ports, and *port1* must be a lower-numbered port than *port2*. • *port2*—Specifies the end of a range of upstream ports, and *port2* must be a higher-numbered port than *port1*.
upstream *chan1 chan2*	(Optional for Cisco cBR-8) Specifies a specific upstream channel, or a range of upstream channels on the specified cable interface(s), whose cable modems you want to display information about, where: • *chan1*—Specify only *chan1* if you want to display information about a single upstream. When used with the *chan2* argument, specifies the beginning of a range of upstream channels, and *chan1* must be a lower-numbered channel than *chan2*. • *chan2*—Specifies the end of a range of upstream channels, and *chan2* must be a higher-numbered channel than *chan1*.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. Not available for Cisco cBR-8
total	(Optional) Displays a total of DOCSIS device-class information for the CMs connected to all interfaces, or to the specified cable interfaces.
docsis version summary	Displays the DOCSIS device class or version information for cable modems on one or more cable interfaces and upstreams.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.

Release	Modification
12.3(23)BC7	The output for the **show cable modem docsis version summary total** forms of the command were modified.
12.2(33)SCD2	This command was modified. The command output was modified to display the cable modems that are in upstream and downstream partial service mode.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays a summary of DOCSIS version information for all cable modems for a single cable interface or upstream, or for a range of cable interfaces or upstreams.

Use the **device-class** option on Cisco cBR Series Converged Broadband Router to display a summary of the device class information of the devices.

Examples: show cable modem docsis version Command

The following example shows typical output for the default form of the **show cable modem docsis version** command on a Cisco uBR10012 router:

```
Router# show cable modem docsis version
MAC Address    I/F       MAC            Prim  Reg QoS  US Phy DS Chl
                         State          Sid   Ver Prov Mode   Mode
0018.6852.800a C5/1/0/U3 w-online(pt)   166   2.0 1.1  tdma   WB
0018.6852.7f92 C5/1/0/U1 w-online(pt)   167   2.0 1.1  tdma   WB
0014.bfbe.3ea6 C5/1/0/U0 w-online(pt)   168   2.0 1.1  tdma   WB
0018.6852.8022 C5/1/0/U2 w-online(pt)   169   2.0 1.1  tdma   WB
0018.6852.7fa0 C5/1/0/U0 w-online(pt)   170   2.0 1.1  tdma   WB
0018.6852.8016 C5/1/0/U3 w-online(pt)   171   2.0 1.1  tdma   WB
0018.6852.8008 C5/1/0/U2 w-online(pt)   172   2.0 1.1  tdma   WB
0018.6852.800e C5/1/0/U1 w-online(pt)   173   2.0 1.1  tdma   WB
0018.6852.8000 C5/1/0/U1 w-online(pt)   174   2.0 1.1  tdma   WB
0002.8a8c.ed06 C5/1/1/U0 online(pt)     79    2.0 1.1  tdma   NB
0018.6852.801c C5/1/1/U0 w-online(pt)   80    2.0 1.1  tdma   WB
0018.6852.8006 C5/1/1/U0 w-online(pt)   81    2.0 1.1  tdma   WB
00e0.6f2c.6a4e C5/1/1/U0 online(pt)     82    1.1 1.1  tdma   NB
0011.ae02.a63c C5/1/3/U0 online(pt)     37    2.0 1.1  tdma   NB
0011.ae00.c514 C5/1/3/U0 online(pt)     38    2.0 1.1  tdma   NB
```

The following example shows sample output for the **show cable modem docsis version** command for a particular cable interface on a Cisco uBR10012 router:

```
Router# show cable modem cable 5/1/0 docsis version

MAC Address    I/F       MAC            Prim  Reg QoS  US Phy DS Chl
                         State          Sid   Ver Prov Mode   Mode
0018.6852.800a C5/1/0/U3 w-online(pt)   166   2.0 1.1  tdma   WB
0018.6852.7f92 C5/1/0/U1 w-online(pt)   167   2.0 1.1  tdma   WB
0014.bfbe.3ea6 C5/1/0/U0 w-online(pt)   168   2.0 1.1  tdma   WB
0018.6852.8022 C5/1/0/U2 w-online(pt)   169   2.0 1.1  tdma   WB
0018.6852.7fa0 C5/1/0/U0 w-online(pt)   170   2.0 1.1  tdma   WB
```

```
0018.6852.8016 C5/1/0/U3 w-online(pt)   171   2.0 1.1  tdma   WB
0018.6852.8008 C5/1/0/U2 w-online(pt)   172   2.0 1.1  tdma   WB
0018.6852.800e C5/1/0/U1 w-online(pt)   173   2.0 1.1  tdma   WB
0018.6852.8000 C5/1/0/U1 w-online(pt)   174   2.0 1.1  tdma   WB
```

Table below describes the significant fields shown in the display.

Table 111: show cable modem docsis version Field Descriptions

Field	Description
MAC Address	The MAC address of the CM.
I/F	The cable interface line card providing the upstream for this CM.
MAC State	The current state of the MAC layer.
Prim Sid	The primary SID assigned to this CM.
Reg Ver	Displays the maximum supported version of DOCSIS that the CM supports. The possible values are: 1.0, 1.1, 2.0, and 3.0. Shows “n/a” if the modem is not online.
QoS Prov	Displays the version of DOCSIS that the CM currently is provisioned and registered for. The possible values are: 1.0 or 1.1. Shows “n/a” if the modem is not online.
US Phy Mode	Displays the DOCSIS operating mode for the CM, with the following possible values: • tdma—DOCSIS 1.X, Time Division Multiple Access (TDMA)-only mode • atdma—DOCSIS 2.0 Advanced Time Division Multiple Access (A-TDMA) mode • scdma—DOCSIS 2.0 Synchronous Code Division Multiple Access (SCDMA) mode **Note** This field is the same as that returned by the docsIfCmtsCmStatusModulationType object in the DOCS-IF-MIB.
DS Chl Mode	Displays the downstream channel mode for the CM, with the following possible values: • NB—Narrowband • WB—Wideband

Examples: show cable modem version docsis version total Command

The following example shows the corresponding display for the **show cable modem docsis version total** command:

```
Router# show cable modem docsis version total
Total Registered CMs:   15
Total Unregistered CMs: 0
Total DOCSIS 3.0 Operating/Capable/Registered CMs: 0/0/0
Total DOCSIS 2.0 Operating/Capable/Registered CMs: 0/14/14
Total DOCSIS 1.1 Operating/Capable/Registered CMs: 15/15/1
Total DOCSIS 1.0 Operating/Capable/Registered CMs: 0/15/0
Total v1.1 US QoS operating CMs: 15
Total V1.0 US QoS operating CMs: 0
Total Wide Band US operating CMs: 0
Total scdma US Phy operating CMs: 0
```

```
Total atdma US Phy operating CMs: 0
Total tdma US Phy operating CMs:  15
Total Wide Band DS operating CMs:   11
Total Narrow Band DS operating CMs: 4
```

Beginning in Cisco IOS Release 12.2(33)SCD2, the output of the **show cable modem docsis version total** command was modified to display the cable modems that are in partial service mode as shown in the following example:

```
Router# show cable modem docsis version total
Total Registered CMs:   35
Total Unregistered CMs: 1
Total DOCSIS 3.0 Operating/Capable/Registered CMs: 21/22/22
Total DOCSIS 2.0 Operating/Capable/Registered CMs: 0/34/12
Total DOCSIS 1.1 Operating/Capable/Registered CMs: 35/35/1
Total DOCSIS 1.0 Operating/Capable/Registered CMs: 0/35/0
Total v1.1 US QoS operating CMs: 35
Total V1.0 US QoS operating CMs: 0
Total Wide Band US operating CMs: 21
Total Wide Band US partial-mode CMs: 9
Total scdma US Phy operating CMs: 0
Total atdma US Phy operating CMs: 0
Total tdma US Phy operating CMs:  14
Total Wide Band DS operating CMs:   22
Total Wide Band DS partial-mode CMs: 12
Total Narrow Band DS operating CMs: 13
```

Table below describes the fields shown in the show cable modem docsis version total command display.

Table 112: show cable modem docsis version total Field Descriptions

Field	Description
Total Registered CMs	Total number of cable modems currently online in a CMTS router.
Total Unregistered CMs	Total number of cable modems that are either offline and not currently communicating with the CMTS router, or that are attempting to come online but are not yet registered.
Total DOCSIS x.y Operating/Capable/Registered CMs: a/b/c	Total number of cable modems (in a/b/c format) for the specified DOCSIS version (x.y) that have the following status: • Operating—Total number (a) of CMs currently operating in the specified DOCSIS version. • Capable—Total number (b) of CMs that can operate in the specified DOCSIS version, but might not be operating in that version. • Registered—Total number (c) of CMs that are currently registered in the specified DOCSIS version.
Total Vx.y US QoS operating CMs	Total number of cable modems whose upstreams are currently operating in a specified DOCSIS version (x.y) quality of service (QoS).
Total Wide Band US operating CMs	Total number of cable modems with upstreams currently operating in wideband channel mode.
Total Wide Band US partial-mode CMs	Total number of cable modems with upstreams currently operating in partial wideband channel mode.

Field	Description
Total *mode* US Phy operating CMs	Total number of cable modems with upstreams currently operating in a particular wideband channel mode, where *mode* is: • scdma—DOCSIS 2.0 Synchronous Code Division Multiple Access (SCDMA) mode • atdma—DOCSIS 2.0 Advanced Time Division Multiple Access (A-TDMA) mode • tdma—DOCSIS 1.X, Time Division Multiple Access (TDMA) mode **Note** The US Phy Mode counters (scdma, atdma, and tdma) remain 0 on the UB interfaces.
Total Wide Band DS operating CMs	Total number of cable modems with downstreams operating in wideband channel mode.
Total Wide Band DS partial-mode CMs	Total number of cable modems with downstreams operating in partial wideband channel mode.
Total Narrow Band DS operating CMs	Total number of cable modems with downstreams operating in narrowband channel mode.

Examples: show cable modem docsis version summary Command

The following example shows typical output for the default form of the **show cable modem docsis version summary** command on a Cisco uBR10012 router:

```
Router# show cable modem docsis version summary
                          Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 ------------------  ---------  ------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/1/U0 4      0    3    1    0     4    0     0    0    0    4     2    2
C5/1/3/U0 2      0    2    0    0     2    0     0    0    0    2     0    2
```

Beginning in Cisco IOS Release 12.2(33)SCD2, the output of the **show cable modem docsis version summary** command was modified to display the cable modems that are in full or partial service mode as shown in the following example:

```
Router# show cable modem docsis version summary
                          Cable Modem DOCSIS Version Summary
                 DOCSIS Registered   US QoS     US Phy Mode    DOCSIS Mode
                 ------------------ --------- ------------- ----------------
Interface Online v3.0 v2.0 v1.1 v1.0 v1.1 v1.0 scdm atdm tdma UP  WB   WP  NB
C7/0/0/UB 12     12   0    0    0    12   0    0    0    0    9   12   12  0
C7/0/0/U0 2      0    2    0    0    2    0    0    0    2    0   0    0   2
C7/0/0/U1 1      0    1    0    0    1    0    0    0    1    0   0    0   1
C7/0/0/U3 4      0    4    0    0    4    0    0    0    4    0   0    0   4
C8/0/0/UB 9      9    0    0    0    9    0    0    0    0    0   9    0   0
```

```
C8/0/0/U0 1      1    0    0    0    1    0    0    0    1    0   1    0   0
C8/0/0/U1 5      0    4    1    0    5    0    0    0    5    0   0    0   5
C8/0/0/U3 1      0    1    0    0    1    0    0    0    1    0   0    0   1
```

The following example shows typical output for the **show cable modem docsis version summary** command with the **total** option on a Cisco uBR10012 router:

```
Router# show cable modem docsis version summary total
                            Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS         US Phy Mode       DS Mode
                 -----------------  ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/1/U0 4      0    3    1    0     4    0     0    0    0    4     2    2
C5/1/3/U0 2      0    2    0    0     2    0     0    0    0    2     0    2
Total:    15     0    14   1    0     15   0     0    0    0    15    11   4
```

Beginning in Cisco IOS Release 12.3(23)BC7, the output for the **show cable modem docsis version summary total** command was modified as shown in the following example:

```
Router# show cable modem docsis version summary total
                            Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS         US Phy Mode       DS Mode
                 -----------------  ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/1/U0 4      0    3    1    0     4    0     0    0    0    4     2    2
C5/1/3/U0 2      0    2    0    0     2    0     0    0    0    2     0    2
-------------------------------------------------------------------------------
Total:    15     v3.0: 0             v1.1: 15     WB  : 0           WB: 11
                 v2.0: 14            v1.0: 0      scdm: 0           NB: 4
                 v1.1: 1                          atdm: 0
                 v1.0: 0                          tdma: 15
-------------------------------------------------------------------------------
```

Beginning in Cisco IOS Release 12.2(33)SCD2, the output of the **show cable modem docsis version summary total** command was modified to display the cable modems that are in full or partial service mode as shown in the following example:

```
Router# show cable modem docsis version summary total
                              Cable Modem DOCSIS Version Summary
                 DOCSIS Registered   US QoS     US Phy Mode    DOCSIS Mode
                 ------------------ --------- -------------- ----------------
Interface Online v3.0 v2.0 v1.1 v1.0 v1.1 v1.0 scdm atdm tdma UP  WB   WP  NB
C7/0/0/UB 12     12   0    0    0    12   0    0    0    0    9   12   12  0
C7/0/0/U0 2      0    2    0    0    2    0    0    0    2    0   0    0   2
C7/0/0/U1 1      0    1    0    0    1    0    0    0    1    0   0    0   1
C7/0/0/U3 4      0    4    0    0    4    0    0    0    4    0   0    0   4
C8/0/0/UB 9      9    0    0    0    9    0    0    0    0    0   9    0   0
C8/0/0/U0 1      1    0    0    0    1    0    0    0    1    0   1    0   0
C8/0/0/U1 5      0    4    1    0    5    0    0    0    5    0   0    0   5
C8/0/0/U3 1      0    1    0    0    1    0    0    0    1    0   0    0   1
-------------------------------------------------------------------------------
Total:    35     v3.0: 22            v1.1: 35     UB  : 21          WB: 22
                                                 UP  : 9           WP: 12
                 v2.0: 12            v1.0: 0      scdm: 0           NB: 13
```

```
                v1.1: 1                          atdm: 0
                v1.0: 0                          tdma: 14
------------------------------------------------------------------------------
```

Examples: show cable modem docsis version summary cable total Command

The following example shows sample output for the **show cable modem docsis version summary cable total** command for all enabled upstreams on a specific cable interface line card on a Cisco uBR10012 router:

```
Router# show cable modem docsis version summary cable 5/1/0 total
                           Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 -----------------    ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
Total:    9      0    9    0    0     9    0     0    0    0    9     9    0
```

Beginning in Cisco IOS Release 12.3(23)BC7, the output for the **show cable modem docsis version summary cable total** command was modified as shown in the following example:

```
Router# show cable modem docsis version summary cable 5/1/0 total
                           Cable Modem DOCSIS Version Summary

                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 -----------------    ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
------------------------------------------------------------------------------
Total:    9      v3.0: 0             v1.1: 9      WB  : 0           WB: 9
                 v2.0: 9             v1.0: 0      scdm: 0           NB: 0
                 v1.1: 0                          atdm: 0
                 v1.0: 0                          tdma: 9
------------------------------------------------------------------------------
```

The following example shows sample output for the **show cable modem docsis version summary cable total** command for a range of interfaces on the Cisco uBR10012 router:

```
Router# show cable modem docsis version summary cable 5/1/0 cable 5/1/3 total
                           Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 -----------------    ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/1/U0 4      0    3    1    0     4    0     0    0    0    4     2    2
C5/1/3/U0 2      0    2    0    0     2    0     0    0    0    2     0    2
Total:    15     0    14   1    0     15   0     0    0    0    15    11   4
```

Beginning in Cisco IOS Release 12.3(23)BC7, the output for the **show cable modem docsis version summary cable total** command for a range of interfaces was modified as shown in the following example:

```
Router# show cable modem docsis version summary cable 5/1/0 cable 5/1/3 total
                            Cable Modem DOCSIS Version Summary

                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 -----------------  ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/1/U0 4      0    3    1    0     4    0     0    0    0    4     2    2
C5/1/3/U0 2      0    2    0    0     2    0     0    0    0    2     0    2
-------------------------------------------------------------------------------
Total:    15     v3.0: 0             v1.1: 15     WB  : 0           WB: 11
                 v2.0: 14            v1.0: 0      scdm: 0           NB: 4
                 v1.1: 1                          atdm: 0
                 v1.0: 0                          tdma: 15
-------------------------------------------------------------------------------
```

The following example shows sample output for the **show cable modem docsis version summary cable upstream total** command for a range of interfaces and upstreams on the Cisco uBR10012 router:

```
Router# show cable modem docsis version summary cable 5/1/0 cable 5/1/3 upstream 0 3 total
                            Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 -----------------  ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/1/U0 4      0    3    1    0     4    0     0    0    0    4     2    2
C5/1/3/U0 2      0    2    0    0     2    0     0    0    0    2     0    2
Total:    15     0    14   1    0     15   0     0    0    0    15    11   4
```

Beginning in Cisco IOS Release 12.3(23)BC7, the output for the **show cable modem docsis version summary cable upstream total** command for a range of interfaces and upstreams was modified as shown in the following example:

```
Router# show cable modem docsis version summary cable 5/1/0 cable 5/1/3 upstream 0 3 total
                            Cable Modem DOCSIS Version Summary

                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 -----------------  ---------  -------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/1/U0 4      0    3    1    0     4    0     0    0    0    4     2    2
C5/1/3/U0 2      0    2    0    0     2    0     0    0    0    2     0    2
-------------------------------------------------------------------------------
Total:    15     v3.0: 0             v1.1: 15     WB  : 0           WB: 11
                 v2.0: 14            v1.0: 0      scdm: 0           NB: 4
                 v1.1: 1                          atdm: 0
```

```
                v1.0: 0                             tdma: 15
--------------------------------------------------------------------------------
```

The following example shows sample output for the **show cable modem docsis version summary cable upstream total** command for a range of upstreams in an interface on the Cisco uBR10012 router:

```
Router# show cable modem docsis version summary cable 5/1/0 upstream 0 3 total
                            Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 ------------------  ---------  ------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
Total:    9      0    9    0    0     9    0     0    0    0    9     9    0
```

Beginning in Cisco IOS Release 12.3(23)BC7, the output for the **show cable modem docsis version summary cable upstream total** command for a range of upstreams was modified as shown in the following example:

```
Router# show cable modem docsis version summary cable 5/1/0 upstream 0 3 total
                            Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 ------------------  ---------  ------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C5/1/0/U0 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U1 3      0    3    0    0     3    0     0    0    0    3     3    0
C5/1/0/U2 2      0    2    0    0     2    0     0    0    0    2     2    0
C5/1/0/U3 2      0    2    0    0     2    0     0    0    0    2     2    0
--------------------------------------------------------------------------------
Total:    9      v3.0: 0             v1.1: 9      WB  : 0           WB: 9
                 v2.0: 9             v1.0: 0      scdm: 0           NB: 0
                 v1.1: 0                          atdm: 0
                 v1.0: 0                          tdma: 9
--------------------------------------------------------------------------------
```

The following example shows sample output for the **show cable modem cable docsis version summary** command for all enabled upstreams on a specific cable interface line card on a Cisco uBR10012 router:

```
Router# show cable modem cable 8/0/1 docsis version summary
                            Cable Modem DOCSIS Version Summary
                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 ------------------  ---------  ------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C8/0/1/U0 4      0    2    1    1     0    4     0    0    0    4     0    4
```

Beginning in Cisco IOS Release 12.3(23)BC7, the output for the **show cable modem cable docsis version summary** command for a range of upstreams was modified as shown in the following example:

```
Router# show cable modem cable 8/0/1 docsis version summary
                            Cable Modem DOCSIS Version Summary

                 DOCSIS Registered    US QoS        US Phy Mode       DS Mode
                 ------------------  ---------  ------------------  -------
Interface Online v3.0 v2.0 v1.1 v1.0  v1.1 v1.0  WB   scdm atdm tdma  WB   NB
C8/0/1/U0 4      0    2    1    1     0    4     0    0    0    4     0    4
```

show cable modem docsis version summary command

The following example shows typical output for the default form of the **show cable modem docsis version summary** command on the Cisco cBR Series Converged Broadband Router:

```
Router# show cable modem docsis version summary
                            Cable Modem DOCSIS Version Summary
                  DOCSIS Registered    US QoS        US Phy Mode      DS Mode
                 -------------------  ---------  -------------------  -------
Interface    online v3.1 v3.0 v2.0 v1.1 v1.0 v1.1 v1.0 ofdma atdm tdma UP   WB   WP   NB
C1/0/5/U12   0    0    0    0    0    0    0    0    1    0    0    0    0    0    0
```

Table below describes the significant fields shown in the display.

Table 113: show cable modem docsis version summary Field Descriptions

Field	Description
Interface	The cable interface line card providing the upstream for this cable modem.
Online	Total number of cable modems currently online on this cable interface.
DOCSIS Registered	Total number of cable modems registered on this cable interface with the specified DOCSIS version (x.y) capabilities.
US QoS	Total number of cable modems whose upstreams are currently operating in a specified DOCSIS version (x.y) quality of service (QoS).
US Phy Mode	Total number of cable modems on this cable interface with upstreams currently operating in a particular wideband channel mode, where: • WB—Total number of upstreams on this cable interface operating in any wideband channel mode. • ofdma—Total number of upstreams on this cable interface operating in DOCSIS 3.1 Orthogonal Frequency Division Multiple Access (OFDMA) mode. • atdma—Total number of upstreams on this cable interface operating in DOCSIS 2.0 Advanced Time Division Multiple Access (A-TDMA) mode. • tdma—Total number of upstreams on this cable interface operating in DOCSIS 1.X, Time Division Multiple Access (TDMA) mode. **Note** The US Phy Mode counters (scdma, atdma, and tdma) remain 0 on the UB interfaces.
DS Mode	Total number of cable modems on this cable interface whose downstreams are operating in the following modes: • WB—Total number of downstreams on this cable interface operating in wideband channel mode. • NB—Total number of downstreams on this cable interface operating in narrowband channel mode.

Field	Description
DOCSIS Mode	• UP—Total number of cable modems in upstream bonding partial service mode (p). • WB—Total number of cable modems in downstream bonding fully-operational mode (w-online). • WP—Total number of cable modems in downstream bonding partial service mode (p-online). • NB—Total number of cable modems in narrowband online mode (online).

Related Commands

Command	Description
show cable modem docsis device-class	Displays the DOCSIS device-class information for cable modems (CMs) on all or specified cable interfaces and upstreams.
show cable modem partial-mode	Displays information about the cable modems that are in upstream and downstream partial service mode.

show cable modem docsis version d31-capable

To display the DOCSIS 3.1 version information for cable modems (CMs) on one or more cable interfaces and upstreams, use the **show cable modem docsis version d31-capable** command in privileged EXEC configuration mode.

show cable modem docsis version d31-capable

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1x	The MRC/MTC column is added to the command output.
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays a summary of DOCSIS 3.1 version information for all cable modems for a single cable interface or upstream, or for a range of cable interfaces or upstreams.

Examples: show cable modem docsis version d31-capable command

The following example shows output for the **show cable modem docsis version d31-capable** command on a Cisco cBR Series Converged Broadband Router (Cisco IOS XE Dublin 17.12.1x or later):

```
Router# show cable modem docsis version d31-capable

MAC Address    I/F            MAC              Reg Oper DSxUS DS   RCC   US     MRC/
                              State            Ver Ver        OFDM ID    OFDMA  MTC
4800.33ef.4b66 C1/0/0/UB      w-online(pt)     3.1 3.1  36x6  4    2     2      5/8
4800.33ef.5e4a C1/0/0/UB      w-online(pt)     3.1 3.1  35x6  3    3     2      5/8
4800.33ee.e971 C1/0/0/UB      w-online(pt)     3.1 3.1  32x2  0    5     0      2/2
4800.33e5.f746 C1/0/0/UB      w-online(pt)     3.1 3.1  34x2  4    7     0      2/2
```

Note D4.0 modems registering in D3.1 mode show up in the d31-capable list.

MRC/MTC information can help the operator distinguish these D4.0 modems from traditional D3.1 modems. MRC/MTC is greater than 2/2 for D4.0 modems.

The following example shows output for the **show cable modem docsis version d31-capable** command on a Cisco cBR Series Converged Broadband Router (Releases before Cisco IOS XE Dublin 17.12.1x):

```
Router# show cable modem docsis version d31-capable
```

```
MAC Address    I/F         MAC            Reg    Oper  DSxUS  DS     RCC   US
                           State          Ver    Ver          OFDM   ID    OFDMA
4800.33ea.7012 C1/0/0/UB   w-online(pt)   3.1    3.1   33x4   1      5     1
203d.66ae.4169 C1/0/0/UB   w-online(pt)   3.1    3.1   33x4   1      5     1
```

Table below describes the significant fields that are shown in the display.

Table 114: show cable modem docsis version Field Descriptions

Field	Description
MAC Address	The MAC address of the CM.
I/F	The cable interface line card providing the upstream for this CM.
MAC State	The current state of the MAC layer.
Reg Ver	Displays the maximum supported version of DOCSIS 3.1 that the cable modem supports. Shows n/a if the modem is not online.
Oper Ver	Displays the actual version of DOCSIS protocol that the CM is currently using. Depending upon CMTS capabilities and configuration, this could be lower than the Reg Ver.
DSxUS	State of the downstream and upstream channels on the cable modem.
DS OFDM	Displays the number downstream OFDM channels being actively used by the CM.
RCC ID	Receive channel configuration (RCC) ID of the cable modem.
US OFDMA	Displays the number of upstream OFDMA channels being actively used by the CM. The current CMTS implementation limit is 2 upsteam OFDMA channels, so the value could be 0, 1, or 2.
MRC/MTC	Displays Multiple Receive Channel (MRC) and Multiple Transmit Channel (MTC) capabilities of the modems. For D4.0 modems registering in D3.1 mode, the MRC and MTC values is greater than 2 OFDM and OFDMA channels. The first set of D4.0 modems based on Broadcom chipset advertise a value of 5/8 for MRC/MTC. Traditional D3.1 modems, advertise a MRC/MTC value of 2/2.

Related Commands

Command	Description
show cable modem phy	Displays the DOCSIS PHY layer information for one or more cable modems.
show interface cable mac-scheduler	Displays the OFDMA channel capacity and utilization.

show cable modem docsis version d40-capable

Use the **show cable modem docsis version d40-capable** command in privileged EXEC configuration mode to display the DOCSIS 4.0 version information for cable modems (CMs) on one or more cable interfaces and upstreams.

show cable modem docsis version d40-capable [**operational** | **not-operational**]

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1x	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Syntax Description

operational	Displays a list of DOCSIS 4.0 operational modems.
not-operational	Displays a list of DOCSIS 4.0 capable modems not D4.0 operational.

Usage Guidelines

This command displays a summary of DOCSIS 4.0 version information for all cable modems for a single cable interface or upstream, or for a range of cable interfaces or upstreams.

show cable modem docsis version d40-capable command

The following example shows output for the **show cable modem docsis version d40-capable** command on a Cisco cBR Series Converged Broadband Router:

```
Router# show cable modem docsis version d40-capable
MAC Address    I/F            MAC              Reg Oper DSxUS DS   RCC   US     MRC/
                              State            Ver Ver        OFDM ID    OFDMA  MTC
4800.33ef.3b66 C1/0/0/UB      w-online(pt)     4.0 3.1  36x6  4    2     2      5/8
4800.33ef.3e4a C1/0/0/UB      w-online(pt)     4.0 3.1  35x6  3    3     2      5/8
4800.33ee.f856 C1/0/0/UB      w-online(pt)     4.0 3.1  34x6  2    4     2      5/8
4800.33ee.fc34 C1/0/0/UB      w-online(pt)     4.0 3.1  36x4  4    2     0      5/8
4800.33ee.f971 C1/0/0/UB      w-online(pt)     4.0 3.1  32x4  0    5     0      5/8
4800.33ef.3a79 C1/0/0/UB      w-online(pt)     4.0 4.0  36x6  4    2     2      5/8
4800.33ef.3e4e C1/0/0/UB      w-online(pt)     4.0 4.0  35x6  3    3     2      5/8

Router# show cable modem docsis version d40-capable not-operational
MAC Address    I/F            MAC              Reg Oper DSxUS DS   RCC   US     MRC/
                              State            Ver Ver        OFDM ID    OFDMA  MTC
4800.33ef.3b66 C1/0/0/UB      w-online(pt)     4.0 3.1  36x6  4    2     2      5/8
4800.33ef.3e4a C1/0/0/UB      w-online(pt)     4.0 3.1  35x6  3    3     2      5/8
4800.33ee.f856 C1/0/0/UB      w-online(pt)     4.0 3.1  34x6  2    4     2      5/8
4800.33ee.fc34 C1/0/0/UB      w-online(pt)     4.0 3.1  36x4  4    2     0      5/8
4800.33ee.f971 C1/0/0/UB      w-online(pt)     4.0 3.1  32x4  0    5     0      5/8

Router# show cable modem docsis version d40-capable operational
```

```
MAC Address    I/F           MAC              Reg Oper DSxUS DS   RCC   US     MRC/
                             State            Ver Ver        OFDM ID    OFDMA  MTC
4800.33ef.3a79 C1/0/0/UB     w-online(pt)     4.0 4.0  36x6  4    2     2      5/8
4800.33ef.3e4e C1/0/0/UB     w-online(pt)     4.0 4.0  35x6  3    3     2      5/8
```

The table below describes the significant fields that are shown in the command output:

Table 115: show cable modem docsis version Field Descriptions

Field	Description
MAC Address	The MAC address of the CM.
I/F	The cable interface line card providing the upstream for this CM.
MAC State	The current state of the MAC layer.
Reg Ver	Displays the maximum supported version of DOCSIS 4.0 that the cable modem supports. Shows n/a if the modem is not online.
Oper Ver	Displays the actual version of the DOCSIS protocol that the CM is currently using. Depending upon CMTS capabilities and configuration, this could be lower than the Reg Ver.
DSxUS	State of the downstream and upstream channels on the cable modem.
DS OFDM	Displays the number downstream OFDM channels being actively used by the CM.
RCC ID	Receive channel configuration (RCC) ID of the cable modem.
US OFDMA	Displays the number of upstream OFDMA channels being actively used by the CM. Current CMTS implementation limit is 2 upsteam OFDMA channels, so the value could be 0, 1, or 2.
MRC/MTC	Displays Multiple Receive Channel (MRC) and Multiple Transmit Channel (MTC) capabilities of the modems.

Related Commands

Command	Description
show cable modem phy	Displays the DOCSIS PHY layer information for one or more cable modems.
show interface cable mac-scheduler	Displays the OFDMA channel capacity and utilization.

show cable modem domain-name

To update the cable-specific Domain Name System (DNS) cache and display the domain name for specified cable modems (CMs) and customer premise equipment (CPE) behind a CM on a Cisco CMTS router, use the **show cable modem domain-name** command in privileged EXEC mode.

Cisco uBR7246VXR Router and Cisco uBR7225VXR Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **domain-name**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot* /*port* | *slot*/*subslot* /*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **domain-name**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.

name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Use the **show cable modem domain-name** command without any options to initiate an update to the cable-specific DNS cache on the CMTS router and to enable use of domain names in other CMTS router **cable modem** commands that support a name option.

Note In Cisco IOS Release 12.2(33)SCA, although the **show cable modem domain-name** command accepts an IPv4 address format for a CM, DNS for IPv4-managed cable devices is not supported.

Examples

The following example shows sample output for all CMs and CPE behind a CM for the **show cable modem domain-name** command, listing the devices by their MAC and IP addresses and displaying the associated domain name:

```
Router# show cable modem domain-name
MAC Address    IP Address                              Domain Name
0018.6835.27b3 10.3.37.76
0019.474a.c14a 2001:0DB8:3800:809:A896:1431:75EA:5EA1  cisco-test-cm1.cisco.com
0007.0e03.6851 10.3.37.36
0007.0e01.b085 10.3.37.34
0018.6835.27aa 2001:0DB8:3800:809:E97D:2986:9F37:FFE   cisco-test-cm2.cisco.com
```

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem calls	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.

Command	Description
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem errors

To display packet header error statistics for one or more cable modems , use the **show cable modem errors** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *port* | *slot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **errors**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **errors**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot* / *subslot* / *cable-interface-index* [**upstream** *port*]] **errors**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. (Cisco cBR-8 router—) The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router— The valid range is from 0 to 15.

upstream *port*	(Optional) Displays information for all cable modems using this specific upstream. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports on the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. Not available on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. Not available on the Cisco cBR-8 router.
errors	Displays packet header error statistics for one or more cable modems .

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX, 12.2(1)XF, and 12.2(4)BC1	This command was introduced for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **upstream** and **name** keywords and *logical-channel-index* variable were removed.

Usage Guidelines

This command displays packet header error information for all cable modems , for all cable modems attached to a specific CMTS cable interface, or for a particular CM, as identified by its IP address or MAC address.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.2(15)BC1 and later releases, use the **clear cable modem flap-counters** command to clear these counters.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

The following example shows sample output for the **show cable modem errors** command for all cable modems on a particular cable interface.

```
Router# show cable modem c8/1/0 errors

MAC Address    I/F          CRC        HCS
0050.7366.1243 C8/1/0/U1    0          1
0002.b970.0027 C8/1/0/U4    0          0
0006.5314.858d C8/1/0/U4    8          3
Router#
```

Table below describes the fields shown in the **show cable modem errors** displays:

Table 116: Descriptions for the show cable modem errors Fields

Field	Description
MAC Address	The MAC address for the CM.
I/F	The cable interface line card, including the upstream, for this CM.
CRC	Number of times the CMTS upstream receiver flagged a packet with a cyclic redundancy check (CRC) error from this CM. CRC errors usually indicate downstream signal interruption or interference noise on a plant. Occasional CRC errors can always be expected, but a high number of CRC errors could indicate plant problems such as intermittent upstream problems, laster clipping, common-path distortion, or impulsive noise or interference.

Field	Description
HCS	Number of times the CMTS upstream receiver flagged a packet with a header checksum (HCS) error from this CM. HCS errors could indicate the same sort of plant problems as CRC errors.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered cable modems .
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more cable modems .
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show interface cable modem	Displays information about the cable modems connected to a particular cable interface.

show cable modem extended-power

To display the list of cable modems that are transmitting upstream data at extended power level, use the **show cable modem extended-power** command in privilege EXEC mode.

show cable modem extended-power

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

This example shows the output of the **show cable modem extended-power** command that displays all the cable modems that are transmitting upstream data at extended power level:

```
Router# show cable modem extended-power
MAC Address    IP Address      I/F           MAC           Prim  Report  ECN
                                             State         Sid   Power
001e.6bfb.3382 10.50.0.3        C1/0/0/UB     w-online      3     57.00   Y
0022.cea5.0214 10.50.1.102      C1/0/0/UB     w-online      5     54.00   Y
001e.6bfb.1378 10.50.6.83       C1/0/0/UB     w-online      6     54.00   Y
```

Table below describes significant fields shown in the display.

Table 117: show cable modem extended-power Field Descriptions

Field	Description
MAC Address	MAC address of the cable modem.
IP Address	IP address that the DHCP server has assigned to the cable modem.
I/F	Cable interface line card providing the upstream for the cable modem.
MAC State	Current state of the MAC layer.
Prim Sid	Primary Service ID (SID) assigned to the cable modem.
Report Power	Power (in dB) at which cable modems are transmitting upstream data.
ECN	Extended high power at which the CM is operating.

Related Commands

Command	Description
cable upstream ext-power	Enables or disables the DOCSIS extended transmit power support on the Cisco CMTS.

show cable modem fiber-node mac-domain

To display all modems that are available in a specified fiber-node and mac domain in a service group profile, use the **show cablemodem fiber-node mac-domain** command in the privileged EXEC mode.

show cable modem fiber-node *fiber-node id* **mac-domain** *mac-domain id*

Syntax Description

fiber-node	Fiber-node profile information.
fiber-node id	Fiber node ID.
mac-domain	DOCSIS MAC version/capabilities.
mac-domain id	Summary total/active/registered modems with DOCSIS information per interface.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 3.17.0S	This command was introduced.

Example:

```
Router#show cable modem fiber-node 1 mac-domain 0
68ee.96d9.6a6b 30.101.12.24 C2/0/0/UB init(o) 1 3.00 2128 0 N
68ee.96d9.96a8 30.101.12.18 C2/0/0/U1 offline 2 -0.50 2131 0 N
c8fb.2631.0ede 30.101.12.2 C2/0/0/p w-online(pt) 3 3.00 1809 0 N
c8fb.2631.0cf2 30.101.12.3 C2/0/0/p w-online(pt) 4 3.00 1808 0 N
c8fb.2631.0eac 30.101.12.4 C2/0/0/p w-online(pt) 5 3.00 1811 0 N
c8fb.2631.0d3a 30.101.12.5 C2/0/0/p w-online(pt) 6 3.00 1811 0 N
68ee.96d9.7772 30.101.12.14 C2/0/0/p w-online(pt) 7 3.00 2132 1 N
c8fb.2631.0db6 30.101.12.7 C2/0/0/p w-online(pt) 8 3.00 1835 0 N
c8fb.2631.0dc8 30.101.12.6 C2/0/0/p w-online(pt) 9 3.00 1813 0 N
c8fb.2631.0ec2 30.101.12.8 C2/0/0/p w-online(pt) 10 3.00 1811 0 N
c8fb.2631.0b18 30.101.12.9 C2/0/0/p w-online(pt) 11 3.50 1838 0 N
c8fb.2631.0c7a 30.101.12.10 C2/0/0/p w-online(pt) 12 3.00 1813 0 N
c8fb.2631.0d54 30.101.12.11 C2/0/0/p w-online(pt) 13 3.50 1835 0 N
c8fb.2631.0d7a 30.101.12.12 C2/0/0/p w-online(pt) 14 3.00 1810 0 N
c8fb.2631.0c86 30.101.12.13 C2/0/0/p w-online(pt) 15 3.00 1809 0 N
c8fb.2631.0b1c 30.101.12.15 C2/0/0/p w-online(pt) 16 3.50 1812 0 N
c8fb.2631.0c08 30.101.12.16 C2/0/0/p w-online(pt) 17 3.00 1808 0 N
68ee.96d9.7a65 3
```

show cable modem flap

To display flap list statistics for one or more cable modems, use the **show cable modem flap** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot* /*cable-interface-index*} [**upstream** *port logical-channel-index*] | **name** *fqdn*] **flap**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* /*subslot*/*cable-interface-index*} [**upstream** *port logical-channel-index*] | **name** *fqdn*] **flap mtc**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* /*subslot*/*cable-interface-index*} [**upstream** *port*]] **flap**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific cable modem to be displayed. If you specify the IP address for a CPE device behind a cable modem, information for that cable modem is displayed.
mac-address	(Optional) MAC address of a specific cable modem to be displayed. If you specify the MAC address for a CPE device behind a cable modem, information for that cable modem is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router— The valid range is from 0 to 3 and 6 to 9
subslot	Secondary slot number of the cable interface line card. • Cisco uBR10012 —The valid subslots are 0 or 1. • Cisco cBR-8 router— The valid subslot is 0.
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is 0 to 15.

upstream *port*	(Optional) Displays information for all cable modems using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. Cisco cBR-8 router— The valid range is from 0 to 7
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This variable is not supported on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This keyword is not supported on the Cisco cBR-8 router.
flap mtc	Displays aggregate data across all upstream channels for each flap detector for cable modems in MTC mode. Displays per channel flap information for a single cable modem in MTC mode. The **mtc** keyword is not supported on the Cisco cBR-8 router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX, 12.2(1)XF, and 12.2(4)BC1	This command was introduced for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a cable modem or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a cable modem.
12.2(33)SCC	A new keyword, mtc, was added to provide multiple transmit channel (MTC) information for cable modems in the MTC mode. • The mtc keyword displays aggregate data across all upstream channels for each flap detector for cable modems in the MTC mode. • The show cable modem flap command remains unchanged for non-MTC mode cable modems.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **name** keyword and *logical-channel-index* variable are removed.

Usage Guidelines

This command displays information about the flap list activity for one or more cable modems. Unlike the **show cable flap-list** command, the **show cable modem flap** command displays flap counters of a cable modem irrespective of the plant condition.



Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include ip-address** command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.



Note In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

For cable modems in MTC mode, the show cable modem flap command will display aggregate data across all upstream channels for each flap detector. However, for a single MTC cable modem, the show cable modem flap command will display per channel flap information.



Note The output of the **show cable modem flap** command will remain unchanged for non-MTC mode cable modems.

Examples

This example shows the output for the **show cable modem flap** command on a Cisco CMTS router:

```
Router# show cable modem flap
```

```
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0025.2e34.4386 C6/0/0/U0     0     46657 3974  0      0      0     (14212 msec)
0025.2e2f.d4b6 C6/0/0/U0     0     47868 1896  0      0      0     (18000 msec)
0025.2e2f.d4de C6/0/0/U0     0     47960 1883  0      0      0     (19552 msec)
0023.bee1.e96b C6/0/0/U0     0     46537 4333  0      0      0     (22432 msec)
0025.2e2f.d4d8 C6/0/0/U0     0     21891 780   0      0      0     ( -- )
0025.2e2f.d48c C6/0/0/U0     0     47918 1828  0      0      0     ( -- )
0025.2e2f.d490 C6/0/0/U0     0     47900 1812  0      0      0     ( -- )
0019.474e.e46a C8/0/0/U0     0     33424 0     0      0      0     (6372 msec)
0019.474e.e266 C8/0/0/U0     0     33418 0     0      0      0     (8352 msec)
0022.ce89.96f2 C8/0/0/U0     0     33427 0     0      0      0     (11112 msec)
0025.2e2f.d58a C8/0/0/U0     0     33423 0     0     !33420  33420 Oct 5  16:02:16(15252
msec)
001a.c30c.7ef6 C8/0/0/U0     0     33424 2     0      0      0     (17592 msec)
0022.ce89.96b0 C8/0/0/U0     0     33414 0     0      0      0     ( -- )
0025.2e2f.d6de C8/0/0/U0     0     33414 0     0     !33411  33411 Oct 5  16:02:
21( -- )
0025.2e34.43c8 C8/0/0/U0     0     33411 0     0      0      0     ( -- )
0023.bee1.e974 C8/0/0/U0     0     33406 0     0      0      0     ( -- )
0019.474e.e3a7 C8/0/0/U0     0     33324 0     0      0      0     ( -- )
```

This example shows the output for the **show cable modem flap** command for all cable modems on a specific cable interface:

```
Router# show cable modem c6/0/0 flap
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0025.2e34.4386 C6/0/0/U0     0     46778 3980  0      0      0     (14212 msec)
0025.2e2f.d4b6 C6/0/0/U0     0     48002 1899  0      0      0     (18000 msec)
0025.2e2f.d4de C6/0/0/U0     0     48098 1889  0      0      0     (19552 msec)
0023.bee1.e96b C6/0/0/U0     0     46658 4351  0      0      0     (22432 msec)
0025.2e2f.d4d8 C6/0/0/U0     0     21979 781   0      0      0     ( -- )
0025.2e2f.d48c C6/0/0/U0     0     48048 1835  0      0      0     ( -- )
0025.2e2f.d490 C6/0/0/U0     0     48029 1819  0      0      0     ( -- )
```

This example shows the output for the **show cable modem flap** command for a particular cable modem:

```
Router# show cable modem 0010.7bb3.fcd1 flap
MAC Address    I/F       Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0010.7bb3.fcd1 C5/0/U5   0     36278 92    0     369     372   Jun 1 13:05:23 (14212 msec)
```

This example shows the output of the **show cable modem flap** command for all cable modems in the MTC mode on a specific cable interface:

```
Router# show cable modem c5/0/0 flap
MAC Address    I/F       Ins   Hit   Miss  CRC   P-Adj   Flap  Time
000e.5c44.d2f0 C5/0/0/U0 0     3040  0     0     0       0  ( -- )
0019.474a.d542 C5/0/0/U3 0     2930  214   0     0       1     May 27 05:21:26(19552 msec)
001a.c3ff.d578 C5/0/0/UB 0     12195 60    0     0       4     May 25 10:01:03(22432 msec)
```

This example shows the output of the **show cable modem flap** on the Cisco cBR-8 router:

```
Router#show cable modem flap
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0025.2eaf.82e4 C1/0/0/U0     0     2541  0     0      0      0
0025.2eaf.82f4 C1/0/0/U1     0     2542  0     0      0      0
0025.2e2d.74f8 C1/0/0/U0     0     2535  2     0      0      0
0025.2e2d.75be C1/0/0/U0     0     2539  17    0      0      3     Jan 18 10:25:06
0025.2eaf.7f38 C1/0/0/U1     0     2539  0     0      0      0
```

```
0025.2eaf.8302 C1/0/0/U1     0     2538  0     0      0      0
c8fb.26a5.56ca C1/0/1/U0     0     2542  10    0      0      1      Jan 18 09:43:01
c8fb.26a5.5814 C1/0/1/U0     0     2544  9     0      0      1      Jan 18 09:43:01
c8fb.26a5.56b6 C1/0/1/U0     0     2542  6     0      0      1      Jan 18 09:43:01
c8fb.26a5.5400 C1/0/1/U3     0     2542  9     0      0      2      Jan 18 09:43:16
c8fb.26a5.57a6 C1/0/1/U3     0     2542  10    0      0      2      Jan 18 09:43:16
c8fb.26a5.5574 C1/0/1/U3     0     2542  10    0      0      2      Jan 18 09:43:16
c8fb.26a5.55ac C1/0/1/U2     0     2541  15    0      0      2      Jan 18 09:43:21
c8fb.26a5.54e0 C1/0/1/U0     0     2542  13    0      0      2      Jan 18 09:43:21
c8fb.26a5.572e C1/0/1/U2     0     2541  13    0      0      2      Jan 18 09:43:26
c8fb.26a5.5866 C1/0/1/U3     0     2541  12    0      0      2      Jan 18 09:43:31
c8fb.26a5.57f4 C1/0/1/U3     0     2540  13    0      0      2      Jan 18 09:43:41
c8fb.26a5.5936 C1/0/1/U3     0     2540  12    0      0      2      Jan 18 09:43:41
c8fb.26a5.5810 C1/0/1/U3     0     2540  10    0      0      2      Jan 18 09:43:41
c8fb.26a5.52f2 C1/0/1/U2     0     2540  10    0      0      1      Jan 18 09:43:41
c8fb.26a5.5580 C1/0/1/U0     0     2540  7     0      0      1      Jan 18 09:43:41
c8fb.26a5.5792 C1/0/1/U3     0     2540  4     0      0      0
c8fb.26a5.5474 C1/0/3/U3     0     2542  13    0      0      2      Jan 18 09:42:06
c8fb.26a5.52fe C1/0/3/U2     0     2542  13    0      0      2      Jan 18 09:42:06
c8fb.26a5.52ca C1/0/3/U0     0     2542  13    0      0      2      Jan 18 09:42:11
c8fb.26a5.56d8 C1/0/3/U0     0     2542  10    0      0      1      Jan 18 09:42:11
c8fb.26a5.5376 C1/0/3/U0     0     2542  13    0      0      2      Jan 18 09:42:16
c8fb.26a5.53f6 C1/0/3/U1     0     2420  1404  0      0      187    Jan 18 14:18:21
c8fb.26a5.5428 C1/0/3/U3     0     2422  1293  0      0      180    Jan 18 14:18:31
c8fb.26a5.56b2 C1/0/3/U0     0     2523  19    0      0      3      Jan 18 09:45:21
c8fb.26a5.54e4 C1/0/3/U0     0     2525  23    0      0      3      Jan 18 09:44:56
c8fb.26a5.560a C1/0/3/U0     0     2526  10    0      0      1      Jan 18 09:42:21
c8fb.26a5.5742 C1/0/3/U1     0     2418  1361  0      0      188    Jan 18 14:19:36
c8fb.26a5.52c8 C1/0/3/U2     0     2512  8     0      0      1      Jan 18 09:42:21
c8fb.26a5.5624 C1/0/3/U1     0     2517  5     0      0      1      Jan 18 09:42:31
c8fb.26a5.5384 C1/0/3/U0     0     2520  5     0      0      1      Jan 18 09:42:31
c8fb.26a5.5598 C1/0/3/U0     0     2518  4     0      0      0
c8fb.26a5.5346 C1/0/3/U0     0     2411  1358  0      0      185    Jan 18 14:16:31

Router#
```

This example shows the output for the **show cable modem flap** command for a particular cable modem on the Cisco cBR-8 router:

```
Router#show cable modem c8fb.26a5.5598 flap
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
c8fb.26a5.5598 C3/0/3/U0     0     2525  4     0      0      0

Router#
```

Table below describes the significant fields shown in the display:

Table 118: show cable modem flap Field Descriptions

Field	Description
MAC Address	The MAC address for the CM.
I/F	The cable interface line card, including upstream, for this cable modem.
Ins	The number of times the cable modem comes up and inserts itself into the network. It can indicate intermittent downstream sync loss or DHCP or modem registration problems.

Field	Description
Hit	The number of times the cable modem responds to MAC layer keepalive messages. (The minimum hit rate is once per 30 seconds. It can indicate intermittent upstream, laser clipping, or common-path distortion.
Miss	The number of times the cable modem misses the MAC layer keepalive message. An 8 percent miss rate is normal for the Cisco cable interface line cards. It can indicate intermittent upstream, laser clipping, or common-path distortion.
CRC	The number of cyclic redundancy check (CRC) errors from this cable modem. It can indicate intermittent upstream, laser clipping, or common-path distortion.
P-Adj	The number of times the headend instructed the cable modem to adjust transmit (TX) power more than 3 dB. It can indicate amplifier degradation, poor connections, or thermal sensitivity.
Flap	The sum of P-Adj and Ins values. cable modems with high flap counts have high SIDs and might not register.
Time	The most recent time that the cable modem dropped the connection. The value displayed in the brackets indicates the duration (milliseconds) between the cable interface to become active and the first ranging success after a line card switchover (cable modem recovery time).

Related Commands

Command	Description
cable flap-list aging	Specifies the number of days to keep a cable modem in the flap-list table before aging it out of the table.
cable flap-list insertion-time	Sets the insertion time interval that determines whether a cable modem is placed in the flap list.
cable flap-list miss-threshold	Configures the threshold for recording a flap-list event, in terms of missed Station Maintenance messages.
cable flap-list power-adjust threshold	Specifies the power-adjust threshold for recording a cable modem flap-list event.
cable flap-list size	Specifies the maximum number of cable modems that can be listed in the flap-list table.
clear cable flap-list	Clears all the entries in the flap-list table.
show cable flap-list	Displays the current contents of the flap list.
show cable modem	Displays information for the registered and unregistered cable modems.
show interface cable modem	Displays information about the cable modems connected to a particular cable interface.

show cable modem internal load-balance

To display the load balance debug information for a cable modem, use the **show cable modem internal load-balance** command in privileged EXEC mode.

showcablemodem*mac-address***internal load-balance**

Syntax Description

mac-address	MAC address of a specific cable modem to be displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE Fuji 16.8.1	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

This example shows the output for the **show cable modem internal load-balance** command for a particular cable modem:

```
Router# show cable modem c8fb.26a6.c49c internal load-balance
Modem Hardware Information :
----------------------------
CM MAC Address                        : c8fb.26a6.c49c
CM MAC Version                        : DOC3.0
CM Wideband Capable                   : Y
Modem CMTS Status Information :
-------------------------------
Modem Status                        : {Modem= online(pt), Security=assign(tek)}
Modem US Bonding Mode               : Single-Channel
Modem DS Bonding Mode               : Single-Channel
Modem US Channels Information :
-------------------------------
Upstream Host Interface, TCS        : Cable3/0/1 0x4
UDC Enabled                         : N
US Frequency Range Capability       : Standard (5-42 MHz)
Extended Upstream Transmit Power    : 0dB
Multi-Transmit Channel Mode         : N
Upstream Channel                    : US2
Modem DS Channels Information :
-------------------------------
Downstream Channel DCID RF Channel : 6     3/0/0:5 (SC-QAM)
Primary Downstream                 : Do3/0/0:5 (RfId : 24581)
Modem Load-Balance Information In CMTS Config :
-----------------------------------------------
CMTS CFG CM Restricted to RLBG          : FALSE
CMTS CFG CM Restricted to RLBG Static   : FALSE
CMTS CFG CM Excluded from Being Assigned to DOSIS LBG  : FALSE
CMTS CFG CM Excluded from Being Assigned to DOSIS LBG  : FALSE
CMTS CFG CM Restricted to RLBG Dynamic  : FALSE
Modem Load-Balance Information In CM Config File :
--------------------------------------------------
CFG LB group ID in config file         : N/A
CFG Service Type ID in config file     :
```

```
CFG LB policy ID in config file        : 0
CFG Required DS Attribute Mask         : 0x0
CFG Forbidden DS Attribute Mask        : 0x0
CFG Required US Attribute Mask         : 0x0
CFG Forbidden US Attribute Mask        : 0x0
Modem Load-Balance Information Applied :
----------------------------------------
LB group ID assigned               : 2147557888
LB Service Type ID                 :
LB Tag                             :
LB policy ID                       : 0
LB priority                        : 0
LB Last CM Operation               : LB_NO_SKIP
LB Last Counts State               : 4
LB Balance Status DS               : LB_NO_SKIP
LB Balance Status US               : LB_NO_SKIP
LB Channel History                 :
Modem D30 LB Status Information :
--------------------------------
LB Failures Info     :
      LB Failures US : 0
      LB Failures DS : 0
LB  Debug Variables     :
     LB triggered dxc : 0
     LB target rcc_id : 0
     LB target rfid   : 4294967295
     LB group id      : 2147557888
     LB reg group id  : 0
     LB priority      : 0
     LB policy_id     : 0
     LB reg_policy_id : 0
```

show cable modem ipv6

To display IPv6 information for specified cable modems (CMs) and customer premise equipment (CPE) behind a CM on a Cisco CMTS router, use the **show cable modem ipv6** command in privileged EXEC mode.

Cisco uBR7246VXR Router and Cisco uBR7225VXR Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **ipv6** [**cpe** | **prefix** | **registered** | **unregistered**]

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*port* | *slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **ipv6** [**cpe** | **prefix** | **registered** | **unregistered**]

Cisco cBR-8 Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot*/*subslot*/*cable-interface-index*] **ipv6** [**prefix** | **registered** | **summary** | **unregistered**]

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
cable	Identifies the cable interface on the Cisco router.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. (Cisco cBR-8) The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.
cpe	(Optional) Displays IPv6 information for the CPE devices behind the CM with the specified IPv4 or IPv6 address.
prefix	(Optional) Displays the IPv6 prefix of the network.
registered	(Optional) Displays IPv6 information for registered CMs.
summary	(Optional) Displays the summary of the IPv6 information on Cisco cBR-8 Converged Broadband Router.
unregistered	(Optional) Displays IPv6 information for unregistered CMs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
12.2(33)SCG1	The output for the **show cable modem** *mac-address* **ipv6 cpe** has been modified.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The**upstream**, **name** and **cpe** keywords were and *logical-channel-index* variable was removed.

Usage Guidelines

Use the **show cable modem ipv6** command without any options to display IPv6 information for all CMs on the CMTS router.

Using the keyword options, you can display IPv6 information by IP address (IPv4 or IPv6) of a particular CM, for all CMs associated with a specified cable interface, by MAC address of a CM, or by domain name of a CM.



Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the Cisco CMTS router before any domain name can be used as part of a cable command.

To display the number of CPEs behind a CM, use the **show cable modem ipv6 registered** command.

To display CPE information behind a specific CM, use the **show cable modem** *mac-address* **ipv6 cpe** command.

Examples

IPv6 Information for all CMs

The following example shows sample output for the **show cable modem ipv6** command for all CMs on the Cisco CMTS routers, listing the devices by their MAC and IP addresses and displaying the associated domain name:

```
Router# show cable modem ipv6
MAC Address    Type Interface  Mac State    D/IP IP Address
0004.27a5.b761 B/D  C6/0/2/U1   online        N  ---
0007.0e01.d9a1 B/D  C6/0/2/U0   online        N  ---
0006.2854.7275 R/D  C6/0/2/U1   online        Y  2001:0DB8:3800:80B:7565:5B87:1D7D:5AD5
```

IPv6 prefix information for all CMs

The following example shows sample output for the **show cable modem ipv6 prefix** command for all CMs on the Cisco CMTS routers:

```
Router# show cable modem ipv6 prefix
Device Type: B - CM Bridge, R - CM Router
IP Assignment Method: D - DHCP
MAC Address    Type D/IP IPv6 prefix
0006.2854.7275 R/D  Y    2001:ODB8:3800:80C::/64
```

Starting with Cisco IOS Release12.2(33)SCG1, the output for the **show cable modem ipv6 prefix** command displays multiple IPv6 prefix assigned. The D/IP field is not supported. The following example shows the sample output for the **show cable modem ipv6 prefix** command for all CMs on the Cisco CMTS router:

```
Router#
show cable modem ipv6 prefix
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:36:53.075 UTC Thu Aug 2 2012
Device Type: B - CM Bridge, R - CM Router
IP Assignment Method: D - DHCP
MAC Address    Type IPv6 prefix
0023.bed9.4c91 R/D  2001:40:1012::/64
               R/D  2001:40:2012:1::/64
0000.002e.074c R/D  2001:40:1012:8::/64
               R/D  2001:40:2012:1D::/64
```

```
0000.002e.074b R/D  2001:40:1012:23::/64
               R/D  2001:40:2012:1C::/64
0000.002e.074a R/D  2001:40:1012:22::/64
               R/D  2001:40:2012:1B::/64
```

Starting with Cisco IOS Release12.2(33)SCG1, the following example shows sample output for the **show cable modem** *mac-address* **ipv6 prefi**x command for multiple IPv6 prefixes assigned to CPEs behind a CM with a specific MAC address on the Cisco CMTS router:

```
Router#
show cable modem 0023.bed9.4c8e ipv6 prefix
Load for five secs: 0%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:37:22.335 UTC Thu Aug 2 2012
Device Type: B - CM Bridge, R - CM Router
IP Assignment Method: D - DHCP
MAC Address    Type IPv6 prefix
0023.bed9.4c91 R/D  2001:40:1012::/64
               R/D  2001:40:2012:1::/64
```

Example of the show cable modem ipv6 Command for all Registered CMs

The following example shows sample output for the **show cable modem ipv6 registered** command for all registered CMs on the Cisco CMTS router:

```
Router# show cable modem ipv6 registered
Interface Prim Online     CPE IP Address                              MAC Address
          Sid  State
C4/0/U2   1    online     0   ---                                     0018.6835.27b3
C4/0/U2   2    online     0   2001:0DB8:3800:809:A896:1431:75EA:5EA1  0019.474a.c14a
C4/1/U1   2    online     0   ---                                     0007.0e03.6851
C4/1/U1   3    online     0   ---                                     0007.0e01.b085
C4/1/U1   4    online     0   2001:0DB8:3800:809:E97D:2986:9F37:FFE   0018.6835.27aa
```

Example of the show cable modem ipv6 cpe Command for all CMs

The following example shows sample output for the **show cable modem ipv6 cpe** command for all CMs on the Cisco CMTS router:

```
Router# show cable modem 0019.474a.c14a ipv6 cpe
MAC Address    IP Address                              Domain Name
```

0005.0052.2c1d 2001:420:3800:809:48F7:3C33:B774:9185

Starting with Cisco IOS Release12.2(33)SCG1, the following example shows sample output for the **show cable modem** *mac-address* **ipv6 cpe** command for registered CMs on the Cisco CMTS router:

```
Router# show cable modem 0023.bed9.4c8e ipv6 cpe
Load for five secs: 0%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:37:20.439 UTC Thu Aug 2 2012
MAC Address    IP Address
0023.bed9.4c91 2001:40:3:4:200:5EB7:BB6:C759
               2001:40:3:4:210:D73B:7A50:2D05
```

Table below describes the significant fields shown in the display.

Table 119: show cable modem ipv6 Field Descriptions

Field	Description
MAC Address	MAC address of this CM.

Field	Description
Type	Type of device that this CM is functioning as, with the following possible values: • B/D—CM as bridge using DHCP address assignment. • G/D—CPE router using DHCP address assignment. • C/A—CPE using Stateless Address Auto-Configuration (SLAAC) address assignment. **Note** In Cisco IOS Release 12.2(33)SCA, the Cisco CMTS router does not support SLAAC.
Interface	Cable line card interface and upstream associated with this CM.
Mac State	The current state of the MAC layer for this CM .
D/IP	Dual IP flag. Identifies whether or not (“Y” or “N”) the CM or CPE supports both IPv4 and IPv6 addressing. Starting from Cisco IOS Release 12.2(33)SCG1, D/IP field is not supported.
IP Address	IP address acquired by the CM. Prior to acquisition of the IP address, or if the CM fails registration, the following output is shown: • IPv4 address not yet acquired—”0.0.0.0” • IPv6 address not yet acquired—“::” • CM fails IPv6 registration, but online with IPv4 address or CM fails IPv4 registration, but online with IPv6 address: “---” • IPv6 address of IPv4-only CM, or IPv4 address of an IPv6-only CM: “---”
Domain Name	Domain name for the CM.

Table below shows the possible values for the MAC state field:

Table 120: Descriptions for the MAC State Field

MAC State Value [14]	Description
Registration and Provisioning Status Conditions for Devices Using IPv4 Addressing	
init(r1)	The CM sent initial ranging.
init(r2)	The CM is ranging. The CMTS received initial ranging from the CM and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed. **Note** If a CM appears to be stuck in this state, it could be that the CM is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the CM to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the **cable load-balance group** commands.

MAC State Value [14]	Description
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a CM appears to be stuck in this state, the CM has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
init(o)	The CM has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the CM remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
resetting	The CM is being reset and will shortly restart the registration process.
Registration and Provisioning Status Conditions for Devices Using IPv6 Addressing	
init6(s)	The Cisco CMTS router has seen the DHCPv6 SOLICIT message from the CM.
init6(a)	The Cisco CMTS router has seen the ADVERTISE message from the DHCPv6 server to the CM.
init6(r)	The Cisco CMTS router has seen the REQUEST response from the CM to the DHCPv6 server.
init6(i)	The Cisco CMTS router has seen the REPLY message from the DHCPv6 server to the CM.
init6(o)	The Cisco CMTS router has seen the REQEST message from the CM to the TFTP server.
init6(t)	The Cisco CMTS router has seen the REQUEST message from the CM to the TOD server.
Non-error Status Conditions	

MAC State Value [14]	Description
cc(r1)	The CM had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The CM has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
cc(r2)	This state should normally follow cc(r1) and indicates that the CM has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	The CM is considered offline (disconnected or powered down).
online	The CM has registered and is enabled to pass data on the network.
online(d)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the CM using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.
online(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	The CM registered, BPI is enabled and KEK is assigned.
online(pt)	The CM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.

MAC State Value [14]	Description
Note If an exclamation point (!) appears in front of one of the online states, it indicates that the **cable dynamic-secret** command has been used with either the **mark** or **reject** option, and that the cable modem has failed the dynamic secret authentication check.	
expire(pk)	The CM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.
expire(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	The CM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.
expire(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	
reject(m)	The CM attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the **cable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so.

MAC State Value [14]	Description
reject(c)	The CM attempted to register, but registration was refused due to a a number of possible errors: • The CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • The CM has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The CM attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and CMTS.)
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
reject(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
Note In Cisco IOS Release 12.1(20)EC, Cisco IOS Release 12.2(15)BC1, and earlier releases, when network access is disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) even if BPI encryption fails. Use the **show cable modem**mac-address command to confirm whether BPI is enabled or disabled for a particular cable modem.	
reject(ts)	The CM attempted to register, but registration failed because the TFTP server timestamp in the CM registration request did not match the timestamp maintained by the CMTS. This might indicate that the CM attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	The CM attempted to register, but registration failed because the IP address in the CM request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
reject(na)	The CM attempted to register, but registration failed because the CM did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.

[14] The CM MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtsCmStatusValue object in the CISCO-DOCS-EXT-MIB.



Note For the complete list of the cable modem status, see Table 100: Descriptions for the MAC State Field , on page 1892.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.

show cable modem ipv6 summary

To display the summary of IPv6 information on Cisco cBR Series Converged Broadband Routers, use the **show cable modem ipv6 summary** command in privileged EXEC mode.

show cable modem ipv6 [**prefix** | **registered** | **summary** | **unregistered**]

Syntax Description

prefix	(Optional) Displays the IPv6 prefix of the network.
registered	(Optional) Displays IPv6 information for registered CMs.
summary	(Optional) Displays the summary of the IPv6 information on Cisco cBR Series Converged Broadband Routers.
unregistered	(Optional) Displays IPv6 information for unregistered CMs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable modem ipv6 summary** command displays IPv6 summary information for all IPv6 CM's on the CMTS router. The summary information includes the total number of online IPv6 modems and total number of modems in each different state like init6(s), init6(a), init6(o) and so on.

Examples

The following example shows sample output for the **show cable modem ipv6summary** command for all CMs on the Cisco cBR Series Converged Broadband Routers:

```
Router# show cable modem ipv6 summary
Interface                    Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC init6S init6A init6O
Ca3/0/0       7     6     6     1     1       0        0      0      0      0
Ca3/0/1       16    16    16    0     0       0        0      0      0      0
Ca3/0/3       16    16    16    0     0       0        0      0      0      0

Total:        39    38    38    1     1       0        0      0      0      0
```

Related Commands

Command	Description
show cable modem summary	Displays a summary of CMs on one or more cable interfaces.
show cable modem summary total	Displays a summary and a total for all CMs on the chasis.

show cable load-balance move-history cable x/y/z

To display detailed information of every cable modem movement triggered through load balance, use the **show cable load-balance move-history cablex/y/z** command in privileged EXEC mode.

The detailed information of the modem movement are:

- The mac address of the cable modem that was moved.
- The mac-domain of the cable modem.
- The load balance group ID of cable modem.
- Old downstream information of the cable modem, including the primary downstream channel, RCC ID before moving.
- New downstream information of the cable modem, including the new primary downstream channel, RCC ID after moving.
- Old upstream information of the cable modem including the index of mac-domain, the bitmap of the upstream channel before moving.
- New upstream information of the cable modem including the index of mac-domain, the bitmap of the upstream channel after moving.
- The action of the cable modem movement, such as DBC, DCC, UCC, REINIT(DCC with init-tech 0).
- The trigger of the cable modem movement, such as D2.0 LB, D3.0 static LB, D3.0 dynamic LB.
- The start time of the cable modem movement.
- The elapsed time - how long the cable modem movement spent.
- The result of the action on modem movement - success, faiure, and the internal confirmation code.

show cable load-balance move-history cable x/y/z

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

This example shows the output for the **show cable load-balance move-history cablex/y/z** command for a particular cable modem:

```
Router#show cable load-balance move-history c3/0/1
Modem              Host          Grp Id              Primary RF/RCC
        MD/TCS                      Action Trans-Start         Elapse    Client
  Result
                              Interface                          Src
Target                   Src            Target                   Time
```

```
 Time(ms)
c8fb.26a6.c49c Ca3/0/1    2147557888 Do3/0/0:0/0       Do3/0/0:5/0       145/0x2    145/0x2
    DCC    Aug 11 10:46:28  2101     D2.0 LB         Success(13)
c8fb.26a6.c660 Ca3/0/1    2147557888 Do3/0/0:1/0       Do3/0/0:5/0       145/0x2    145/0x2
    DCC    Aug 11 10:45:55  4693     D2.0 LB         Success(13)
c8fb.26a6.c49a Ca3/0/1    2147557888 Do3/0/0:0/0       Do3/0/0:5/0       145/0x2    145/0x2
    DCC    Aug 11 10:45:55  4682     D2.0 LB         Success(13)
c8fb.26a6.c5c6 Ca3/0/1    2147557888 Do3/0/0:1/0       Do3/0/0:4/0       145/0x2    145/0x2
    DCC    Aug 11 10:45:24  4675     D2.0 LB          Success(13)
```

show cable modem low-latency-capable

To display the Low Latency DOCSIS Capable information, use the **show cable modem low-latency-capable** command in privileged EXEC mode.

show cable modem low-latency-capable

Syntax Description

show cable modem low-latency-capable	To display the Low Latency DOCSIS Capable information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced.

Examples

The following is a sample output of the **show cable modem low-latency-capable** command.

```
Router# show cable modem low-latency-capable
MAC Address     I/F             MAC             Reg  Oper  DSxUS DS   RCC    US
                                State           Ver  Ver        OFDM ID     OFDMA
206a.9454.30a4  C1/0/0/UB       w-online(pt)    3.1  3.1   8x4   0    1      0
a84e.3f37.0e9a  C1/0/6/UB       w-online(pt)    3.1  3.1   8x4   0    1      0
0cb9.3772.7c9c  C1/0/7/UB       w-online(pt)    3.1  3.1   8x4   0    1      0
206a.9454.30a4  C1/0/8/UB       w-online(pt)    3.1  3.1   8x2   0    1      0
```

show cable modem mac

To display MAC layer information for one or more CMs, use the **show cable modem mac** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **mac** [**summary** [**total**]]

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*port* | *slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **mac** [**summary** [**total**]]

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot*/*subslot*/*cable-interface-index*] **mac** [**summary** [**total**]]

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. (Cisco cBR-8) The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.
summary [**total**]	(Optional) Displays a summary of MAC layer information for each cable interface. If you add the optional **total** keyword, the display includes a total of CMs that are included in each of the displayed fields.

Command Default

Displays MAC layer information for all CMs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX and 12.2(4)BC1	This command was introduced for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
12.2(8)BC2	This command was enhanced to show whether a CM is capable of operating in DOCSIS 1.0 or DOCSIS 1.1 mode, and the version for which it is currently provisioned.
12.2(11)BC1	The **mac** option was enhanced to support the **summary** and **summary total** options.
12.2(15)CX	This command was enhanced to support DOCSIS 2.0 CMs using Advanced Time Division Multiple Access (A-TDMA) modulation profiles.
12.3(17a)BC	Introduced revised information that is displayed for the following two versions of the show cable modem mac command: **show cable modem mac summary** Refer to “Usage Guidelines.”

Release	Modification

12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes:
	• Support for the Cisco uBR7225VXR router was added.
	• Support for specifying the IPv6 address of a CM or CPE device was added.
	• The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
	• The following new initialization states were added to show initialization of CMs and CPEs supporting IPv6:
	  • init6(s)—CMTS router has seen SOLICIT message.
	  • init6(a)—CMTS router has seen ADVERTISE message.
	  • init6(r)—CMTS router has seen REQUEST message.
	  • init6(i)—CMTS router has seen REPLY message.
	  • init6(o)—CMTS router has seen version 6 TFTP request.
	  • init6(t)—CMTS router has seen version 6 TOD request.

12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The**upstream** and **name** keywords were and *logical-channel-index* variable was removed.

Usage Guidelines

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Cisco IOS Release 12.3(17a)BC introduces changes for two versions of the show cable modem mac command.

- **show cable modem mac summary**

The information displayed with this command is revised. The DOCSIS 2.0 column in the Quality of Service (QoS) Provision Mode field has been removed, as this field is not applicable to QoS provisioning in DOCSIS 2.0.

Command Output in Cisco IOS Release 12.3(17a)BC and Later Releases

```
Router# show cable modem mac summary
                           Cable Modem Summary
                           -------------------
                        Mac Version                QoS Provision Mode
Interface       Total   DOC2.0  DOC1.1  DOC1.0   Reg/Online   DOC1.1  DOC1.0
Cable5/1/0/U0   10      0       2       8        10           0       10
```

Command Output in Cisco IOS Release 12.3(13a)BC and Earlier Releases

```
Router# scm mac sum
                           Cable Modem Summary
                           -------------------
                        Mac Version                QoS Provision Mode
Interface       Total   DOC2.0  DOC1.1  DOC1.0   Reg/Online   DOC2.0  DOC1.1  DOC1.0
Cable8/0/0/U0   8       0       5       3        5            0       5       0
```

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Examples

This section contains examples for the different forms of the **show cable modem mac** command.

Default Displays

The following example shows typical output for the default form of the **show cable modem mac** command:

```
Router# show cable modem mac

MAC Address    MAC         Prim  Ver    QoS     Frag Concat PHS Priv  DS    US
               State       Sid          Prov                         Saids Sids
0050.7366.1243 online      1     DOC1.0 DOC1.0  no   no     no  BPI   0     0
0002.b970.0027 online      2     DOC1.1 DOC1.0  no   yes    yes BPI+  0     4
0006.5314.858d online      3     DOC1.1 DOC1.1  yes  yes    yes BPI+  0     4
0010.64ff.e4ad online      1     DOC1.1 DOC1.0  yes  yes    yes BPI+  0     4
0010.f025.1bd9 init(rc)    2     DOC1.0 DOC1.0  no   no     no  BPI   0     0
0010.9659.4447 online(pt)  3     DOC1.0 DOC1.0  no   yes    no  BPI   0     0
0010.9659.4461 online(pt)  4     DOC1.0 DOC1.0  no   yes    no  BPI   0     0
0010.64ff.e459 online      5     DOC1.0 DOC1.0  no   yes    no  BPI   0     0
```

```
0020.4089.7ed6 online      6     DOC1.0 DOC1.0  no   no     no  BPI   0     0
0090.9607.3831 online(pt)  7     DOC1.0 DOC1.0  no   no     no  BPI   0     0
0090.9607.3830 online(pt)  1     DOC1.0 DOC1.0  no   no     no  BPI   0     0
0050.7366.12fb init(i)     2     DOC1.0 DOC1.0  no   no     no  BPI   0     0
0010.fdfa.0a35 online(pt)  3     DOC1.1 DOC1.1  yes  yes    yes BPI+  0     4
```

The following example shows sample output for the **show cable modem mac** command for a particular cable interface:

```
Router# show cable modem c3/0 mac

MAC Address    MAC         Prim  Ver    QoS     Frag Concat PHS Priv  DS    US
               State       Sid          Prov                         Saids Sids
0050.7366.1243 online      1     DOC1.0 DOC1.0  no   no     no  BPI   0     0
0002.b970.0027 online      2     DOC1.1 DOC1.0  no   yes    yes BPI+  0     4
0006.5314.858d online      3     DOC1.1 DOC1.1  yes  yes    yes BPI+  0     4
```

The following example shows sample output for the **show cable modem mac** command for a particular CM, as identified by its MAC address:

```
Router# show cable modem 0010.7bb3.fcd1 mac

MAC Address    MAC         Prim  Ver    QoS     Frag Concat PHS Priv  DS    US
               State       Sid          Prov                         Saids Sids
0010.7bb3.fcd1 online      91    DOC1.1 DOC1.1  yes  yes    yes BPI+  1     4
```

The following example shows a sample output for the **show cable modem mac** command for a CM, as identified by its MAC address:

```
Router# show cable modem xxxx.xxxx.xxxx mac
                                                                          D
MAC Address    IP Address     I/F           MAC           Prim RxPwr  Timing Num I
                                            State         Sid  (dBmv) Offset CPE P
xxxx.xxxx.xxxx x.x.x.x  C6/0/2/U0          *
online        3087 0.50   1037   0   N
```



Note The * in front of the MAC state indicates that the CM did not satisfy the bpi-plus-policy and the data traffic is blocked. The **cable privacy bpi-plus-policy** command enforces this requirement.



Note The ! in front of the MAC state indicates that the CM has attempted to register with a modified cm configuration file. This is possibly a non-compliant CM trying to modify the service it is receiving.

The following example shows sample output for the **show cable modem mac** command for a particular CM, as identified by its IP address:

```
Router# show cable modem 10.1.1.10 mac

MAC Address    MAC         Prim  Ver    QoS     Frag Concat PHS Priv  DS    US
               State       Sid          Prov                         Saids Sids
0002.b970.0027 online      2     DOC1.1 DOC1.0  no   yes    yes BPI+  0     4
```

Table below describes the fields shown in the default forms of the **show cable modem mac** displays:

Table 121: Descriptions for the Default show cable modem mac Fields

Field	Description
MAC Address	The MAC address for the CM.
MAC State	The current state of the MAC layer.
Prim SID	The primary SID assigned to this CM.
Ver	Displays the maximum supported version of DOCSIS that the CM supports (DOCSIS 1.0, DOCSIS 1.1, DOCSIS 2.0).
QoS Prov	Displays the version of DOCSIS that the CM currently is provisioned and registered for (DOCSIS 1.0 and DOCSIS 1.1).
Frag	Indicates whether DOCSIS 1.1 or 2.0 MAC-layer fragmentation is enabled for this CM.
Concat	Indicates whether DOCSIS 1.1 or 2.0 MAC-layer concatenation is enabled for this CM.
PHS	Indicates whether DOCSIS 1.1 or 2.0 packet header suppression (PHS) is enabled for this CM.
Priv	Indicates whether Baseline Privacy Interface (BPI) or BPI Plus (BPI+) encryption is enabled for the CM.
DS Saids	Number of downstream security association IDs (Saids) used by this CM.
US Sids	Number of upstream service IDs (SIDs) used by this CM.

Table below shows the possible values for the MAC state field:

Table 122: Descriptions for the MAC State Field

MAC State Value[15]	Description
Registration and Provisioning Status Conditions for Devices Using IPv4 Addressing	
init(r1)	The CM sent initial ranging.
init(r2)	The CM is ranging. The CMTS received initial ranging from the Cm and has sent RF power, timing offset, and frequency adjustments to the CM.

MAC State Value[15]	Description
init(rc)	Ranging has completed. **Note** If a CM appears to be stuck in this state, it could be that the CM is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the CM to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the **cable load-balance group** commands.
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a CM appears to be stuck in this state, the CM has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
init(o)	The CM has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the CM remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
resetting	The CM is being reset and will shortly restart the registration process.
Registration and Provisioning Status Conditions for Devices Using IPv6 Addressing	
init6(s)	The Cisco CMTS router has seen the DHCPv6 SOLICIT message from the CM.
init6(a)	The Cisco CMTS router has seen the ADVERTISE message from the DHCPv6 server to the CM.
init6(r)	The Cisco CMTS router has seen the REQUEST response from the CM to the DHCPv6 server.
init6(i)	The Cisco CMTS router has seen the REPLY message from the DHCPv6 server to the CM.
init6(o)	The Cisco CMTS router has seen the REQEST message from the CM to the TFTP server.

MAC State Value[15]	Description
init6(t)	The Cisco CMTS router has seen the REQUEST message from the CM to the TOD server.
Non-error Status Conditions	
cc(r1)	The CM had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The CM has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
cc(r2)	This state should normally follow cc(r1) and indicates that the CM has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	The CM is considered offline (disconnected or powered down).
online	The CM has registered and is enabled to pass data on the network.
online(d)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the CM using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.
online(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	The CM registered, BPI is enabled and KEK is assigned.

MAC State Value[15]	Description
online(pt)	The CM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.
Note If an exclamation point (!) appears in front of one of the online states, it indicates that the **cable dynamic-secret** command has been used with either the **mark** or **reject** option, and that the cable modem has failed the dynamic secret authentication check.	
expire(pk)	The CM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.
expire(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	The CM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.
expire(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	
reject(m)	The CM attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the **cable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so.

MAC State Value[15]	Description
reject(c)	The CM attempted to register, but registration was refused due to a a number of possible errors: • The CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • The CM has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The CM attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and CMTS.)
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
reject(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
Note In Cisco IOS Release 12.1(20)EC, Cisco IOS Release 12.2(15)BC1, and earlier releases, when network access is disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) even if BPI encryption fails. Use the **show cable modem**mac-address command to confirm whether BPI is enabled or disabled for a particular cable modem.	
reject(ts)	The CM attempted to register, but registration failed because the TFTP server timestamp in the CM registration request did not match the timestamp maintained by the CMTS. This might indicate that the CM attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	The CM attempted to register, but registration failed because the IP address in the CM request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.

MAC State Value[15]	Description
reject(na)	The CM attempted to register, but registration failed because the CM did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.

15 The CM MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtsCmStatusValue object in the CISCO-DOCS-EXT-MIB.



Note For the complete list of the cable modem status, see Table 100: Descriptions for the MAC State Field , on page 1892.

Summary and Total Options

The following example shows the same display for the **show cable modem mac summary** command:

```
Router# show cable modem mac summary

                           Cable Modem Summary
                           -------------------
                           Mac Version                      QoS Provision Mode
Interface       Total   DOC2.0  DOC1.1  DOC1.0   Reg/Online   DOC2.0  DOC1.1  DOC1.0
Cable8/1/0/U1   1       1       0       0        1            0       0       1
Cable8/1/0/U4   2       2       0       2        2            1       1       0
Router#
```

The following example shows the summary display when the **total** option is added:

```
Router# show cable modem mac summary total

                           Cable Modem Summary
                           -------------------
                           Mac Version                      QoS Provision Mode
Interface       Total   DOC2.0  DOC1.1  DOC1.0   Reg/Online   DOC2.0  DOC1.1  DOC1.0
Cable5/1/0/U5   1       0       0       1        1            0       0       1
Cable6/1/0/U0   11      0       0       11       8            0       0       8
Cable6/1/1/U2   17      0       1       16       15           0       0       15
Cable7/0/0/U0   2       0       0       2        1            0       0       1
Cable7/0/0/U5   1       0       0       1        0            0       0       0
Total:          32      0       1       31       25           0       0       25
Router#
```

Table below describes the fields shown in the **show cable modem mac summary** displays:

Table 123: Descriptions for the show cable modem mac summary Fields

Field	Description
I/F	The cable interface line card providing the upstream for this CM.
Total	Total number of CMs currently active on this cable interface.

Field	Description
MAC Version DOC 2.0	Total number of CMs on this interface that reported in their registration request as having DOCSIS 2.0 capabilities.
MAC Version DOC 1.1	Total number of CMs on this interface that reported in their registration request as having DOCSIS 1.1 capabilities.
MAC Version DOC 1.0	Total number of CMs on this interface that reported in their registration request as having DOCSIS 1.0 capabilities.
Reg/Online	Total number of CMs on this interface that have completed registration and are currently online.
QoS Provisioned Mode DOC 2.0	Total number of CMs on this interface that have been provisioned and registered for DOCSIS 2.0 operations.
QoS Provisioned Mode DOC 1.1	Total number of CMs on this interface that have been provisioned and registered for DOCSIS 1.1 operations.
QoS Provisioned Mode DOC 1.0	Total number of CMs on this interface that have been provisioned and registered for DOCSIS 1.0 operations.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem errors	Displays error statistics for one or more CMs.
show cable modem flap	Displays flap list statistics for one or more CMs.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more CMs.
show cable modem phy	Displays the DOCSIS PHY layer information for one or more CMs.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem maintenance

To display station maintenance (SM) error statistics for one or more cable modems, use the **show cable modem maintenance** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers

show cable modem [*ip-addressmac-address* | **cable** {*slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **maintenance**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **maintenance**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*cable-interface-index*} [**upstream** *port*]] **maintenance**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router— The valid range is from 0 to 3 and 6 to 9
subslot	Secondary slot number of the cable interface line card. • Cisco uBR10012 —The valid subslots are 0 or 1. • Cisco cBR-8 router— The valid subslot is 0.
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is 0 to 15.

upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. Cisco cBR-8 router—The valid range is 0 to 7.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This variable is not supported on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This keyword is not supported on the Cisco cBR-8 router.
maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3XA	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **name** keyword and *logical-channel-index* variable are removed.

Usage Guidelines

This command displays information about the number of times that a CM has exhausted its maximum retry attempts to respond to a Station Maintenance (SM) request, as well as the number of times that the CMTS has canceled ranging with a CM during a Station Maintenance interval. This information can be used to determine whether a particular cable modem or interface is experiencing plant or network difficulties.

You can display this information for all online cable modems, all online cable modems for a specific cable interface, or for one particular cable modem.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

This example shows the output for the **show cable modem maintenance** command for all online cable modems:

```
Router# show cable modem maintenance

MAC Address    I/F          Prim  SM Exhausted          SM Aborted
                            Sid   Count Time            Count Time
0010.9507.01db C5/1/0/U5    1     0     --- -- 00:00:00 0     --- -- 00:00:00
0002.b96f.fdbb C6/1/0/U0    5     1     Jun 20 13:23:03 0     --- -- 00:00:00
0002.fdfa.129d C6/1/0/U0    6     0     --- -- 00:00:00 0     --- -- 00:00:00
0002.fdfa.137d C6/1/0/U0    7     0     --- -- 00:00:00 0     --- -- 00:00:00
0050.7302.3d73 C6/1/0/U0    8     0     --- -- 00:00:00 0     --- -- 00:00:00
0002.fdfa.12d5 C6/1/0/U0    9     0     --- -- 00:00:00 0     --- -- 00:00:00
0002.fdfa.1163 C6/1/0/U0    10    0     --- -- 00:00:00 0     --- -- 00:00:00
0006.28f9.8bbd C6/1/0/U0    11    0     --- -- 00:00:00 0     --- -- 00:00:00
00d0.bad3.c0cf C6/1/0/U0    12    0     --- -- 00:00:00 0     --- -- 00:00:00
0003.e38f.e85b C6/1/0/U0    14    149   Jun 21 14:24:03 0     --- -- 00:00:00
0001.9659.519f C6/1/0/U0    18    53    Jun 21 14:25:32 0     --- -- 00:00:00
0003.e3a6.8195 C6/1/0/U0    19    10    Jun 21 05:37:54 0     --- -- 00:00:00
0003.e3a6.8173 C6/1/1/U2    15    2     Jun 20 13:41:27 0     --- -- 00:00:00
0002.fdfa.12ef C6/1/1/U2    16    1     Jun 20 13:16:30 0     --- -- 00:00:00
0002.fdfa.12e9 C6/1/1/U2    17    1     Jun 20 13:16:30 0     --- -- 00:00:00
0003.e3a6.7f69 C6/1/1/U2    18    2     Jun 20 13:43:10 0     --- -- 00:00:00
0030.80bc.3095 C6/1/1/U2    19    2     Jun 20 13:45:00 0     --- -- 00:00:00
0003.e38f.e9ab C6/1/1/U2    20    1     Jun 20 13:43:47 0     --- -- 00:00:00
0006.28f9.9d19 C6/1/1/U2    22    0     --- -- 00:00:00 0     --- -- 00:00:00
```

```
0003.e3a6.7fe3 C6/1/1/U2   23    0     --- -- 00:00:00 0     --- -- 00:00:00
0020.4005.3f06 C6/1/1/U2   24    0     --- -- 00:00:00 0     --- -- 00:00:00
Router#
```

This example shows the output for the **show cable modem maintenance** command for all cable modems on a specific cable interface:

```
Router# show cable modem c8/1/0 maintenance

MAC Address    I/F         Prim  SM Exhausted          SM Aborted
                           Sid   Count Time            Count Time
0050.7366.1243 C8/1/0/U1   1     1     Apr 28 13:06:11 0     --- -- 00:00:00
0002.b970.0027 C8/1/0/U4   2     0     --- -- 00:00:00 0     --- -- 00:00:00
0006.5314.858d C8/1/0/U4   3     2     Apr 28 13:07:28 0     --- -- 00:00:00
Router#
```

This example shows the output for the **show cable modem maintenance** command for a particular CM:

```
Router# show cable modem 0010.7bb3.fcd1 maintenance

MAC Address    I/F         Prim  SM Exhausted          SM Aborted
                           Sid   Count Time            Count Time
0010.7bb3.fcd1 C5/0/U5     1     3     Jun 1  10:24:52 0     Jan 1  00:00:00
Router#
```

This example shows the output for the **show cable modem maintenance** command for all online cable modems:

```
Router#show cable modem maintenance
MAC Address    I/F           Prim  SM    Exhausted       SM    Aborted
                             Sid   Count Time            Count Time
0025.2e2d.75be C1/0/0/U1     1     0     --- -- 00:00:00 0     --- -- 00:00:00
0025.2e2d.74f8 C1/0/0/U0     2     1     Jan 18 18:54:14 0     --- -- 00:00:00
0025.2eaf.8302 C1/0/0/U0     3     0     --- -- 00:00:00 0     --- -- 00:00:00
0025.2eaf.82e4 C1/0/0/U0     4     1     Jan 18 18:54:56 0     --- -- 00:00:00
0025.2eaf.82f4 C1/0/0/U1     5     1     Jan 18 18:55:01 0     --- -- 00:00:00
0025.2eaf.7f38 C1/0/0/U1     6     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.56b6 C1/0/1/U0     1     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5792 C1/0/1/U3     2     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.57a6 C1/0/1/U3     3     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5574 C1/0/1/U3     4     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5936 C1/0/1/U3     5     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5810 C1/0/1/U3     6     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5400 C1/0/1/U3     7     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.572e C1/0/1/U2     8     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.56ca C1/0/1/U0     9     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.52f2 C1/0/1/U2     10    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.57f4 C1/0/1/U3     11    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5866 C1/0/1/U3     12    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5814 C1/0/1/U0     13    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.55ac C1/0/1/U2     14    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5580 C1/0/1/U0     15    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.54e0 C1/0/1/U0     16    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.560a C1/0/3/U0     1     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5384 C1/0/3/U0     2     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5376 C1/0/3/U0     3     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5598 C1/0/3/U0     4     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.52fe C1/0/3/U2     5     0     --- -- 00:00:00 0     --- -- 00:00:00
```

```
c8fb.26a5.56d8 C1/0/3/U0     6     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.53f6 C1/0/3/U1     7     5     May 22 10:05:31 0     --- -- 00:00:00
c8fb.26a5.56b2 C1/0/3/U0     8     1     Jan 18 18:56:33 0     --- -- 00:00:00
c8fb.26a5.52ca C1/0/3/U0     9     0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.52c8 C1/0/3/U2     10    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5474 C1/0/3/U3     11    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5742 C1/0/3/U1     12    5     May 22 10:01:45 0     --- -- 00:00:00
c8fb.26a5.5346 C1/0/3/U0     13    5     May 22 10:03:34 0     --- -- 00:00:00
c8fb.26a5.54e4 C1/0/3/U0     14    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5624 C1/0/3/U1     15    0     --- -- 00:00:00 0     --- -- 00:00:00
c8fb.26a5.5428 C1/0/3/U3     16    6     May 22 10:03:24 0     --- -- 00:00:00

Router#
```

This example shows the output for the **show cable modem maintenance** command for all cable modems on a specific cable interface:

```
Router#show cable modem C1/0/0 maintenance
MAC Address    I/F           Prim  SM    Exhausted       SM    Aborted
                             Sid   Count Time            Count Time
0025.2e2d.75be C1/0/0/U1     1     0     --- -- 00:00:00 0     --- -- 00:00:00
0025.2e2d.74f8 C1/0/0/U0     2     1     Jan 18 18:54:14 0     --- -- 00:00:00
0025.2eaf.8302 C1/0/0/U0     3     0     --- -- 00:00:00 0     --- -- 00:00:00
0025.2eaf.82e4 C1/0/0/U0     4     1     Jan 18 18:54:56 0     --- -- 00:00:00
0025.2eaf.82f4 C1/0/0/U1     5     1     Jan 18 18:55:01 0     --- -- 00:00:00
0025.2eaf.7f38 C1/0/0/U1     6     0     --- -- 00:00:00 0     --- -- 00:00:00

Router#
```

This example shows the output for the **show cable modem maintenance** command for a particular CM:

```
Router#show cable modem 0025.2eaf.7f38 maintenance
MAC Address    I/F           Prim  SM    Exhausted       SM    Aborted
                             Sid   Count Time            Count Time
0025.2eaf.7f38 C1/0/0/U1     6     0     --- -- 00:00:00 0     --- -- 00:00:00

Router#
```

Table below describes the fields shown in the **show cable modem maintenance** displays:

Table 124: Descriptions for the show cable modem maintenance Fields

Field	Description
MAC Address	The MAC address for the CM.
I/F	The cable interface line card, including upstream, for this CM.
Prim SID	The primary SID assigned to this CM.
SM Exhausted Count	Number of times this CM has repeatedly timed out and exhausted the maximum allowable retry attempts when it was sent a Station Maintenance request. The CMTS responds by taking the CM offline, forcing the CM to reinitialize and reregister.

Field	Description
SM Exhausted Time	The last time that this CM repeatedly timed out and exhausted the maximum allowable retry attempts when it was sent a Station Maintenance request.
SM Aborted Count	Number of times the CMTS has canceled ranging for a CM during a Station Maintenance period, typically because the CM has been reset.
SM Aborted Time	The last time the CMTS canceled ranging for a CM during a Station Maintenance period, typically because the CM has been reset.

Related Commands

Command	Description
cable flap-list miss-threshold	Configures the threshold for recording a flap-list event, in terms of missed Station Maintenance messages.
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem calls	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem domain-name	Updates the cable-specific DNS cache and display the domain name for specified CMs and CPE behind a CM on a Cisco CMTS router.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem offline

To display a list of the cable modems (CMs) that are marked as offline with the Cisco CMTS router, use the **show cable modem offline** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **offline**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*port* | *slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **offline**

Cisco cBR-8 Converged Broadband Router
show cable modem offline

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.

upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router.
offline	Displays a list of the cable modems that are marked as offline.

Command Default

Displays a list of all offline CMs known by the Cisco CMTS router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(7)XR and 12.1(1a)T1	This command was introduced.
12.2(4)BC1	Support for the Cisco uBR10012 router was introduced.

12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes:
	• Support for the Cisco uBR7225VXR router was added.
	• Support for specifying the IPv6 address of a CM or CPE device was added.
	• The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
	• The following new initialization states were added to show initialization of CMs and CPEs supporting IPv6:
	  • init6(s)—CMTS router has seen SOLICIT message.
	  • init6(a)—CMTS router has seen ADVERTISE message.
	  • init6(r)—CMTS router has seen REQUEST message.
	  • init6(i)—CMTS router has seen REPLY message.
	  • init6(o)—CMTS router has seen version 6 TFTP request.
	  • init6(t)—CMTS router has seen version 6 TOD request.

12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. All the keywords and variables were removed.

Usage Guidelines

This command displays a list of CMs that had either been online previously or had attempted to register with the CMTS, but that are now considered offline. Offline cable modems remain in the CMTS databases for 24 hours and then are deleted.



Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

The following example shows sample output for the default form of the **show cable modem offline** command.

```
Router# show cable modem offline

Interface   MAC address     Prim Previous  Offline          Rx     Rx    SM
                            Sid  State     Time             Power  SNR   Exhaust
                                                                       Count
Cable5/0/U0 0030.946a.5d61 1    init(i)   Jun 14 21:31:57   0.00  31.86 162
Cable5/0/U0 0030.946a.5d85 2    init(i)   Jun 14 22:47:39  -0.25  31.26 156
Cable5/0/U0 0030.946a.5b6d 3    init(i)   Jun 14 14:20:11   1.00  30.56 166
```

The following example shows sample output for the **show cable modem offline** command for a particular upstream on a cable interface:

```
Router# show cable modem c3/0 upstream 0 offline

Interface MAC address    Prim Previous    Offline          Rx     Rx    SM
                         Sid  State       Time             Power  SNR   Exhaust
                                                                       Count
C3/0/U0   0050.7366.1c69 58   init(rc)    Jan 7  16:46:49   4.50  26.72 2
```

```
C3/0/U0   0050.7366.1c53 59   init(rc)    Jan 7  16:47:09   5.25  25.10 1
C3/0/U0   0050.7366.1ca7 60   init(rc)    Jan 7  16:47:11   5.00  25.57 1
C3/0/U0   0050.7366.1c45 61   init(rc)    Jan 7  16:49:27   5.00  26.74 2
C3/0/U0   0050.7366.1c95 62   init(rc)    Jan 7  16:51:29   5.50  31.82 1
C3/0/U0   0050.7366.1c99 64   init(rc)    Jan 7  16:52:55   5.25  26.76 2
```

The following example shows sample output for the **show cable modem offline** command for a single CM, as identified by its IP address:

```
Router# show cable modem 22.1.1.10 offline

Interface   MAC address    Prim Previous  Offline          Rx     Rx    SM
                           Sid  State     Time             Power  SNR   Exhaust
                                                                       Count
Cable5/0/U0 0030.946a.5b6d 3    init(i)   Jun 14 14:20:11   1.00  30.56 166
```

The following example shows sample output for the **show cable modem offline** command for a single CM, as identified by its MAC address:

```
Router# show cable modem 0030.946a.5d61 offline

Interface   MAC address    Prim Previous  Offline          Rx     Rx    SM
                           Sid  State     Time             Power  SNR   Exhaust
                                                                       Count
Cable5/0/U0 0030.946a.5d61 1    init(i)   Jun 14 21:31:57   0.00  31.86 162
```

Table below describes the major fields shown in the **show cable modem offline** displays:

Table 125: Descriptions for the show cable modem offline Fields

Field	Description
Interface	The cable interface line card that this CM last used when it was online.
MAC address	Hardware MAC address for this CM.
Prim SID	The primary SID that had been last assigned to this CM before it went offline.
Previous State	The last known state of the MAC layer for this CM before it went offline. **Note** A pound sign (#) in the Previous State column indicates that the **cable tftp-enforce mark-only** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so (Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases).
Offline Time	The time and date that this CM last went offline.

Field	Description
Rx Power	The last known received power level (in dB) for the CM before it went offline. **Note** An asterisk (*) in the Rx Power column indicates that a power adjustment was made for that CM. An exclamation point (!) indicates that the CM had reached its maximum power transmit level and could not increase its power level further.
Rx SNR	The last known signal-to-noise ratio (SNR) value for this CM before it went offline.
SM Exhaust Count	Number of times that this CM has exhausted the maximum allowable retries for not responding to the regular Station Maintenance (SM) messages sent to it by the CMTS.
Note Using the **clear counters** command to reset a cable interface's counters also resets the SM Exhaust Count field for all offline CMs to zero and resets the Offline Time field for all offline CMs to the current time.	

Table below shows the possible values for the Previous State field:

Table 126: Descriptions for the Previous State Field

MAC State Value [16]	Description
Registration and Provisioning Status Conditions for Devices Using IPv4 Addressing	
init(r1)	The CM sent initial ranging.
init(r2)	The CM is ranging. The CMTS received initial ranging from the Cm and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed. **Note** If a CM appears to be stuck in this state, it could be that the CM is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the CM to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the **cable load-balance group** commands.
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.

MAC State Value [16]	Description
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a CM appears to be stuck in this state, the CM has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
init(o)	The CM has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the CM remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
resetting	The CM is being reset and will shortly restart the registration process.
Registration and Provisioning Status Conditions for Devices Using IPv6 Addressing	
init6(s)	The Cisco CMTS router has seen the DHCPv6 SOLICIT message from the CM.
init6(a)	The Cisco CMTS router has seen the ADVERTISE message from the DHCPv6 server to the CM.
init6(r)	The Cisco CMTS router has seen the REQUEST response from the CM to the DHCPv6 server.
init6(i)	The Cisco CMTS router has seen the REPLY message from the DHCPv6 server to the CM.
init6(o)	The Cisco CMTS router has seen the REQEST message from the CM to the TFTP server.
init6(t)	The Cisco CMTS router has seen the REQUEST message from the CM to the TOD server.
Non-error Status Conditions	
cc(r1)	The CM had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The CM has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.

MAC State Value [16]	Description
cc(r2)	This state should normally follow cc(r1) and indicates that the CM has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	The CM is considered offline (disconnected or powered down).
online	The CM has registered and is enabled to pass data on the network.
online(d)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the CM using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.
online(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	The CM registered, BPI is enabled and KEK is assigned.
online(pt)	The CM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.
Note If an exclamation point (!) appears in front of one of the online states, it indicates that the **dynamic-secret** command has been used with either the **mark** or **reject** option, and that the cable modem has failed the dynamic secret authentication check.	
expire(pk)	The CM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.

MAC State Value [16]	Description
expire(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	The CM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.
expire(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	
reject(m)	The CM attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the **cablecable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so.
reject(c)	The CM attempted to register, but registration was refused due to a a number of possible errors: • The CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • The CM has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The CM attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and CMTS.)
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
reject(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.

MAC State Value [16]	Description
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
Note In Cisco IOS Release 12.1(20)EC, Cisco IOS Release 12.2(15)BC1, and earlier releases, when network access is disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) even if BPI encryption fails. Use the **show cable modem** *mac-address* command to confirm whether BPI is enabled or disabled for a particular cable modem.	
reject(ts)	The CM attempted to register, but registration failed because the TFTP server timestamp in the CM registration request did not match the timestamp maintained by the CMTS. This might indicate that the CM attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	The CM attempted to register, but registration failed because the IP address in the CM request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
reject(na)	The CM attempted to register, but registration failed because the CM did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.

[16] The CM MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtsCmStatusValue object in the CISCO-DOCS-EXT-MIB.

Note For the complete list of the cable modem status, see Table 100: Descriptions for the MAC State Field , on page 1892.

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
clear counters	Clears counters for one or all interfaces.
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.
show cable modem classifiers	Displays information about the classifiers for a particular CM.

Command	Description
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem registered	Displays a list of the CMs that are marked as registered with the Cisco CMTS.
show cable modem unregistered	Displays a list of the CMs that are marked as unregistered with the Cisco CMTS.
show cable modem vendor	Displays the vendor name or Organizational Unique Identifier (OUI) for the CMs on each cable interface.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem partial-mode

To display information about cable modems that are in upstream and downstream partial service mode, use the **show cable modem partial-mode** command in privileged EXEC mode.

show cable modem partial-mode

Cisco cBR-8 Converged Broadband Router
show cable modem partial-mode [ofdma]

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCD2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router.
Cisco IOS XE Amsterdam 17.3.1w	This command was updated to include the new partial mode reason.

Usage Guidelines

If all cable modems are in full service mode (all downstream and upstream channels of the cable modems are online and operational), then the show cable modem partial-mode command does not provide any output. This command provides output only when the cable modems register in partial service mode (one or more downstream or upstream channels of the downstream or upstream bonded cable modems are not operational).

Examples

The following is a sample output of the show cable modem partial-mode command that displays all the cable modems in partial service mode:

```
Router# show cable modem partial-mode
MAC Address    IP Address      I/F         MAC           Prim  RCC  UP-reason/
                                           State         Sid   ID   Failed-tcs
001e.6bfb.33a0 2.99.81.14      C7/0/0/p    p-online(pt)  3     2     0x1 / 0x4
0022.cef4.3d9a 2.99.81.23      C7/0/0/p    p-online(pt)  4     2     0x1 / 0x4
001e.6bfb.194e 2.99.81.32      C7/0/0/p    p-online(pt)  6     2     0x1 / 0x4
001e.6bfb.1538 2.99.81.38      C7/0/0/p    p-online(pt)  8     2     0x1 / 0x4
001e.6bfb.0d22 2.99.81.29      C7/0/0/p    p-online(pt)  9     1     0x1 / 0x4
001e.6bfb.1a7e 2.99.81.30      C7/0/0/p    p-online(pt)  10    1     0x1 / 0x4
001e.6bfa.f58a 2.99.81.9       C7/0/0/p    p-online(pt)  12    1     0x1 / 0x4
0022.cef4.3fa2 2.99.81.24      C7/0/0/p    p-online(pt)  13    2     0x1 / 0x4
001e.6bfb.1b72 2.99.81.10      C7/0/0/p    p-online(pt)  14    2     0x1 / 0x4
0023.be50.e578 2.99.81.17      C7/0/0/UB   p-online(pt)  16    2     N/A
0025.2e2d.784a 2.99.81.28      C7/0/0/UB   p-online(pt)  17    2     N/A
0025.2e2d.748c 2.99.81.26      C7/0/0/UB   p-online(pt)  18    2     N/A
```

Table below describes the significant fields shown in the display.

Table 127: show cable modem partial-mode Field Descriptions

Field	Description
MAC Address	MAC address of the cable modem.
IP Address	IP address that the DHCP server has assigned to the cable modem.
I/F	Cable interface line card providing the upstream for the cable modem.
MAC State	Current state of the MAC layer.
Prim Sid	Primary Service ID (SID) assigned to the cable modem.
RCC ID	Receive channel configuration (RCC) ID of the cable modem.
UP-reason/Failed-tcs	• UP-reason—Upstream partial service reason. This is a bitmap defined in upstream resiliency. • Failed-tcs—Transmit channel set (TCS) bitmap of the cable modem, which is not available.

This example shows the output of the **show cable modem partial-mode** command on the Cisco cBR-8 router:

```
Router# show cable modem partial-mode
MAC Address    IP Address      I/F         MAC           Prim  RCC  UP-reason/
                                           State         Sid   ID   Failed-tcs
001e.6bfb.33a0 2.99.81.14      C7/0/0/p    p-online(pt)  3     2     0x1 / 0x4
0022.cef4.3d9a 2.99.81.23      C7/0/0/p    p-online(pt)  4     2     0x1 / 0x4
001e.6bfb.194e 2.99.81.32      C7/0/0/p    p-online(pt)  6     2     0x1 / 0x4
001e.6bfb.1538 2.99.81.38      C7/0/0/p    p-online(pt)  8     2     0x1 / 0x4
001e.6bfb.0d22 2.99.81.29      C7/0/0/p    p-online(pt)  9     1     0x1 / 0x4
001e.6bfb.1a7e 2.99.81.30      C7/0/0/p    p-online(pt)  10    1     0x1 / 0x4
001e.6bfa.f58a 2.99.81.9       C7/0/0/p    p-online(pt)  12    1     0x1 / 0x4
0022.cef4.3fa2 2.99.81.24      C7/0/0/p    p-online(pt)  13    2     0x1 / 0x4
001e.6bfb.1b72 2.99.81.10      C7/0/0/p    p-online(pt)  14    2     0x1 / 0x4
0023.be50.e578 2.99.81.17      C7/0/0/UB   p-online(pt)  16    2     N/A
0025.2e2d.784a 2.99.81.28      C7/0/0/UB   p-online(pt)  17    2     N/A
0025.2e2d.748c 2.99.81.26      C7/0/0/UB   p-online(pt)  18    2     N/A
```

Thisexample shows the output of the **show cable modem partial-mode** command on the Cisco cBR-8 router:

```
Router#show cable modem partial-mode
MAC Address     IP Address   I/F          MAC           Prim  RCC     UP-reason/
                                          State         Sid   ID      Failed-tcs
f81d.0f01.1e10  9.2.0.46     C1/0/0/p     w-online      1     1       0x21/0x20  (RNG,
RxMER)
4800.33ef.0cca  9.2.0.35     C1/0/0/p     w-online      41    1       0x20/0x20  (RxMER)


Router#show cable modem f81d.0f01.1e10 partial-mode
MAC Address    IP Address      I/F          MAC          Prim  RCC   UP-reason/

                                            State        Sid   ID    Failed-tcsf
81d.0f01.1e10  9.2.0.46        C1/0/0/p     w-online     1     1     0x20 / 0x20

        0x01 = Ranging
```

```
        0x10 = CWErr Partial Mode
        0x20 = RxMER downgrade
        0x21 = Rng, RxMER
```

Thisexample shows the output of the **show cable modem partial-mode ofdma** command on the Cisco cBR-8 router:

```
Router#show cable modem partial-mode ofdma
MAC Address    IP Address      I/F           MAC           Prim  RCC    UP-reason/
                                             State         Sid   ID     Failed-tcs
f81d.0f01.1e10 9.2.0.46        C1/0/0/p      w-online      1     1      0x21/0x20  (RNG,
RxMER)
4800.33ef.0cca 9.2.0.35        C1/0/0/p      w-online      41    1      0x20/0x20  (RxMER)
```

Related Commands

Command	Description
show cable modem	Displays information about the registered and unregistered cable modems.
show cable modem docsis-version	Displays information about the DOCSIS version of cable modems on one or more cable interfaces.

show cable modem partial-service

To display the impaired state of the cable modems on the Cisco CMTS router, use the **show cable modem partial-service** command in privileged EXEC mode.

show cable modem [*interface*] **partial-service** [**us-partial**] [**ds-partial**] [**ds-suspended**]

Cisco cBR-8 Converged Broadband Router
show cable modem [*interface*] **partial-service** [**us-partial**] [**ds-partial**] [**ds-suspended**]

Syntax Description

(Optional) *interface*	The cable mac-domain interface.
(Optional) **us-partial**	Show only CMs in DS partial-service.
(Optional) **ds-partial**	Show only CMs in US partial-service.
(Optional) **ds-suspended**	List all CMs that include one or more suspended channels in their RCC. This includes both p-online and w-online CMs. Also, a list of suspended channels is printed for each CM.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router.
Cisco IOS XE Cupertino 17.9.1w	The **us-partial** , **ds-partial** , and **ds-suspended** options are introduced.

Examples

The following is a sample output of the **show cable modem partial-service** :

```
Router#show cable modem partial-service
MAC Address    IP Address   I/F         MAC           DSxUS  Impaired   Impaired  Forwarding

                                        State          State  DS         US        Interface

4800.33ef.3c42 9.38.8.4     C1/0/0/UB    p-online(pt)   33x6   1/0/0:9              In1/0/0:8
4800.33ef.3ee6 9.38.8.15    C1/0/0/UB    p-online(pt)   33x6   1/0/0:4              Wi1/0/0:3
4800.33ef.0d1a 9.38.8.11    C9/0/0/p     p-online(pt)   33x5   9/0/0:9    1         Do9/0/0:0
4800.33ef.3e92 9.38.8.7      C9/0/1/p     w-online(pt)   34x5                 1           N/A
4800.33ef.0666 9.38.8.2      C9/0/8/p     w-online(pt)   34x5                 1           N/A
4800.33ef.3f3e 9.38.8.16     C9/0/9/p     w-online(pt)   34x5                 1           N/A

Router#
```

Examples

The following is a sample output of the **show cable modem partial-service ds-partial**:

```
Router#show cable modem partial-service ds-partial
MAC Address    IP Address   I/F          MAC          DSxUS  Impaired   Impaired  Forwarding

                                         State         State  DS         US        Interface

4800.33ef.3c42 9.38.8.4     C1/0/0/UB     p-online(pt)  33x6   1/0/0:9              In1/0/0:8
4800.33ef.3ee6 9.38.8.15    C1/0/0/UB     p-online(pt)  33x6   1/0/0:4              Wi1/0/0:3
4800.33ef.0d1a 9.38.8.11    C9/0/0/p      p-online(pt)  33x5   9/0/0:9     1        Do9/0/0:0

Router#
```

Examples

The following is a sample output of the **show cable modem partial-service us-partial**:

```
Router#show cable modem partial-service us-partial
MAC Address    IP Address   I/F          MAC          DSxUS  Impaired   Impaired  Forwarding

                                         State         State  DS          US       Interface

4800.33ef.0d1a 9.38.8.11    C9/0/0/p      p-online(pt)  33x5               1         N/A
4800.33ef.3e92 9.38.8.7     C9/0/1/p      w-online(pt)  34x5               1         N/A
4800.33ef.0666 9.38.8.2     C9/0/8/p      w-online(pt)  34x5               1         N/A
4800.33ef.3f3e 9.38.8.16    C9/0/9/p      w-online(pt)  34x5               1         N/A

Router#
```

Examples

The following is a sample output of the **show cable modem partial-service ds-suspended** command:

```
Router#show cable modem partial-service ds-suspended
Load for five secs: 10%/1%; one minute: 15%; five minutes: 17%
Time source is NTP, *21:14:34.590 EDT Fri Sep 16 2022
MAC Address    IP Address      I/F           MAC               DSxUS  Suspended DS
                                             State             State

c8fb.26a3.b9cc 9.9.0.119       C1/0/4/UB     p-online(pt)      4x1    1/0/4:11
                                                                      1/0/4:12
                                                                      1/0/4:13
                                                                      1/0/4:14
c8fb.26a3.ba5c 9.9.0.66        C1/0/4/UB     p-online(pt)      4x1    1/0/4:11
                                                                      1/0/4:12
                                                                      1/0/4:13
                                                                      1/0/4:14
c8fb.26a3.bb3c 9.9.0.142       C1/0/4/UB     w-online(pt)      8x4    1/0/4:11
                                                                      1/0/4:12
                                                                      1/0/4:13
                                                                      1/0/4:14
c8fb.26a3.d032 9.9.1.66        C1/0/4/UB     p-online(pt)      4x1    1/0/4:11
                                                                      1/0/4:12
                                                                      1/0/4:13
                                                                      1/0/4:14
c8fb.26a3.b980 9.9.1.197       C1/0/5/UB     w-online(pt)      8x4    1/0/5:12
                                                                      1/0/5:13
c8fb.26a3.b056 9.9.2.186       C1/0/5/UB     w-online(pt)      8x4    1/0/5:12
                                                                      1/0/5:13
c8fb.26a3.bb42 9.9.0.88        C1/0/5/UB     p-online(pt)      7x1    1/0/5:12
                                                                      1/0/5:13
c8fb.26a3.7bbc 9.9.2.215       C1/0/5/UB     p-online(pt)      7x1    1/0/5:12
                                                                      1/0/5:13
c8fb.26a3.bbd0 9.9.2.170       C1/0/5/UB     p-online(pt)      6x1    1/0/5:12
```

```
                                                                    1/0/5:13
c8fb.26a3.b9e6 9.9.3.242       C1/0/5/UB     w-online(pt)       8x4    1/0/5:12
                                                                    1/0/5:13
c8fb.26a3.6ef6 9.9.2.88        C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.9264 9.9.2.7         C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.8f74 9.9.0.176       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.7bd2 9.9.0.136       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.8df4 9.9.1.255       C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.7fda 9.9.0.110       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.9480 9.9.1.123       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.727c 9.9.4.60        C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.8092 9.9.3.181       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.74aa 9.9.1.112       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.7278 9.9.3.157       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.9516 9.9.0.234       C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.9490 9.9.0.78        C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.6f94 9.9.2.123       C2/0/6/UB     p-online(pt)       7x4    2/0/6:33
c8fb.26a3.8e96 9.9.1.82        C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.7eb0 9.9.3.174       C2/0/6/UB     p-online(pt)       7x1    2/0/6:33
c8fb.26a3.947e 9.9.2.173       C2/0/6/UB     p-online(pt)       7x1    2/0/6:33

Router#
```

The following table below describes the significant fields shown in the display:

Table 128: show cable modem partial-service Field Descriptions

Field	Description
MAC Address	MAC address of the cable modem.
IP Address	IP address of the cable modem.
I/F	Interface on the cable modem.
MAC State	State of the cable modem.
DSxUS State	State of the downstream and upstream channels on the cable modem.
Impaired DS	Name of the impaired downstream RF channel.
Impaired US	Port number of the impaired upstream RF channel.
Forwarding Interface	DS SF forwarding interface

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered cable modems.
show interface cable modem	Displays information about the cable modems connected to a particular cable interface.

show cable modem path-sel

To display the path selection status of a cable modem, use the **show cable modem path-sel** command in the privileged EXEC mode.

show cable modem [*ip address* | *mac address*] **path-sel** [**verbose**]

Syntax Description

ip address	(Mandatory if there is no MAC address specified) IPv4 or IPv6 address of a CM that is displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac address	(Mandatory if there is no IP address specified) MAC address of a CM that is displayed. You can also specify the MAC address for a CPE device behind a CM, and information for that CM is displayed.
verbose	(Optional) Displays detailed information for the CM classifiers.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display the path selection status of a cable modem.

The following example shows a sample output for the **path-sel** option for a particular cable modem:

```
router#show cable modem 38c8.5cfe.efa6 path-sel

CM 38c8.5cfe.efa6 Path-Sel Info: 07:20

RCS Filter Result: Succeed
Candidate RCS List: 2
  RCC-Id   Owner-Id   Preliminary  RCP      TLV-56   LBG      SF-Attr   CM-Attr
  1        1 :12289   Pass         Pass      --      Pass     Pass      Pass
  2        1 :12290   Pass         Pass      --      Pass     Pass      Pass

TCS Filter Result: Succeed
TCS Info:
  TCS in CGD            : 0x7         UCID: 1 2 3
  TCS in Freq Range     : 0x7         UCID: 1 2 3
  TCS Impaired          : 0x0
TCS Passed filters:
  Preliminary           : 0x7         UCID: 1 2 3
  LB Group              : 0x7         UCID: 1 2 3
  SF Attr Mask          : 0x7         UCID: 1 2 3
  CM Attr Mask          : 0x7         UCID: 1 2 3

Candidate US-BG List: 4
  UBG-Id   Chan-Mask    Preliminary  TLV-56   LBG      SF-Attr   CM-Attr
  1        0x7          Pass          --      Pass     Pass      Pass
```

```
  65537    0x2          Pass          --      Pass     Pass      Pass
  65538    0x4          Pass          --      Pass     Pass      Pass
  65536    0x1          Pass          --      Pass     Pass      Pass

Primary DS Chan Result: Skipped
Candidate Primary DS Chan List: 0

Primary US Chan Result: Skipped
Candidate Primary US Chan List: 0
```

The following example shows a sample output for the **path-sel verbose** option for a particular cable modem:

```
router#show cable modem 38c8.5cfe.efa6 path-sel verbos

CM 38c8.5cfe.efa6 Path-Sel Info: 07:40

MAC-Domain Cable3/0/0 Capability:
  D3.1-Mode             : Y
  MRC-Mode              : Y
  MTC-Mode              : 2

MAC-Domain Cable3/0/0 Service-Group:
  MD-DS-SG              : 3
  MD-US-SG              : 1 (TCS 0x7)

Modem Capability:
  DOCSIS Version        : DOC3.0
  D3.1 Initial Ranging  : N
  MRC-SC-QAM Chan       : 8
  MRC-OFDM Chan         : 0
  MTC-SC-QAM Chan       : 4
  MTC-OFDMA Chan        : 0

Modem Attribute Mask:
  DS Required           : 0x00000000
  DS Forbidden          : 0x00000000
  US Required           : 0x00000000
  US Forbidden          : 0x00000000

RX/TX Chan Enforcement:
  TLV-1  DS Freq        : N/A
  TLV-56 DS Freqs       : N/A
  TLV-56 US Chans       : N/A

Candidate Load-Balance Groups: 2
  Grp-Id       LBG-Type   Weight   Sanity-Chk
  30011        RLBG       6        Pass - LBG is subset of MD-SG
  30012        RLBG       6        Fail - LBG is not in any FN

RCS Filter Result: Succeed
Candidate RCS List: 2
  RCC-Id   Owner-Id   Preliminary  RCP      TLV-56   LBG      SF-Attr   CM-Attr
  1        1 :12289   Pass         Pass      --      Pass     Pass      Pass
  2        1 :12290   Pass         Pass      --      Pass     Pass      Pass

TCS Filter Result: Succeed
TCS Info:
  TCS in CGD            : 0x7         UCID: 1 2 3
  TCS in Freq Range     : 0x7         UCID: 1 2 3
  TCS Impaired          : 0x0
TCS Passed filters:
  Preliminary           : 0x7         UCID: 1 2 3
```

```
  LB Group              : 0x7         UCID: 1 2 3
  SF Attr Mask          : 0x7         UCID: 1 2 3
  CM Attr Mask          : 0x7         UCID: 1 2 3

Candidate US-BG List: 4
  UBG-Id   Chan-Mask    Preliminary  TLV-56   LBG      SF-Attr   CM-Attr
  1        0x7          Pass          --      Pass     Pass      Pass
  65537    0x2          Pass          --      Pass     Pass      Pass
  65538    0x4          Pass          --      Pass     Pass      Pass
  65536    0x1          Pass          --      Pass     Pass      Pass

Primary DS Chan Result: Skipped
Candidate Primary DS Chan List: 0

Primary US Chan Result: Skipped
Candidate Primary US Chan List: 0
```

Related Commands

Command	Description
clear cable modem path-sel	Clears the path selection status of a cable modem.
show cable mac-domain rcc	Displays runtime receive channel configuration (RCC) on a cable line card interface.
show cable mac domain rcc simplified	Shows detailed information for DOCSIS 3.1 capable RCC.

show cable modem phy normalized

To display DOCSIS PHY layer information for one or more cable modems (CMs), use the **show cable modem phy normalized** command in privileged EXEC mode.

The **show cable modem phy normalized** command is only supported on cBR-8.

Cisco cBR-8 Converged Broadband Router
show cable modem [*ip-address* | *mac-address* | **cable** *slot* / *subslot* / *cable-interface-index*] **phy normalized**
show cable modem phy normalized

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. Cisco cBR-8 router—The valid subslot is 0.
phy normalized	Shows the power level normalized to the actual channel width to provide for an equal comparison between DOCSIS 3.1 SC-QAMs and DOCSIS 3.0 or earlier SC-QAMs. **Note** By default, DOCSIS 3.1 modems report transmit power for 1.6 Mhz equivalent bandwidth for both SC-QAM and OFDMA channels. In comparison, DOCSIS 3.0 and earlier modems report transmit power based on the actual channel width. To compare equivalent reported power levels between DOCSIS 3.1 and legacy modems, ensure that the **show cable modem <> phy normalized** command is used.

Command Default

Displays PHY information for all CMs.

Command Modes

Privileged EXEC (#)

Command History

This table includes the following release-specific history entries:

- CX and BC Releases
- SC Release

CX and BC Releases	Modification
12.2(15)BC2	The service ID (SID) and Mode fields were added to the default display.
12.3(17a)BC	Enhanced the **show cable modem phy normalized** command. The MicroReflec column (MicroReflections) has been removed, and the DOCSIS Prov (DOCSIS Provider) column has been added in its place. This new column contains DOCSIS version information. See updated examples.
SC Release	**Modification**
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCC	For DOCSIS 3.0-certified cable modems with multiple upstream channels, the command output was modified to display PHY layer details of each upstream channel. In this case, the output may contain multiple results for the same MAC address. The asterix (*) that appears beside the DOCSIS operating mode under the Mode column identifies that the CM is operating in the MTC mode.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
Cisco cBR-8 Converged Broadband Router	
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** and **name** keywords were removed. The *logical-channel-index* is removed.
Cisco IOS XE Everest 16.6.1	This command was modified. The **ofdma** keyword was added.

Usage Guidelines

This command displays information about the DOCSIS PHY layer for one or more CMs. You can display information for all CMs, for all CMs on a particular cable interface, or for a particular CM, as identified by its IP or MAC address.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

The following is a sample output of the **show cable modem phy normalized** command:

```
Router# show cable mode c1/0/0 phy normalized

MAC Address I/F Sid USPwr USMER Timing DSPwr DSMER Mode DOCSIS
(dBmV) (SNR) Offset (dBmV) (SNR) Prov
(dB) (dB)
4800.33ef.0cca C1/0/0/U0 1 45.00 38.16 2306 0.00 ----- atdma* 1.1
4800.33ef.0cca C1/0/0/U1 1 45.00 39.13 2305 0.00 ----- atdma* 1.1
4800.33ef.0cca C1/0/0/U2 1 45.50 39.13 2306 0.00 ----- atdma* 1.1
4800.33ef.0cca C1/0/0/U5 1 55.00 ----- 2416 0.00 ----- ofdma 1.1
4800.33ef.3dd2 C1/0/0/U0 2 48.50 39.13 2178 0.00 ----- atdma* 1.1
4800.33ef.3dd2 C1/0/0/U1 2 49.00 39.13 2177 0.00 ----- atdma* 1.1
4800.33ef.3dd2 C1/0/0/U2 2 49.00 39.13 2178 0.00 ----- atdma* 1.1
4800.33ef.3dd2 C1/0/0/U5 2 55.25 ----- 2288 0.00 ----- ofdma 1.1
f81d.0f01.1e10 C1/0/0/U0 22 44.00 39.13 2076 0.00 ----- atdma* 1.1
f81d.0f01.1e10 C1/0/0/U1 22 45.00 38.16 2075 0.00 ----- atdma* 1.1
f81d.0f01.1e10 C1/0/0/U2 22 45.25 38.16 2075 0.00 ----- atdma* 1.1
f81d.0f01.1e10 C1/0/0/U5 22 62.50 ----- 2399 0.00 ----- ofdma 1.1
f81d.0f01.6040 C1/0/0/U0 23 28.50 38.16 2078 0.00 ----- atdma* 1.1
f81d.0f01.6040 C1/0/0/U1 23 29.00 42.14 2078 0.00 ----- atdma* 1.1
f81d.0f01.6040 C1/0/0/U2 23 29.50 39.13 2077 0.00 ----- atdma* 1.1
f81d.0f01.6040 C1/0/0/U5 23 36.25 ----- 2400 0.00 ----- ofdma 1.1


Router# show cable modem 4800.33ef.0cca phy normalized

MAC Address I/F Sid USPwr USMER Timing DSPwr DSMER Mode DOCSIS
(dBmV) (SNR) Offset (dBmV) (SNR) Prov
(dB) (dB)
4800.33ef.0cca C1/0/0/U0 1 45.00 39.13 2306 0.00 ----- atdma* 1.1
4800.33ef.0cca C1/0/0/U1 1 45.00 39.13 2305 0.00 ----- atdma* 1.1
4800.33ef.0cca C1/0/0/U2 1 45.50 39.13 2306 0.00 ----- atdma* 1.1
4800.33ef.0cca C1/0/0/U5 1 55.00 ----- 2416 0.00 ----- ofdma 1.1
```

The following example shows sample output for the **show cable modem phy normalized** command for all CMs on the Cisco CMTS router:

```
Router# show cable modem phy normalized

MAC Address    I/F         Sid  USPwr  USSNR  Timing  MicroReflec DSPwr  DSSNR  Mode
                           (dBmV) (dBmV) Offset  (dBc)       (dBmV) (dBmV)
0008.0e09.81f8 C3/0        1    50.00  28.40  1705     26          -3.4   36.02 tdma
```

```
0003.6b3c.1aa7 C3/0        2     0.00  28.27  3643      0           0.00  ----- tdma
0008.0e09.7fe2 C4/0        3    35.00  28.44  1760     27          12.00  35.03 tdma
```

The following example shows sample output for the **show cable modem phy normalized** command for all CMs on a particular cable interface:

```
Router# show cable modem cable 3/0
 phy normalized
MAC Address    I/F         Sid  USPwr  USSNR  Timing  MicroReflec DSPwr  DSSNR  Mode
                                (dBmV) (dBmV) Offset  (dBc)       (dBmV) (dBmV)
0008.0e09.81f8 C3/0        1    50.00  28.40  1705     26          -3.4   36.02 tdma
0003.6b3c.1aa7 C3/0        2     0.00  28.27  3643      0           0.00  ----- tdma
```

The following example shows sample output for the **show cable modem phy normalized** command for a particular CM:

```
Router# show cable modem 0050.7366.1243 phy normalized

MAC Address    I/F         Sid  USPwr  USSNR  Timing  MicroReflec DSPwr  DSSNR  Mode
                                (dBmV) (dBmV) Offset  (dBc)       (dBmV) (dBmV)
0050.6736.4124 C3/0        14   38.00  24.58  1651     0           8.00  35.41  tdma
```

Example from Cisco IOS Release 12.2(33)SCD

The following example shows a sample output of the **show cable modem phy normalized** command for all CMs on the Cisco CMTS router:

```
Router# show cable modem phy normalized
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
001c.ea37.9b5c C3/0/U2.0     27     0.00  36.12 5394    0.00  -----  tdma   1.1
001c.ea37.9b78 C3/0/U2.0     29     0.00  36.12 5396    0.00  -----  tdma   1.1
001c.ea37.9b5a C3/0/U3.0     31     0.00  36.12 5394    0.00  -----  tdma   1.1
001c.ea37.9ba4 C3/0/U2.0     32     0.00  36.12 5393    0.00  -----  tdma   1.1
001c.ea37.9aac C3/1/U2.1     28     0.00  36.12 5620    0.00  -----  tdma   1.1
001a.c3ff.d1a4 C3/1/U0.0     29    43.50  36.12 6020    0.00  -----  tdma*  1.1
001a.c3ff.d1a4 C3/1/U1.0     29    43.50  36.12 6020    0.00  -----  tdma*  1.1
001a.c3ff.d1a4 C3/1/U2.0     29    43.50  36.12 6019    0.00  -----  tdma*  1.1
001a.c3ff.d1a4 C3/1/U3.0     29    43.50  36.12 6021    0.00  -----  tdma*  1.1
```

Table below describes the fields shown in the **show cable modem phy normalized** displays:

Table 129: Descriptions for the show cable modem phy normalized fields

Field	Description
MAC Address	The MAC address for the CM.
I/F	The cable interface on the CMTS that is providing services for this CM.
SID	Service ID that this CM is using.

Field	Description
USPwr (dBmV)	Displays the CM transmit level in dBmV, as measured by the CMTS.
USSNR (dBmV)	Upstream signal-to-noise ratio (SNR) or carrier-to-noise ratio (CNR), in dB, as measured by the CMTS. This field shows the CNR value for cable interfaces that support onboard hardware-based spectrum management, such as the Cisco uBR-MC16S card, and shows the SNR value for other cable interfaces. **Note** Although the field name shows the value as being given in dBmV, the actual value should be interpreted in dB.
Timing Offset	The timing offset for the CM, in ticks, as recognized on the CMTS. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. **Note** An exclamation point (!) in the Timing Offset column indicates that the CM has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. **Note** The timing offset shown here is typically smaller than the TX Time Offset value shown by the **show cable modem remote-query** command, because the latter value is the offset as recognized on the CM (which will include any internal delay between when the CM software begins the transmission and when the bits actually appear on the local cable interface).

Field	Description
Microreflec (dBc)	The approximate value of microreflections on the downstream, measured in dBc below the signal level, as seen by the CM. Microreflections are a type of impairment that is caused by impedance mismatches between amplifiers, couples, cables, and other equipment in the cable plant. Microreflections create copies of a signal that arrive at the receiver with different amounts of delay and attenuation, generating intersymbol interference (ISI) that can cause the receiver to improperly detect the amplitude and phase of the incoming signal. **Note** This value is not exact but provides an approximate indication of the microreflections that have been received.
DSPwr (dBmV)	Downstream receive power level, in dBmV, as reported by the CM.
DSSNR (dBmV) **Note** This command displays values for the downstream power and SNR values only if you have configured the **cable modem remote-query** command on the CMTS, and if the CM supports providing those options.	Downstream signal-to-noise ratio (SNR), in dB, as reported by the CM.
Mode	DOCSIS operating mode for the CM: • tdma=DOCSIS 1.X, TDMA-only mode • atdma=DOCSIS 2.0 A-TDMA mode A hyphen (-) indicates the mode is unknown or the CM has not yet registered. For DOCSIS 3.0-certified cable modems with multiple upstream channels, the output may contain multiple results for the same MAC address. In Cisco IOS Release 12.2(33)SCC, the asterix (*) that appears beside the DOCSIS operating mode under the Mode column identifies that the CM is operating in the MTC mode. **Note** This field is the same as that returned by the docsIfCmtsCmStatusModulationType object in the DOCS-IF-MIB.

Cisco cBR-8 Converged Broadband Router

This example shows the output of the **show cable modem phy normalized** command:

```
Router# show cable modem phy normalized
Load for five secs: 2%/0%; one minute: 2%; five minutes: 2%
Time source is NTP, 10:47:07.255 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
c8fb.26a8.05b2 C1/0/0/U0     1     57.25  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     1     56.00  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a8.09e0 C1/0/0/U0     2     55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.09e0 C1/0/0/U1     2     56.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.051a C1/0/0/U0     3     57.00  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a8.051a C1/0/0/U1     3     55.75  35.18 1775    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U0     5     37.75  36.12 3306    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U1     5     38.25  36.12 1782    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U0     6     52.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U1     6     53.50  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0688 C1/0/0/U0     7     52.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.0688 C1/0/0/U1     7     53.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.09f8 C1/0/0/U0     8     52.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.09f8 C1/0/0/U1     8     53.00  36.12 1773    0.00  -----  tdma*  1.1
0023.bee1.eb54 C1/0/0/U0     9     38.50  36.12 1777    0.00  -----  tdma*  1.1
0023.bee1.eb54 C1/0/0/U1     9     38.50  36.12 1777    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U0     10    55.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U1     10    56.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd78 C1/0/0/U0     11    52.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd78 C1/0/0/U1     11    53.00  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a7.ef0e C1/0/0/U0     12    55.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef0e C1/0/0/U1     12    56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05b6 C1/0/0/U0     13    55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.05b6 C1/0/0/U1     13    56.50  36.12 1770    0.00  -----  tdma*  1.1
54d4.6f88.5cd8 C1/0/0/U0     14    43.75  36.12 2089    0.00  -----  tdma*  1.1
54d4.6f88.5cd8 C1/0/0/U1     14    43.75  36.12 2090    0.00  -----  tdma*  1.1
c8fb.26a8.0a0c C1/0/0/U1     15     0.00  36.12 1771    0.00  -----  tdma   1.0
c8fb.26a7.ef20 C1/0/0/U0     16    53.00  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.ef20 C1/0/0/U1     16    52.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.09e2 C1/0/0/U0     17    56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.09e2 C1/0/0/U1     17    55.50  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U0     18    55.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U1     18    56.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U0     19    55.50  35.18 1773    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U1     19    56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.ef0a C1/0/0/U0     20    53.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef0a C1/0/0/U1     20    52.75  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.04fe C1/0/0/U0     21    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.04fe C1/0/0/U1     21    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0684 C1/0/0/U0     22    55.50  36.12 1775    0.00  -----  tdma*  1.1
c8fb.26a8.0684 C1/0/0/U1     22    56.75  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U0     24    56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U1     24    55.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U0     25    52.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U1     25    53.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.067c C1/0/0/U0     26    52.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.067c C1/0/0/U1     26    53.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.e636 C1/0/0/U0     27    55.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e636 C1/0/0/U1     27    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.fd76 C1/0/0/U0     28    52.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd76 C1/0/0/U1     28    53.50  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a8.09ec C1/0/0/U0     29    53.00  36.12 1771    0.00  -----  tdma*  1.1
```

```
c8fb.26a8.09ec C1/0/0/U1     29    52.75  35.18 1773    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U0     30    56.00  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U1     30    57.25  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U0     31    56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U1     31    55.50  34.77 1770    0.00  -----  tdma*  1.1
c8fb.26a8.067a C1/0/0/U0     32    53.00  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.067a C1/0/0/U1     32    52.75  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.08c4 C1/0/0/U0     33    56.50  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a8.08c4 C1/0/0/U1     33    56.25  35.18 1774    0.00  -----  tdma*  1.1
c8fb.26a7.e680 C1/0/0/U0     34    53.00  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a7.e680 C1/0/0/U1     34    53.00  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.e6da C1/0/0/U0     35    55.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.e6da C1/0/0/U1     35    56.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U0     36    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U1     36    56.50  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U0     37    55.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U1     37    56.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U0     38    52.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U1     38    53.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0a0a C1/0/0/U0     39    55.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.0a0a C1/0/0/U1     39    56.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05bc C1/0/0/U0     40    53.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05bc C1/0/0/U1     40    52.75  34.77 1770    0.00  -----  tdma*  1.1
c8fb.26a7.ef0c C1/0/0/U0     41    55.50  35.18 1767    0.00  -----  tdma*  1.1
c8fb.26a7.ef0c C1/0/0/U1     41    56.75  36.12 1767    0.00  -----  tdma*  1.1
c8fb.26a8.0690 C1/0/0/U0     42    56.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0690 C1/0/0/U1     42    56.25  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0678 C1/0/0/U0     43    56.00  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.0678 C1/0/0/U1     43    56.25  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U0     44    55.75  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U1     44    56.50  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U0     46    55.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U1     46    56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U0     47    55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U1     47    56.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U0     48    57.00  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U1     48    56.25  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U0     49    55.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U1     49    56.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef10 C1/0/0/U0     50    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef10 C1/0/0/U1     50    56.00  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U0     51    56.00  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U1     51    55.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U0     52    53.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U1     52    52.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U0     53    56.50  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U1     53    56.25  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U0     54    53.00  34.77 1768    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U1     54    52.75  35.18 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0610 C1/0/0/U0     55    55.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0610 C1/0/0/U1     55    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e6d8 C1/0/0/U0     56    53.25  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a7.e6d8 C1/0/0/U1     56    52.00  35.18 1774    0.00  -----  tdma*  1.1
c8fb.26a8.0676 C1/0/0/U0     57    52.50  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0676 C1/0/0/U1     57    53.75  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.067e C1/0/0/U0     58    52.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.067e C1/0/0/U1     58    53.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.0a04 C1/0/0/U0     59    56.25  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0a04 C1/0/0/U1     59    57.00  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0674 C1/0/0/U0     60    52.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0674 C1/0/0/U1     60    53.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0a02 C1/0/0/U0     61    55.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0a02 C1/0/0/U1     61    56.00  34.77 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e6fe C1/0/0/U0     62    55.75  36.12 1770    0.00  -----  tdma*  1.1
```

```
c8fb.26a7.e6fe C1/0/0/U1     62    56.50  36.12 1770    0.00  -----  tdma*  1.1
0019.474a.d5ae C1/0/0/U1     4      0.00  36.12 1774    0.00  -----  tdma   1.1
0016.924f.8200 C1/0/0/U0     23     0.00  36.12 1764    0.00  -----  tdma   1.1

Router#
```

This example shows the output for a specific MAC Address for the **show cable modem phy normalized** command:

```
Router# show cable modem c8fb.26a8.05b2 phy normalized
Load for five secs: 2%/0%; one minute: 3%; five minutes: 2%
Time source is NTP, 10:57:17.773 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
c8fb.26a8.05b2 C1/0/0/U0     1     57.25  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     1     56.00  34.77 1772    0.00  -----  tdma*  1.1

Router#
```

This example shows the output for a specific cable interface for the **show cable modem phy normalized** command:

```
Router# show cable modem cable modem 1/0/1 phy normalized

Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 11:40:05.265 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
c8fb.26a7.e6fe C1/0/0/U0     1     55.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.e6fe C1/0/0/U1     1     56.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U0     2     55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U1     2     56.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U0     4     55.50  34.77 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U1     4     56.75  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U0     6     56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U1     6     55.50  33.97 1773    0.00  -----  tdma*  1.1
c8fb.26a7.ef0c C1/0/0/U0     7     55.50  34.77 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef0c C1/0/0/U1     7     56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U0     8     55.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U1     8     56.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0688 C1/0/0/U0     9     52.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0688 C1/0/0/U1     9     53.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U0     10    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U1     10    57.25  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U0     11    52.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U1     11    53.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U0     12    52.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U1     12    53.50  34.77 1770    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U0     13    55.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U1     13    56.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U0     14    55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U1     14    56.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U0     15    55.75  36.12 1767    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U1     15    56.50  36.12 1767    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U0     16    57.00  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     16    56.25  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U0     17    57.25  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U1     17    56.00  35.18 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U0     18    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U1     18    56.50  35.18 1771    0.00  -----  tdma*  1.1
```

```
c8fb.26a8.0a0c C1/0/0/U0     20    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0a0c C1/0/0/U1     20    57.25  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U0     21    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U1     21    56.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U0     22    37.75  36.12 3304    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U1     22    38.25  35.18 1781    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U0     23    52.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U1     23    54.00  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U0     24    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U1     24    55.75  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U0     25    52.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U1     25    53.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U0     26    53.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U1     26    52.75  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U0     27    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U1     27    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U0     28    55.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U1     28    55.75  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U0     29    57.25  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U1     29    56.00  34.77 1770    0.00  -----  tdma*  1.1

Router#
```

This example shows the output for a specific IP Address for the **show cable modem phy normalized** command:

```
Router# show cable modem 209.165.200.227 phy normalized
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 11:12:23.912 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
c8fb.26a8.05b2 C1/0/0/U0     1     57.25  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     1     56.00  36.12 1772    0.00  -----  tdma*  1.1

Router#
```

Related Commands

Command	Description
cable modem remote-query	Enables and configures the remote-query feature to gather CM performance statistics on the CMTS.
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem errors	Displays error statistics for one or more CMs.

Command	Description
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem mac	Displays MAC layer information for one or more CMs.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem phy

To display DOCSIS PHY layer information for one or more cable modems (CMs), use the **show cable modem phy** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **phy**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*port* | *slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **phy**

Cisco cBR-8 Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot*/*subslot*/*cable-interface-index*]**phy**
show cable modem phy | **include ofdma**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. Cisco cBR-8 router—The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface). This option is not supported on the Cisco cBR-8 router.

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. This option is not supported on the Cisco cBR-8 router.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This option is not supported on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This option is not supported on the Cisco cBR-8 router.
phy	Displays DOCSIS PHY layer information for one or more cable modems.

Command Default

Displays PHY information for all CMs.

Command Modes

Privileged EXEC (#)

Command History

This table includes the following release-specific history entries:

- CX and BC Releases
- SC Release

CX and BC Releases	Modification
12.1(4)CX and 12.2(4)BC1	This command was introduced for the Cisco uBR7100 series, Cisco uBR7200 series, and CIsco uBR10012 routers.
12.2(15)BC2	The service ID (SID) and Mode fields were added to the default display.
12.3(17a)BC	Enhanced the **show cable modem phy** command. The MicroReflec column (MicroReflections) has been removed, and the DOCSIS Prov (DOCSIS Provider) column has been added in its place. This new column contains DOCSIS version information. See updated examples.
SC Release	**Modification**

CX and BC Releases	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCC	For DOCSIS 3.0-certified cable modems with multiple upstream channels, the command output was modified to display PHY layer details of each upstream channel. In this case, the output may contain multiple results for the same MAC address. The asterix (*) that appears beside the DOCSIS operating mode under the Mode column identifies that the CM is operating in the MTC mode.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
Cisco cBR-8 Converged Broadband Router	
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** and **name** keywords were removed. The *logical-channel-index* is removed.
Cisco IOS XE Everest 16.6.1	This command was modified. The **ofdma** keyword was added.

Usage Guidelines

This command displays information about the DOCSIS PHY layer for one or more CMs. You can display information for all CMs, for all CMs on a particular cable interface, or for a particular CM, as identified by its IP or MAC address.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands

might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

The following is a sample output of the **show cable modem phy** command with the**ofdma** keyword.

```
Router# show cable modem phy | include ofdma
5039.5584.5bbe C1/0/0/U0 15 38.75 ----- 2282 0.00 ----- ofdma 1.1
0895.2a9b.26f1 C1/0/0/U0 16 28.00 ----- 2146 0.00 ----- ofdma 1.1
```

Examples from Cisco IOS Release 12.3(13a)BC and Earlier Releases

```
Router# show cable modem phy
MAC Address    I/F          Sid  USPwr  USSNR  Timing MicroReflec DSPwr  DSSNR  Mode
                                 (dBmV)  (dB)   Offset (dBc)      (dBmV)   (dB)
0008.0e06.7b14 C8/0/0/U0    1    0.00   30.36  1938   0           0.00  -----  tdma
0050.f112.5977 C8/0/0/U0    2    0.00   30.36  1695   0           0.00  -----  tdma
0090.837b.b0b9 C8/0/0/U0    3    0.00   30.64  1187   0           0.00  -----  tdma
0007.0e03.6e99 C8/0/0/U0    5    0.00   30.36  2747   0           0.00  -----  tdma
0007.0e04.5091 C8/0/0/U0    6    0.00   30.94  2746   0           0.00  -----  tdma
0006.5314.81d9 C8/0/0/U0    7    0.00   30.36  2745   0           0.00  -----  tdma
0003.6b1b.ee63 C8/0/0/U0    8    0.00   31.26  2745   0           0.00  -----  tdma
0030.eb15.84e7 C8/0/0/U0    12   0.00   30.36  1157   0           0.00  -----  tdma
```

The following example shows sample output for the **show cable modem phy** command for all CMs on the Cisco CMTS router:

```
Router# show cable modem phy

MAC Address    I/F          Sid  USPwr  USSNR  Timing  MicroReflec DSPwr  DSSNR  Mode
                                 (dBmV) (dBmV) Offset  (dBc)       (dBmV) (dBmV)
0008.0e09.81f8 C3/0         1    50.00  28.40  1705     26          -3.4   36.02 tdma
0003.6b3c.1aa7 C3/0         2     0.00  28.27  3643      0           0.00  ----- tdma
0008.0e09.7fe2 C4/0         3    35.00  28.44  1760     27          12.00  35.03 tdma
```

The following example shows sample output for the **show cable modem phy** command for all CMs on a particular cable interface:

```
Router# show cable modem cable 3/0
 phy
MAC Address    I/F          Sid  USPwr  USSNR  Timing  MicroReflec DSPwr  DSSNR  Mode
                                 (dBmV) (dBmV) Offset  (dBc)       (dBmV) (dBmV)
0008.0e09.81f8 C3/0         1    50.00  28.40  1705     26          -3.4   36.02 tdma
0003.6b3c.1aa7 C3/0         2     0.00  28.27  3643      0           0.00  ----- tdma
```

The following example shows sample output for the **show cable modem phy** command for a particular CM:

```
Router# show cable modem 0050.7366.1243 phy

MAC Address    I/F         Sid  USPwr  USSNR  Timing  MicroReflec DSPwr  DSSNR  Mode
                                (dBmV) (dBmV) Offset  (dBc)       (dBmV) (dBmV)
0050.6736.4124 C3/0        14   38.00  24.58  1651     0           8.00  35.41  tdma
```

Example from Cisco IOS Release 12.2(33)SCD

The following example shows a sample output of the **show cable modem phy** command for all CMs on the Cisco CMTS router:

```
Router# show cable modem phy
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
001c.ea37.9b5c C3/0/U2.0     27     0.00  36.12 5394    0.00  -----  tdma   1.1
001c.ea37.9b78 C3/0/U2.0     29     0.00  36.12 5396    0.00  -----  tdma   1.1
001c.ea37.9b5a C3/0/U3.0     31     0.00  36.12 5394    0.00  -----  tdma   1.1
001c.ea37.9ba4 C3/0/U2.0     32     0.00  36.12 5393    0.00  -----  tdma   1.1
001c.ea37.9aac C3/1/U2.1     28     0.00  36.12 5620    0.00  -----  tdma   1.1
001a.c3ff.d1a4 C3/1/U0.0     29    43.50  36.12 6020    0.00  -----  tdma*  1.1
001a.c3ff.d1a4 C3/1/U1.0     29    43.50  36.12 6020    0.00  -----  tdma*  1.1
001a.c3ff.d1a4 C3/1/U2.0     29    43.50  36.12 6019    0.00  -----  tdma*  1.1
001a.c3ff.d1a4 C3/1/U3.0     29    43.50  36.12 6021    0.00  -----  tdma*  1.1
```

Table below describes the fields shown in the **show cable modem phy** displays:

Table 130: Descriptions for the show cable modem phy fields

Field	Description
MAC Address	The MAC address for the CM.
I/F	The cable interface on the CMTS that is providing services for this CM.
SID	Service ID that this CM is using.
USPwr (dBmV)	Displays the CM transmit level in dBmV, as measured by the CMTS.

Field	Description
USSNR (dBmV)	Upstream signal-to-noise ratio (SNR) or carrier-to-noise ratio (CNR), in dB, as measured by the CMTS. This field shows the CNR value for cable interfaces that support onboard hardware-based spectrum management, such as the Cisco uBR-MC16S card, and shows the SNR value for other cable interfaces. **Note** Although the field name shows the value as being given in dBmV, the actual value should be interpreted in dB.
Timing Offset	The timing offset for the CM, in ticks, as recognized on the CMTS. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. **Note** An exclamation point (!) in the Timing Offset column indicates that the CM has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. **Note** The timing offset shown here is typically smaller than the TX Time Offset value shown by the **show cable modem remote-query** command, because the latter value is the offset as recognized on the CM (which will include any internal delay between when the CM software begins the transmission and when the bits actually appear on the local cable interface).
Microreflec (dBc)	The approximate value of microreflections on the downstream, measured in dBc below the signal level, as seen by the CM. Microreflections are a type of impairment that is caused by impedance mismatches between amplifiers, couples, cables, and other equipment in the cable plant. Microreflections create copies of a signal that arrive at the receiver with different amounts of delay and attenuation, generating intersymbol interference (ISI) that can cause the receiver to improperly detect the amplitude and phase of the incoming signal. **Note** This value is not exact but provides an approximate indication of the microreflections that have been received.

Field	Description
DSPwr (dBmV)	Downstream receive power level, in dBmV, as reported by the CM.
DSSNR (dBmV) **Note** This command displays values for the downstream power and SNR values only if you have configured the **cable modem remote-query** command on the CMTS, and if the CM supports providing those options.	Downstream signal-to-noise ratio (SNR), in dB, as reported by the CM.
Mode	DOCSIS operating mode for the CM: • tdma=DOCSIS 1.X, TDMA-only mode • atdma=DOCSIS 2.0 A-TDMA mode A hyphen (-) indicates the mode is unknown or the CM has not yet registered. For DOCSIS 3.0-certified cable modems with multiple upstream channels, the output may contain multiple results for the same MAC address. In Cisco IOS Release 12.2(33)SCC, the asterix (*) that appears beside the DOCSIS operating mode under the Mode column identifies that the CM is operating in the MTC mode. **Note** This field is the same as that returned by the docsIfCmtsCmStatusModulationType object in the DOCS-IF-MIB.

Cisco cBR-8 Converged Broadband Router

This example shows the output of the **show cable modem phy** command:

```
Router#show cable modem phy
Load for five secs: 2%/0%; one minute: 2%; five minutes: 2%
Time source is NTP, 10:47:07.255 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
c8fb.26a8.05b2 C1/0/0/U0     1     57.25  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     1     56.00  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a8.09e0 C1/0/0/U0     2     55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.09e0 C1/0/0/U1     2     56.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.051a C1/0/0/U0     3     57.00  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a8.051a C1/0/0/U1     3     55.75  35.18 1775    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U0     5     37.75  36.12 3306    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U1     5     38.25  36.12 1782    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U0     6     52.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U1     6     53.50  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0688 C1/0/0/U0     7     52.75  36.12 1773    0.00  -----  tdma*  1.1
```

```
c8fb.26a8.0688 C1/0/0/U1     7     53.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.09f8 C1/0/0/U0     8     52.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.09f8 C1/0/0/U1     8     53.00  36.12 1773    0.00  -----  tdma*  1.1
0023.bee1.eb54 C1/0/0/U0     9     38.50  36.12 1777    0.00  -----  tdma*  1.1
0023.bee1.eb54 C1/0/0/U1     9     38.50  36.12 1777    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U0     10    55.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U1     10    56.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd78 C1/0/0/U0     11    52.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd78 C1/0/0/U1     11    53.00  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a7.ef0e C1/0/0/U0     12    55.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef0e C1/0/0/U1     12    56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05b6 C1/0/0/U0     13    55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.05b6 C1/0/0/U1     13    56.50  36.12 1770    0.00  -----  tdma*  1.1
54d4.6f88.5cd8 C1/0/0/U0     14    43.75  36.12 2089    0.00  -----  tdma*  1.1
54d4.6f88.5cd8 C1/0/0/U1     14    43.75  36.12 2090    0.00  -----  tdma*  1.1
c8fb.26a8.0a0c C1/0/0/U1     15     0.00  36.12 1771    0.00  -----  tdma   1.0
c8fb.26a7.ef20 C1/0/0/U0     16    53.00  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.ef20 C1/0/0/U1     16    52.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.09e2 C1/0/0/U0     17    56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.09e2 C1/0/0/U1     17    55.50  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U0     18    55.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U1     18    56.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U0     19    55.50  35.18 1773    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U1     19    56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.ef0a C1/0/0/U0     20    53.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef0a C1/0/0/U1     20    52.75  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.04fe C1/0/0/U0     21    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.04fe C1/0/0/U1     21    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0684 C1/0/0/U0     22    55.50  36.12 1775    0.00  -----  tdma*  1.1
c8fb.26a8.0684 C1/0/0/U1     22    56.75  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U0     24    56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U1     24    55.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U0     25    52.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U1     25    53.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.067c C1/0/0/U0     26    52.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.067c C1/0/0/U1     26    53.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.e636 C1/0/0/U0     27    55.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e636 C1/0/0/U1     27    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.fd76 C1/0/0/U0     28    52.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd76 C1/0/0/U1     28    53.50  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a8.09ec C1/0/0/U0     29    53.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.09ec C1/0/0/U1     29    52.75  35.18 1773    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U0     30    56.00  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U1     30    57.25  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U0     31    56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U1     31    55.50  34.77 1770    0.00  -----  tdma*  1.1
c8fb.26a8.067a C1/0/0/U0     32    53.00  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.067a C1/0/0/U1     32    52.75  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.08c4 C1/0/0/U0     33    56.50  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a8.08c4 C1/0/0/U1     33    56.25  35.18 1774    0.00  -----  tdma*  1.1
c8fb.26a7.e680 C1/0/0/U0     34    53.00  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a7.e680 C1/0/0/U1     34    53.00  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.e6da C1/0/0/U0     35    55.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.e6da C1/0/0/U1     35    56.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U0     36    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U1     36    56.50  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U0     37    55.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U1     37    56.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U0     38    52.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U1     38    53.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0a0a C1/0/0/U0     39    55.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.0a0a C1/0/0/U1     39    56.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05bc C1/0/0/U0     40    53.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05bc C1/0/0/U1     40    52.75  34.77 1770    0.00  -----  tdma*  1.1
```

```
c8fb.26a7.ef0c C1/0/0/U0     41    55.50  35.18 1767    0.00  -----  tdma*  1.1
c8fb.26a7.ef0c C1/0/0/U1     41    56.75  36.12 1767    0.00  -----  tdma*  1.1
c8fb.26a8.0690 C1/0/0/U0     42    56.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0690 C1/0/0/U1     42    56.25  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0678 C1/0/0/U0     43    56.00  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.0678 C1/0/0/U1     43    56.25  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U0     44    55.75  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U1     44    56.50  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U0     46    55.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U1     46    56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U0     47    55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U1     47    56.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U0     48    57.00  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U1     48    56.25  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U0     49    55.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U1     49    56.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef10 C1/0/0/U0     50    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef10 C1/0/0/U1     50    56.00  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U0     51    56.00  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U1     51    55.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U0     52    53.75  35.18 1769    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U1     52    52.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U0     53    56.50  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U1     53    56.25  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U0     54    53.00  34.77 1768    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U1     54    52.75  35.18 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0610 C1/0/0/U0     55    55.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0610 C1/0/0/U1     55    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e6d8 C1/0/0/U0     56    53.25  36.12 1774    0.00  -----  tdma*  1.1
c8fb.26a7.e6d8 C1/0/0/U1     56    52.00  35.18 1774    0.00  -----  tdma*  1.1
c8fb.26a8.0676 C1/0/0/U0     57    52.50  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0676 C1/0/0/U1     57    53.75  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.067e C1/0/0/U0     58    52.75  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.067e C1/0/0/U1     58    53.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.0a04 C1/0/0/U0     59    56.25  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0a04 C1/0/0/U1     59    57.00  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0674 C1/0/0/U0     60    52.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0674 C1/0/0/U1     60    53.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0a02 C1/0/0/U0     61    55.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0a02 C1/0/0/U1     61    56.00  34.77 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e6fe C1/0/0/U0     62    55.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e6fe C1/0/0/U1     62    56.50  36.12 1770    0.00  -----  tdma*  1.1
0019.474a.d5ae C1/0/0/U1     4      0.00  36.12 1774    0.00  -----  tdma   1.1
0016.924f.8200 C1/0/0/U0     23     0.00  36.12 1764    0.00  -----  tdma   1.1

Router#
```

This example shows the output for a specific MAC Address for the **show cable modem phy** command:

```
Router#show cable modem c8fb.26a8.05b2 phy
Load for five secs: 2%/0%; one minute: 3%; five minutes: 2%
Time source is NTP, 10:57:17.773 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                 (dB)
c8fb.26a8.05b2 C1/0/0/U0     1     57.25  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     1     56.00  34.77 1772    0.00  -----  tdma*  1.1

Router#
```

This example shows the output for a specific cable interface for the **show cable modem phy** command:

```
Router#show cable modem cable modem 1/0/1 phy

Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 11:40:05.265 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
c8fb.26a7.e6fe C1/0/0/U0     1     55.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.e6fe C1/0/0/U1     1     56.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U0     2     55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.ef06 C1/0/0/U1     2     56.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U0     4     55.50  34.77 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08ca C1/0/0/U1     4     56.75  35.18 1770    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U0     6     56.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08d6 C1/0/0/U1     6     55.50  33.97 1773    0.00  -----  tdma*  1.1
c8fb.26a7.ef0c C1/0/0/U0     7     55.50  34.77 1771    0.00  -----  tdma*  1.1
c8fb.26a7.ef0c C1/0/0/U1     7     56.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U0     8     55.50  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a7.fd72 C1/0/0/U1     8     56.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0688 C1/0/0/U0     9     52.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0688 C1/0/0/U1     9     53.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U0     10    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a7.e6dc C1/0/0/U1     10    57.25  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U0     11    52.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.08b8 C1/0/0/U1     11    53.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U0     12    52.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.060a C1/0/0/U1     12    53.50  34.77 1770    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U0     13    55.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.ef00 C1/0/0/U1     13    56.75  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U0     14    55.75  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.ef08 C1/0/0/U1     14    56.50  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U0     15    55.75  36.12 1767    0.00  -----  tdma*  1.1
c8fb.26a7.eef6 C1/0/0/U1     15    56.50  36.12 1767    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U0     16    57.00  36.12 1772    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     16    56.25  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U0     17    57.25  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0606 C1/0/0/U1     17    56.00  35.18 1768    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U0     18    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0682 C1/0/0/U1     18    56.50  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0a0c C1/0/0/U0     20    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0a0c C1/0/0/U1     20    57.25  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U0     21    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.0604 C1/0/0/U1     21    56.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U0     22    37.75  36.12 3304    0.00  -----  tdma*  1.1
c8fb.2633.8c94 C1/0/0/U1     22    38.25  35.18 1781    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U0     23    52.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05c0 C1/0/0/U1     23    54.00  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U0     24    56.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a7.eefc C1/0/0/U1     24    55.75  36.12 1768    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U0     25    52.75  36.12 1769    0.00  -----  tdma*  1.1
c8fb.26a8.09ee C1/0/0/U1     25    53.50  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U0     26    53.50  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05c6 C1/0/0/U1     26    52.75  35.18 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U0     27    55.75  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.08d4 C1/0/0/U1     27    56.00  36.12 1771    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U0     28    55.50  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b8 C1/0/0/U1     28    55.75  35.18 1772    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U0     29    57.25  36.12 1770    0.00  -----  tdma*  1.1
c8fb.26a8.05c4 C1/0/0/U1     29    56.00  34.77 1770    0.00  -----  tdma*  1.1
```

```
Router#
```

This example shows the output for a specific IP Address for the **show cable modem phy** command:

```
Router#show cable modem 209.165.200.227 phy
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 11:12:23.912 PST Thu May 7 2015
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)          Prov
                                          (dB)                (dB)
c8fb.26a8.05b2 C1/0/0/U0     1     57.25  36.12 1773    0.00  -----  tdma*  1.1
c8fb.26a8.05b2 C1/0/0/U1     1     56.00  36.12 1772    0.00  -----  tdma*  1.1

Router#
```

Related Commands

Command	Description
cable modem remote-query	Enables and configures the remote-query feature to gather CM performance statistics on the CMTS.
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem errors	Displays error statistics for one or more CMs.
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem mac	Displays MAC layer information for one or more CMs.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem phy us-pwr

The cBR-8 routers display all the upstream channel attributes with reference to 1.6MHz, 6.4MHz and channel width by using the command **show cable modem phy us-pwr reference** in privileged EXEC mode.

This command is helpful in filtering out the references 1.6MHz, 6.4MHz, and channel width values with their specific attributes from the **show cable modem verbose** command.

show cable modem [*ip-address* | *mac-address*] **phy us-pwr** *<ref>*

Cisco cBR-8 Converged Broadband Router

This example shows the output for a specific mac domain for the **show cable modem phy verbose** command before normalization without basepower:

```
Router#show cable modem 5039.5585.4662 verbose
MAC Address                       : 5039.5585.4662
IP Address                        : 55.32.1.20
IPv6 Address                      : ---
Dual IP                           : N
Prim Sid                          : 7
Host Interface                    : C2/0/1/UB
RPD ID                            : 9088.556b.a3f4
MD-DS-SG / MD-US-SG               : 1 / 2
MD-CM-SG                          : 0x610102
Primary Wideband Channel ID       : 16645 (Wi2/0/1:4)
Primary Downstream                : Do2/0/1:30 (RfId : 16670, SC-QAM)
Wideband Capable                  : Y
DS Tuner Capability               : 8
RCP Index                         : 3
RCP ID                            : 00 10 00 00 04
Downstream Channel DCID RF Channel : 31    2/0/1:30 (SC-QAM)
Downstream Channel DCID RF Channel : 25    2/0/1:24 (SC-QAM)
Downstream Channel DCID RF Channel : 26    2/0/1:25 (SC-QAM)
Downstream Channel DCID RF Channel : 27    2/0/1:26 (SC-QAM)
Downstream Channel DCID RF Channel : 28    2/0/1:27 (SC-QAM)
Downstream Channel DCID RF Channel : 29    2/0/1:28 (SC-QAM)
Downstream Channel DCID RF Channel : 30    2/0/1:29 (SC-QAM)
Downstream Channel DCID RF Channel : 32    2/0/1:31 (SC-QAM)
UDC Enabled                       : N
US Frequency Range Capability     : Standard (5-42 MHz)
Extended Upstream Transmit Power  : 0dB
Multi-Transmit Channel Mode       : Y
Max US SC-QAMs Supported          : 4
Number of US in UBG               : 4
Minimum power load in DRW (dB)    : 3.75
Upstream Channel                  : US4        US5        US6        US7
Upstream Channel Width (MHz)      : 1.6        3.2        6.4        6.4
Device ID                         : 0          0          0          0
Ranging Status                    : sta        sta        sta        sta
Upstream SNR (dB)                 : 45.15      42.14      42.14      42.14
Upstream Data SNR (dB)            : 43.32      46.33      40.33      46.33
Received Power Delta (dBmV)       : 0.00       -0.50      -1.00      -1.00
Config Received Power(dBmV@chw)   : 0.00       0.00       0.00       0.00
Received Power(dBmV@chw)          : 0.00       -0.50      -1.00      -1.00
Config Received Power(dBmV@1.6MHz) : 0.00      -3.00      -6.00      -6.00
Received Power(dBmV@1.6MHz)       : 0.00       -3.50      -7.00      -7.00
Data Burst resiliency suspended   : N          N          N          N
Reported Transmit Power (dBmV)    : 42.50      42.25      41.25      40.75
```

```
Peak Transmit Power (dBmV)          : 51.00      51.00      51.00      51.00
Phy Max Power (dBmV)                : 51.00      51.00      51.00      51.00
Max Dynamic ranging window (dBmV)   : 47.25      47.25      47.25      47.25
Min Dynamic ranging window (dBmV)   : 35.25      35.25      35.25      35.25
Minimum Transmit Power (dBmV)       : 18.00      21.00      24.00      24.00
Power Load (dB)                     : 8.50       8.75       9.75       10.25
Timing Offset              (97.6 ns): 1370       1371       825        1396
Initial Timing Offset               : 571        571        827        571
Rng Timing Adj Moving Avg(0.381 ns): 0          0          -1         0
Rng Timing Adj Lt Moving Avg        : 0          0          0          0
Rng Timing Adj Minimum              : 0          0          -512       0
Rng Timing Adj Maximum              : 0          0          256        0
Pre-EQ Good                         : 0          0          0          0
Pre-EQ Scaled                       : 0          0          0          0
Pre-EQ Impulse                      : 0          0          0          0
Pre-EQ Direct Loads                 : 0          0          0          0
Total Codewords rx                  : 54         12         75         11
Good Codewords rx                   : 54         12         75         11
Corrected Codewords rx              : 0          0          0          0
Uncorrectable Codewords rx          : 0          0          0          0
Phy Operating Mode                  : atdma*     atdma*     atdma*     atdma*
sysDescr                            :
Downstream Power                    : 0.00 dBmV (SNR = ----- dB)
MAC Version                         : DOC3.0
Operational Version                 : DOC3.0
QoS Provisioned Mode                : DOC1.1
Enable DOCSIS2.0 Mode               : Y
Service Flow Priority               : N
Modem Status                        : {Modem= w-online(pt), Security=assign(tek)}
Capabilities                        : {Frag=N, Concat=N, PHS=Y}
Security Capabilities               : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                  : {L2VPN=N, eSAFE=N}
L2VPN type                          : {CLI=N, DOCSIS=N}
Sid/Said Limit                      : {Max US Sids=16, Max DS Saids=15}
UGS Service Flow Limit              : {Max UGS Service Flows=0}
Optional Filtering Support          : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support          : {Taps/Symbol= 1, Num of Taps= 24}
OUDP Leak Test                      : N/A
CM Capability Reject                : {1,3,4,15,22,23,35,38}
CM STATUS ACK Support               : N
Flaps                               : 0()
Errors                              : 0 CRCs, 0 HCSes
Stn Mtn Failures                    : 0 aborts, 0 exhausted
Total US Flows                      : 2(2 active)
Total DS Flows                      : 2(2 active)
Total US Data                       : 34 packets, 3662 bytes
Total US Throughput                 : 0 bits/sec, 0 packets/sec
Total DS Data                       : 0 packets, 0 bytes
Total DS Throughput                 : 0 bits/sec, 0 packets/sec
LB group ID assigned                : 2147533315
LB group ID in config file          : N/A
LB policy ID                        : 0
Fiber-node ID                       : 3 4
```

This example shows the output for a specific mac domain for the **show cable modem phy us-pwr** command without basepower:

```
Router#show cable modem 5039.5585.4662 phy us-pwr 1p6-ref

Modem Capability and Ranging Data(dBmV@1.6MHz)
----------------------------------------------
Extended Upstream Tx Power          : 0dB
Min Pwr Load in DRW(dB)             : 3.75
```

```
US Ch          :  US4    US5    US6    US7
US Ch Width    :  1.6    3.2    6.4    6.4
Max Dyn Rng Win:  47.25  44.25  41.25  41.25
Min Dyn Rng Win:  35.25  32.25  29.25  29.25

Tx Power and Rx Power(dBmV@1.6MHz)
----------------------------------
Phy Op Mode    :  atdma  atdma  atdma  atdma*
Tx Pwr Minimum :  18.00  18.00  18.00  18.00
Tx Pwr Peak    :  51.00  51.00  51.00  51.00
Tx Pwr Phy Max :  51.00  51.00  51.00  51.00
Tx Pwr Reported:  42.50  39.25  35.25  34.75
Rx Pwr Config  :  0.00   -3.00  -6.00  -6.00
Rx Pwr         :  0.00   -3.50  -7.00  -7.00
video-LWR-S-A1#scm 5039.5585.4662 phy us-pwr 6p4-ref

Modem Capability and Ranging Data(dBmV@6.4MHz)
----------------------------------------------
Extended Upstream Tx Power         : 0dB
Min Pwr Load in DRW(dB)            : 3.75

US Ch          :  US4    US5    US6    US7
US Ch Width    :  1.6    3.2    6.4    6.4
Max Dyn Rng Win:  53.25  50.25  47.25  47.25
Min Dyn Rng Win:  41.25  38.25  35.25  35.25

Tx Power and Rx Power(dBmV@6.4MHz)
----------------------------------
Phy Op Mode    :  atdma  atdma  atdma  atdma*
Tx Pwr Minimum :  24.00  24.00  24.00  24.00
Tx Pwr Peak    :  57.00  57.00  57.00  57.00
Tx Pwr Phy Max :  51.00  51.00  51.00  51.00
Tx Pwr Reported:  48.50  45.25  41.25  40.75
Rx Pwr Config  :  6.00   3.00   0.00   0.00
Rx Pwr         :  6.00   2.50   -1.00  -1.00
video-LWR-S-A1#scm 5039.5585.4662 phy us-pwr chw-ref

Modem Capability and Ranging Data(dBmV@Chw)
-------------------------------------------
Extended Upstream Tx Power         : 0dB
Min Pwr Load in DRW(dB)            : 3.75

US Ch          :  US4    US5    US6    US7
US Ch Width    :  1.6    3.2    6.4    6.4
Max Dyn Rng Win:  47.25  47.25  47.25  47.25
Min Dyn Rng Win:  35.25  35.25  35.25  35.25

Tx Power and Rx Power(dBmV@Chw)
-------------------------------
Phy Op Mode    :  atdma  atdma  atdma  atdma*
Tx Pwr Minimum :  18.00  21.00  24.00  24.00
Tx Pwr Peak    :  51.00  54.00  57.00  57.00
Tx Pwr Phy Max :  51.00  51.00  51.00  51.00
Tx Pwr Reported:  42.50  42.25  41.25  40.75
Rx Pwr Config  :  0.00   0.00   0.00   0.00
Rx Pwr         :  0.00   -0.50  -1.00  -1.00
```

This example shows the output for a specific mac domain for the **show cable modem phy verbose** command before normalization with basepower:

```
Router#show cable modem 5039.5585.4662 verbose
MAC Address                        : 5039.5585.4662
IP Address                         : 55.32.1.20
IPv6 Address                       : ---
```

```
Dual IP                              : N
Prim Sid                             : 7
Host Interface                       : C2/0/1/UB
RPD ID                               : 9088.556b.a3f4
MD-DS-SG / MD-US-SG                  : 1 / 2
MD-CM-SG                             : 0x610102
Primary Wideband Channel ID          : 16645 (Wi2/0/1:4)
Primary Downstream                   : Do2/0/1:30 (RfId : 16670, SC-QAM)
Wideband Capable                     : Y
DS Tuner Capability                  : 8
RCP Index                            : 3
RCP ID                               : 00 10 00 00 04
Downstream Channel DCID RF Channel : 31    2/0/1:30 (SC-QAM)
Downstream Channel DCID RF Channel : 25    2/0/1:24 (SC-QAM)
Downstream Channel DCID RF Channel : 26    2/0/1:25 (SC-QAM)
Downstream Channel DCID RF Channel : 27    2/0/1:26 (SC-QAM)
Downstream Channel DCID RF Channel : 28    2/0/1:27 (SC-QAM)
Downstream Channel DCID RF Channel : 29    2/0/1:28 (SC-QAM)
Downstream Channel DCID RF Channel : 30    2/0/1:29 (SC-QAM)
Downstream Channel DCID RF Channel : 32    2/0/1:31 (SC-QAM)
UDC Enabled                          : N
US Frequency Range Capability        : Standard (5-42 MHz)
Extended Upstream Transmit Power     : 0dB
Multi-Transmit Channel Mode          : Y
Max US SC-QAMs Supported             : 4
Number of US in UBG                  : 4
Minimum power load in DRW (dB)       : 6.50
Upstream Channel                     : US4        US5        US6        US7
Upstream Channel Width (MHz)         : 1.6        3.2        6.4        6.4
Device ID                            : 0          0          0          0
Ranging Status                       : sta        sta        sta        sta
Upstream SNR (dB)                    : 42.14      42.14      42.14      42.14
Upstream Data SNR (dB)               : 43.32      46.33      40.33      46.33
Received Power Delta (dBmV)          : 0.00       0.00       -1.00      -1.00
Config Received Power(dBmV@chw)      : -6.00      -3.00      0.00       0.00
Received Power(dBmV@chw)             : -6.00      -3.00      -1.00      -1.00
Config Received Power(dBmV@1.6MHz)   : -6.00      -6.00      -6.00      -6.00
Received Power(dBmV@1.6MHz)          : -6.00      -6.00      -7.00      -7.00
Data Burst resiliency suspended      : N          N          N          N
Reported Transmit Power (dBmV)       : 36.50      39.25      41.25      40.75
Peak Transmit Power (dBmV)           : 51.00      51.00      51.00      51.00
Phy Max Power (dBmV)                 : 51.00      51.00      51.00      51.00
Max Dynamic ranging window (dBmV)    : 44.50      44.50      44.50      44.50
Min Dynamic ranging window (dBmV)    : 32.50      32.50      32.50      32.50
Minimum Transmit Power (dBmV)        : 18.00      21.00      24.00      24.00
Power Load (dB)                      : 14.50      11.75      9.75       10.25
Timing Offset             (97.6 ns): 1370       1371       825        1396
Initial Timing Offset                : 571        571        827        571
Rng Timing Adj Moving Avg(0.381 ns): 0          0          -1         0
Rng Timing Adj Lt Moving Avg         : 0          0          0          0
Rng Timing Adj Minimum               : 0          0          -512       0
Rng Timing Adj Maximum               : 0          0          256        0
Pre-EQ Good                          : 0          0          0          0
Pre-EQ Scaled                        : 0          0          0          0
Pre-EQ Impulse                       : 0          0          0          0
Pre-EQ Direct Loads                  : 0          0          0          0
Total Codewords rx                   : 176        42         105        41
Good Codewords rx                    : 176        42         105        41
Corrected Codewords rx               : 0          0          0          0
Uncorrectable Codewords rx           : 0          0          0          0
Phy Operating Mode                   : atdma*     atdma*     atdma*     atdma*
sysDescr                             :
Downstream Power                     : 0.00 dBmV (SNR = ----- dB)
MAC Version                          : DOC3.0
```

```
Operational Version                : DOC3.0
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Service Flow Priority              : N
Modem Status                       : {Modem= w-online(pt), Security=assign(tek)}
Capabilities                       : {Frag=N, Concat=N, PHS=Y}
Security Capabilities              : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                 : {L2VPN=N, eSAFE=N}
L2VPN type                         : {CLI=N, DOCSIS=N}
Sid/Said Limit                     : {Max US Sids=16, Max DS Saids=15}
UGS Service Flow Limit             : {Max UGS Service Flows=0}
Optional Filtering Support         : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support         : {Taps/Symbol= 1, Num of Taps= 24}
OUDP Leak Test                     : N/A
CM Capability Reject               : {1,3,4,15,22,23,35,38}
CM STATUS ACK Support              : N
Flaps                              : 2(May 7  08:53:00)
Errors                             : 0 CRCs, 0 HCSes
Stn Mtn Failures                   : 0 aborts, 0 exhausted
Total US Flows                     : 2(2 active)
Total DS Flows                     : 2(2 active)
Total US Data                      : 123 packets, 7100 bytes
Total US Throughput                : 0 bits/sec, 0 packets/sec
Total DS Data                      : 0 packets, 0 bytes
Total DS Throughput                : 0 bits/sec, 0 packets/sec
LB group ID assigned               : 2147533315
LB group ID in config file         : N/A
LB policy ID                       : 0
Fiber-node ID                      : 3 4
```

This example shows the output for a specific mac domain for the **show cable modem phy us-pwr** command with basepower:

```
Router#show cable modem 5039.5585.4662 phy us-pwr 1p6-ref

Modem Capability and Ranging Data(dBmV@1.6MHz)
----------------------------------------------
Extended Upstream Tx Power         : 0dB
Min Pwr Load in DRW(dB)            : 6.50

US Ch          :  US4    US5    US6    US7
US Ch Width    :  1.6    3.2    6.4    6.4
Max Dyn Rng Win:  44.50  41.50  38.50  38.50
Min Dyn Rng Win:  32.50  29.50  26.50  26.50

Tx Power and Rx Power(dBmV@1.6MHz)
----------------------------------
Phy Op Mode    :  atdma  atdma  atdma  atdma*
Tx Pwr Minimum :  18.00  18.00  18.00  18.00
Tx Pwr Peak    :  51.00  51.00  51.00  51.00
Tx Pwr Phy Max :  51.00  51.00  51.00  51.00
Tx Pwr Reported:  36.50  36.25  35.25  34.75
Rx Pwr Config  :  -6.00  -6.00  -6.00  -6.00
Rx Pwr         :  -6.00  -6.00  -7.00  -7.00
video-LWR-S-A1#scm 5039.5585.4662 phy us-pwr 6p4-ref

Modem Capability and Ranging Data(dBmV@6.4MHz)
----------------------------------------------
Extended Upstream Tx Power         : 0dB
Min Pwr Load in DRW(dB)            : 6.50

US Ch          :  US4    US5    US6    US7
US Ch Width    :  1.6    3.2    6.4    6.4
Max Dyn Rng Win:  50.50  47.50  44.50  44.50
```

```
Min Dyn Rng Win:  38.50  35.50  32.50  32.50

Tx Power and Rx Power(dBmV@6.4MHz)
----------------------------------
Phy Op Mode    :  atdma  atdma  atdma  atdma*
Tx Pwr Minimum :  24.00  24.00  24.00  24.00
Tx Pwr Peak    :  57.00  57.00  57.00  57.00
Tx Pwr Phy Max :  51.00  51.00  51.00  51.00
Tx Pwr Reported:  42.50  42.25  41.25  40.75
Rx Pwr Config  :  0.00   0.00   0.00   0.00
Rx Pwr         :  0.00   0.00   -1.00  -1.00
video-LWR-S-A1#scm 5039.5585.4662 phy us-pwr chw-ref

Modem Capability and Ranging Data(dBmV@Chw)
-------------------------------------------
Extended Upstream Tx Power         : 0dB
Min Pwr Load in DRW(dB)            : 6.50

US Ch          :  US4    US5    US6    US7
US Ch Width    :  1.6    3.2    6.4    6.4
Max Dyn Rng Win:  44.50  44.50  44.50  44.50
Min Dyn Rng Win:  32.50  32.50  32.50  32.50

Tx Power and Rx Power(dBmV@Chw)
-------------------------------
Phy Op Mode    :  atdma  atdma  atdma  atdma*
Tx Pwr Minimum :  18.00  21.00  24.00  24.00
Tx Pwr Peak    :  51.00  54.00  57.00  57.00
Tx Pwr Phy Max :  51.00  51.00  51.00  51.00
Tx Pwr Reported:  36.50  39.25  41.25  40.75
Rx Pwr Config  :  -6.00  -3.00  0.00   0.00
Rx Pwr         :  -6.00  -3.00  -1.00  -1.00
```

show cable modem phy ofdm

To display the CM count per downstream or upstream profile, use the **show cable modem phy ofdm** command in privileged EXEC mode.

show cable modem phy ofdm [**downstream prof-count** | **upstream iuc-count**]

Syntax Description

downstream prof-count	Displays the CM count per downstream channel and profile.
upstream iuc-count	Displays the CM count per upstream port and IUC.

Command Modes

Privileged EXEC (#)

Command History

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1x	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows sample output for the **show cable modem phy ofdm** command for Cisco cBR Series Converged Broadband Routers:

```
Router#show cable modem phy ofdm upstream iuc-count
                        |<----------- CM Count per profile ----------->|
I/F           IF-INDX  IUC-5  IUC-6  IUC-9 IUC-10 IUC-11 IUC-12 IUC-13
-----------   ------- ------ ------ ------ ------ ------ ------ ------
C1/0/0/U6     488046       3      0      0      0      0      0      3
C1/0/0/U7     488047       3      0      0      0      0      0      3
C9/0/0/U6     501870       1      0      0      0      0      0      1
C9/0/0/U7     501871       1      0      0      0      0      0      1
C9/0/1/U6     501918       1      0      0      0      0      0      2
C9/0/1/U7     501919       1      0      0      0      0      0      2

Router#show cable modem phy ofdm downstream prof-count
                        |<----------------------------- CM Count per profile
-------------------------->|
Channel       IF-INDX  P-0  P-1  P-2  P-3  P-4  P-5  P-6  P-7  P-8  P-9 P-10 P-11 P-12 P-13
 P-14 P-15
------------- ------- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
 ---- ----
In0/0/0:158   264134     0    0    0    3    0    0    -    -    -    0    -    -    -
-    -    -
In0/0/0:159   264135     0    0    0    3    0    0    -    -    -    0    -    -    -
-    -    -
Do9/0/0:158   321478     1    0    0    0    4    0    -    -    -    0    -    -    -
-    -    -
```

show cable modem phy ofdm-profile

To display the OFDM profiles associated with the cable modems (CMs), use the **show cable modem phy ofdm-profile** command in privileged EXEC mode.

Cisco cBR-8 Converged Broadband Router
show cable modem [*ip-address* | *mac-address* | **Cable** {*slot* / *subslot* / *cable-interface-index*}] **phy ofdm-profile**[*downstreamupstream*]

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	(Optional) Slot where the line card resides. For Cisco cBR-8 Converged Broadband Router, the valid range is from 0 to 3 and 6 to 9.
subslot	(Optional) Secondary slot number of the cable interface line card. The valid subslot is 0.
cable-interface-index	(Optional) Downstream port or MAC domain index of the line cards. For Cisco cBR-8 Converged Broadband Router, the valid range is from 0 to 15.
upstream	Displays the OFDM profiles associated with a CM for upstream channel.
downstream	Displays the OFDM profiles associated with a CM for downstream channel.

Command Default

Displays the profile information for all CMs.

Command Modes

Privileged EXEC (#)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.1SP	This command was modified. The output format was updated.
Cisco IOS XE Everest 16.6.1	This command was modified. The **upstream** and **downstream** keywords were added.
Cisco IOS XE Amsterdam 17.3.1w	This command was modified. The output format was updated.

Examples

The following example shows sample output for the **show cable modem phy ofdm-profile upstream** command for Cisco cBR Series Converged Broadband Routers:

```
Router# show cable modem phy ofdm-profile upstream
MAC Address    I/F           UCID  Curr  Recm    Assigned Update Last Update
```

```
                                    IUC   IUC     IUCs     cnt    (ago)
0895.2a9b.2916 C1/0/0/UB     13     5     5       5, 13    2      0h:01m:37s
4800.33ef.3e26 C1/0/0/UB     13     5     5       5, 13    2      0h:02m:36s
fc52.8d5e.9eee C1/0/2/UB     13     11    11      11, 13   1      0h:01m:27s
4800.33ef.0c8e C1/0/2/UB     13     5     5       5, 13    2      0h:02m:36s
4800.33ef.0d06 C1/0/6/UB     13     5     5       5, 13    2      0h:04m:01s
fc52.8d5e.8b3e C1/0/8/UB     13     5     5       5, 13    1      0h:01m:37s
```

The following example shows sample output for the **show cable modem phy ofdm-profile downstream** command for Cisco cBR Series Converged Broadband Routers:

```
Router# show cable modem phy ofdm-profile downstream
MAC Address       I/F          Chan         DCID      Curr   Recm   Dwngd   Unfit
                                                      Prof   Prof   Prof    Prof
4800.33ea.70c2    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ea.6e12    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ef.0c5e    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ea.6e3e    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ea.70a6    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ea.6fce    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ef.0c82    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ef.0c96    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ea.704e    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
4800.33ea.6c36    C1/0/3/UB    In1/0/1:158 159       5      5      4       N/A
```

The following example shows sample output for the **show cable modem phy ofdm-profile** command in Cisco IOS-XE Release 3.18.1SP with the updated output format:

```
router# show cable modem fc52.8d5e.84bd phy ofdm-profile
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
fc52.8d5e.84bd C1/0/0/UB     In1/0/0:158   159   5     5     4      N/A
```

The following example shows sample output for the **show cable modem phy ofdm-profile** command withthe updated output format:

```
Router#show cable modem phy ofdm upstream
MAC Address      I/F           UCID  Curr  Recm  Assigned Update Last Update  Curr IUC
                                     IUC   IUC   IUCs     cnt    (ago)        Mod
f81d.0f01.1e10   C1/0/0/U5     6     13    13    13       0      1h:02m:47s   QPSK
f81d.0f01.6040   C1/0/0/U5     6     5     5     5, 13    1      0h:02m:31s   1024-QAM
4800.33ef.0cca   C1/0/0/U5     6     13    13    13       0      0h:01m:45s   QPSK
4800.33ef.3dd2   C1/0/0/U5     6     5     5     5, 13    1      0h:01m:39s   1024-QAM
```

Table 131: Descriptions for the show cable modem phy ofdm-profile fields

Field	Description
MAC Address	The MAC address for the CM.
I/F	The cable interface on the CMTS that is providing services for this CM.
Chan	Downstream channel assigned to the CM.
UCID	Upstream channel ID used by a CM.
DCID	Downstream channel ID used by a CM.
Curr Prof	Current profile ID.
Recm Prof	Recommended profile ID.

Field	Description
Unfit Prof	Unfit profile ID.
Dwngd Prof	Downgrade profile ID.
Curr IUC	Indicates the Interval Usage Code (IUC) that is currently in use.
Recm IUC	Indicates the IUC that is recommended for use based on the channel MER data.
Assigned IUCs	Indicates the IUCs that have been assigned to the cable modem. Up to two IUCs can be assigned.
Update cnt	Indicates the number of times an IUC update has occurred.
Last Update	Indicates the time of the last IUC update.

Related Commands

Command	Description
show controllers integrated-Cable rf-channel prof-order	Displays information about the profile downgrade ordering on a given OFDM channel.
show cable modem prof-mgmt	Displays detailed profile management data associated with each cable modem.

show cable modem primary-channel

To display the primary-channel and host interface for all modems or for modems on a MAC domain host interface, use the **show cable modem primary-channel** command.

show cable modem [**cable** {*slot* / *subslot* / *port* | *slot*/*subslot* / *cable-interface-index*} [**upstream** *port* [*logical-channel-index*]]] **primary-channel** [**non-bonding-capable** [**legacy-ranging**]] [**wideband** [**registered-traditional-docsis**]]

Cisco cBR-8 Converged Broadband Router
show cable modem [**cable** *slot*/*subslot* / *cable-interface-index*] **primary-channel**
show cable modem primary-channel [**non-bonding-capable** [**legacy-ranging**]] [**wideband** [**registered-traditional-docsis**]]

Syntax Description

slot	Slot where the line card resides. The valid range is from 5 to 8. Cisco cBR-8 router—The valid range is 0.
subslot	Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. Cisco cBR-8 router—The valid value is from 0 to 3 and 6 to 9.
port	Downstream port number. The valid range is from 0 to 4 (depending on the cable interface). This interface is not supported on the Cisco cBR-8 router.
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using this specific upstream. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports on the cable interface line card. This option is not supported on the Cisco cBR-8 router.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This option is not supported on the Cisco cBR-8 router.
non-bonding-capable	Displays the cable modems and primary downstreams of the cable modems that are not capable of bonding.
legacy-initial-ranging	Displays modems that access with legacy INIT-RNG-REQ.
wideband	Displays wideband online modems.

registered-traditional-docsis	Displays wideband cable modems registered in traditional pre-DOCSIS3.0 mode.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** keyword was removed. The *logical-channel-index* is removed.

Usage Guidelines

Use this command to display the primary downstream channel information of modems for different modem categories in terms of bonding capability, such as, non-bonding-capable modems accessed with legacy initial ranging or wideband cable modems registered via traditional DOCSIS.

Examples

The following **show cable modem primary-channel non-bonding-capable** command shows the individual cable modems displays and the primary downstream channel for each cable modem.

```
Router# show cable modem primary-channel non-bonding-capable

MAC Address IP Address Host MAC Prim Num Primary DS

Interface State Sid CPE Downstream RfId

000f.66f9.aa73 80.17.1.3 C6/0/0/U0 online(pt) 1 0 C6/0/0 255

0007.0e02.d7e9 80.17.1.7 C6/0/0/U0 online(pt) 5 0 Mo3/0/0:1 1

0013.10bb.22f9 80.17.1.2 C6/0/0/U0 online(pt) 2 0 Mo3/0/0:1 1

000f.66f9.b193 80.17.1.6 C6/0/0/U0 online(pt) 22 0 C6/0/0 255

0012.17ea.f3fb 80.17.1.4 C6/0/0/U0 online(pt) 23 0 C6/0/0 255

0013.10bb.23d1 80.17.1.5 C6/0/1/U1 online(pt) 5 0 C6/0/1 255
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem voice	Displays detected voice-enabled modems.
show cable service-voice downstream type	Shows the current enforced downstream type on the uBR10-MC5x20 line card.

show cable modem primary-channel summary total

To display the number of cable modems grouped by primary downstream channels information under a Channel Grouping Domain (CGD), use the **show cable modem primary-channel summary total** command in privileged EXEC mode.

show cable modem primary-channel [**cable** *slot* / *subslot* / **port**] **summary total**

Cisco cBR-8 Converged Broadband Router
show cable modem primary-channel [**cable** *slot* / *subslot* / *cable-interface-index*] **summary total**

Syntax Description

slot	The slot used for the cable interface line card. Valid values are 5 to 8.
subslot	The subslot used for the cable interface line card. Valid values are 0 to 1.
port	The downstream port used as a MAC domain host interface port. Valid values are 0 to 4.
cable-interface-index	MAC domain host interface. The valid range is from 0 to 15. This option is supported on the Cisco cBR-8 router.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router.

Usage Guidelines

Use the **show cable modem primary-channel summary total** command to display the number of cable modems grouped by primary downstream channels. You can also use this command to display information for narrowband and wideband modems and group the information based on a SPA or a uBR10-MC 5x20 primary downstream. You can also display information on modems based on a specific cable MAC domain.

Examples

The following example shows attributes of the primary channels to which the various modems are hosted under the CGD domain c6/0/0.

```
Router#show cable modem primary-channel
MAC Address    IP Address      Host      MAC          Prim  Num  Primary    DS
                               Interface State        Sid   CPE  Downstream RfId
000f.66f9.aa73 80.17.1.2       C6/0/0/U0 online       13    0    C6/0/0     255
000f.66f9.b193 80.17.1.3       C6/0/0/U0 online       14    0    C6/0/0     255
0012.17ea.f3fb 80.17.1.5       C6/0/0/U0 online       15    0    C6/0/0     255
0019.474a.d4f8 80.17.1.13      C6/0/0/U0 online       16    0    C6/0/0     255
0000.cab7.7f1c 80.17.1.8       C6/0/0/U0 online       17    1    C6/0/0     255
0019.474a.d3d4 80.17.1.11      C6/0/0/U0 online       18    0    C6/0/0     255
0007.0e02.d7e9 80.17.1.10      C6/0/0/U0 online       19    0    C6/0/0     255
0019.474a.cd82 80.17.1.20      C6/0/0/U0 online       20    0    C6/0/0     255
```

```
0019.474a.d3fa 80.17.1.7       C6/0/0/U0 online       22    0    C6/0/0     255
0018.6852.82ea 80.17.1.6       C6/0/0/U0 online       24    0    C6/0/0     255
0013.10bb.23d1 80.17.1.12      C6/0/0/U0 online       23    1    Mo3/0/0:0  0
```

The following example shows modems grouped according to their capability, indicating whether they are wideband or narrowband modems. The command also displays the local of the primary downstreams of the modem, indicating whether the primary downstream is a SPA downstream (Remote) or a uBR10-MC 5x20 downstream (Local). The Wideband column indicates if the status of the modem is online or wideband-online.

```
Router#show cable modem primary-channel summary total
                                 Cable Modem
            Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO 0-Blaze
Local Primary Narrowband:
C6/0/0      5     5     5     0     0       0        0      0     0      0     0
C6/0/1      0     0     0     0     0       0        0      0     0      0     0
Subtotal:   5     5     5     0     0       0        0      0     0      0     0
Local Primary Wideband:
C6/0/0      5     5     5     0     0       0        0      0     0      0     0
C6/0/1      0     0     0     0     0       0        0      0     0      0     0
Subtotal:   5     5     5     0     0       0        0      0     0      0     0
Remote Primary Narrowband:
Mo3/0/0:0   1     1     1     0     0       0        0      0     0      0     0
Subtotal:   1     1     1     0     0       0        0      0     0      0     0
Remote Primary Wideband:
Subtotal:   0     0     0     0     0       0        0      0     0      0     0
Total:      11    11    11    0     0       0        0      0     0      0     0
```

The example below shows the modems grouped by primary downstream channels for the cable MAC domain c6/0/0.

```
Router#show cable modem primary-channel summary c6/0/0 total
                                 Cable Modem
            Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO 0-Blaze
Local Primary Narrowband:
C6/0/0      5     5     5     0     0       0        0      0     0      0     0
Local Primary Wideband:
C6/0/0      5     5     5     0     0       0        0      0     0      0     0
Remote Primary Narrowband:
Mo3/0/0:0   1     1     1     0     0       0        0      0     0      0     0
Subtotal:   1     1     1     0     0       0        0      0     0      0     0
Remote Primary Wideband:
Subtotal:   0     0     0     0     0       0        0      0     0      0     0
Total:      11    11    11    0     0       0        0      0     0      0     0
```

This example shows the output of the **show cable modem primary-channel summary total** command on the Cisco cBR-8 router:

```
Router#show cable modem primary-channel summary C6/0/1 total
Load for five secs: 2%/0%; one minute: 2%; five minutes: 1%
Time source is NTP, 11:47:37.535 PST Thu May 7 2015
                                 Cable Modem
              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO

Local Primary Narrowband:
In6/0/1:0     1     1     1     0     0       0        0      0     0      0
In6/0/1:1     1     0     0     1     1       0        0      0     0      0
Subtotal:     2     1     1     1     1       0        0      0     0      0
```

```
Local Primary Wideband:
In6/0/1:0     22    22    22    0     0       22       0       0       0       0
In6/0/1:1     37    37    37    0     0       37       0       0       0       0
Subtotal:     59    59    59    0     0       59       0       0       0       0

Total:        61    60    60    1     1       59       0       0       0       0
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered cable modems.

show cable modem privacy

To display the privacy information for the registered and unregistered CMs, use the **show cable modem privacy** command in privileged EXEC mode.

Cisco uBR7200 Series Routers
show cable modem {*ip-addressmac-address*} **privacy** [**verbose**]

Cisco uBR10012 Router
show cable modem {*ip-addressmac-address*} **privacy** [**verbose**]

Cisco cBR-8 Converged Broadband Router
show cable modem {*ip-addressmac-address*} **privacy** [**verbose**]

Syntax Description

ip-address	IPv4 or IPv6 address of a specific cable modem to be displayed. If you specify the IP address for a CPE device behind a cable modem, information for that cable modem is displayed.
mac-address	MAC address of a specific cable modem to be displayed. If you specify the MAC address for a CPE device behind a cable modem, information for that cable modem is displayed.
privacy	Displays the privacy information for the CMs.
verbose	Displays detailed information for the CMs.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router.

Usage Guidelines

This command displays privacy information of a particular cable modem, identified by its IP address or MAC address.

Examples

The following sample output from the **show cable modem privacy** command shows the privacy information for a particular cable modem using a specified MAC address.

```
Router# show cable modem 0018.6835.2987 privacy
MAC Address             : 0018.6835.2987
Primary SID             : 10
BPI Mode                : BPI+
BPI State               : assign(tek)
Security Capabilities   :
 Encryption             : DES-56
 EAE                    : Unsupported
Latest Key Sequence     : 2
 Key Status             : Active
```

```
 Remaining Lifetime     : 294 sec
 Key Gracetime          : 60 sec
Current Key Sequence    : 2
CA Certificate Details   :
 Certificate Serial       : 57BF2DF60E9FFBECF8E69709DE34BC26
 Certificate Self-Signed  : False
 Certificate State        : Chained
CM Certificate Details   :
 cable modem Certificate Serial    : 010244AF1A135202
 cable modem Certificate State     : Chained
KEK Reject Code         : None
KEK Reject Reason       : No Information
KEK Invalid Code        : None
KEK Invalid Reason      : No Information

Primary SID Information   :
SID                     : 10
Encryption Algorithm    : 56-bit DES
Latest Sequence Number  : 5
 Key Status             : Active
 Remaining Lifetime     : 144 sec
 Key Gracetime          : 60 sec
Current Sequence Number : 4
 Key Status             : Active
 Remaining Lifetime     : 54 sec
 Key Gracetime          : 60 sec
TEK Reject Code         : None
TEK Reject Reason       : No Information
TEK Invalid Code        : None
TEK Invalid Reason      : No Information
```

Example of **show cable modem privacy verbose** Command Output for a Specified MAC Address

The following example shows sample output for the **verbose** option for a particular CM:

```
Router# show cable modem 0018.6835.2987 privacy verbose


MAC Address             : 0018.6835.2987
Primary SID             : 10
BPI Mode                : BPI+
BPI State               : assign(tek)
Security Capabilities   :
 Encryption             : DES-56
 EAE                    : Unsupported
Latest Key Sequence     : 2
 Key Status             : Active
 Remaining Lifetime     : 256 sec
 Key Gracetime          : 60 sec
 Authorization Key      : 20040655048319671l9C16051FD722C5209E165F
 Key Encryption Key     : F14EFC15118B6B06
 Upstream HMAC Key      : 150E3F56451F6E033DEB79BCF819A9D8EAF6B95D
 Downstream HMAC Key    : 9AA3EC8869D64927560589692CCE4C21F3DA9029
Current Key Sequence    : 2
Authorization Counters  :
 Authorization Infos     : 4
 Authorization Requests  : 2
 Authorization Replies   : 2
 Authorization Rejects   : 0
 Authorization Invalids  : 0
Traffic Key Counters     :
 Traffic Key Requests    : 4
 Traffic Key Replies     : 4
```

```
 Traffic Key Rejects     : 0
 Traffic Key Invalids    : 0
Certificate Counters      :
 Untrusted Manufacturer   : 0
 Untrusted cable modem Certificate : 0
 Issuer Not Found         : 0
 Invalid Signature        : 0
 Expired Certificate      : 0
 Certificate Not Activated: 0
 Certificate in Hotlist   : 0
 Public Key Mismatch      : 0
 Invalid MAC              : 0
 Invalid cable modem Certificate   : 0
CA Certificate Details   :
 Certificate Serial       : 57BF2DF60E9FFBECF8E69709DE34BC26
 Certificate Self-Signed  : False
 Certificate State        : Chained
CM Certificate Details   :
 cable modem Certificate Serial    : 010244AF1A135202
 cable modem Certificate State     : Chained
KEK Reject Code          : None
KEK Reject Reason        : No Information
KEK Invalid Code         : None
KEK Invalid Reason       : No Information
Primary SID Information   :
SID                      : 10
Encryption Algorithm     : 56-bit DES
Latest Sequence Number   : 5
 Key Status              : Active
 Remaining Lifetime      : 106 sec
 Key Gracetime           : 60 sec
 Hardware Keys Match     : True
 DES Key                 : 156819BF016E139B
 DES IV                  : 07291CAE15AD0845
Current Sequence Number : 4
 Key Status              : Active
 Remaining Lifetime      : 16 sec
 Key Gracetime           : 60 sec
 Hardware Keys Match     : True
 DES Key                 : 23EF1C9801F40EE3
 DES IV                  : 163D19831AFB25DC
TEK Requests             : 4
TEK Replies              : 4
TEK Rejects              : 0
TEK Invalids             : 0
TEK Receive Errors       : 0
TEK Reject Code          : None
TEK Reject Reason        : No Information
TEK Invalid Code         : None
TEK Invalid Reason       : No Information
```

Table below describes the major fields shown in the **show cable modem privacy** command display:

Table 132: show cable modem privacy Field Descriptions

Field	Description
MAC Address	MAC address for the CM.
Prim SID	Primary SID assigned to the CM.
BPI Mode	Baseline Privacy Interface (BPI) mode used.

Field	Description
BPI State	Displays the BPI state.
Security Capabilities	Security capabilities of the modem like encryption algorithm and Early Authentication and Encryption (EAE).
Encryption	Encryption method used.
EAE	EAE support.
Latest Key Sequence	Latest key sequence number.
Key Status	Status of the key; whether active or not.
Remaining Lifetime	Remaining lifetime of the key in seconds.
Key Gracetime	Grace time available for the key in seconds.
Authorization Key	Authorization key code.
Key Encryption Key	Key used to encrypt the traffic key.
Upstream HMAC Key	Upstream Hashed Message Authentication Code (HMAC) key.
Downstream HMAC Key	Downstream Hashed Message Authentication Code (HMAC) key.
Current Key Sequence	Current key sequence number.
Authorization Counters	Authorization counter information.
Authorization Infos	Authorization information.
Authorization Requests	Number of authorized requests.
Authorization Replies	Number of authorized replies.
Authorization Rejects	Rejected authorization.
Authorization Invalids	Invalid authorization.
Traffic Key Counters	Traffic key counter informayion.
Traffic Key Requests	Number of traffic key requests.
Traffic Key Replies	Number of traffic key replies.
Traffic Key Rejects	Number of traffic key rejects.
Traffic Key Invalids	Number of invalid traffic keys.
Certificate Counters	Certificate counter information.
Untrusted Manufacturer	Count of untrusted manufacturers.
Untrusted cable modem Certificate	Count of untrusted cable modem certificates.

Field	Description
Issuer Not Found	Count of certificate issuers not found in the database.
Invalid Signature	Count of invalid signatures.
Expired Certificate	Number of expired certificates.
Certificate Not Activated	Count of certificates not activated.
Certificate in Hotlist	Number of certificates in hotlist.
Public Key Mismatch	Number of public key mismatch.
Invalid MAC	Number of invalid MACs.
Invalid cable modem Certificate	Number of invalid cable modem certificates.
CA Certificate Details	CA certificate information.
Certificate Serial	CA certificate serial number.
Certificate Self-Signed	Self-signed CA certificate.
Certificate State	Current state of the CA certificate.
CM Certificate Details	CM certificate information.
CM Certificate Serial	CM certificate serial number.
CM Certificate State	Current state of the cable modem certificate.
KEK Reject Code	Key Encryption Key (KEK) reject code.
KEK Reject Reason	KEK reject reason.
KEK Invalid Code	KEK invalid code.
KEK Invalid Reason	Reason for the invalid KEK.
Primary SID Information	Primary SID assigned to this CM.
SID	SID used by the CM.
Encryption Algorithm	Encryption algorithm used.
Latest Sequence Number	Latest sequence number.
Current Sequence Number	Current sequence number.
Hardware Keys Match	Hardware key match.
DES Key	Data Encryption Standard (DES) key number.
DES IV	Initialization vector. This can be AES or DES.
TEK Requests	Displays the number of Traffic Exchange Key (TEK) requests.

Field	Description
TEK Replies	Number of TEK requests.
TEK Rejects	Number of TEK rejects.
TEK Invalids	Number of invalid TEKs.
TEK Receive Errors	Number of TEK receive errors.
TEK Reject Code	TEK reject code.
TEK Reject Reason	TEK reject reason.
TEK Invalid Code	TEK invalid code.
TEK Invalid Reason	TEK invalid reason.

Related Commands

Command	Description
cable privacy	Enables and configures BPI+ encryption on a cable interface.
cable privacy kek	Sets KEK and timeout periods.
cable privacy tek	Sets TEK and timeout periods.
show cable privacy	Displays information about BPI status and operation.

show cable modem prof-mgmt

To display detailed profile management data associated with a specific cable modem, use the **show cable modem prof-mgmt** command in privileged EXEC mode.

Cisco cBR-8 Converged Broadband Router
show cable modem [*ip-address mac-address*] **prof-mgmt** [**upstream** | **graph** | **counts** | **downstream**] [**ignored** | **verbose**]

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of the cable modem (CM). If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
upstream	Displays upstream ODFM profile management data.
downstream	Displays downstream OFDM profile management data.
graph	Displays the DOCSIS 3.1 upstream OFDMA RxMER data in graphical format. The x-axis represents the subcarrier frequency in megahertz (MHz) and the y-axis represents decibels (dB). The standard graph (without the CLI count option) shows all data points as `+`. As the number of subcarriers per frequency column is more, there can be range of data points. The `+` symbol is used to indicate that one or more subcarriers has RxMER dB at that level. The vertical bar (`|`) indicates range where no subcarrier has that specific dB level, but there are subcarriers with dB values high and low.
counts	Displays the graph with the actual number of subcarriers at that dB level. The `counts` option displays one of the following values: `1,2,3,4,5,6,7,8,9,0,*`, where `*` indicates any value more than 10.
ignored	Displays the `ping docsis pnm` data without the results affecting the DOCSIS upstream OFDMA profile management IUC selection.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Command History

Release	Modification
IOS-XE 3.18.0SP	This command is introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.1SP	This command is modified. The output of the command with the **verbose** keyword is modified to display detailed profile information.
Cisco IOS XE Everest 16.6.1	This command is modified. The **upstream** keyword is added.
Cisco IOS XE Gibraltar 16.10.1c	This command is modified. The **ignored**, **count**, **graph**, and **verbose** keywords are added.
Cisco IOS XE Amsterdam 17.3.1w	This command is modified. New modulation is added to the recommended, current, and downgrade IUC.
Cisco IOS XE Cupertino 17.9.1y	The output for **show cable modem prof-mgmt upstream [graph | verb | raw]** command is updated so that the output begins at the starting subcarrier. In releases before Cisco IOS XE Cupertino 17.9.1y, the output begins at subcarrier 0.

The following example shows output for the **show cable modem 4800.33ef.0d2a prof-mgmt upstream graph** command for Cisco cBR Series Converged Broadband Routers starting from Cisco IOS XE Cupertino 17.9.1y.

```
router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream graph
Upstream Profile Management Data (Verbose):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 2

Ucid                    : 7
MD US Chan              : Cable9/0/0/U6
Ctlr US Chan            : UC9/0/0:U12
RxMer Exempt Percent    : 0
RxMer Margin qDB        : 0
RxMer Threshold Percent : 2
Start Sc                : 148
End Sc                  : 1507
Num RxMER Measurement   : 1360
Tx Time                 : 0h:00m:42s ago   (Mar 23 13:52:38.373)
Rx Time                 : 0h:00m:42s ago   (Mar 23 13:52:38.387)
MER Poll Period   (min) : 5
Auto Profile Upgrade    : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
Upgrd Dly rcmd IUC      : none
Recommended IUC         : 5  (1024-QAM)
Current IUC             : 5  (1024-QAM)
Downgrade IUC           : 6  (512-QAM)

0x0094  AAB0B7BD  A8A8B5AC  B2B7B5A8  BBAEBBB3  B9AAB7B4  B6AEB4BE  B7AAB8A7  B3A8A9AA
0x00B4  B5B0AEA8  AAB1BCAA  B4C4AFAC  BFAFACAA  AEB7B5B5  B2AAAAA9  A7B4B2B8  A1BFB1B0
0x00D4  B4AEB4B1  B8A9B0B8  B1B6B3AF  B0ADABB3  AEABAAB1  B3B1ABAE  B6B1ABBF  AEA6B2B1
0x00F4  AFADB0AF  B6AFACB6  BAA9A3B3  A8A3BAB4  ADAEA8B4  A5ACA8A6  BCB4ADB1  B1ABB8B8
0x0114  B9ACB3A9  B2ACABAE  ADA8B0A5  B1AEB3BD  B6B0B6A8  B3AEA5AA  B4ACC2B5  B5A9ACAE
0x0134  A9B0A9B0  D2BFB2AE  A9B9B8AA  AAB3BBAB  B2AFB3B4  B9B2B3A9  B3C3C1B6  BDA8ACB4
0x0154  B7B7B5AB  B5B2B2B6  AEACB3B2  B7B2B9B1  ACBEA6A9  B5B0A3B3  A3B1A8AD  B9B3B1AC
```

```
0x0174  A5ACA4AD  A7AEC6B9  A1B0ACBC  B4ABB4AD  A8B9B4AF  B8BCB2AB  AFBCABAC  ABB6B1B4
0x0194  A8AFADA7  B1AFABAB  A5AFB7B2  B0B0A9B7  A6A2ACAF  B4B8A9AB  ABC7A1B2  B5B9ABBB
0x01B4  B6AFACB5  B1AEADB3  B4AFABAB  B3ABB6A9  B9BDAEA8  B2ADA7A5  A7AAAEA7  B3B0ADAE
0x01D4  B2ABB4A4  A9ABA8A7  B0ABB4AE  A4B9AFB6  ADAEA8B2  ADA2B4B1  B0AFADB0  ADABACAB
0x01F4  AD9FACAF  BBB3A8B6  AEA0B3A6  BCB2A5A3  B6B3ABAF  B5A5A8A9  B0B4ADB2  xxxxxxxx
0x0214  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x0234  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x0254  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x0274  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x0294  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x02B4  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x02D4  xxxxxxxx  xxACAEA8  B6AE9EAB  A7A5AEB4  AFA4B2A6  AFA8AAB5  AAABA8A2  AEAEA9B5
0x02F4  ABB1AAB1  A9ACACA4  ABB6ABA7  A6ADB0A6  B4B4A5A6  B0A9B1AE  A7AFABA8  B3A8AEAC
0x0314  ADAFB2AF  AFB3A6AF  A6ADA5AB  ACB0B8A8  AEA6A6A7  A9AAB1B4  A7A8ADA7  ABACA7A1
0x0334  A7B0ADBB  A0A5ACAC  A8B5B2B0  BCA8B3A4  A3ADAEAC  ADA4B1BD  BCA8BAA9  ADA8AEB7
0x0354  A4AEA8AC  A6AEB2AC  A5B1B4AD  C1A4B9A7  A7A5A6B0  C1ADAAA5  B1A9AEA5  A9A9A3AF
0x0374  BEAFAAAD  AB9FA7AD  AEB1AFA2  ABB8AAAB  A7B5BBAE  A3A9B4A5  AABAADAA  B7A5C1AF
0x0394  A4B4A7A6  A6A6A5A5  AEA4ABAA  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x03B4  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x03D4  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxA5B8B4
0x03F4  ABA8ACAC  A2ADC3B0  ACB2B1B0  A5A4B0B1  B2B0BCB1  B0AEB1AA  B0ACAEA7  ABB7A9BF
0x0414  ADABB3BB  B1A9B2B1  A5A8AAAA  BBAEAEAD  A4A8AFAA  B0AAACA7  B3A8A9AE  A4C0B6B0
0x0434  B8B2B0B5  A9AAABA6  A2AAB0BC  AAAAAEAD  ABAFACB4  A5B1A5B0  ADA9A9AA  BCA9ACA7
0x0454  A5A8A6AF  A8B5B4A9  C2ADA5AF  A8A8ABAD  AEB5BAA9  A9AFA5B8  9BAAB2A3  ACAEB0B0
0x0474  B1ADB4A4  A5BBACA8  B4AEB0AE  A8B7A8A5  9DA9A3B2  B0AAB2AB  BBB6A6B0  AFB2A3A9
0x0494  B1B1BCBE  A9A8B0AE  AAA5AEAD  B5B1AAA9  BABDAEB8  ACAFABAE  9FA9ABB1  B2A0ABB7
0x04B4  B2AEACB2  ABA4A9A7  A9AAA3B5  A6B8A9BB  C7AEAFA9  A4B1A8A3  B6B3C4C1  A8BBA8AB
0x04D4  A8ACADC7  A2B5AAAF  A8B2ADAB  B0A6A5A9  B0B0AEB7  ABA6A7A4  B8B0AFAB  AAA7A9B8
0x04F4  B0A5B7B7  A6B3B6AB  ABC0A8B0  ACAAA8A7  B5BEABB7  B1B3BCA9  ABB6AFB8  B5B8B6A8
0x0514  A7B8B4AF  B5B1ADAA  AFB3B2A8  A8A7B2AC  A8B1B1AA  B7A5BBAD  AFABAFAC  B7B1B5A8
0x0534  BFA9B7AA  B2A5B1B1  B6A8B0A8  AAA9ABB2  A0B8AEAE  ACA8ABB4  A6A4A7B2  ADACA5AE
0x0554  BCB7B4AB  B2AEB5AC  AAADADBA  B2B7B4B6  B3B3AFAE  ACBAB0AC  B1AFAEBD  AEB0A4B0
0x0574  AFB1B1A9  BCACABB7  AEAFAABB  B5AAACA6  B9ADBAA9  B3B2ACBB  B7B2ADA9  AFBAB5AC
0x0594  B3B2A3B1  AFB6B1A3  ABA3B1B8  AFACAAAE  A7A6B1B0  B5B6B2B1  A9AE9EB7  A6ADABAE
0x05B4  ACBFA9B1  AFB3AFC0  BBB1A7B0  B5B2B5B6  B5AEACAB  B7AAA4B4  A8B8ABBB  ADBDA8AB
0x05D4  A9B7AEAD  B9AFACAE  ACACA3AA  B4B2A7B0

mslot RxMER(in 1/4 dB):

# msMer    0  : B1B1B1B0 B1AFAFAF AFB0B2B4 B2AEAEB1 ADAFAFAD ADADADAB ACABADAB ABACADAE
# msMer    32 : ABACADAE AEAFABAF ACACACAE ACAEAEAB B1AEACAF B1AFAEAF ABB0B1AF AFAFADB1
# msMer    64 : B0AE

                                                RxMER vs Subcarrier
      |
52.25 |           +

49.50 |           |    +   +                                                                ++

46.75 |+++++ + + +++++ ++  ++   ++                     ++ ++++       +++ ++++ ++++ ++  ++
++ + +++  +++
44.00 |+++++++++++++++++++++++++++            ++++++++++++++
++++++++++++++++++++++++++++++++++
41.25 |+++++++++++++++++++++++++++            +++++++++++++++
++++++++++++++++++++++++++++++++++
38.50 |    +  +       ++  ++  ++++             +++   +++++++++      +  ++   ++++++++++
  ++  + +++ ++
35.75 |

33.00 |

30.25 |

  dB  |
```

```
24.75 |

22.00 |

19.25 |

16.50 |

13.75 |

11.00 |

08.25 |

05.50 |

02.75 |

00.00 |                          xxxxxxxxxxxxxxx             xxxxxxx


+-------------------------------------------------------------------------------------------------

       3 3 3 3 3 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5
 5 6 6 6 6 6 6 6
       0 1 1 2 3 4 4 5 6 6 7 8 8 9 0 1 1 2 3 3 4 5 5 6 7 8 8 9 0 0 1 2 2 3 4 5 5 6 7 7 8 9
 9 0 1 2 2 3 4 4
       . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 . . . . . . . .
       5 2 9 6 3 0 7 4 1 8 5 2 9 6 3 0 7 4 1 8 5 2 9 6 3 0 7 4 1 8 5 2 9 6 3 0 7 4 1 8 5 2
 9 6 3 0 7 4 1 8
                                                 Subcarrier Frequency
```

```
router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream ver
Upstream Profile Management Data (Verbose):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 2

Ucid                    : 7
MD US Chan              : Cable9/0/0/U6
Ctlr US Chan            : UC9/0/0:U12
RxMer Exempt Percent    : 0
RxMer Margin qDB        : 0
RxMer Threshold Percent : 2
Start Sc                : 148
End Sc                  : 1507


0x0094  AAB0B7BD  A8A8B5AC  B2B7B5A8  BBAEBBB3  B9AAB7B4  B6AEB4BE  B7AAB8A7  B3A8A9AA
0x00B4  B5B0AEA8  AAB1BCAA  B4C4AFAC  BFAFACAA  AEB7B5B5  B2AAAAA9  A7B4B2B8  A1BFB1B0
0x00D4  B4AEB4B1  B8A9B0B8  B1B6B3AF  B0ADABB3  AEABAAB1  B3B1ABAE  B6B1ABBF  AEA6B2B1
0x00F4  AFADB0AF  B6AFACB6  BAA9A3B3  A8A3BAB4  ADAEA8B4  A5ACA8A6  BCB4ADB1  B1ABB8B8
0x0114  B9ACB3A9  B2ACABAE  ADA8B0A5  B1AEB3BD  B6B0B6A8  B3AEA5AA  B4ACC2B5  B5A9ACAE
0x0134  A9B0A9B0  D2BFB2AE  A9B9B8AA  AAB3BBAB  B2AFB3B4  B9B2B3A9  B3C3C1B6  BDA8ACB4
0x0154  B7B7B5AB  B5B2B2B6  AEACB3B2  B7B2B9B1  ACBEA6A9  B5B0A3B3  A3B1A8AD  B9B3B1AC
0x0174  A5ACA4AD  A7AEC6B9  A1B0ACBC  B4ABB4AD  A8B9B4AF  B8BCB2AB  AFBCABAC  ABB6B1B4
0x0194  A8AFADA7  B1AFABAB  A5AFB7B2  B0B0A9B7  A6A2ACAF  B4B8A9AB  ABC7A1B2  B5B9ABBB
0x01B4  B6AFACB5  B1AEADB3  B4AFABAB  B3ABB6A9  B9BDAEA8  B2ADA7A5  A7AAAEA7  B3B0ADAE
0x01D4  B2ABB4A4  A9ABA8A7  B0ABB4AE  A4B9AFB6  ADAEA8B2  ADA2B4B1  B0AFADB0  ADABACAB
0x01F4  AD9FACAF  BBB3A8B6  AEA0B3A6  BCB2A5A3  B6B3ABAF  B5A5A8A9  B0B4ADB2  xxxxxxxx
0x0214  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x0234  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
```

```
0x0254  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x0274  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x0294  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x02B4  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x02D4  xxxxxxxx  xxACAEA8  B6AE9EAB  A7A5AEB4  AFA4B2A6  AFA8AAB5  AAABA8A2  AEAEA9B5
0x02F4  ABB1AAB1  A9ACACA4  ABB6ABA7  A6ADB0A6  B4B4A5A6  B0A9B1AE  A7AFABA8  B3A8AEAC
0x0314  ADAFB2AF  AFB3A6AF  A6ADA5AB  ACB0B8A8  AEA6A6A7  A9AAB1B4  A7A8ADA7  ABACA7A1
0x0334  A7B0ADBB  A0A5ACAC  A8B5B2B0  BCA8B3A4  A3ADAEAC  ADA4B1BD  BCA8BAA9  ADA8AEB7
0x0354  A4AEA8AC  A6AEB2AC  A5B1B4AD  C1A4B9A7  A7A5A6B0  C1ADAAA5  B1A9AEA5  A9A9A3AF
0x0374  BEAFAAAD  AB9FA7AD  AEB1AFA2  ABB8AAAB  A7B5BBAE  A3A9B4A5  AABAADAA  B7A5C1AF
0x0394  A4B4A7A6  A6A6A5A5  AEA4ABAA  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x03B4  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx
0x03D4  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxxxxxxx  xxA5B8B4
0x03F4  ABA8ACAC  A2ADC3B0  ACB2B1B0  A5A4B0B1  B2B0BCB1  B0AEB1AA  B0ACAEA7  ABB7A9BF
0x0414  ADABB3BB  B1A9B2B1  A5A8AAAA  BBAEAEAD  A4A8AFAA  B0AAACA7  B3A8A9AE  A4C0B6B0
0x0434  B8B2B0B5  A9AAABA6  A2AAB0BC  AAAAAEAD  ABAFACB4  A5B1A5B0  ADA9A9AA  BCA9ACA7
0x0454  A5A8A6AF  A8B5B4A9  C2ADA5AF  A8A8ABAD  AEB5BAA9  A9AFA5B8  9BAAB2A3  ACAEB0B0
0x0474  B1ADB4A4  A5BBACA8  B4AEB0AE  A8B7A8A5  9DA9A3B2  B0AAB2AB  BBB6A6B0  AFB2A3A9

0x0594  B3B2A3B1  AFB6B1A3  ABA3B1B8  AFACAAAE  A7A6B1B0  B5B6B2B1  A9AE9EB7  A6ADABAE
0x05B4  ACBFA9B1  AFB3AFC0  BBB1A7B0  B5B2B5B6  B5AEACAB  B7AAA4B4  A8B8ABBB  ADBDA8AB
0x05D4  A9B7AEAD  B9AFACAE  ACACA3AA  B4B2A7B0
```

```
router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream raw
Upstream Profile Management Data (Verbose):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 2

Ucid                   : 7
MD US Chan             : Cable9/0/0/U6
Ctlr US Chan           : UC9/0/0:U12
RxMer Exempt Percent   : 0
RxMer Margin qDB       : 0
RxMer Threshold Percent : 2
Start Sc               : 148
End Sc                 : 1507
Num RxMER Measurement  : 1360
Tx Time                : 0h:02m:19s ago   (Mar 23 13:57:42.393)
Rx Time                : 0h:02m:19s ago   (Mar 23 13:57:42.400)
MER Poll Period   (min) : 5
Auto Profile Upgrade   : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
Upgrd Dly rcmd IUC     : none
Recommended IUC        : 5  (1024-QAM)
Current IUC            : 5  (1024-QAM)
Downgrade IUC          : 6  (512-QAM)
RxMER Recommended IUC  : 5  (1024-QAM)
Min Data IUC           : 13
RxMER send/recv count  : 2/2
RxMER retries curr/total: 0/0
DBC                    : 1/1/0/0/0
                          (send/succeed/err/reject/timeout)
State                  : Ready
Profile Downgrade      : Enabled
Profile Downgrade count : 0
Profile Downgrade Partial count : 0
Int  tot/good/cor/uncor : 109/109/0/0  (3/1)
Aggr tot/good/cor/uncor : 203/203/0/0
Downgrade Check Time   : 0h:00m:15s ago

0x0094  A8B2B9C3  C3AEB6B0  AFACAEB0  BBB7B5AB  ABBBB6B9  B0B3BABB  AEAAABAD  B8B1B4B2
0x00B4  AEAFABB5  BFB9A8B6  B9ADC5B6  B1B8B5B2  B4B2B8AB  AFAEA7A9  B2A8BAB3  AFACB0B4
```

```
0x00D4  A9BBB2AF  B5ABB0B2  A8B1B6B1  AAB3B0AC  A6AEB2AF  B6B0B2A8  B5B6A9AF  AFAEB3B8
0x00F4  AFB4B9AC  B7AEB1AF  B9B4B2B9  BBAFB9B4  B7BCB0B5  BBB4ACB7  B0C0B7BB  BBBABBBB
0x0114  AEB6BBB3  AEC5B5B4  AFB4C3AB  AEACAFB6  B1B5A8A8  C4AFBBB2  A4A8ADB2  AFB1B0B1
0x0134  AEB5ABB1  B1AFB2B6  A8B1B1B4  BDA6B3A8  A8ADB2B3  AFBEB5C4  AEB6B0BC  AAAEAFAA
0x0154  AFAEB4BA  B7ADB4B4  B6B0B6BD  A7B0B3B8  B0B7B4A9  B6B8B9BE  BCB6BBAD  A8B6A5BA
0x0174  B9B3ABB9  ABACB4B3  B8ACADAF  C4B6BCB4  BAAFAAB1  AFB0ADA2  ABB4B0B4  B4AEC5B5
0x0194  BAB3B5B7  BFB8A3AB  B0C0B2A6  B0AEB9AC  BBB0B1B5  C1BAA9AF  BFB5B1AE  B4B5B3B5
0x01B4  B9ABB9B2  B1B4B9AC  B2ADAAAF  B6B2AEAC  ABB4AEAF  B2B7A6B3  C1B1B1B0  B1A8B3B2
0x01D4  B3BFA8BB  AEABB1BB  B2AFB1B1  B3B3ACBA  B7B6BDA8  B0ADB0B2  AFB3ADB4  B5B4AEAD
0x01F4  B0B8C0A9  B0AFB4AA  B2B0ABB4  B5B0BAAD  B2B6B1AC  B3AFADB8  BAB7B4B7  00000000
0x0214  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0234  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0254  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0274  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0294  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x02B4  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x02D4  00000000  00B5B7B4  B0AFB1BC  B4BAB4B8  B1ADB4AF  B4A9B2AD  B1AEC0A8  AEBAB1A5
0x02F4  AEC1B6AC  BCB6B9BB  A6B3AFB9  BAAEB6B3  B5A3AEB2  B4AEBBAD  C0A9B2B0  AEBBB9BD
0x0314  B7B4B2B4  B1ADA5A9  B7B2B2B8  B1C1AFB1  A7BCBCB9  B4B6B6B2  B0BBAEB2  B1B3BCBB
0x0334  ABB1B1BC  ABC2B6BA  BDB0B5A5  C6B4C0B2  AABFB2A4  ABA7ADB4  AAB3B2AD  B9BEA9B8
0x0354  C4B3AFAC  AEAFB1B5  AAB0B5BA  AAB0B1B4  BFB5ABAF  B0B4AAA9  BBACAFB1  B5A9B9B7
0x0374  B5B8C1B7  B5B1A9B0  ADBCBAAE  B4AFA8A9  ACB1B8AB  C1ABB7AD  ABB1B3BF  B0BDB7BD
0x0394  BAADC3B4  B3BEB0B2  B0BFB6AD  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF
0x03B4  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF
0x03D4  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFFFFFFF  FFA8B8AE
0x03F4  B1AFBFBA  ABC0BBAD  AEB7B2BA  B0B3AEBC  AEB1C6A9  B7B1B4AE  AAAFB9AD  A4B0AEB6
0x0414  BAB8B8B5  B3BDA9B5  B2BAAFC2  AFAEB2A9  B9B1B0B1  B5B4B3AB  B6A8C8BF  BEB4BBB7
0x0434  B0B0A8B4  B7C0AAB9  B3A9B4BE  B9B7BAB1  A4B1B7C5  C0B5AFB8  B7ABB1B6  C4B8BCAE
0x0454  C2ADB6B0  B5B5ADBA  B4B1A9BD  B2AFA6AF  B6AFAFAE  B6ADB5AB  AEB8BCB9  B4AEAFB1

0x0534  BBB4B2B4  AFB2B4B5  ADA9B3B0  AEA7B1AE  B2B4B5C6  B1B7C2AA  B1B6B0AD  BAB2B7B3
0x0554  AEB8A9BA  B8B1B1B1  ABB7C1B3  B2B5BAB2  B8B0ADC0  A8AFABB5  B0B6B4B2  A3B2B4B1
0x0574  AEB4BBAF  AFB5ABBB  A9ABAFB7  ACB8B4B3  B2B5ADBE  BAB0B2B7  B2B0B2B7  A5B6B2BD
0x0594  A7C0B5B2  C6B2AEA8  B0B4ACB8  AEAEADB8  AFB3AEC3  AEB6B1B4  B0ADBEB1  B5B7B7AB
0x05B4  B2B5B0AF  B2B6C1A9  C0ADBEAB  B6B0A9BC  B6BAA9B6  B6ACB4AE  B1A9B6BB  BBACADB1
0x05D4  B2BAB0AC  ABB3BABF  B8ADBDC0  B0B7C0AE
```

The following example shows sample output for the **show cable modem prof-mgmt upstream** command for Cisco cBR Series Converged Broadband Routers:

```
router# show cable modem XXXX.XXXX.XXXX prof-mgmt upstream
Upstream Profile Management Data :
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 1

Ucid                    : 7
MD US Chan              : Cable9/0/0/U6
Ctlr US Chan            : UC9/0/0:U12
RxMer Exempt Percent    : 0
RxMer Margin qDB        : 0
RxMer Threshold Percent : 2
Start Sc                : 148
End Sc                  : 1507
Num RxMER Measurement   : 1360
Tx Time                 : 0h:02m:33s ago   (Apr 13 17:10:04.883)
Rx Time                 : 0h:02m:33s ago   (Apr 13 17:10:04.890)
MER Poll Period   (min) : 5
Auto Profile Upgrade    : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
Upgrd Dly rcmd IUC      : none
Recommended IUC         : 5  (1024-QAM)
Current IUC             : 5  (1024-QAM)
Downgrade IUC           : 6  (512-QAM)
```

```
RxMER Recommended IUC   : 5  (1024-QAM)
Min Data IUC            : 13
RxMER send/recv count   : 55/55
RxMER retries curr/total: 0/0
DBC                     : 1/1/0/0/0
                           (send/succeed/err/reject/timeout)
State                   : Ready
Profile Downgrade       : Enabled
Profile Downgrade count : 0
Profile Downgrade Partial count : 0
Int  tot/good/cor/uncor : 104/104/0/0  (3/1)
Downgrade Check Time    : 0h:00m:05s ago


SC RxMER Distribution (Excluded SCs are ignored):
*: 2%
>44dB: ******************************** 64.93%
>42dB: ***************** 34.69%
>39dB:   0.37%
>36dB:
 >33dB:
 >30dB:
 >27dB:
 >24dB:
 >21dB:
 >18dB:
 >15dB:
 <15dB:
       --------------------------------------------------100
                    Percent of Subcarriers

Active SC RxMER Statistics                      : (dB)      (1/4 dB hex)
Active Subcarrier RxMER Mean                    : 44.50     0xB2
Active Subcarrier RxMER Standard Deviation      :  1.50     0x06
Active Subcarrier RxMER Threshold Value         : 41.50     0xA6
Active Subcarrier RxMER Threshold Frequency (Hz): 63250000
```

Examples

The following example shows sample output for the **show cable modem prof-mgmt upstream verbose** command for Cisco cBR Series Converged Broadband Routers. This command shows the results of both periodic RxMER probes and RxMER probes that are triggered via **ping docsis pnm** or **ping docsis pnm upstream** command.

```
router# show cable modem XXXX.XXXX.XXXX prof-mgmt upstream verbose
Upstream Profile Management Data (Verbose):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 1

Ucid                   : 6
RxMer Exempt Percent   : 0
RxMer Margin qDB       : 0
RxMer Threshold Percent : 2
Start Sc               : 148
End Sc                 : 3307
Num RxMER Measurement  : 3308
Tx Time                : 0h:03m:16s ago
Rx Time                : 0h:03m:16s ago
MER Poll Period   (min) : 5
Auto Profile Upgrade   : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
New rcmd IUC           : none
Recommended IUC        : 5
Downgrade IUC          : 12
```

```
RxMER send/recv count   : 214/214
DBC                     : 3/3/0/0/0
                           (send/succeed/err/reject/timeout)
State                   : Ready
0x0000  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0020  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0040  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0060  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0080  00000000 00000000 00000000 00000000 00000000 BDB4AEB1 B4B0B1AD ACABB0BC
0x00A0  A4B2ACAB B7B0B4B8 B2B198B9 BBB7B0B1 B291AB99 B3B2ACB3 B8BAB5B0 B2ACBBB1
0x00C0  BBA7A0B1 B0AEBAB9 B7B1B4BA BCB1B1B6 B2B099A9 B1B1B5B1 AFACB5A6 B9B7B1B5
0x00E0  B6B0AE93 A9B3B7AC B0B7B4B1 BDBFB8AC BDB1B299 A6B5A8AE B1B3B7B4 B1AEAFB9
0x0100  CCBEB2AE A8B6B1B5 B3B1B297 B5B6B1B5 B7BBB7AC ABA3ADBD B1C1B2B1 AEB2AFB1
0x0120  B6B7AC9E A7A7AFB7 B7B3A5B5 B7B1B7A5 A0AFB8AC B4B4B0BB B7B9B09A 9EACA6B3
0x0140  B4B4AFB3 B1B2A7B4 B9BAADB7 ABB6AFBF B1B7B8A9 B2B8AEA2 AFABB2B5 B9BABBB6
0x0160  B4B3B4B2 B5AFAAA7 A1ABACAC 91BEBEB2 BAB1B1AC B1BDB5AB 8EB5B6B7 B2B4BDB3
0x0180  B2B7B0B0 A2ADB9B5 B19CB1B2 B4B0ACAE BDACB2B0 C0B8AFBA A48FA8B8 A9ADB4AE
0x01A0  B6ABACB2 B1B3B9B5 B8B388B4 A9BAA9BE AEBAAEAF B3ADB1B5 B3B29A9C A7ABB5B3
0x01C0  B0AFBDB1 AFAFB1C0 B4ABA787 AEA3B1B4 B2B3B3B7 B2BBBAB9 B4B6ABA9 88A6B0A9
0x01E0  A6B1A9B7 B8ACBAB1 B8ACB0AC 9AAFAFB5 B3B5B2B4 B5B3B1B0 B3BEB6B2 B77DB5B3
0x0200  BDAEB1AF B5C5B5B5 B6B6B9B2 AA949AAA ACAFBAAD B2B0B6B6 B0AFBBB1 ADB494B6
0x0220  B1BAB5B9 B6ACB6AA BAADB9B1 A9A49889 ACAFB2AB B3B3A9BB B2BCB5B5 B3ADB194
0x0240  A8AEB4B7 B2B4A6B1 B8AFAAB1 ABB3B4B7 9CB1ACB5 B6B7BFB0 AEB6B8AD B1B08AAE
0x0260  9392ABAD B5B5BCB2 B9A8A6B9 B0ADB4B6 B19BB4AE B5BAA1AF ABB5ADB0 AEB2B2AB
0x0280  B3ADA3B4 AAB5BBBA B4B5B0B8 BCA9A29C ACAE8DA7 B5B5BBB6 B2AFB7B2 B7B8B6AE
0x02A0  B9B6B6A4 B1B4B3B1 BAB3B7B5 B7B1B2B3 B1BFACAA B4B1B8B4 A9AFB1B6 C0B5B59F
0x02C0  B5B7B6B2 8FAAB4B6 B0C0B6B2 B0B4B4B2 B6AEB1B6 AEA5B8B4 B0B7B3B1 C0B4AEB2
0x02E0  ADBDB0B2 B8A1ACAA BAB7B1AD B8ABBAC0 B2BBB7B0 B2B391AA BBAEB2AF B9BAB6AF
0x0300  BCBEB6AD B8B6A5A3 B8B5B6B1 BFB4BAC1 BCB2BDB4 BCB8B8A2 B8AEB4B6 A7A7B6B1
0x0320  9AB1B5AC B8AEB0A2 8AA9A7B2 B5B4B8C5 B4B1C1B3 ADB7BEAD 93A7B5AD B1B3B9B2
0x0340  A7B5B0BC BBAEBCB3 AA96AFB1 B3ABB0AE 8DA7B9B0 B5B7ABA5 A38C90B1 ABB1B0B5
0x0360  A5AEB6B8 ACABB7BD ABB496B4 AEB5BBB4 B0B3B2AA B8B2ADB6 B3A9A6A0 B1B4B3A8
0x0380  988CAAB1 B3ACB8B2 AAB9B683 A5AEB5BD BAB3B2AE BAA9B4B7 B0A1B6AB 95B3B2BD
0x03A0  B5B1B1B4 B7B4B4B3 BBB0ADB2 9B98B6AA B395ADAB B3B1B1B4 B7ACB6B1 B281B7B6
0x03C0  B9AEB4AD BCA9B2BA BDAEA9B5 B7ADA4B7 B3B2B3BA B3BAB6B0 B8B1B4AE B5B493B1
0x03E0  B8BBADB8 B0B4ADB4 ADB8B0B6 B2B5AA89 B1ACADB6 B2B8B5AF B4B8B4BD B0B4B3A6
0x0400  A5AEADB1 B2ACADB4 B2ACB5BC AEBAB3BA 9AB7ABBF BDB1ACBA B5B1B0AD B1B6BFAF
0x0420  A692AAB7 BCACBBC0 B2AEBCAF B1AAADC7 AD96ACB2 BBB8B7AE ACADBCC1 B2B8B4AF
0x0440  B6B8A2AE ABB3B2AE ABAFB0AB B2B5B3B7 B7AFA1A4 B1B4ABB1 B7B3A9AF BAB5B3BD
0x0460  B4B1AD8A B1BCB3BC B8B6ADAF B3C2B9B4 AFADB6A3 A3B8ACB2 AEB6AEB2 B9BAACAA
0x0480  ADB9B9AE 97A7B8B3 B3AFB8A8 B8B1B6B9 B8C6AEB6 AE8AA9B2 B2BAB8AA B2AABFBB
0x04A0  ADB8B3C0 B29AA9B4 B9ACBAB3 B5AEAFB3 B3B7ADB6 B1B999B5 B0A8AFB8 B4B1AFB6
0x04C0  B0AEACB3 AEAA978A AAB5A8BB B2B7AFAF BCB2BAAE B4B3B489 A8AFBEB8 BABAAEB5
0x04E0  B0B6AFB1 B4B3B0B2 97AFACB4 B0B0B2B1 AEBBB4AE BDB4ACAC 8490A6AE B1B5C0B4
0x0500  B1B9BAAD ADB2B6B4 B789B1B0 B5C3B8AE B4A9B4B2 B3B9BCAF B5AC9AAA B9B4B4B4
0x0520  B9B1B1BA B6BAB4BA B8A8799B B1BAB5B6 B7AAACB3 AEB4BAB4 B0B5AC96 AEB4B4B6
0x0540  B2B9B0AB B3B2BFBA B0AEAF85 94A5B0B9 B3B1A8A7 ABB5B9B8 B3BEBFAE 76AEB4B7
0x0560  CDB7BBB3 B3ACAEBB B5BEADB6 A5A1B1B4 BEB6B8B1 BCBBAEB5 BAB2B7B1 AF7A9FB5
0x0580  B6AFB4B4 B0B5B7B3 B2BABDBA B29981A7 A5B1AFAD B8B8AFB1 ACB3ACB3 B2B6889C
0x05A0  ACB0BFB4 BCB8B3C2 B7B4B4B2 B4B2A976 B7B9AEB5 B2B8B6B1 BBB8B8B0 B9B0B496
0x05C0  91A8B3B8 AFB4B4B4 B7B5B7BA B5B4ABA6 8DB2B1B5 BDB5B1B8 B6B3B6B7 B2B7B2B6
0x05E0  A18DB0B1 B4B4AEBA B1BDBEB7 B8ACBAB6 B4A0ABB3 B5B3B9B4 B8BEB0BD B7B9B8B7
0x0600  B1A89FB3 B4ADB4AF B9B9B6B7 B9B6B2B9 B0ABA59F B8B3B9B8 BAB6BAB7 BABAABBB
0x0620  B2B6AB89 A5BFB3C0 BEAFB2B8 B5B2BBB5 B4C4B3A5 8AACA4B4 AEB7B4AC B4B3BCAB
0x0640  AFAEAAAB 7A8DABB7 B3B5B5BC BBB5B6B6 B6B2B1B4 B47EB1B6 BEB4BCAD B3B4B2B0
0x0660  ADA8B1AF A68A86A5 A5BDB7AE B3B3B1B1 B7B3B2B0 B3AB739F AEACB0B0 BCB2B2B1
0x0680  B1B3B6B4 B0AFA08A A6B8B1B5 B9B5AFA9 B3B1ACA9 A8A69F78 92AEA8B3 B5B9B4A9
0x06A0  AEB4BEB5 B4B1A7A4 71A8B3BA B4AEB4A9 AAB5A9B4 AEBBA9B0 8D8DACB2 B0B1ABB8
0x06C0  BEAEB9B3 AFB3ADB2 9F6DA1B2 BBB1B7B3 A5AAAAB4 B5ABB0B6 AB8A739E A6B1ACB3
0x06E0  B0BBB4AD AFADAFB1 AEA27C92 A8A8BDB2 A6B6B6AC B3B1B3BA B1B39E68 AAA7B5B3
0x0700  B2B1BAAA B0B1B1B6 ABAC9F78 7A9DA9B5 AEB0AEB9 ABAEAEAC B4A7ACA2 6FA3B8B2
0x0720  B1B5B9B0 ADAEAFAF B2ACA3A3 806B95A0 ADAEB6B0 A8ACB1B8 73AEA8AB A3708DA2
0x0740  AEB1B1B7 B4ADA9AB BDB5C0A8 B5A573A7 B2B0ADB7 ACA9ADB3 AFABA8A9 9B9B7076
0x0760  909FABAC ADAEACA6 ACBBB8AF B3B2B179 A6AAABAB B2AEC0A1 9CACB0AF B2AEA589
```

```
0x0780  739BA6AB B0AFACA7 B0B6B6AD B1B0AF9C 6C86A8A1 ACA4ACAD A8B4AFAF AFB5BABB
0x07A0  AD85B3C3 AEB9B6B5 B0AFA3A9 B2B2A8AE 987C7FA9 ABA7B6B0 ABAEA8B8 B7BBB7B0
0x07C0  B7A977A4 B4B8B8C5 B9AEA7B3 B9B8B3AA B6AC988A A5B2ACB0 B3B4AFAD B5B8ACAD
0x07E0  AFAFA57B 96A8ABBB B8BAB0BD B7B8B4BB B0B9B99C 83A8B9B6 BCB0B5B0 A8AEAEB3
0x0800  B7B1B0B2 8E94B4B5 B7BBAEAC B0B0BCBF BFB8B8B1 B27AB4B5 BABAB9B6 AEACBDB3
0x0820  BBBFB7B4 AE9D91A9 B5B6C1B7 BDBABDA6 B1B1BEB9 B6B491AD BBAEB3B1 B8AEB7B4
0x0840  B5B7B1BD B4B3A481 AEB9AFB4 B4B1B5B7 B3B6BAB1 B8AEB39C A5A8B6AF B7BFB6BE
0x0860  B1ABB2B4 B5B3B3B5 8DACBAC1 AFBCB2BC AEB4BAAF B4B7AFAA 9288B4AE B7B1B8B5
0x0880  B8B4B0B6 B2B4B8B0 B29DAAB3 BAB9C0BE B7AAB0B6 B6B7C5B5 B6AE91B1 B0ACBABB
0x08A0  B5ABBEB3 B7BEC5B5 B2B3909E BAAEB4BA BBC0B5B8 B6B0B4B7 BABDB7A2 B1B7BCB4
0x08C0  B4B4B8B5 B2B1ADB1 AFB6AF9C 93A8AFB3 AEB4AFB3 B4B0BAB4 B4B6B2AB 96ACB6B6
0x08E0  B7AFB7AF B0AFADB9 BAC6B6B7 B39FB2B2 B6BDAFB8 BCB4BAB0 B8BCADB6 A9999FAE
0x0900  ACAFA9BB B5C4B9B4 B8B5BCB9 ADAC8CAE B9B1B9B9 B5ABB2AB BCBEBEB6 A9B3AE9E
0x0920  B6B7B7B4 B4B3B0B3 AFB7BDBD B2B9AA93 AFB9B5B2 B1B1B3BD C1C0B8BA B5B1AEA9
0x0940  94B5C1B9 B2B9B5B8 B4B6AFB9 B9C2B1B8 A7AEBAB8 BCB3B4B4 B2B0BAB7 B7BAB5B9
0x0960  B98CB1B1 BAB6B5BA B0BBB5BE BAC0BDBE B49F97B0 B4B3BCAD B2B2BAAC BCB6B7BD
0x0980  B3B499B9 B6B9BFBD C1B8BDB7 B2B9BAB7 A9B7A38C ACB5B3B0 ACBBB1B5 B9BDB8BC
0x09A0  B7B6B39E AAA8B3B2 B0B6B3B7 BBB5BAB6 B9B7B2B1 94B7C1B4 B5B9B6B4 BAB7B7B8
0x09C0  ABBBB5B7 9298B2AD B2C7BAB8 B1B6B0B9 C0B6BFBD AE94ABAB BAB3BDA9 B4B3B9C0
0x09E0  AEBDB5B3 B1A794AA B2B8B2B9 B2B4AAB3 B0B4B7BD B9B496A4 B4B0B2BB B4BAB6B9
0x0A00  B1ADABB3 ADC2A790 AAAFB4BA B3B0B7B2 B3BEB8B8 BBB6B39F 99B5BAB5 AEB4B6B6
0x0A20  B7B4B4BF BCB3B6BF 96AABCB3 BBB0ADB2 B8BAB8B4 B2B2BAB0 AB94B0B1 B5B2B6BF
0x0A40  ACC3B3BB B8B7B6BF AF9CA3B4 B5B0BFB9 BCB1B8B7 B3B7AFBE B7AF91B2 B6B7C2B4
0x0A60  B8B2B2AE B7C3AFB1 B2AE9F9B B4B6B1B4 B8B2C4B4 B2B3B1B3 B1B7AD95 A3BBB7B8
0x0A80  B5B9B7B8 BCB8B7B7 BCB6BAAF 94BCB3B8 B9BBBBC3 BCC0BABF ABB6B9B4 A5B2BABC
0x0AA0  BEB6B6B3 BCB9B2B9 B9BCB4B6 B29DAFB2 B9AAB7B8 B9B4B9B3 B8B6BDB9 B7ABA3BE
0x0AC0  B3B3B6AE AFB8C1B5 ADB2B4B3 B3B49BB3 B6B2C2B1 BCBAB8AD B2B4C1B9 B9B5AE9C
0x0AE0  ABB3BEAD B1B7B6B8 B3BBC4B6 B9B3AB9C ACB2B0B7 B3B5B8BE B3ADACB4 B7BCBFB0
0x0B00  92B2B8AE ABBAB8BE BCB4B6B4 C2B5B8AE 9293B0B9 AEB9B1BA B3B8B3B8 AFB1BABC
0x0B20  B08FA8B3 B0BAB7BE AFABA8AD B5B6B1B6 B3A58EAE B4ADBFBE B4BEB3B7 B5B9B9B3
0x0B40  ACAC90A2 BFB9B3B7 BFB3B4B9 ACBFB5B9 B6B7AE8E ACBBB7BA B8B5ACB3 AAB1B6B4
0x0B60  B7B6A992 94ABB2B7 B7B0B3AE BDBDB9BF C0B0BFB3 8AAEB2B8 B6B2BEB5 B1BEB6AF
0x0B80  B4B4B5AC 9A8DAFB3 B4B2BDB4 BAB3B7C3 B3B3B5C0 AD889AB3 B7B5B5C6 B3B1AEB8
0x0BA0  C5B6AFB1 B3B08DB1 ABB5B1AC B6ACBAB6 BCC3C3B4 ADAA8F98 B2B6ABBF B5B0B3B2
0x0BC0  B7B4B8C0 B3B6BC8A A6BCB9BD B5BFB4B9 B4BCB9B1 B6BAAF9F 8FB4AFBA B6B8B4B3
0x0BE0  B1B9B1B3 B3B0ADB6 8F9CB5B7 ACB8C2AE BEB4B7AB BCB8B1B1 AC8AA8A9 BAAFB5C0
0x0C00  BDBBB9BC ADB7B3C0 B49291AB B2ADB9B0 BEC3B9BC C2B1B1CA BDAC8CB4 A8B4B2AE
0x0C20  BAB6B5B6 BAB7BBC2 B5BB9B8E B0ABB4AB B3ACB8B6 B3BCB6AF B4B3B18E A0B5BEB2
0x0C40  B8B8B7AD B7BCAFB0 B7B1B9AC 89A9B7BB B3B1C5B8 B8B8B7B3 B9AEB4AD 8F94AEB2
0x0C60  B3B3BFAB B8C1B6BB B5B3BCBA B28AB1B7 B2BDBCB2 B4B4B7BA B6B8B8B4 A8A08DAD
0x0C80  BAC5AFB8 B4B7AEB1 ADB1ADAF B8AD859C AEACBFB2 B4BBB7BC B2B6B3BF B9B3B487
0x0CA0  ABBEB4AF B3B2C0B6 B6B7B1B3 B5A8AB8E 90ABBFB1 ACBEB0BC B3B1BEAC AFB1B7AD
0x0CC0  839CB2B7 B1B6BAB8 BCB2BFB6 B9AFB3AD 9788B1BE B1B8B9B8 B1B4B7B7 ADB7B2AD
0x0CE0  AB859DB7 B2BBB7C0 B6A5B6AE 00000000 00000000 00000000 00000000 00000000
0x0D00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x0E60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

```
0x0F60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

mslot RxMER(in 1/4 dB):

# msMer    0  : B0AEB1B1 AFB2B3B1 B0AEAFB2 B2AEB1AF AEB0AEAE ADB0B0AF B1ABB0AF ABB0AFAD
# msMer    32 : B4B3B2B1 B2B2B1B5 AFB0B0AD AAB0AAAF B0ACAFB2 B2AEB1B1 B0B1B3AE AFB3B1B2
# msMer    64 : B0B0AFAD B0AFADB0 B2AEB0AC B3B2AFAD AEB1B0B0 B1B3B4B1 B3B5ADAE AFABACAC

# msMer    96 : AAABADAA A8A9ABA7 AAA3A3AC A0ABA5A6 AEA7ACAF ABB1AEB1 B2B1B2AF B1B2AEB3
# msMer    128: B2B4B4AD B1B4AFB3 B2B2B4B5 B3B4B3B4 B3B3B4B3 B1B0B1B1 B2B3B2B3 B2B2B1B6
# msMer    160: B6B4B4B3 B3B3B2B2 B1AFB1B4 B1B4B1B2 B0B2AFB4 B0B0B2B1 B2B0B1B2 AFB4B1AD
# msMer    192: B2AEAFB1 AF

SC RxMER Distribution (Excluded SCs counted as 0):
*: 2%
>44dB: ******************************** 67.05%
  44dB: ******* 14.11%
  43dB: ***  6.80%
  42dB: *  2.72%
  41dB:   1.42%
  40dB:   1.36%
  39dB:   1.10%
  38dB:   1.01%
  37dB:   1.04%
  36dB:   1.01%
  35dB:   0.85%
  34dB:   0.28%

  33dB:
 <33dB:   1.20%
        ----------------------------------------------------100
                   Percent of Subcarriers

Active SC RxMER Statistics (in 1/4 dB):
Active Subcarrier RxMER Mean                    : 0xB0
Active Subcarrier RxMER Standard Deviation      : 0x1A
Active Subcarrier RxMER Threshold Value         : 0x8A
Active Subcarrier RxMER Threshold Frequency (Hz): 81325000
```

Examples

The following example shows sample output for the **show cable modem prof-mgmt upstream ingored** command for Cisco cBR Series Converged Broadband Routers. This command is used along with the **ping docsis pnm ignore** command. The **verbose** version of the command shows the collected RxMER data for the modem. Using the **ping docsis pnm ignore** command to collect a new set of RxMER data without using **verbose** in the profile management and the **show cable modem prof-mgmt upstream ignored** command displays the collected RxMER data.

```
router# show cable modem XXXX.XXXX.XXXX prof-mgmt upstream ignored
Upstream Profile Management Data (Ignored):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 1

Ucid                    : 6
RxMer Exempt Percent    : 0
RxMer Margin qDB        : 0
RxMer Threshold Percent : 2
Start Sc                : 148
End Sc                  : 3307
```

```
Num RxMER Measurement   : 3308
Tx Time                 : 0h:00m:18s ago
Rx Time                 : 0h:00m:18s ago
MER Poll Period   (min) : 5
Auto Profile Upgrade    : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
New rcmd IUC            : none
Recommended IUC         : 5
Downgrade IUC           : 12
RxMER send/recv count   : 215/215
DBC                     : 3/3/0/0/0
                           (send/succeed/err/reject/timeout)
State                   : Ready
0x0000  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0020  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0040  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0060  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0080  00000000 00000000 00000000 00000000 00000000 B5B7A9B2 B9B4B6BF BDADB1B1
0x00A0  A8B2B0BA ADB4ABB2 AFBDA2BD C2AFB6A7 AE92B7AE B6B0A8B4 B9BEBEBE B2ADB8B3
0x00C0  B6B3ABBC B2B4AEB4 A9B8C4B2 BCB4B5AE B5B196A5 B1B1B3B3 B4AFA5AA B2BBB8B3
0x00E0  B1AFAB99 A7B9C3B4 B4B5BDB4 B6B8B8B2 B4ABAC9A A4A6A6AE B7B2B7BE BBABB2BA
0x0100  B0B6B4AD ABBCABB4 AEB3A29F B0B0ADB3 B9B2B2AF AF9FB1B4 B6B3B0B3 B1B2BCB6
0x0120  B3B7A6A0 A8A9BCB2 ADABB4B9 ACB4B4B3 9EAFB6C0 B1BAADB6 B2BAA98D A7B9B3BA
0x0140  B2B6B0B4 B5B2A7B7 B2ADBEB4 AABEB1B7 B2B8A7A8 A9B4B4AA B2B4B7B2 B8B2B3BD
0x0160  AFBAA8B6 ACA9AAAE A5ABA89B A2B4BAB2 B9B5B1B4 AEB4B9B5 8AAFB1AC BFBCA8B1
0x0180  B4ACBAB2 B5B9B6B7 B59CAFB6 B3B6AAB0 B8B7B9B0 B3AFADB0 AA8DA2AF 98ACBAB4
0x01A0  BBBFB3BB B2B0B8AA BCB987B0 BDB4B4B7 ADB9B2AD BABBB4B7 B4A8A09B B1B0BAB4
0x01C0  AAAEB3AE BAACB2B5 B6BAAB86 A7A6B6AC B0B6ADB6 AFAFB7B4 B8B1B4A2 8CB7B9B2
0x01E0  BAB6BEB5 ABB6B4B4 B8B1BAA7 99ABABB4 B4B5B4B3 B7AAB6B1 BABAB2BD A481ACB3
0x0200  B7B2B6AD B2B9BBB4 AFC0B9B6 A7979EA5 B4ACB0B1 B0ACB8B2 B8BAB1B6 BAB894B3
0x0220  B8B1BAC1 B1B5B3B0 B7ABB7B3 B8A6AB8C A8B4ADBA BFBAB1AD B4B6BBB3 B0B1AC91
0x0240  A8A8B0B8 B3A3B1AE B3AFB4B2 BCB3BAB7 99B3B3B4 B2B2AAB1 B2AEB3B0 B398A8B4
0x0260  9E98ABAD ACB6B3A9 B1B2ADAE A6C0B4AF B19BB4B6 B2B3ABB3 B6B4B5C0 AFB2AEAA
0x0280  C4AD9BC6 BAADBDB5 BAB3AFB1 B8B4ADB4 B6B58EA8 B0B0B1B3 B9B1B8B2 B2AFB3B3
0x02A0  B1AAB5A2 B3B2AEB4 B6B9B5AB AEB4B5B7 B4B1AFA8 A7ABB0A8 B1BDBAB4 AEB3A8B5
0x02C0  B2B6B2B4 8CAFAEB3 AFB7B3B3 B8B7B2AD ABBAB1B1 B3A8B8AE B8B3B3B8 BBB8B2BA
0x02E0  B7B6B6B3 AEA2B1AA B9B4B8B2 BAB2ABB0 B8B7C3B8 B3B58EBE BFACACC0 B7B5B7AD
0x0300  B6C1B4C0 B5B1A6A0 ADB9B4B9 B1B8B6B9 B3BCBEAC B4B6B7A3 B1ADADBC AFB1B395
0x0320  BFB2B3B1 AFB7A9A5 88AEABB3 B1B8AEB6 B0ACB7B3 B3ADB1A6 98AEB1B4 B5ACB1B1
0x0340  ABA9B6AD B4A7BEAC A797B0B1 B1A7A48A A7B4A8B6 B3A8B6AD A78E95B0 ACBEB2B1
0x0360  B6B3ADBF B1BAB5AA ACB193B6 C3B2B0B4 B1ACACB0 B7AEB5B6 B4ADA495 B2A9A594
0x0380  8DA9B7B5 AFABBCB8 BBAAB383 A2B9B1C2 B9ACAEAB ACB2B0B2 ABB1B8B4 9EB1B4B8
0x03A0  B1B7B0AD ABBDB0B0 B7B4B1B6 94A2B5A9 8CB7ABB6 B7B3BEC0 AFAEB8B9 B981B0BD
0x03C0  B2B7BDB2 B6B8AEB4 AFACB5BE B8ABA6B2 C1B1BCB5 ACB4B6B9 B9AAB8B6 BEAE90B0
0x03E0  ADBEB7B3 B4AEADB4 B0B5BCB4 BDB3AB87 A7ABB1BA B5C0B3AB AEBBB2B4 BCACBBAB
0x0400  ADB6BABA B7C0BFB9 A8A9B7B6 B1B1B1B1 A0ABB6BD B2B1BBB8 B1B1BCB1 B4B5B6AF
0x0420  A496A6B5 BEB4B4AB BDB2B7B5 B9B3A8B2 B199B2B8 B5B4B2BC AFABB1B4 B3BABAB9
0x0440  AB9EA9B1 B7B0B4B7 B5B2B0B5 B3B6AEB2 B7AF90A1 B2B2BBB3 AEAFADB3 A8A6AEB1
0x0460  B8B0B386 BDB5B3AF B6B4B6AD B1B2AFAF B7AFABB0 9CB1BAB4 B7BDC2B9 AEB2AEB1
0x0480  AEABABB4 94B3B7B6 B9B3A9B8 B6ABBDB7 B5B6AFB3 AA84B4B4 BCB7B0B3 B4A4B9B3
0x04A0  B3B3B2B0 B49599B2 B7B7BAB3 B1B7A9AC B8BAB2B5 B5AE9BB9 BBB8B3BA B3B5B4B1
0x04C0  BDBCABB2 AEAF938C A8B9B3BD AFB1B7AC B2B6B9BD AEB1B488 A8C4B3B2 B6B3B2A9
0x04E0  ACB4B1B2 B3B0B8AD 9EB2B1B6 BCB9B1B0 BDADB0AF B7B5A5B0 8494ACAD AAB1BAB5
0x0500  B1AFBCB5 BDB6B3B7 B88CB9B2 B2B7ACB1 B9B0B0C0 B9BCBBB1 B49C98AF B6B8ADB3
0x0520  BAB2A7AB B3B5AEB9 C2A877A4 B2BAB5B7 B0AFB2A5 B2B7B6B4 BFBEB79B B4B4B2B7
0x0540  B6AFB0B3 C0B6B4AE ABBBAD86 92ABB4B1 C0B3B2B3 B3A9BBAF B8B3B3B3 7BB6B5BA
0x0560  B1B4BCB6 ABB4ABB1 B4B8ADB7 A0A0B4B1 BAB0ADB8 BCBAB5BA BCBAB0B0 AB7CA5B1
0x0580  B9BBB9BB B3B3AEB8 AAB5B9AC B3A781A8 B4B4AEB0 B6B7B8B4 B1B7AAB5 B4B390A1
0x05A0  B4B4B1B0 B9C0BDBF ACB0B4BE B0B3B778 B8BBB7BB B0BAB4B1 B4B6B9B6 BCB7B79C
0x05C0  91ADB5AD AEB7BAC1 ACB7BCB4 B3B7B5AB 8CB7ABB4 C1B7C5B4 BEBAB7B3 B4BDB7BF
0x05E0  AD8BAAB0 C1B2BAB5 B0B1B7B1 B5BAB1B8 B59DB3B3 ABB8BAB2 B2BBB7B3 B9BDB6B6
0x0600  BAB799B7 B1B6B1BD B3B1C0A7 B5B3B3B7 C0B19D90 B1AEB6B2 B3B6C0B8 ACA7B2B6
0x0620  B9B7AC86 B4B3ADBC B7AFB1B5 B1C0B0C0 B3BEB6A6 869EB4B4 B2B3B9B6 B1AFB0B3
0x0640  AEB0A9A3 7C92A2AE B2B0B2BC B5B8B8AE C0B2ADB8 BA7FAEC9 B4B0BEB0 B0AEB3AE
```

```
0x0660  B6AEB0B1 AC8F85A5 A7B5B5B8 ADB3AEBD B5B5AEB4 AEA474A4 B5B3B3BB B4C3ABAC
0x0680  B1AEB0B3 B8B6A88A A9B0B1B9 B8B1ADB6 B8B3BAB5 ACADA579 8FA8A8B6 B7B1ACAD
0x06A0  ABB4B6AE B0B7B3B9 70AAB4BE B3B9AFB3 A8B6B2BC ABB5A6AB 9188A9AA B6AFB6AC
0x06C0  AEBEB3B3 BCB6BFA8 AB6AA2AE B3B7B1B7 ABACAFBA BBABB1AC A594749E AAADB1BB
0x06E0  B4B3A7AC B6B5B1AF A6A17B91 ACB2B2B3 B1B4A5AD BDB4C0B2 BEBC9E6A A9A7A8B3
0x0700  B4B0B2AB B6B4BAB9 B9A39D7A 7CA6B1AB B1B3B6B2 A8B7B1B1 B1B2B6A6 71A6B5BB
0x0720  B4B4B7B5 B5ABB2B3 B2B4A8A5 876794A3 ADB1ADAD AEAAAEB3 72ADAEA1 9F728FA6
0x0740  A9AFADB9 B5ADB0AE B1B8ADB8 B6A774A4 A9AABAB6 B8AEB1A9 B7AFA9AD A2947173
0x0760  989DA2BA B8AAB6AC B7B0B0AD B8BCAD79 AEBDB7B4 B7AEB0AF A3B6B8AC B9AD9F8E
0x0780  759EAEB1 AEB5AEA5 ADB5B3A8 A7ACA59B 6C8C9DB2 ADB5B3B7 AE9CBCB9 AEBDB9B5
0x07A0  B288ADC0 B4B7ADB8 A6AFA8AC BCAFB4A4 A3797F9E AAADB1BC B5A8B1AF B0ACAAB2
0x07C0  A9AF75AC B2B0B3BF B4B5B1B2 B5B5BDBD B4ADA18D ABB8B5B1 A8ADB4BD AFB8B2AF
0x07E0  B5B1A57A 99A8A7B6 BEB2B7C2 B8B7AEB5 B9B2AFAD 82B4B8B7 B3BABFBF ACB0B8B6
0x0800  B2B7A9A8 9594A9BB B7ADB6B2 B5B6BAB1 B9B2C2AE B279AEB0 B9B7BAB5 B6B0B1B2
0x0820  B7B3B1AA ACA291B4 B5B2ABB0 B8AFB1B4 BEADB8B8 B9A692AE B2B1B2C0 C1B8B6B4
0x0840  B0BBC1B6 B9AFAA7D AFADBBB3 B5B5B9AA BAB1B8B4 B1B4B69C 9CBAB4B7 B6B1ACB8
0x0860  B6ADBBBF B1B8B9B3 8DAFAFB4 B4C4B9B5 C0B4B5B3 AFAEB6AB 9786A9AF B1B6B7AD
0x0880  B4B3ACAF BDB1BBB5 B5A3BBB9 BAADB8BE B3B6B1AD BAB9C0B8 BAAB90B7 B8B3B3AD
0x08A0  B1B3B7B3 BFB8B8AD B3B29694 ABB8B3BC B8A9ADB7 B0B3B4B3 B5B4B59F B6B9BDB5
0x08C0  C1B8B7B1 B7B1ACC2 B1B6AE9C 95B2B2B5 B3BBB1B7 B7BDBBB3 BDBAACB3 93A8B7B8
0x08E0  BAB3B7B1 B7B6B6B9 C3C3BEBB B79EB8BA B5B6B7B7 B3B1AEBD BFB0B7AC B29FA4B6
0x0900  B4BBB5AD B2BEACB8 B4BCBFB7 BAB68EAE B4ABB6AB BCB4B1BB B8B4B3C2 AFB4AF9B
0x0920  B1BDB6BE B4B3AEAF BBB4B8B2 B2B7BC8D B0AEB7BB B8C3BAB8 B4B8BFB4 B8B7BAB6
0x0940  8EB4ACAE BAB7B2B3 B4B8B3BA AFBAB2AF A6A6B1B7 B6B9B4AC B2B9B2B5 B1B5B7B8
0x0960  B088B7B8 BDACB5B7 BEBDB3AF BAB7B9B2 B4A897AA B1B6B6BF ADBDB0B4 B4B1B9B6
0x0980  A9AE9AB6 AFB8B8AF B7B8BAB1 B4B1ACB1 B3AEAD87 ACB4AFB3 B2BEB4B3 B3BDB2BE
0x09A0  B3BAAC9C A2B6B0B3 BBB5B3B0 AEB4AEB8 B5BABBAA 90B5BDAA B1B7AAC5 ADB4B3B5
0x09C0  B1AABBB2 9E92B1B3 AAC2BDC4 B1AEB0C0 BEBAB2B4 A898ACB5 B8B9BABC B1BDB2B4
0x09E0  BDB7B8B4 B0AA8FB1 B2B9BAB2 B4ACB6B4 B2ADB6B4 B5AC94A2 AEB1B8C6 B1C0B5B9
0x0A00  B3C0B6AC ABA9BA90 B1C8BEBF B7B0B7B4 B7C0B2B9 B2B1A6A7 96B6B1AB B9AFC0BD
0x0A20  B9B9BFBB B6B3BEB1 96B7ADC0 B4B7B6B4 B6B8B8C0 B6ABB1B0 AE96BABD B1B0ABB8
0x0A40  C1C0B5B2 B2C1B0BD B69EA5B7 BAAFAEBC B6BEB4B4 BAB1BCC2 BAAD92B3 BEB8B5B6
0x0A60  BCB9BAB3 C0AFAEB7 BBB6A59E B1BFB3AF BDB6B5B3 BAB2B4B5 BEBAB391 ACB4B3B2
0x0A80  B6B0B6B9 B8ADB3AB B7B6B1B1 90B0B4B1 B7C4B8B8 B6C0B4B5 B6C2BAB2 A49FB6B6
0x0AA0  B7B3BFB0 B2B9B5A9 B7B4B8B7 B893B2B7 B8B5BDB7 BDBEB2AE BABDBABC AFA69CB2
0x0AC0  B6BABCB3 B7B5B1B2 AFB2B0BE B4B199B3 BCB1B4B0 B3BBBAB4 B6BDB7C4 B4B7AB93
0x0AE0  B0B3B9B8 B5BDBEB5 BDB5BEBB BAB3AC98 A2B1B0B5 BAB4B3A7 BEB4B4B6 B3B6BBB5
0x0B00  8FB2B5AE B5AEB7B0 B8BBBFBD AFB9B3AF 9C94ACBA B0BBB1BC C3B1ADC6 ADB5B7B9
0x0B20  B194BAB5 B6B6B5B0 B0ACB5BA B7C7B2BD B8A58EB0 BBB7B7B5 BAB8B8B2 B1BBA8B1
0x0B40  ADB392A2 C1B9B8BB B4B1BAB9 B2C0C3B4 BEB7A989 B6B0B1B3 B2BEAEAF ACB4B8B7
0x0B60  B7B0AA96 93A9B4B8 AEB4B5B9 BAB3B8B9 B4B3AFB7 87AEB4B9 B7B4B7AA B4B0B8B8
0x0B80  BAB3BAB3 AA89ADA8 B1AEB7B4 B5B4B4BB B9B2BAB6 A78C9DA9 B4B4AAC3 B2AEB5B4
0x0BA0  B1ADBDBA B4BF87BB ADBDBCB3 B8B7B6B6 BFB9B2AD B7B19792 ACB1B2BE B6BDBCB4
0x0BC0  B5B9B4B3 B6ADAB85 B1AEB1B7 B1B3B9BF B5BEB3BA BBB3ABA2 8BA7B2B3 B7BABFB2
0x0BE0  BBB5BBB3 B3BCABA5 8E9BB6B2 C2AFB5B6 B3B8C0A8 AFBFB7BA B186B0B4 B1B1B6B0
0x0C00  C0ACB7B3 B0BAC1B1 B19792AB B3B6B4B9 B4B8AEB7 BDB6B2AC B6A787AE B3B8B6BA
0x0C20  B0B8B1B5 BFBCB3C2 B3B69D89 AAAAB6B3 B7B7BAB2 BBB5BBB8 BAB7A689 A2ABB2B0
0x0C40  BBB8B8B6 C1AEAFB5 B4B3B1A7 87AEB4C0 B6BEB0B2 B7B7B7BD B4BEAAAE 9192A6BB
0x0C60  B8BCB4AC B8B1BBB6 B6ADACB6 B187B4B2 B3B3B9B4 B2B5B1B2 B4B4B3AF B89B8ABB
0x0C80  ABB0B2B3 B1BCB4AF B3AFB8B9 B6B2849C AFB6BBAC B3B8B8B9 B1C8B8B9 B1B2B685
0x0CA0  A5B9B1B4 B7BDBCB9 B4B4B7B5 B3C2B393 8DAAAEB3 B7BEB3B9 BBBCC0C1 B4B3B7B2
0x0CC0  81AAB8BB ABB8B9AA B5B8BCBC B7B4B3AB 9986A8B2 B0B1AEB1 BCAEB3AC B3B7B8AA
0x0CE0  A7849EB2 B5BAB1B6 B6AFB7B6 00000000 00000000 00000000 00000000 00000000
0x0D00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

```
0x0E60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000


SC RxMER Distribution (Excluded SCs counted as 0):
*: 2%
>44dB: ********************************** 69.68%
  44dB: ****** 12.59%
  43dB: ***  6.32%
  42dB: *  2.43%
  41dB:   1.55%

  40dB:   1.07%
  39dB:   0.75%
  38dB:   1.13%
  37dB:   1.01%
  36dB:   0.85%
  35dB:   0.94%
  34dB:   0.41%
  33dB:
 <33dB:   1.20%
        ---------------------------------------------------100
                   Percent of Subcarriers

Active SC RxMER Statistics (in 1/4 dB):
Active Subcarrier RxMER Mean                    : 0xB0
Active Subcarrier RxMER Standard Deviation      : 0x1D
Active Subcarrier RxMER Threshold Value         : 0x89
Active Subcarrier RxMER Threshold Frequency (Hz): 81325000
```

The following example shows the output for the **show cable modem** *mac address* **prof-mgmt upstream graph ignored** command.

```
Router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream graph ignored
Upstream Profile Management Data (Verbose)(Ignored):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 1

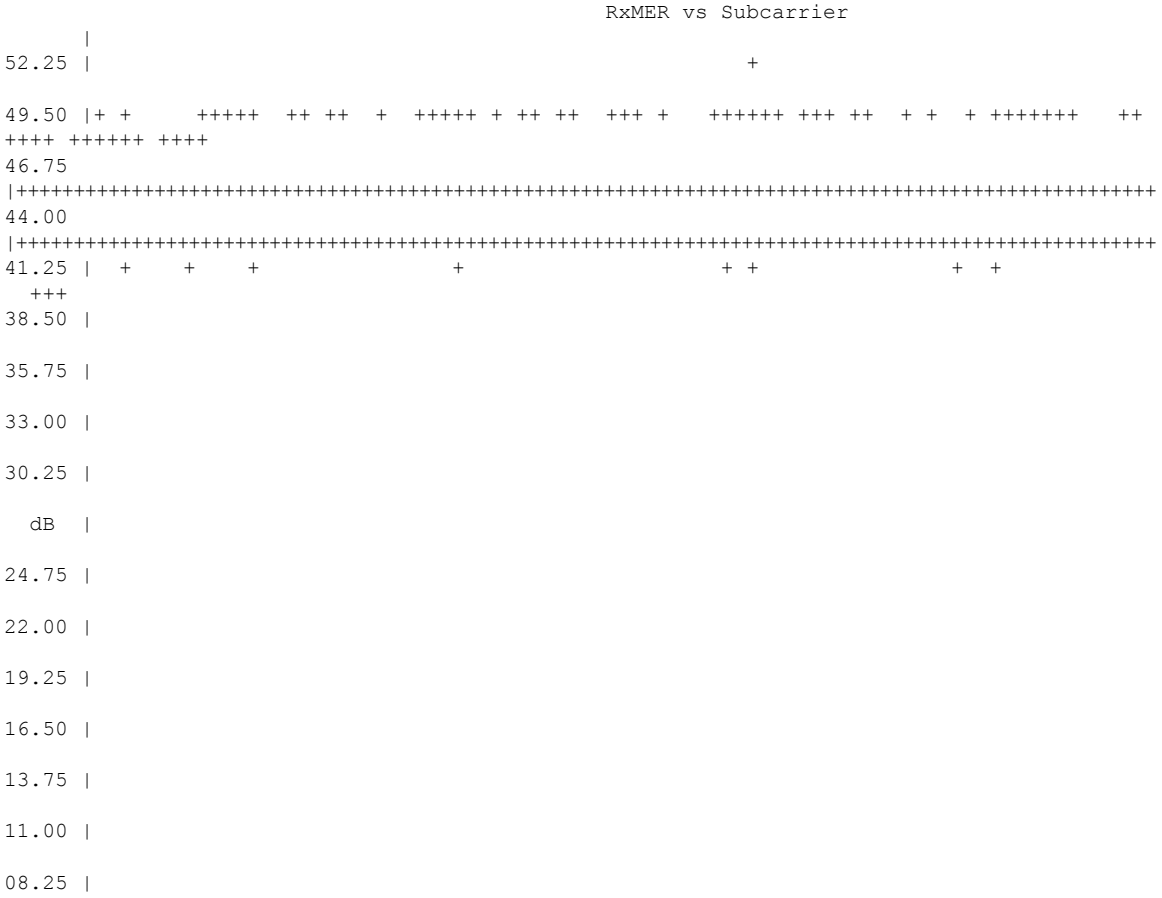
Ucid                    : 7
MD US Chan              : Cable9/0/31/U6
Ctlr US Chan            : UC9/0/31:U12
RxMer Exempt Percent    : 0
RxMer Margin qDB        : 0
RxMer Threshold Percent : 2
Start Sc                : 148
End Sc                  : 2507
Num RxMER Measurement   : 2360
Tx Time                 : 0h:00m:44s ago
Rx Time                 : 0h:00m:44s ago
MER Poll Period   (min) : 5
Auto Profile Upgrade    : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
```

```
Upgrd Dly rcmd IUC      : none
Recommended IUC         : 5  (1024-QAM)
Current IUC             : 5  (1024-QAM)
Downgrade IUC           : 6  (512-QAM)
RxMER send/recv count   : 1916/1916
DBC                     : 1/1/0/0/0
                           (send/succeed/err/reject/timeout)
State                   : Ready
Profile Downgrade       : Disabled
0x0000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0020  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0040  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0060  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0080  00000000  00000000  00000000  00000000  00000000  BAB8BABB  B4BCB9BB  C4C1BEC2
0x00A0  BDBAB4C1  C3B9BBC3  BEC1BDC8  B1B0B9B5  BDC4C1B6  BEC0BEBD  B7B6C0B9  B6B3BEC5
0x00C0  B5BABAC1  C7B5C7B2  B9B7B0C1  B2BDB4B5  C0B8C2B7  BBBFBDC2  B2AEB5C2  BEBABAC0
0x00E0  B1BDBDB9  B7B5B7B8  B4BBC1C0  C0B9B8BE  BBBEC2C4  BEC3BFB4  BCB7BAC3  B6BDB1BC
0x0100  C0B9B7B5  BCBEBAC0  B9BBBFC3  BCBEBAB9  B6BCC0BE  BBC1C0B7  C0B9B6B9  BFB8C0B8
0x0120  BABDBAB5  C1B1C1B9  C0C5B7BF  B8C3BDBB  C2BBBCC1  BCC4B8B5  BFBABFBD  C0BAB7B5
0x0140  BCBEB7B9  C0B4B2B5  BEAEBDC0  BDB6B5BD  B2BFC4C0  C1C6C5C0  BABCC1B7  BDBDBDC0
0x0160  C2B9B7BA  C5BFB8BD  BEC2BDB7  B8BABDB4  C3BCB7B8  B7BEC1BA  B6BBB6C0  BABAC7B0
0x0180  BEBAB8B7  C0B8C0B9  B6C3B3BF  C9BFB6C8  BAB7B9BC  BCC1B1B4  B7BBC0BE  B8B9B7C1
0x01A0  C1C1BDB9  BFB7BDBC  BAC0BBB6  BFBCB1BC  BACAB5BA  B6C0C1B7  BAB4BDCF  BAC2B3B3
0x01C0  C0B7B2BA  B9B8ADBD  BEB6B7B8  BEB7B4B7  C0B6BDBE  B5B9B8B4  C5BEB3B5  BCBFB6BB
0x01E0  B4BCB8C5  BFB8C0B0  B7BBB7BD  BFB7C0BE  B9BDBDB7  C0BCB5BC  C3C0C2C0  B5BDBFB9
0x0200  B5BBC6C0  C0BFBAC0  B3C3BDC2  B2B9BAB5  BABDC6BE  BAB9B5BB  C7C1B7C3  BAB8BABE
0x0220  BFC1B5C6  BDB5C3C0  BBB9B9B4  BDB8BAB8  BCBABEB5  BCBCB8BC  BDBFBDC0  BBB7BDC0
0x0240  C0B4BEBD  B6B9BEBA  BFBABAC0  C2BDB8B8  BEB2C2BB  CCB8BABB  C0BAC4B4  BCB3C2CC

0x0260  C1B8B9BD  C6C2B6C1  B8B9B7B0  C9BABCC5  BBC0B9C1  BBB9BAB6  B8BABCBC  C1B8BAB9
0x0280  BFBEBDBC  BAB3BDC0  BABCBBBE  BDC0B5B6  BCBEC3BA  BDBDC0BA  C0BEB4B9  BAC1B9C0
0x02A0  BABAB4B5  C0BFBAB6  C8BEBDC1  B8BCC0BE  C0CAC8C2  C0C1B8B4  C9C0BFBF  BCC0C0BD
0x02C0  C0BCC3BD  B7BFB8BB  C1B5C0B7  BBBAC0BD  B8B9C2BC  B4BDB6B6  BEBEBCBF  BDB7B8B5
0x02E0  BEB7BDBD  B9BDC5BB  BEB9BCBB  B4BEB3B9  B6BDB9BE  BBBEC0BD  C0B6BAB7  BDC7B6B7
0x0300  BCBCB9BF  B9B5C3C3  BFC1BEC5  BCC4B7B4  B2C6B7B8  C2C0C8B8  B8BBB5BC  B6BDB9C0
0x0320  C6B3C1BE  BDB5C9BD  C1B8BABA  CEBDBDB7  B8BDB8B4  B7C6B2BC  B9C0B6BE  BFBFB6BC
0x0340  BEC2B9C0  BEC0BAAF  BEBEBDBC  BEBAB8BD  B1B9BCC3  B8BFB8BD  BFBCBDBE  C1B4B6BF
0x0360  C1CCB7C0  B5BABFB9  C4B7BCBA  BCB7BEBC  BFB1B9BC  B8BBC4BF  BCBEBCC4  BCC3C1CB
0x0380  B2BCBDBA  C2BBBCBF  BEC1C2BD  BCC2B8BF  B9BEBAB8  BEB9BCBD  BEC0BABA  B4B6BABD
0x03A0  BFC0BDB7  BBBAC2C3  BBBEBFC0  BFCBC1B7  B9BDB8C2  BBC2BAC0  B4BFB0BC  C9BEB3BE
0x03C0  C4BAB9BE  C5C0BBC5  B8C3BDC2  B9C6BCBE  BDBEC6C0  BAC5C3B4  B9C4B9BA  B6BFC1BE
0x03E0  BBC5C2BC  B8BDB8BD  B8BDB4BB  BFB8B6BE  BCBBB8C1  BDBDB8BD  C1C0BCBE  B7BEBBB7
0x0400  B4C5C6BE  BDB8B8B9  B7BFBAB8  B6BDC0C1  BDB9C2B6  C4BBB9B6  BAC9B4BA  C1B5C1B7
0x0420  B4C4C3C4  B4BCBFC2  BEB9BDBE  C5BCBEB9  BEBABCC0  BCB6C0BF  C1BAC1B7  B6BDB6BD
0x0440  C2C1BDBB  B9B4C0B0  BEB8C1BD  C4BBBFBB  BBBEC3B4  BEBECCBC  B7B7B3B8  BABECABB
0x0460  BFC0BEB9  B3BCB9B8  BDB6BBB4  C7C2B8BB  BDBEB7C1  B4BBBDBE  BDBABEBA  C4C2B7B8
0x0480  BBB7B3B4  BABFBEC5  BCB7BBBD  B4C2B7C9  C1BDC3B4  B9CDBDBA  BCCBB7BA  B9B7BBB8
0x04A0  BBB8BBB0  BFBEBEB4  C2B8BAB9  BBB9BFBB  C3C0B7BB  C3B7BEC5  BBB9C6B8  C0BDC2BE
0x04C0  CAB7C3B7  C4BDBACB  C0BAB9BF  BEC3BFC2  B8BFBCBC  BDBDBBC0  C1C2B8BA  BABDC1C0
0x04E0  B9BBB9B7  C0B5C3BC  BFBCB8B9  B8C3BEBD  B9B5BFB7  BCB2BABA  B7BCC1B7  B8C3C3BA
0x0500  C0B7B7BC  C3B6B8C3  BFBBBDC2  B7BCC2BD  B7BEB7BE  C0BAB3BF  BAC6BEB3  C6BEC3BF
0x0520  B8B4B6BA  BCBFB8C1  BEBFBFBC  BABBB8BF  BCBCB9B4  B7C0BABA  BDC5B9C0  C6BAAEC2
0x0540  B7BFB3BC  BCBEBBBC  B9B8B3B4  B7C0C4BC  B6C1BBB3  B4BDBEC9  B9C3BCB5  BFC1B6B9
0x0560  C3C2BFBE  BABEB8BB  C6BDAFBA  C2C4C3D5  BFBFBDC1  C5BABBBA  B8BAC7B8  BEB8BAB5
0x0580  BAB9BFB4  CBBCBCC0  BDB9B7C0  B9BAC3C2  C3C1BAC5  C0BEBDB9  BCC6BDBD  C3B7BABA
0x05A0  C1B3BAB8  B3B4B8BE  C0B6C0B5  B9B6B8B9  BAB7B4BC  BABCBAC4  B9BFBDB9  B8BEB4C2
0x05C0  BCBCBDBE  BEC1B9C0  BEBCBCC6  C7BBC5B9  BAC1BEBB  C4C7B3BD  BCC2C3C6  BDBFB7BA
0x05E0  B9B7B9BD  B9C1C2BD  BBBCB4BE  BDB9C4BD  C5B9C0B9  B9B9B9BF  C2BABFC0  C0C0BDC8
0x0600  BDBFB9C2  BFB7C4BF  C1C5B7BC  B8C1B2B7  B9BEB8BC  B2BFBFB9  B9B5BDBA  C0C2BFBD
0x0620  C7B7BDB8  BBC1BEC0  B7B5C4B9  B5C3BFC3  C2BBB7C3  B8BDB8BE  C6C0BFC4  BDBAB8BC
0x0640  B9C0BDBD  BFBCBAC5  B9BBBBBC  BFB4BDBB  B2BBB9C1  B7B5BAB7  BEBEBBBD  B7BEB7BB
0x0660  BEBAB9B8  BDC0B7BD  BCC0BAB8  BCBABEC4  B8B6BFB6  C0B4BFC3  BBBCBDC0  B9BBC9B9
0x0680  BEBAC3BE  BEBDC1B5  BEBEC3BB  BDBFBBB8  B9BEC2BF  C4C2BCC3  BCC1BFBB  BFBABEB5
0x06A0  BBBDC0B6  C1C4B5BF  C2BCBDBC  BEC5B1B7  C2BBBCB6  C1BBBABF  B7C7BDC6  C5BAC0C3
```

```
0x06C0  C5BDBFB8  C0C2C2B6  BFBDC3B2  C0C4B1BE  C0C2BAB6  BAB3C1B4  B6BEBCBF  BCB8C4BC
0x06E0  B7BDBCBD  BFB6B7B9  C1B7C0BD  B8BAAFC4  BEB6B4BE  B5B9B9CB  BDBBC2BA  BFBEC2BC
0x0700  C3BBBFBE  B8BFC1B5  B1BEB7B5  B9BDBDC1  BFBBBDBF  BDC3BCBE  B5BCB4BE  C4B9C0BC
0x0720  B7BABFBB  B2BEC4C0  C9BEC3B3  B7BEB3C6  AFBAC3C5  B9BEBEC1  BCBFB9BE  C2C2B3C3
0x0740  BAB9BBB5  B7C6BDB4  B8B7BCBA  BDB9C3BC  BFC1BFB9  B6BBB6C8  B9C0BEBF  BCC0C1B7
0x0760  BAB5BFBE  C1B9BEC8  B4C3BEB8  C6CBBDC1  BBC1BAC1  B8B8C0B7  BBC3C0BF  BBB7C3BD
0x0780  BCBEC0CC  C3BFBDBA  BFC1BFC3  CBBCBBBF  BEB6B4B7  B7BBC0BF  B9C0BBBF  C5C5C0B7
0x07A0  BCBABAC0  BEB7B6C0  B8BCBAC3  C8C4CAB9  B7C1C3B4  B8C5C2BE  BABABCC5  C0B8BAB4
0x07C0  B9BDB4BC  C0C1B8B8  C1C6BEB7  B9B5C3C1  B8B9BCBE  BFB8C1BA  C2C0B7C4  BFBBBBB9
0x07E0  B6C1BCC0  BDBCC1C4  B9BFBEBF  B4BBC1BD  BFBEB7BE  BCBDBFBB  C1B8B9BF  C3C2C0C2

0x0800  BEBCBABE  C1C3B6BC  BDBFBABA  BEC1BFB6  C3C4BFBE  C3BBBFB7  BEBDC5CB  BABEB4BC
0x0820  BDBEC0BF  BDBCBCBA  BBBFBBB8  B9BDBBBF  BEB7CABD  BEBAB5B8  C9B7B9BA  C0B4BFC5
0x0840  B4BCB4B6  BBB5B9BF  BFC4C1C2  C0BFB9C4  BFBDB2BC  B3B8B6C0  B4BAC2C5  BAC8BAC0
0x0860  BBBDB1BE  C2B6B7C3  BBC2BDB9  B8BAC3C0  BFB7B8BD  C5BDC0BF  B8BEB6C0  C0C6C1C1
0x0880  B8BEB7C0  C2CCC0C4  BDC1C6C8  BFC1B6B9  BEC1C5BE  B5C4BABC  CBAFC6C3  B8C2BAC3
0x08A0  BCBAB5BF  B6BBBFBF  BCBABAB8  C0C7C0C0  B9C8BBB9  BABBBBB1  C7B8B7AF  BDB2BAB7
0x08C0  C0BBB8BA  BEBCAFB7  C2B9C1BB  BAB9BBC2  B8BABCC3  BAB9B4C3  BBB8BCC1  B5B7B6B9
0x08E0  BAB7B7BB  C0BFC5CA  BEBCBDBD  C3BAC0B9  C2C0BDB4  C8CCB7C7  C9C3BEB6  C0BEC6C0
0x0900  C4B8B7BF  CABBB9C0  B8B4B8BE  BBBDBFC9  B4BDB9C0  C0B6B7C5  BFBEBFC1  BDC0B5B3
0x0920  BDBBB8B5  BEC9C1B5  B8BDC1B1  BDBCB3BA  C3BBB4BC  B7B7C0BC  C8B8B5C4  B9C3C4C2
0x0940  BAC0BBBA  BEBABCC0  BCC3B5B7  BCBDB8C6  B7BEBAC1  BDBFC2C2  BCBCC3BF  BCB7BEBB
0x0960  B6C4B6BC  C0BEB6C0  BCBFBEBA  B9BFBBC1  C1BAC0BE  BEBEC3C3  BFBFB9BE  C0BABFBD
0x0980  BABDB7BA  BECABFBC  C1B8B9CB  BCB3C0B7  BBC9C3BA  C4C2C0BB  C2C4B9BF  B8C4B4BF
0x09A0  C3C0BABD  C6BCC0BE  BDC0BCBB  BFBBC4B3  B1B9C3BC  BCCABCC0  B9BEBDC6  B4BABAC2
0x09C0  C0BEC3B9  B4CDC5B6  B7BEC1BB
```



```
05.50 |

02.75 |

00.00 |


+-----------------------------------------------------------------------------------------------------

       2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6 6
 7 7 7 7 7 7 7 7
       0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9 0 2 3 4 5 6 8 9 0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9
 0 2 3 4 5 6 8 9
       . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 . . . . . . . .
       5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7
 9 1 3 5 7 9 1 3
                                                 Subcarrier Frequency


Active SC RxMER Statistics                      : (dB)      (1/4 dB hex)
Active Subcarrier RxMER Mean                    : 47.00     0xBC
Active Subcarrier RxMER Standard Deviation      :  5.25     0x15
Active Subcarrier RxMER Threshold Value         : 44.50     0xB2
Active Subcarrier RxMER Threshold Frequency (Hz): 78825000
```

The following example shows output for the **show cable modem prof-mgmt upstream** command for Cisco cBR Series Converged Broadband Routers starting from Cisco IOS XE Amsterdam 17.3.1w release.

```
Router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream
Upstream Profile Management Data :
MAC Address                     : XXXX.XXXX.XXXX
Num RxMER Measurement           : 1160
Tx Time                         : 0h:01m:18s ago
Rx Time                         : 0h:01m:18s ago
MER Poll Period   (min)         : 5
Recommended IUC                 : 5  (1024-QAM)
Current IUC                     : 5  (1024-QAM)
Downgrade IUC                   : 6  (512-QAM)
RxMER send/recv count           : 14/14
```

The following example shows the output for the **show cable modem** *mac address* **prof-mgmt upstream graph** command.

```
Router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream graph
Upstream Profile Management Data (Verbose):
MAC Address           : XXXX.XXXX.XXXX
Number of US Chan     : 1

Ucid                   : 7
MD US Chan             : Cable9/0/43/U6
Ctlr US Chan           : UC9/0/31:U12
RxMer Exempt Percent   : 0
RxMer Margin qDB       : 0
RxMer Threshold Percent : 2
Start Sc               : 148
End Sc                 : 2507
Num RxMER Measurement  : 2360
Tx Time                : 0h:04m:45s ago
```

```
Rx Time                 : 0h:04m:44s ago
MER Poll Period   (min) : 5
Auto Profile Upgrade    : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
Upgrd Dly rcmd IUC      : none
Recommended IUC         : 5  (1024-QAM)
Current IUC             : 5  (1024-QAM)
Downgrade IUC           : 6  (512-QAM)
RxMER send/recv count   : 1915/1915
DBC                     : 1/1/0/0/0
                           (send/succeed/err/reject/timeout)
State                   : Ready
Profile Downgrade       : Disabled
0x0000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0020  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0040  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0060  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0080  00000000  00000000  00000000  00000000  00000000  BAB9B9B8  BFCCBEB9  B6BDBCB4
0x00A0  BABAB8BD  B3B8B5B3  BCBABFBA  BCB6C0BD  BABEB8B3  B6BDBDBD  B8B9C9BD  B3ADBDB9
0x00C0  BDBCBDBD  BEC1BDB3  BCC3BBB6  BDB3BDBB  BCB5B3BD  B9BDBCB8  C4C0BBBA  BFB1C0BE
0x00E0  BFBBC4B7  BBBDBDBF  B8B7BEB7  C0BABDC0  B9BABABA  C0B8BDB5  C5C3BEB9  BCBEBAB1
0x0100  BBB9BDB9  C8C1BCBD  BCBEB6B8  BFB5BEBD  BEB9BEC2  BEC4BEB7  B8B8BFC1  BEB7B6BE
0x0120  B9BBBCBD  B2C1BDBA  B4BBB8C1  BDC3BFB9  ACC4BBC2  C3B7B3BD  BCB4BFBB  B9C2C8BF
0x0140  B4C2C2BD  BCC0BABD  B9B5BFC0  C0C3BCC1  BBBCBBC4  AEB9B9BD  C6C1BEB4  B5C7C5BB
0x0160  C4BEB8B9  BFB2BBC4  BBB7BAB8  B6C6B5BC  BDB6BEB4  B3C7C3B8  BBC2C0B9  B9B4BAB1
0x0180  B4B3C0BD  B8BFB6C3  B2B7B8B7  BDBAC3C5  BAC4B9C3  B8BBC1B8  BDBABCBB  B8C0B9B2
0x01A0  C1BDBCBE  BDB6C0BC  BFBEC4B9  C0B4BCBA  B7C1B6BC  B8B5B9B7  BAB6BCB7  B7B7B7BA
0x01C0  C1B0BFB6  BBC2B2B8  B5BABEB9  B8BCC4BA  BBB3B8C1  BABBBDB7  B5B9B9BA  BBBFB9B4
0x01E0  C3B4B9BA  BFB0C0C0  C2B8BDC1  BEBABBB9  C4B6BFB6  C3BEC1B3  BCBAC4BF  C0BBC3C2
0x0200  B2B9B9BA  B8B4C0C2  C5B4B6B5  BEC4BEB9  C1B8C5BC  C4C0B6B9  BEC0BDBF  BAB8BFC2
0x0220  BAB9B4BB  BDBDC5C3  B9C2B9B3  B6B8B9C6  BAB7CAB9  B5B9B9BD  BBC2B4BF  B3BCB6BE
0x0240  C1BAC3C1  BBBABBBE  C5BCBBBB  C2C0BCC1  B8B9B6BA  C3B7C6B9  C2BABEBE  BABDC9B8

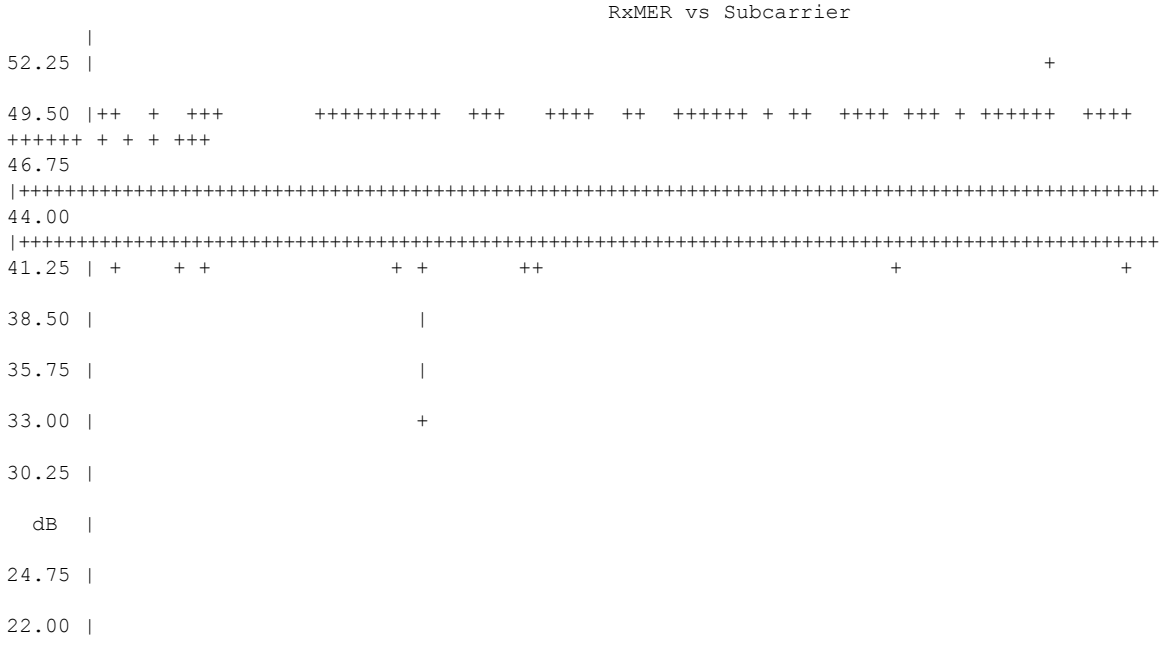
0x0260  C4C1BCB7  B7BEB8BA  B3B8BAB4  BDC3C5BD  BDB5BDB9  B9BCBCBF  BEBDC5B7  BBC1B5BD
0x0280  B9BCB4B7  BFB3BDCB  BBBECCBE  B6BABABB  C8B1B9BD  BFBAC1BC  B9C1BFB7  C0BDBFBA
0x02A0  BCB1B8BA  C9BEC4BF  B4C2B7BC  B8BDB8BC  C5C2B8B7  C4BBC6BA  BCB6B9B9  C4BEBABF
0x02C0  B6AFBAB6  C5BCB8BB  BDC3B6BC  B4BAB4BC  C7C6C6BB  C6C2BAB4  BABDBBBB  BDC3BAC1
0x02E0  C5BEB3C0  BDC1B3BE  C9CBB8BF  C8BEC1BF  B4B4BFBE  BCCABEBE  B4BAB5BD  AEB0BCBC
0x0300  B9BCBDBD  B8C0C2C0  BAB5C3BB  B6C2B4BE  C0BEBEB4  C0BEBEB1  BDBBB7C9  BBBFBBBE
0x0320  C5B9BEBB  B6C3B7B7  BEBBBCB7  BEB9BABE  B8BEC2BC  BFC0C0BA  BEBCBABB  B4B7B8C2
0x0340  BCB1B7BC  B6B5BDBA  B3BAB8B8  C1C1C2B2  BFB7BBC0  BEC8BBB5  BBB5B7B7  BABBC3BC
0x0360  B9C5BCBA  C0BCB8BD  B4BFBDB8  B5BCC3BF  C3C6C5C1  BCBDBDC0  BCB9BDB9  B7B6C0C3
0x0380  C2BDC1BE  BFBDBAB9  BEBCB6BB  C4C0C0C2  C5BBBDC9  BCC2BEBA  BEC3BEC0  C5B8BCC0
0x03A0  C4BCBABA  B7B7BEB7  B5B9B7B3  BCB7AFB9  BABBB6B8  BABBC0B9  BCB3BFBC  BEBCBBC0
0x03C0  B2BFBEBB  BAAEC3B8  C4BFBCC0  C1BBC1B9  C4C0B4B5  BFBAB9BF  BEC1B4BA  B7C1BDBE
0x03E0  C6BFBEC6  C8BFBBC6  C0B6B9C3  BBC7BCBF  BFB7BFC0  C8BEC3BA  BEC5C2B4  C0C5BAC0
0x0400  BEBCB4C1  BDB4C7B9  B7BABAC3  BDB9C1C5  C4B7BCB7  BBBFBABA  BCC6BDC0  B9B8BFB7
0x0420  C2C2C0B6  B8BEB9BF  C5BEC0BD  B5C2BBB7  C0B4B7B8  B8BEC6BF  BBB6B4C5  BCB9C1C0
0x0440  BAC3BEBA  BEBBC0BB  B6B8C0B5  BCB5B9B4  BFBDB4B8  BEB6C5BC  B9BCBFB8  C4BABABD
0x0460  BFB9C5B9  C2BBBABA  BAB5BDBB  C2C4BCBC  BBB5B7C0  B8C0B7C9  C1BCBEC0  BCC4B7C0
0x0480  B4BABDBF  B3C2B8C0  B8B6BFC1  BABDBEC0  C7C1B5BC  BCBABFBE  CBBDBFB4  B7C3BDBB
0x04A0  BCBABFBA  B8B3B8B6  C0C2C3B6  BCB9C0B9  BDC4BCBB  BEB5B6B3  BAB8BEBA  C3C5B7B7
0x04C0  BCC0B6B7  B9BCC1BE  C1BDBAC0  BBBABEC0  C1C0B9B6  BBBBBABD  B6BBC0B5  B5B7B4BC
0x04E0  B8CBBBBA  B8BFC0BA  B8BEB5BD  B7C1B8C0  B5C5BCC1  BBCBBCBA  CAB9BEBD  C6C0BABC
0x0500  CCB9B9C4  C9BBBFB3  BAC0BABE  C6BCC3B0  B6C9BBB8  BFBAC2BB  B6BAC3C4  B4C2BCB9
0x0520  B8C2BDB9  B9C6B9BB  C4BABBBC  B7BDBDB7  BBB6B9BF  BDBCB7BC  C5BFBDB3  BDBAC1C1
0x0540  C9BAC0B3  BDBEC5BD  BBB8B9BA  BCC5C2B8  BFC2BAB9  B7B7BDCB  C4BDC1BC  BABAC3B9
0x0560  C5C4C0B9  BEC0BEBD  BCBBBDB5  BAC4BBC5  BBB7BCBD  BABFC5B9  BFBBBAC2  B8BCBCBC
0x0580  C5BCBFC2  BDB7BABC  BBC2C6C8  BFB6BEB5  B9C0B9BF  B7BFC0BD  C1BEB6C0  B8B7B9BE
0x05A0  C2B3BDBB  C4C7C1C2  C0BABAB7  BCB7B9B6  B9CBBEBA  C4BFBFB7  B7BDBAC9  C4C1C0B7
0x05C0  BDC8B2BC  BCC0B7B7  C8BBC0CF  B7BAC1BD  BCBCC5C8  C4BEC1C1  BABFB7C0  B7BBBEB9
0x05E0  C0BDBBB9  C2B4C3BC  BDB3C1C3  B4B3C4B9  BDBFC0B5  B6B4BBBF  BAB9C3C0  C0BEBCB6
0x0600  BDBFBEBD  C0C0BEBE  BDC2B7B4  C2BEC2B7  B5BEC6BE  BFB8B9BF  B0BBB8BC  B5C5BDBB
0x0620  BEC1B7B6  BEB7B9CA  BDBCC0BD  C3BABCBA  BABBBCBF  B9BDBCBD  BAC6BDBA  C6B9BFC1
```

```
0x0640  BEB8BFBD  BDC0BCBB  BAB8C8C3  C5C0BAB8  C0C0BEC4  CAC4BEBE  C3B5C5B9  B8C3CCBE
0x0660  B6C3C0B8  BABBB4BA  B8BDBCB8  B9BBBCBC  C5B8C0B8  BFB9B7B9  C0BFB3AF  CDB8BEC6
0x0680  C1B9C5BF  BAB5C8BC  BAB2B7C2  BEBCBCC1  BDC1C4BE  B7C0B9BB  C7C1B8B8  BBB9B1BB
0x06A0  C4B9BCC0  B6B8BFB7  C4C2BFBD  C5BFC0C4  C2BEBBBB  CEB3B1B8  C7B7B9B7  C1B4C6BF
0x06C0  BDBDBDB7  C1C1BBBD  C3BCBDB7  C0B5BCB9  BFB9C2C1  BABDB8B5  B7BABAC3  C1B8BFB2
0x06E0  BBB9C0B5  BEBCC4C2  B4BDC8C0  C4BDBDBD  BDC1B8C2  B9B6C5C4  BFB8BBBF  B8BBC2C4
0x0700  BFBAC5BE  B0BBBDBD  B9BEBBB4  C0BCC3B9  BABEBCB9  C3C0B8BA  BBBFBDBD  C3C3BFC6
0x0720  B8BCB7BC  C4B7BEBC  B4C2C0B9  B5BDBCC3  B6B3C9C3  B6CFBFC1  B9BEBCB8  BBB9C8BA
0x0740  BABDBCC1  BBC0BCBE  C0BDBBC3  BEBAC6C4  CABEC3B8  C6BAC3BD  C9BABEBD  BDB8C8BC
0x0760  BFC3BDB9  B6CCB6B5  BFB7B4BE  C1C9BDB9  C1BCBEC3  B8BCB9BD  C6BCBEC5  BABABCC1
0x0780  B4C1B8C2  B8C2C1BE  B9BAB8BC  B8C3BDBC  B9BAD3C0  BCC6C6C1  C5BDB7B3  C3B9B8B2
0x07A0  BBC3BCBD  BEC0B6BD  BBC0BCC0  BDBBC2BE  BDBCBCC0  B9BCB8C0  B2C2B8B6  C3C0BDC4
0x07C0  BEB6BCBA  B6BDBCBF  B8BCBEB6  C8BCC3B5  BDBFBEC3  BBBAC9BE  BAC4BDB8  C5C0D0C5
0x07E0  BBC0BDBD  BBC1B6BF  B8BBC3B4  BAB7B5CC  B4C1B9B6  BCB8C0C0  BBBFC1BF  C1B3C2BD

0x0800  C3BFC9BD  B5B7B8B5  BDBBB8BB  BCC2C2BE  B6C0BEBD  BFBEB8C1  B8B6BFBF  B9C5C3BD
0x0820  C8BEC6BA  BDC1B7BF  AEC1C4BE  BCBEC0C0  BEBBC0BA  BCB9B5B8  B9C0BCBD  C4BBB5C1
0x0840  C0BBC2BD  C7B6C2BA  BFB7BEC5  BEBAC1C8  B9BFC1C0  BAC4B3BD  B7B4C9C0  BEB9C8BC
0x0860  C7BFBABC  C1BFBFB7  B4BEC5B8  BEC5BDC2  C2B3C0C4  BFC0B5C0  BCC1BAC1  BEC4B6C5
0x0880  BBBCBCBF  C7BBBEC2  B8BCC1B3  B8BBB8BC  B2B4B6BA  BBC0B7BA  B5C8B8BF  B8B8B8C1
0x08A0  C5BFBBC0  B8C0BBC0  BDC3BFBC  C3BAB5B7  B8BABABF  C3BABCC9  CCC3BCBE  BEBEBEBF
0x08C0  B7BEBCC2  BABDBFBF  BFB9CAC1  C1BBB8BC  C9C5C3C9  C5B4BCBD  B8C4BEB8  BDBEC5C3
0x08E0  BABEB8C4  B6B7B7BA  B5C2BBBD  BCC3BBB6  BDBDBFC2  B8BCC7C1  C1B6BCBE  BFBCBDB1
0x0900  BAC4B4BC  BDBEB8B1  BBC1B8C2  B9BFBCBB  C2BFB9C0  BFBBC3B5  C1B7C0B8  B8C3C0C2
0x0920  C2BAB8BE  B9BFC4BF  BACAB7C1  BABCB0BB  C1BCC3B9  BBC0BAB4  BCB6C5BA  BDB4BBBE
0x0940  BABCB8C0  BEB7BEBB  B7BEBFC2  B7B9BFC5  BBBBBFBE  B9BFCBBF  C3C1BDC2  BEBEB8BD
0x0960  BABFC1B4  BABABBC2  BBBEBFB5  C4BBBEB9  C3C1BEC0  BCBDBDC0  C1C3C3C3  C4BCCCBF
0x0980  BEBCC0B8  C3BDC3C2  B9C3BABD  BFBEC1C2  B7C0B5BB  BFBFC2C2  C1C1BBBA  BAB4B5B2
0x09A0  BDB7BABB  C6BBBCB8  B9B8BDB1  B9B8BCBF  BEB9C5C0  BFC3C9BE  C2B5B4B6  C4B6C0BD
0x09C0  B7BBBCC0  C3B4C5BE  BFBEBBB7
```

```
mslot RxMER(in 1/4 dB):

# msMer    0  : BBB9BABA BCBBBBBD BBBBBCBD BCBABABC BBBBB8BA B9BCBCBC BCBCBBBC BEBABBBD
# msMer    32 : BBBDBBBD BDBEBABC BCBBBABA BBBDBCBE BEB7BBBC BDBEBEBC BCBBBDB9 BCBBBDBC
# msMer    64 : BCBBBABC BABCBFBC BCBBBCBD BEBCBDBC BBBDBDBF BCBBBCBD BABDBDBE BFBABDBC
# msMer    96 : BBBEBCBD BABEBDBB BDBCBDBF BEBDBCBD BDBDBBBC BFBBBEBB BEBDBCBE BDBEBDBA
# msMer    128: BCBCBFC0 BDBBBCBC BDBDBBBC BEBDBFBD BBBBBC
```



```
19.25 |

16.50 |

13.75 |

11.00 |

08.25 |

05.50 |

02.75 |


00.00 |


+-----------------------------------------------------------------------------------------------------
       2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6 6
 7 7 7 7 7 7 7 7
       0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9 0 2 3 4 5 6 8 9 0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9
 0 2 3 4 5 6 8 9
       . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 . . . . . . . .
       5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7
 9 1 3 5 7 9 1 3
                                                 Subcarrier Frequency


Active SC RxMER Statistics                      : (dB)      (1/4 dB hex)
Active Subcarrier RxMER Mean                    : 47.00     0xBC
Active Subcarrier RxMER Standard Deviation      :  5.50     0x16
Active Subcarrier RxMER Threshold Value         : 44.75     0xB3
Active Subcarrier RxMER Threshold Frequency (Hz): 71475000

Router#
```

The following example shows the output for the **show cable modem** *mac address* **prof-mgmt upstream graph counts** command.

```
Router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream graph counts
Upstream Profile Management Data (Verbose):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 1

Ucid                   : 7
MD US Chan             : Cable9/0/31/U6
Ctlr US Chan           : UC9/0/31:U12
RxMer Exempt Percent   : 0
RxMer Margin qDB       : 0
RxMer Threshold Percent : 2
Start Sc               : 148
End Sc                 : 2507
Num RxMER Measurement  : 2360
Tx Time                : 0h:04m:56s ago
Rx Time                : 0h:04m:56s ago
MER Poll Period   (min) : 5
Auto Profile Upgrade   : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
Upgrd Dly rcmd IUC     : none
Recommended IUC        : 5  (1024-QAM)
Current IUC            : 5  (1024-QAM)
```

```
Downgrade IUC           : 6  (512-QAM)
RxMER send/recv count   : 1915/1915
DBC                     : 1/1/0/0/0
                           (send/succeed/err/reject/timeout)
State                   : Ready
Profile Downgrade       : Disabled
0x0000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0020  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0040  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0060  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0080  00000000  00000000  00000000  00000000  00000000  BAB9B9B8  BFCCBEB9  B6BDBCB4
0x00A0  BABAB8BD  B3B8B5B3  BCBABFBA  BCB6C0BD  BABEB8B3  B6BDBDBD  B8B9C9BD  B3ADBDB9
0x00C0  BDBCBDBD  BEC1BDB3  BCC3BBB6  BDB3BDBB  BCB5B3BD  B9BDBCB8  C4C0BBBA  BFB1C0BE
0x00E0  BFBBC4B7  BBBDBDBF  B8B7BEB7  C0BABDC0  B9BABABA  C0B8BDB5  C5C3BEB9  BCBEBAB1
0x0100  BBB9BDB9  C8C1BCBD  BCBEB6B8  BFB5BEBD  BEB9BEC2  BEC4BEB7  B8B8BFC1  BEB7B6BE
0x0120  B9BBBCBD  B2C1BDBA  B4BBB8C1  BDC3BFB9  ACC4BBC2  C3B7B3BD  BCB4BFBB  B9C2C8BF
0x0140  B4C2C2BD  BCC0BABD  B9B5BFC0  C0C3BCC1  BBBCBBC4  AEB9B9BD  C6C1BEB4  B5C7C5BB
0x0160  C4BEB8B9  BFB2BBC4  BBB7BAB8  B6C6B5BC  BDB6BEB4  B3C7C3B8  BBC2C0B9  B9B4BAB1
0x0180  B4B3C0BD  B8BFB6C3  B2B7B8B7  BDBAC3C5  BAC4B9C3  B8BBC1B8  BDBABCBB  B8C0B9B2
0x01A0  C1BDBCBE  BDB6C0BC  BFBEC4B9  C0B4BCBA  B7C1B6BC  B8B5B9B7  BAB6BCB7  B7B7B7BA
0x01C0  C1B0BFB6  BBC2B2B8  B5BABEB9  B8BCC4BA  BBB3B8C1  BABBBDB7  B5B9B9BA  BBBFB9B4
0x01E0  C3B4B9BA  BFB0C0C0  C2B8BDC1  BEBABBB9  C4B6BFB6  C3BEC1B3  BCBAC4BF  C0BBC3C2
0x0200  B2B9B9BA  B8B4C0C2  C5B4B6B5  BEC4BEB9  C1B8C5BC  C4C0B6B9  BEC0BDBF  BAB8BFC2
0x0220  BAB9B4BB  BDBDC5C3  B9C2B9B3  B6B8B9C6  BAB7CAB9  B5B9B9BD  BBC2B4BF  B3BCB6BE
0x0240  C1BAC3C1  BBBABBBE  C5BCBBBB  C2C0BCC1  B8B9B6BA  C3B7C6B9  C2BABEBE  BABDC9B8
0x0260  C4C1BCB7  B7BEB8BA  B3B8BAB4  BDC3C5BD  BDB5BDB9  B9BCBCBF  BEBDC5B7  BBC1B5BD
0x0280  B9BCB4B7  BFB3BDCB  BBBECCBE  B6BABABB  C8B1B9BD  BFBAC1BC  B9C1BFB7  C0BDBFBA
0x02A0  BCB1B8BA  C9BEC4BF  B4C2B7BC  B8BDB8BC  C5C2B8B7  C4BBC6BA  BCB6B9B9  C4BEBABF
0x02C0  B6AFBAB6  C5BCB8BB  BDC3B6BC  B4BAB4BC  C7C6C6BB  C6C2BAB4  BABDBBBB  BDC3BAC1
0x02E0  C5BEB3C0  BDC1B3BE  C9CBB8BF  C8BEC1BF  B4B4BFBE  BCCABEBE  B4BAB5BD  AEB0BCBC
0x0300  B9BCBDBD  B8C0C2C0  BAB5C3BB  B6C2B4BE  C0BEBEB4  C0BEBEB1  BDBBB7C9  BBBFBBBE
0x0320  C5B9BEBB  B6C3B7B7  BEBBBCB7  BEB9BABE  B8BEC2BC  BFC0C0BA  BEBCBABB  B4B7B8C2
0x0340  BCB1B7BC  B6B5BDBA  B3BAB8B8  C1C1C2B2  BFB7BBC0  BEC8BBB5  BBB5B7B7  BABBC3BC
0x0360  B9C5BCBA  C0BCB8BD  B4BFBDB8  B5BCC3BF  C3C6C5C1  BCBDBDC0  BCB9BDB9  B7B6C0C3
0x0380  C2BDC1BE  BFBDBAB9  BEBCB6BB  C4C0C0C2  C5BBBDC9  BCC2BEBA  BEC3BEC0  C5B8BCC0
0x03A0  C4BCBABA  B7B7BEB7  B5B9B7B3  BCB7AFB9  BABBB6B8  BABBC0B9  BCB3BFBC  BEBCBBC0
0x03C0  B2BFBEBB  BAAEC3B8  C4BFBCC0  C1BBC1B9  C4C0B4B5  BFBAB9BF  BEC1B4BA  B7C1BDBE
0x03E0  C6BFBEC6  C8BFBBC6  C0B6B9C3  BBC7BCBF  BFB7BFC0  C8BEC3BA  BEC5C2B4  C0C5BAC0
0x0400  BEBCB4C1  BDB4C7B9  B7BABAC3  BDB9C1C5  C4B7BCB7  BBBFBABA  BCC6BDC0  B9B8BFB7
0x0420  C2C2C0B6  B8BEB9BF  C5BEC0BD  B5C2BBB7  C0B4B7B8  B8BEC6BF  BBB6B4C5  BCB9C1C0
0x0440  BAC3BEBA  BEBBC0BB  B6B8C0B5  BCB5B9B4  BFBDB4B8  BEB6C5BC  B9BCBFB8  C4BABABD
0x0460  BFB9C5B9  C2BBBABA  BAB5BDBB  C2C4BCBC  BBB5B7C0  B8C0B7C9  C1BCBEC0  BCC4B7C0
0x0480  B4BABDBF  B3C2B8C0  B8B6BFC1  BABDBEC0  C7C1B5BC  BCBABFBE  CBBDBFB4  B7C3BDBB
0x04A0  BCBABFBA  B8B3B8B6  C0C2C3B6  BCB9C0B9  BDC4BCBB  BEB5B6B3  BAB8BEBA  C3C5B7B7
0x04C0  BCC0B6B7  B9BCC1BE  C1BDBAC0  BBBABEC0  C1C0B9B6  BBBBBABD  B6BBC0B5  B5B7B4BC
0x04E0  B8CBBBBA  B8BFC0BA  B8BEB5BD  B7C1B8C0  B5C5BCC1  BBCBBCBA  CAB9BEBD  C6C0BABC
0x0500  CCB9B9C4  C9BBBFB3  BAC0BABE  C6BCC3B0  B6C9BBB8  BFBAC2BB  B6BAC3C4  B4C2BCB9
0x0520  B8C2BDB9  B9C6B9BB  C4BABBBC  B7BDBDB7  BBB6B9BF  BDBCB7BC  C5BFBDB3  BDBAC1C1
0x0540  C9BAC0B3  BDBEC5BD  BBB8B9BA  BCC5C2B8  BFC2BAB9  B7B7BDCB  C4BDC1BC  BABAC3B9
0x0560  C5C4C0B9  BEC0BEBD  BCBBBDB5  BAC4BBC5  BBB7BCBD  BABFC5B9  BFBBBAC2  B8BCBCBC
0x0580  C5BCBFC2  BDB7BABC  BBC2C6C8  BFB6BEB5  B9C0B9BF  B7BFC0BD  C1BEB6C0  B8B7B9BE
0x05A0  C2B3BDBB  C4C7C1C2  C0BABAB7  BCB7B9B6  B9CBBEBA  C4BFBFB7  B7BDBAC9  C4C1C0B7
0x05C0  BDC8B2BC  BCC0B7B7  C8BBC0CF  B7BAC1BD  BCBCC5C8  C4BEC1C1  BABFB7C0  B7BBBEB9
0x05E0  C0BDBBB9  C2B4C3BC  BDB3C1C3  B4B3C4B9  BDBFC0B5  B6B4BBBF  BAB9C3C0  C0BEBCB6
0x0600  BDBFBEBD  C0C0BEBE  BDC2B7B4  C2BEC2B7  B5BEC6BE  BFB8B9BF  B0BBB8BC  B5C5BDBB
0x0620  BEC1B7B6  BEB7B9CA  BDBCC0BD  C3BABCBA  BABBBCBF  B9BDBCBD  BAC6BDBA  C6B9BFC1
0x0640  BEB8BFBD  BDC0BCBB  BAB8C8C3  C5C0BAB8  C0C0BEC4  CAC4BEBE  C3B5C5B9  B8C3CCBE
0x0660  B6C3C0B8  BABBB4BA  B8BDBCB8  B9BBBCBC  C5B8C0B8  BFB9B7B9  C0BFB3AF  CDB8BEC6
0x0680  C1B9C5BF  BAB5C8BC  BAB2B7C2  BEBCBCC1  BDC1C4BE  B7C0B9BB  C7C1B8B8  BBB9B1BB
0x06A0  C4B9BCC0  B6B8BFB7  C4C2BFBD  C5BFC0C4  C2BEBBBB  CEB3B1B8  C7B7B9B7  C1B4C6BF
0x06C0  BDBDBDB7  C1C1BBBD  C3BCBDB7  C0B5BCB9  BFB9C2C1  BABDB8B5  B7BABAC3  C1B8BFB2
0x06E0  BBB9C0B5  BEBCC4C2  B4BDC8C0  C4BDBDBD  BDC1B8C2  B9B6C5C4  BFB8BBBF  B8BBC2C4
0x0700  BFBAC5BE  B0BBBDBD  B9BEBBB4  C0BCC3B9  BABEBCB9  C3C0B8BA  BBBFBDBD  C3C3BFC6
0x0720  B8BCB7BC  C4B7BEBC  B4C2C0B9  B5BDBCC3  B6B3C9C3  B6CFBFC1  B9BEBCB8  BBB9C8BA
```

```
0x0740  BABDBCC1  BBC0BCBE  C0BDBBC3  BEBAC6C4  CABEC3B8  C6BAC3BD  C9BABEBD  BDB8C8BC
0x0760  BFC3BDB9  B6CCB6B5  BFB7B4BE  C1C9BDB9  C1BCBEC3  B8BCB9BD  C6BCBEC5  BABABCC1
0x0780  B4C1B8C2  B8C2C1BE  B9BAB8BC  B8C3BDBC  B9BAD3C0  BCC6C6C1  C5BDB7B3  C3B9B8B2
0x07A0  BBC3BCBD  BEC0B6BD  BBC0BCC0  BDBBC2BE  BDBCBCC0  B9BCB8C0  B2C2B8B6  C3C0BDC4
0x07C0  BEB6BCBA  B6BDBCBF  B8BCBEB6  C8BCC3B5  BDBFBEC3  BBBAC9BE  BAC4BDB8  C5C0D0C5
0x07E0  BBC0BDBD  BBC1B6BF  B8BBC3B4  BAB7B5CC  B4C1B9B6  BCB8C0C0  BBBFC1BF  C1B3C2BD
0x0800  C3BFC9BD  B5B7B8B5  BDBBB8BB  BCC2C2BE  B6C0BEBD  BFBEB8C1  B8B6BFBF  B9C5C3BD
0x0820  C8BEC6BA  BDC1B7BF  AEC1C4BE  BCBEC0C0  BEBBC0BA  BCB9B5B8  B9C0BCBD  C4BBB5C1
0x0840  C0BBC2BD  C7B6C2BA  BFB7BEC5  BEBAC1C8  B9BFC1C0  BAC4B3BD  B7B4C9C0  BEB9C8BC
0x0860  C7BFBABC  C1BFBFB7  B4BEC5B8  BEC5BDC2  C2B3C0C4  BFC0B5C0  BCC1BAC1  BEC4B6C5
0x0880  BBBCBCBF  C7BBBEC2  B8BCC1B3  B8BBB8BC  B2B4B6BA  BBC0B7BA  B5C8B8BF  B8B8B8C1
0x08A0  C5BFBBC0  B8C0BBC0  BDC3BFBC  C3BAB5B7  B8BABABF  C3BABCC9  CCC3BCBE  BEBEBEBF
0x08C0  B7BEBCC2  BABDBFBF  BFB9CAC1  C1BBB8BC  C9C5C3C9  C5B4BCBD  B8C4BEB8  BDBEC5C3
0x08E0  BABEB8C4  B6B7B7BA  B5C2BBBD  BCC3BBB6  BDBDBFC2  B8BCC7C1  C1B6BCBE  BFBCBDB1
0x0900  BAC4B4BC  BDBEB8B1  BBC1B8C2  B9BFBCBB  C2BFB9C0  BFBBC3B5  C1B7C0B8  B8C3C0C2
0x0920  C2BAB8BE  B9BFC4BF  BACAB7C1  BABCB0BB  C1BCC3B9  BBC0BAB4  BCB6C5BA  BDB4BBBE
0x0940  BABCB8C0  BEB7BEBB  B7BEBFC2  B7B9BFC5  BBBBBFBE  B9BFCBBF  C3C1BDC2  BEBEB8BD
0x0960  BABFC1B4  BABABBC2  BBBEBFB5  C4BBBEB9  C3C1BEC0  BCBDBDC0  C1C3C3C3  C4BCCCBF
0x0980  BEBCC0B8  C3BDC3C2  B9C3BABD  BFBEC1C2  B7C0B5BB  BFBFC2C2  C1C1BBBA  BAB4B5B2
0x09A0  BDB7BABB  C6BBBCB8  B9B8BDB1  B9B8BCBF  BEB9C5C0  BFC3C9BE  C2B5B4B6  C4B6C0BD
0x09C0  B7BBBCC0  C3B4C5BE  BFBEBBB7

mslot RxMER(in 1/4 dB):

# msMer    0  : BBB9BABA BCBBBBBD BBBBBCBD BCBABABC BBBBB8BA B9BCBCBC BCBCBBBC BEBABBBD
# msMer    32 : BBBDBBBD BDBEBABC BCBBBABA BBBDBCBE BEB7BBBC BDBEBEBC BCBBBDB9 BCBBBDBC
# msMer    64 : BCBBBABC BABCBFBC BCBBBCBD BEBCBDBC BBBDBDBF BCBBBCBD BABDBDBE BFBABDBC
# msMer    96 : BBBEBCBD BABEBDBB BDBCBDBF BEBDBCBD BDBDBBBC BFBBBEBB BEBDBCBE BDBEBDBA
# msMer    128: BCBCBFC0 BDBBBCBC BDBDBBBC BEBDBFBD BBBBBC

                                              RxMER vs Subcarrier
      |
52.25 |                                                                              1

49.50 |11  1  122       2112123321  111   5211  12  125111 2 34  1132 313 1 123422  3112
321123 1 1 1 111
46.75
|7********9**69***9**********0*****************0******0*****************************0************6
44.00
|*98098850**9**8*0*8*7*097788*965*994990**780**99098760*6798877*708068795979404076696 5*8406899645*81
41.25 | 1    1 1              1 1       11                            1                 1

38.50 |

35.75 |

33.00 |

30.25 |

  dB  |

24.75 |

22.00 |

19.25 |

16.50 |

13.75 |

11.00 |
```

```
08.25 |

05.50 |

02.75 |

00.00 |


+-----------------------------------------------------------------------------------------------

       2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6 6
 7 7 7 7 7 7 7 7
       0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9 0 2 3 4 5 6 8 9 0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9
 0 2 3 4 5 6 8 9
       . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 . . . . . . . .
       5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7
 9 1 3 5 7 9 1 3
                                                 Subcarrier Frequency


Active SC RxMER Statistics                      : (dB)      (1/4 dB hex)
Active Subcarrier RxMER Mean                    : 47.00     0xBC
Active Subcarrier RxMER Standard Deviation      :  5.50     0x16
Active Subcarrier RxMER Threshold Value         : 44.75     0xB3
Active Subcarrier RxMER Threshold Frequency (Hz): 71475000

Router#
```

The following example shows the output for the **show cable modem** *mac address* **prof-mgmt upstream graph ignored counts** command.

```
Router#show cable modem XXXX.XXXX.XXXX prof-mgmt upstream graph ignored counts
Upstream Profile Management Data (Verbose)(Ignored):
MAC Address            : XXXX.XXXX.XXXX
Number of US Chan      : 1

Ucid                    : 7
MD US Chan              : Cable9/0/31/U6
Ctlr US Chan            : UC9/0/31:U12
RxMer Exempt Percent    : 0
RxMer Margin qDB        : 0
RxMer Threshold Percent : 2
Start Sc                : 148
End Sc                  : 2507
Num RxMER Measurement   : 2360
Tx Time                 : 0h:01m:25s ago
Rx Time                 : 0h:01m:25s ago
MER Poll Period   (min) : 5
Auto Profile Upgrade    : Yes
Upgrd Dly Cnt (cur/cfg) : 0/1
Upgrd Dly rcmd IUC      : none
Recommended IUC         : 5  (1024-QAM)
Current IUC             : 5  (1024-QAM)
Downgrade IUC           : 6  (512-QAM)
RxMER send/recv count   : 1916/1916
DBC                     : 1/1/0/0/0
                          (send/succeed/err/reject/timeout)
State                   : Ready
Profile Downgrade       : Disabled
0x0000  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
```

```
0x0020  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0040  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0060  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
0x0080  00000000  00000000  00000000  00000000  00000000  BAB8BABB  B4BCB9BB  C4C1BEC2
0x00A0  BDBAB4C1  C3B9BBC3  BEC1BDC8  B1B0B9B5  BDC4C1B6  BEC0BEBD  B7B6C0B9  B6B3BEC5
0x00C0  B5BABAC1  C7B5C7B2  B9B7B0C1  B2BDB4B5  C0B8C2B7  BBBFBDC2  B2AEB5C2  BEBABAC0
0x00E0  B1BDBDB9  B7B5B7B8  B4BBC1C0  C0B9B8BE  BBBEC2C4  BEC3BFB4  BCB7BAC3  B6BDB1BC
0x0100  C0B9B7B5  BCBEBAC0  B9BBBFC3  BCBEBAB9  B6BCC0BE  BBC1C0B7  C0B9B6B9  BFB8C0B8
0x0120  BABDBAB5  C1B1C1B9  C0C5B7BF  B8C3BDBB  C2BBBCC1  BCC4B8B5  BFBABFBD  C0BAB7B5
0x0140  BCBEB7B9  C0B4B2B5  BEAEBDC0  BDB6B5BD  B2BFC4C0  C1C6C5C0  BABCC1B7  BDBDBDC0
0x0160  C2B9B7BA  C5BFB8BD  BEC2BDB7  B8BABDB4  C3BCB7B8  B7BEC1BA  B6BBB6C0  BABAC7B0
0x0180  BEBAB8B7  C0B8C0B9  B6C3B3BF  C9BFB6C8  BAB7B9BC  BCC1B1B4  B7BBC0BE  B8B9B7C1
0x01A0  C1C1BDB9  BFB7BDBC  BAC0BBB6  BFBCB1BC  BACAB5BA  B6C0C1B7  BAB4BDCF  BAC2B3B3
0x01C0  C0B7B2BA  B9B8ADBD  BEB6B7B8  BEB7B4B7  C0B6BDBE  B5B9B8B4  C5BEB3B5  BCBFB6BB
0x01E0  B4BCB8C5  BFB8C0B0  B7BBB7BD  BFB7C0BE  B9BDBDB7  C0BCB5BC  C3C0C2C0  B5BDBFB9
0x0200  B5BBC6C0  C0BFBAC0  B3C3BDC2  B2B9BAB5  BABDC6BE  BAB9B5BB  C7C1B7C3  BAB8BABE
0x0220  BFC1B5C6  BDB5C3C0  BBB9B9B4  BDB8BAB8  BCBABEB5  BCBCB8BC  BDBFBDC0  BBB7BDC0
0x0240  C0B4BEBD  B6B9BEBA  BFBABAC0  C2BDB8B8  BEB2C2BB  CCB8BABB  C0BAC4B4  BCB3C2CC
0x0260  C1B8B9BD  C6C2B6C1  B8B9B7B0  C9BABCC5  BBC0B9C1  BBB9BAB6  B8BABCBC  C1B8BAB9
0x0280  BFBEBDBC  BAB3BDC0  BABCBBBE  BDC0B5B6  BCBEC3BA  BDBDC0BA  C0BEB4B9  BAC1B9C0
0x02A0  BABAB4B5  C0BFBAB6  C8BEBDC1  B8BCC0BE  C0CAC8C2  C0C1B8B4  C9C0BFBF  BCC0C0BD
0x02C0  C0BCC3BD  B7BFB8BB  C1B5C0B7  BBBAC0BD  B8B9C2BC  B4BDB6B6  BEBEBCBF  BDB7B8B5
0x02E0  BEB7BDBD  B9BDC5BB  BEB9BCBB  B4BEB3B9  B6BDB9BE  BBBEC0BD  C0B6BAB7  BDC7B6B7
0x0300  BCBCB9BF  B9B5C3C3  BFC1BEC5  BCC4B7B4  B2C6B7B8  C2C0C8B8  B8BBB5BC  B6BDB9C0
0x0320  C6B3C1BE  BDB5C9BD  C1B8BABA  CEBDBDB7  B8BDB8B4  B7C6B2BC  B9C0B6BE  BFBFB6BC
0x0340  BEC2B9C0  BEC0BAAF  BEBEBDBC  BEBAB8BD  B1B9BCC3  B8BFB8BD  BFBCBDBE  C1B4B6BF
0x0360  C1CCB7C0  B5BABFB9  C4B7BCBA  BCB7BEBC  BFB1B9BC  B8BBC4BF  BCBEBCC4  BCC3C1CB
0x0380  B2BCBDBA  C2BBBCBF  BEC1C2BD  BCC2B8BF  B9BEBAB8  BEB9BCBD  BEC0BABA  B4B6BABD
0x03A0  BFC0BDB7  BBBAC2C3  BBBEBFC0  BFCBC1B7  B9BDB8C2  BBC2BAC0  B4BFB0BC  C9BEB3BE
0x03C0  C4BAB9BE  C5C0BBC5  B8C3BDC2  B9C6BCBE  BDBEC6C0  BAC5C3B4  B9C4B9BA  B6BFC1BE
0x03E0  BBC5C2BC  B8BDB8BD  B8BDB4BB  BFB8B6BE  BCBBB8C1  BDBDB8BD  C1C0BCBE  B7BEBBB7
0x0400  B4C5C6BE  BDB8B8B9  B7BFBAB8  B6BDC0C1  BDB9C2B6  C4BBB9B6  BAC9B4BA  C1B5C1B7
0x0420  B4C4C3C4  B4BCBFC2  BEB9BDBE  C5BCBEB9  BEBABCC0  BCB6C0BF  C1BAC1B7  B6BDB6BD
0x0440  C2C1BDBB  B9B4C0B0  BEB8C1BD  C4BBBFBB  BBBEC3B4  BEBECCBC  B7B7B3B8  BABECABB
0x0460  BFC0BEB9  B3BCB9B8  BDB6BBB4  C7C2B8BB  BDBEB7C1  B4BBBDBE  BDBABEBA  C4C2B7B8
0x0480  BBB7B3B4  BABFBEC5  BCB7BBBD  B4C2B7C9  C1BDC3B4  B9CDBDBA  BCCBB7BA  B9B7BBB8
0x04A0  BBB8BBB0  BFBEBEB4  C2B8BAB9  BBB9BFBB  C3C0B7BB  C3B7BEC5  BBB9C6B8  C0BDC2BE
0x04C0  CAB7C3B7  C4BDBACB  C0BAB9BF  BEC3BFC2  B8BFBCBC  BDBDBBC0  C1C2B8BA  BABDC1C0
0x04E0  B9BBB9B7  C0B5C3BC  BFBCB8B9  B8C3BEBD  B9B5BFB7  BCB2BABA  B7BCC1B7  B8C3C3BA
0x0500  C0B7B7BC  C3B6B8C3  BFBBBDC2  B7BCC2BD  B7BEB7BE  C0BAB3BF  BAC6BEB3  C6BEC3BF
0x0520  B8B4B6BA  BCBFB8C1  BEBFBFBC  BABBB8BF  BCBCB9B4  B7C0BABA  BDC5B9C0  C6BAAEC2
0x0540  B7BFB3BC  BCBEBBBC  B9B8B3B4  B7C0C4BC  B6C1BBB3  B4BDBEC9  B9C3BCB5  BFC1B6B9
0x0560  C3C2BFBE  BABEB8BB  C6BDAFBA  C2C4C3D5  BFBFBDC1  C5BABBBA  B8BAC7B8  BEB8BAB5
0x0580  BAB9BFB4  CBBCBCC0  BDB9B7C0  B9BAC3C2  C3C1BAC5  C0BEBDB9  BCC6BDBD  C3B7BABA
0x05A0  C1B3BAB8  B3B4B8BE  C0B6C0B5  B9B6B8B9  BAB7B4BC  BABCBAC4  B9BFBDB9  B8BEB4C2
0x05C0  BCBCBDBE  BEC1B9C0  BEBCBCC6  C7BBC5B9  BAC1BEBB  C4C7B3BD  BCC2C3C6  BDBFB7BA
0x05E0  B9B7B9BD  B9C1C2BD  BBBCB4BE  BDB9C4BD  C5B9C0B9  B9B9B9BF  C2BABFC0  C0C0BDC8
0x0600  BDBFB9C2  BFB7C4BF  C1C5B7BC  B8C1B2B7  B9BEB8BC  B2BFBFB9  B9B5BDBA  C0C2BFBD
0x0620  C7B7BDB8  BBC1BEC0  B7B5C4B9  B5C3BFC3  C2BBB7C3  B8BDB8BE  C6C0BFC4  BDBAB8BC
0x0640  B9C0BDBD  BFBCBAC5  B9BBBBBC  BFB4BDBB  B2BBB9C1  B7B5BAB7  BEBEBBBD  B7BEB7BB
0x0660  BEBAB9B8  BDC0B7BD  BCC0BAB8  BCBABEC4  B8B6BFB6  C0B4BFC3  BBBCBDC0  B9BBC9B9
0x0680  BEBAC3BE  BEBDC1B5  BEBEC3BB  BDBFBBB8  B9BEC2BF  C4C2BCC3  BCC1BFBB  BFBABEB5
0x06A0  BBBDC0B6  C1C4B5BF  C2BCBDBC  BEC5B1B7  C2BBBCB6  C1BBBABF  B7C7BDC6  C5BAC0C3
0x06C0  C5BDBFB8  C0C2C2B6  BFBDC3B2  C0C4B1BE  C0C2BAB6  BAB3C1B4  B6BEBCBF  BCB8C4BC
0x06E0  B7BDBCBD  BFB6B7B9  C1B7C0BD  B8BAAFC4  BEB6B4BE  B5B9B9CB  BDBBC2BA  BFBEC2BC
0x0700  C3BBBFBE  B8BFC1B5  B1BEB7B5  B9BDBDC1  BFBBBDBF  BDC3BCBE  B5BCB4BE  C4B9C0BC
0x0720  B7BABFBB  B2BEC4C0  C9BEC3B3  B7BEB3C6  AFBAC3C5  B9BEBEC1  BCBFB9BE  C2C2B3C3
0x0740  BAB9BBB5  B7C6BDB4  B8B7BCBA  BDB9C3BC  BFC1BFB9  B6BBB6C8  B9C0BEBF  BCC0C1B7
0x0760  BAB5BFBE  C1B9BEC8  B4C3BEB8  C6CBBDC1  BBC1BAC1  B8B8C0B7  BBC3C0BF  BBB7C3BD
0x0780  BCBEC0CC  C3BFBDBA  BFC1BFC3  CBBCBBBF  BEB6B4B7  B7BBC0BF  B9C0BBBF  C5C5C0B7
0x07A0  BCBABAC0  BEB7B6C0  B8BCBAC3  C8C4CAB9  B7C1C3B4  B8C5C2BE  BABABCC5  C0B8BAB4
0x07C0  B9BDB4BC  C0C1B8B8  C1C6BEB7  B9B5C3C1  B8B9BCBE  BFB8C1BA  C2C0B7C4  BFBBBBB9
0x07E0  B6C1BCC0  BDBCC1C4  B9BFBEBF  B4BBC1BD  BFBEB7BE  BCBDBFBB  C1B8B9BF  C3C2C0C2
0x0800  BEBCBABE  C1C3B6BC  BDBFBABA  BEC1BFB6  C3C4BFBE  C3BBBFB7  BEBDC5CB  BABEB4BC
```

```
0x0820  BDBEC0BF  BDBCBCBA  BBBFBBB8  B9BDBBBF  BEB7CABD  BEBAB5B8  C9B7B9BA  C0B4BFC5
0x0840  B4BCB4B6  BBB5B9BF  BFC4C1C2  C0BFB9C4  BFBDB2BC  B3B8B6C0  B4BAC2C5  BAC8BAC0
0x0860  BBBDB1BE  C2B6B7C3  BBC2BDB9  B8BAC3C0  BFB7B8BD  C5BDC0BF  B8BEB6C0  C0C6C1C1
0x0880  B8BEB7C0  C2CCC0C4  BDC1C6C8  BFC1B6B9  BEC1C5BE  B5C4BABC  CBAFC6C3  B8C2BAC3
0x08A0  BCBAB5BF  B6BBBFBF  BCBABAB8  C0C7C0C0  B9C8BBB9  BABBBBB1  C7B8B7AF  BDB2BAB7
0x08C0  C0BBB8BA  BEBCAFB7  C2B9C1BB  BAB9BBC2  B8BABCC3  BAB9B4C3  BBB8BCC1  B5B7B6B9
0x08E0  BAB7B7BB  C0BFC5CA  BEBCBDBD  C3BAC0B9  C2C0BDB4  C8CCB7C7  C9C3BEB6  C0BEC6C0
0x0900  C4B8B7BF  CABBB9C0  B8B4B8BE  BBBDBFC9  B4BDB9C0  C0B6B7C5  BFBEBFC1  BDC0B5B3
0x0920  BDBBB8B5  BEC9C1B5  B8BDC1B1  BDBCB3BA  C3BBB4BC  B7B7C0BC  C8B8B5C4  B9C3C4C2
0x0940  BAC0BBBA  BEBABCC0  BCC3B5B7  BCBDB8C6  B7BEBAC1  BDBFC2C2  BCBCC3BF  BCB7BEBB
0x0960  B6C4B6BC  C0BEB6C0  BCBFBEBA  B9BFBBC1  C1BAC0BE  BEBEC3C3  BFBFB9BE  C0BABFBD
0x0980  BABDB7BA  BECABFBC  C1B8B9CB  BCB3C0B7  BBC9C3BA  C4C2C0BB  C2C4B9BF  B8C4B4BF
0x09A0  C3C0BABD  C6BCC0BE  BDC0BCBB  BFBBC4B3  B1B9C3BC  BCCABCC0  B9BEBDC6  B4BABAC2
0x09C0  C0BEC3B9  B4CDC5B6  B7BEC1BB

                                                RxMER vs Subcarrier
      |
52.25 |                                                    1

49.50 |1 2     11211  22 13  4  12311 1 22 11  213 3   211121 221 11  1 2  1 2123121   12
1423 152111 3121
46.75
|**9******8**7***0**********0**********************9*8*************************0****0**********3
44.00
|8***0*7*7*****80*8*0**579*0*799689780*77*09*87*99*05*0*588*77*864790967*9560*9555*90480**7800659483
41.25 |  1    1    1               1                    1 1               1  1
  111
38.50 |

35.75 |

33.00 |

30.25 |

  dB  |

24.75 |

22.00 |

19.25 |

16.50 |

13.75 |

11.00 |

08.25 |

05.50 |

02.75 |

00.00 |


+-----------------------------------------------------------------------------------------------
       2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6 6 6
 7 7 7 7 7 7 7 7 7
       0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9 0 2 3 4 5 6 8 9 0 1 2 4 5 6 7 8 0 1 2 3 4 6 7 8 9
```

```
 0 2 3 4 5 6 8 9
       . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 . . . . . . . .
       5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7 9 1 3 5 7
 9 1 3 5 7 9 1 3
                                              Subcarrier Frequency


Active SC RxMER Statistics                      : (dB)      (1/4 dB hex)
Active Subcarrier RxMER Mean                    : 47.00     0xBC
Active Subcarrier RxMER Standard Deviation      :  5.25     0x15
Active Subcarrier RxMER Threshold Value         : 44.50     0xB2
Active Subcarrier RxMER Threshold Frequency (Hz): 78825000

Router#
```

Examples

The following example shows sample output for the **show cable modem prof-mgmt downstream** command for Cisco cBR Series Converged Broadband Routers:

```
router# show cable modem XXXX.XXXX.XXXX prof-mgmt downstream
MAC Address            : XXXX.XXXX.XXXX
IP Address             : ---
IPv6 Address           : xxxx:XXX:XXXX:XXXX:XXXX:XXX:XXXX:XXX

RxMer Exempt Percent   : 11
RxMer Margin qDB       : 20
Automatic Prof Dwngrd  : Active

DCID                                 : 159
  Configured Profile(s)              : 0 1 2 3 4 5
  Profile(s) in REG-RSP-MP           : 0 1 2 3
  Profile(s) in DBC-REQ              : 0 3 4 5
  Current profile                    : 5  [4096-QAM]
  Percentages of ideal BL vs Curr Prof : 90 (better)  0 (equal)
  Downgrade profile                  : 4
  Recommend profile                  : 5
  Unfit profile(s)                   : N/A
  Recommend profile (Expired)        : N/A
  Unfit profile(s)  (Expired)        : N/A
Number of SubCarriers  : 4096
1st Active SubCarrier  : 1126
# of Active SubCarriers: 1844
Tx Time                : 0h:03m:47s ago

Rx Time                : 0h:03m:47s ago
OFDM Profile Failure Rx: N/A
MER Poll Period   (min): 60
Recommend Timeout (min): 120
Unfit Timeout     (min): 60
Source              : OPT
Sub-    RxMER
Carrier
0x0000  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0020  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0040  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0060  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0080  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0100  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

```
0x0120  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0140  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0160  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0180  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x01A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x01C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x01E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0200  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0220  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0240  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0260  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0280  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x02A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x02C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x02E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0300  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0320  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0340  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0360  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0380  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x03A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x03C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x03E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0400  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0420  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0440  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0460  00000000 0000AFB8 ACB1B3B3 B5B100B0 B5B6B6B3 B2B2B6B4 B2B5B7B2 B2B6B3B6

0x0480  B3B6B5B5 B1B4B6B1 B3B1B4B2 B4B2B9B2 ADB6B0B5 B2B4B4B6 B4B4B1B4 B4B4B4B4
0x04A0  B3B5B2B1 B4B1B4B6 B5B8B7B6 B5B6B3B4 B5B6B5B0 B3B100B6 B1B0B7B3 B2B1AFB1
0x04C0  B5B0B3B7 B5B0B4B5 B1B7B3B4 AFB2B4B0 B4AEB3B5 B2B1B4B3 B2B4B3B4 B6B5B2B2
0x04E0  B0B1B5B4 B6B6B3B4 B2B1AFB3 B1B1B7B4 B3B6B8B4 B0B6B1B5 B6B3B8B5 B6B500B4
0x0500  B9B2B6B6 B4B5B1B1 B0B3B6B7 B2B4B7B3 B2AFB8B5 B0B4B4B1 B5B5B4B2 B4B0AFB2
0x0520  B5B5B1B6 B5B5B4B5 B7B5B5B4 B7B6B5B4 B4B6B1B4 B5B5B2B6 B5B5B4B5 B0B0B4B4
0x0540  B5B3B6B2 B2B200B0 AFB2B1B1 B2B7B4B3 B6B6B5B6 B2B3B1B5 B8B7AFB1 B6B5B6B3
0x0560  B8B4B2B2 B2B5B4B6 B0B4B4B4 B3B2B2AD B9B6B4B2 B5B2B0B9 B4B5B4B1 B3B3B3B5
0x0580  B3B1B6B3 B3B8B3B2 B2B4B3B6 B6B200B4 B0B1B8B6 B0B6B6B2 B0B0B3AF B5B6B1B4
0x05A0  B1B3B4B5 B3B5B4B4 B1B6B5B5 B5B8B4B2 B2B2B4B2 B2B3B6B2 B1B0B5B2 B2B2B1B3
0x05C0  B5B5B5B5 B5B8B3B1 B4B4B4B4 B5B4B7B4 B5B3B7B3 B3B300AF B7B1B1B0 B3B4B3B8
0x05E0  B7B8B3B3 B4B6B6B5 B4B4B3B4 B5B4B2B2 B0B5B2B3 B2B5B2B6 B5B0B4B5 B4B7B2B3
0x0600  B3B5B8B7 B3B4B7B3 B5B3B3BA B5AFB7B7 B3B3B2B4 B5B6B2B7 B3B3B3B2 B3AE00B3
0x0620  B0B5B3B3 B6B1B5B4 B3B8B3B8 B4B4B5B3 B2B6B4B2 B2B5B7B9 B6B3B5B3 B2B0AFB4
0x0640  B1B3B8B3 B5B2B5B6 B5B7B0B3 B8B3BAB7 B5B6B9B6 B5B2B4B3 B7B4B3B2 B2B3B3B5
0x0660  B6B1B2B8 B3B300B4 B1B3B1B3 B4B4B0B3 B5B5B1AF B6B4B7B5 B4B3B6B4 B4B4B6B4
0x0680  B2B1B6B5 B3B7B3B2 B4B5B1AF B2B3B5B2 B0B2B7B0 B4B4B4B1 B3B0B5B1 B3B2B1B7
0x06A0  B2B3B4B7 B2AFB4B5 B3B7B8B4 B5AF00B4 AFB2B2B3 B4AFB5B4 B5B9BAB5 B2B2B4B1
0x06C0  B6B4B3B5 B5B5B4B3 B2AEB3B1 B0B4B5B6 B2B7B5B4 B2B3B5B2 B4B4B5B5 BAB2B1B2
0x06E0  B3B4B3B2 B8B3B3B6 B6AFB4B2 B4B4B4B6 B3B5AFB4 B1B600B6 B7B2B3B3 B3B1B6B8
0x0700  AFB5B6B7 B6B4B3B2 B1B2B3B3 B3B1B1B3 B1B0B3B2 B3B3B5B3 B7B1B3B2 B6B2AFB1
0x0720  B1B1B4B2 B1B3B5B6 B4B6B5B2 B5B3B4B3 B4B4B0B4 B4B4B5B4 B1B0B5B2 B2AE00B1
0x0740  AEB0B4B3 B6B1B3B4 B4B1B5B1 B4B3B5AD B4B1B2B4 B2B4B9B2 B9B1B2B2 AFB8B1B8
0x0760  AFB4B3B1 B4B1B3B5 B3B1B5B3 B1B4B5B5 B5B0B6B5 B0B0B5B7 B2B5B2B5 B2AFB6B4
0x0780  B5B1B3B2 B5B300B0 B6B2B1B4 B1B0B3B1 B3B1B2B3 B4B3B2B2 B1B7B0B2 B3B1B1B3
0x07A0  B0B7B5B3 B5B2ADB5 B4B8B6B5 B4B6B4B1 B3B1B1B4 B0B4B6B2 B2B2B2B4 B0B3B4B0
0x07C0  B0B0B4B4 B6B1B2B1 B0B0B3B0 B3B500B4 B4B1B3B2 B0B3B1B1 B4B2AEB3 B1B4B6AF
0x07E0  B4B1B1B5 B4B2B7B3 B1B4B5B1 B2AFB2B6 B5B3B1B0 B5B5B4B2 B1B3B5B3 B1B3B3B4
0x0800  B2B4B3B2 B7B4B5B7 B6B3B4B4 B3B3B6B2 B2AFB0B1 B4B300B4 B3B0B4AF B3B1B3B3
0x0820  B3B0B4B3 B0B0B1B7 B4B2B3B1 B5B4B3B5 B3B6B5B3 AEB1B4B3 B3B0B0B2 B3B1B3B1
0x0840  B1AFB2B0 B2B2B3B2 B2B5B4B3 B2B3B3B3 B4AEB0B2 B3B6B4B6 B1B4B4B5 B1B300B5
0x0860  B0AEB2B3 B5B4B3B0 B2B6B3B1 B1AFB2B6 B2B5B3B2 B7B5B0B5 B4B2B2B2 B2B3B2B4
0x0880  B1B6B3B6 B2B7B1B2 B2B0B6AE B3B4B3B1 B0B1B5B3 B2B2B3B2 AFB3B3B3 B1B1ADB2
0x08A0  B5B4B1B2 B1AD00AC B2B5B1B1 B2B6B4B2 B3B4AFAF AFB5B3B7 B1B5B1B0 B1AFB1B7
0x08C0  B0AFB7B5 B5B2AFB2 B3B2B4AC B4B4B6B2 B2B2B2B3 B6B0B5B2 B6B1B5B0 B6B5ABB2
0x08E0  B1B3B3B1 B3B3AEB6 B0B4B1AF B4B000B0 B3B2B4AF B1B3B1B3 B3B4B2B1 B5B2B4B3
```

```
0x0900  B3B3B3B4 B5B2AFB5 AEB0AFB5 B3B2B2B1 B5B4B2B5 AFB6B0B2 B2B2B2B0 B1AFAFB3
0x0920  B1ADB0AF B2B0B2B5 B1B1B2B3 B3B5B4B1 B1B0AEAD B3AF00AF B0B6B1B1 AFAEAFB2
0x0940  B2B1B4B4 B3B2B1B3 AFB0B1B4 B4B1B2B3 B5B3B4B5 B1AFB1B0 AFB1ABB3 AFB1B1B1
0x0960  B2AFB2B0 B1B2B4B3 B2AEAFB3 B1B0B2B0 B3B3AEAE B6B3B2B1 AEB3AEAD B1B000B2
0x0980  B4AEB1B3 B3B0B5B0 B1B1B0B3 B2B2B0B3 AFAEB3B2 AFB2AFB4 B4B1B3AF B1B0AEB0
0x09A0  AFB1B1B1 B4B1B3AF B2B5B3B1 B1B1B2B5 B1B4B1AC B1B4AFB3 AFB7AFAE B1B2ACAF
0x09C0  B4AFB0B7 B3B000B2 AFB1B3B0 B1B3B2B3 B0B0B0B4 B0B2B5B1 B2AEB6AF B1B6AFAF
0x09E0  B3AFB2B0 B4B2B1B0 B1B2B6AF B2AFAEB3 B2B0B1B1 B0B3B1AF B0B3B6B3 B0B4B1B2

0x0A00  AFB0B0B3 B6B1B2B3 B0B3B3B1 B1AF00B3 AFB0B1B5 B3B4B1B1 B0B1B1B1 B3ADACB1
0x0A20  AFB3B6B6 B4B1B0AD B0ADB4B2 B3B0B2AD B8B2B1B0 AFB4B4B1 B5B2B7B6 ABB5AEAF
0x0A40  B2B3B0B5 B3B1AFAF B4B6B2B3 B2B2B5B3 B1B2B0B1 B4B100B0 B3AFB3AF B0AEB2AF
0x0A60  B1B3AEB0 B4ACAFB0 AFB3AFAF B0B4AFB0 B3B1ADB5 B6B1B0B3 B2AEB3B0 B0AFB1AE
0x0A80  B2B2B1B1 B0AFB2B1 AEAFB0B3 B2B2B1B3 AEADB5AF B0AFB1B2 B5B1ADAD B3B100B0
0x0AA0  ADB3B1B4 B5B0AEB3 B1B2B0B2 B1B3B0B2 B4B4B1B1 B0B5B0B1 B0B4B3B1 AFB3B0B0
0x0AC0  B2AFB2B4 B4B4AFAE AFB1B1B0 ADB0B2B0 B4AEAFB3 B2AEB4B2 B0B3B1B2 AEB1B3B0
0x0AE0  B0AEB0B2 B4AC00B0 B0AFB2B0 B2AFB4B2 AFACAAB1 AEB6B2B1 B3B4B1B0 B4AFB3B5
0x0B00  B3B0B3B0 B1B10000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0BA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0BC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0BE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0CA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0CC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0CE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x0F80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

Examples

The following example shows sample output for the **show cable modem prof-mgmt downstream** command for Cisco cBR Series Converged Broadband Routers:

```
router# show cable modem XXXX.XXXX.XXXX prof-mgmt downstream
MAC Address            : XXXX.XXXX.XXXX
IP Address             : ---
IPv6 Address           : xxxx:XXX:XXXX:XXXX:XXXX:XXX:XXXX:XXX

RxMer Exempt Percent   : 11
RxMer Margin qDB       : 20
Automatic Prof Dwngrd  : Active

DCID                                  : 159
  Configured Profile(s)               : 0 1 2 3 4 5
  Profile(s) in REG-RSP-MP            : 0 1 2 3
  Profile(s) in DBC-REQ               : 0 3 4 5
  Current profile                     : 5  [4096-QAM]
  Percentages of ideal BL vs Curr Prof : 90 (better)  0 (equal)
  Downgrade profile                   : 4
  Recommend profile                   : 5
  Unfit profile(s)                    : N/A
  Recommend profile (Expired)         : N/A
  Unfit profile(s)  (Expired)         : N/A
Number of SubCarriers  : 4096
1st Active SubCarrier  : 1126
# of Active SubCarriers: 1844
Tx Time                : 0h:03m:47s ago

Rx Time                : 0h:03m:47s ago
OFDM Profile Failure Rx: N/A
MER Poll Period   (min): 60
Recommend Timeout (min): 120
Unfit Timeout     (min): 60
Source              : OPT
Sub-    RxMER
Carrier
0x0000  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0020  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0040  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0060  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0080  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0100  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0120  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0140  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0160  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0180  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x01A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x01C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x01E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0200  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0220  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0240  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0260  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0280  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x02A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x02C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x02E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0300  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0320  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0340  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0360  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0380  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x03A0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x03C0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

```
0x03E0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0400  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0420  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0440  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0460  00000000 0000AFB8 ACB1B3B3 B5B100B0 B5B6B6B3 B2B2B6B4 B2B5B7B2 B2B6B3B6

0x0480  B3B6B5B5 B1B4B6B1 B3B1B4B2 B4B2B9B2 ADB6B0B5 B2B4B4B6 B4B4B1B4 B4B4B4B4
0x04A0  B3B5B2B1 B4B1B4B6 B5B8B7B6 B5B6B3B4 B5B6B5B0 B3B100B6 B1B0B7B3 B2B1AFB1
0x04C0  B5B0B3B7 B5B0B4B5 B1B7B3B4 AFB2B4B0 B4AEB3B5 B2B1B4B3 B2B4B3B4 B6B5B2B2
0x04E0  B0B1B5B4 B6B6B3B4 B2B1AFB3 B1B1B7B4 B3B6B8B4 B0B6B1B5 B6B3B8B5 B6B500B4
0x0500  B9B2B6B6 B4B5B1B1 B0B3B6B7 B2B4B7B3 B2AFB8B5 B0B4B4B1 B5B5B4B2 B4B0AFB2
0x0520  B5B5B1B6 B5B5B4B5 B7B5B5B4 B7B6B5B4 B4B6B1B4 B5B5B2B6 B5B5B4B5 B0B0B4B4
0x0540  B5B3B6B2 B2B200B0 AFB2B1B1 B2B7B4B3 B6B6B5B6 B2B3B1B5 B8B7AFB1 B6B5B6B3
0x0560  B8B4B2B2 B2B5B4B6 B0B4B4B4 B3B2B2AD B9B6B4B2 B5B2B0B9 B4B5B4B1 B3B3B3B5
0x0580  B3B1B6B3 B3B8B3B2 B2B4B3B6 B6B200B4 B0B1B8B6 B0B6B6B2 B0B0B3AF B5B6B1B4
0x05A0  B1B3B4B5 B3B5B4B4 B1B6B5B5 B5B8B4B2 B2B2B4B2 B2B3B6B2 B1B0B5B2 B2B2B1B3
0x05C0  B5B5B5B5 B5B8B3B1 B4B4B4B4 B5B4B7B4 B5B3B7B3 B3B300AF B7B1B1B0 B3B4B3B8
0x05E0  B7B8B3B3 B4B6B6B5 B4B4B3B4 B5B4B2B2 B0B5B2B3 B2B5B2B6 B5B0B4B5 B4B7B2B3
0x0600  B3B5B8B7 B3B4B7B3 B5B3B3BA B5AFB7B7 B3B3B2B4 B5B6B2B7 B3B3B3B2 B3AE00B3
0x0620  B0B5B3B3 B6B1B5B4 B3B8B3B8 B4B4B5B3 B2B6B4B2 B2B5B7B9 B6B3B5B3 B2B0AFB4
0x0640  B1B3B8B3 B5B2B5B6 B5B7B0B3 B8B3BAB7 B5B6B9B6 B5B2B4B3 B7B4B3B2 B2B3B3B5
0x0660  B6B1B2B8 B3B300B4 B1B3B1B3 B4B4B0B3 B5B5B1AF B6B4B7B5 B4B3B6B4 B4B4B6B4
0x0680  B2B1B6B5 B3B7B3B2 B4B5B1AF B2B3B5B2 B0B2B7B0 B4B4B4B1 B3B0B5B1 B3B2B1B7
0x06A0  B2B3B4B7 B2AFB4B5 B3B7B8B4 B5AF00B4 AFB2B2B3 B4AFB5B4 B5B9BAB5 B2B2B4B1
0x06C0  B6B4B3B5 B5B5B4B3 B2AEB3B1 B0B4B5B6 B2B7B5B4 B2B3B5B2 B4B4B5B5 BAB2B1B2
0x06E0  B3B4B3B2 B8B3B3B6 B6AFB4B2 B4B4B4B6 B3B5AFB4 B1B600B6 B7B2B3B3 B3B1B6B8
0x0700  AFB5B6B7 B6B4B3B2 B1B2B3B3 B3B1B1B3 B1B0B3B2 B3B3B5B3 B7B1B3B2 B6B2AFB1
0x0720  B1B1B4B2 B1B3B5B6 B4B6B5B2 B5B3B4B3 B4B4B0B4 B4B4B5B4 B1B0B5B2 B2AE00B1
0x0740  AEB0B4B3 B6B1B3B4 B4B1B5B1 B4B3B5AD B4B1B2B4 B2B4B9B2 B9B1B2B2 AFB8B1B8
0x0760  AFB4B3B1 B4B1B3B5 B3B1B5B3 B1B4B5B5 B5B0B6B5 B0B0B5B7 B2B5B2B5 B2AFB6B4
0x0780  B5B1B3B2 B5B300B0 B6B2B1B4 B1B0B3B1 B3B1B2B3 B4B3B2B2 B1B7B0B2 B3B1B1B3
0x07A0  B0B7B5B3 B5B2ADB5 B4B8B6B5 B4B6B4B1 B3B1B1B4 B0B4B6B2 B2B2B2B4 B0B3B4B0
0x07C0  B0B0B4B4 B6B1B2B1 B0B0B3B0 B3B500B4 B4B1B3B2 B0B3B1B1 B4B2AEB3 B1B4B6AF
0x07E0  B4B1B1B5 B4B2B7B3 B1B4B5B1 B2AFB2B6 B5B3B1B0 B5B5B4B2 B1B3B5B3 B1B3B3B4
0x0800  B2B4B3B2 B7B4B5B7 B6B3B4B4 B3B3B6B2 B2AFB0B1 B4B300B4 B3B0B4AF B3B1B3B3
0x0820  B3B0B4B3 B0B0B1B7 B4B2B3B1 B5B4B3B5 B3B6B5B3 AEB1B4B3 B3B0B0B2 B3B1B3B1
0x0840  B1AFB2B0 B2B2B3B2 B2B5B4B3 B2B3B3B3 B4AEB0B2 B3B6B4B6 B1B4B4B5 B1B300B5
0x0860  B0AEB2B3 B5B4B3B0 B2B6B3B1 B1AFB2B6 B2B5B3B2 B7B5B0B5 B4B2B2B2 B2B3B2B4
0x0880  B1B6B3B6 B2B7B1B2 B2B0B6AE B3B4B3B1 B0B1B5B3 B2B2B3B2 AFB3B3B3 B1B1ADB2
0x08A0  B5B4B1B2 B1AD00AC B2B5B1B1 B2B6B4B2 B3B4AFAF AFB5B3B7 B1B5B1B0 B1AFB1B7
0x08C0  B0AFB7B5 B5B2AFB2 B3B2B4AC B4B4B6B2 B2B2B2B3 B6B0B5B2 B6B1B5B0 B6B5ABB2
0x08E0  B1B3B3B1 B3B3AEB6 B0B4B1AF B4B000B0 B3B2B4AF B1B3B1B3 B3B4B2B1 B5B2B4B3
0x0900  B3B3B3B4 B5B2AFB5 AEB0AFB5 B3B2B2B1 B5B4B2B5 AFB6B0B2 B2B2B2B0 B1AFAFB3
0x0920  B1ADB0AF B2B0B2B5 B1B1B2B3 B3B5B4B1 B1B0AEAD B3AF00AF B0B6B1B1 AFAEAFB2
0x0940  B2B1B4B4 B3B2B1B3 AFB0B1B4 B4B1B2B3 B5B3B4B5 B1AFB1B0 AFB1ABB3 AFB1B1B1
0x0960  B2AFB2B0 B1B2B4B3 B2AEAFB3 B1B0B2B0 B3B3AEAE B6B3B2B1 AEB3AEAD B1B000B2
0x0980  B4AEB1B3 B3B0B5B0 B1B1B0B3 B2B2B0B3 AFAEB3B2 AFB2AFB4 B4B1B3AF B1B0AEB0
0x09A0  AFB1B1B1 B4B1B3AF B2B5B3B1 B1B1B2B5 B1B4B1AC B1B4AFB3 AFB7AFAE B1B2ACAF
0x09C0  B4AFB0B7 B3B000B2 AFB1B3B0 B1B3B2B3 B0B0B0B4 B0B2B5B1 B2AEB6AF B1B6AFAF
0x09E0  B3AFB2B0 B4B2B1B0 B1B2B6AF B2AFAEB3 B2B0B1B1 B0B3B1AF B0B3B6B3 B0B4B1B2

0x0A00  AFB0B0B3 B6B1B2B3 B0B3B3B1 B1AF00B3 AFB0B1B5 B3B4B1B1 B0B1B1B1 B3ADACB1
0x0A20  AFB3B6B6 B4B1B0AD B0ADB4B2 B3B0B2AD B8B2B1B0 AFB4B4B1 B5B2B7B6 ABB5AEAF
0x0A40  B2B3B0B5 B3B1AFAF B4B6B2B3 B2B2B5B3 B1B2B0B1 B4B100B0 B3AFB3AF B0AEB2AF
0x0A60  B1B3AEB0 B4ACAFB0 AFB3AFAF B0B4AFB0 B3B1ADB5 B6B1B0B3 B2AEB3B0 B0AFB1AE
0x0A80  B2B2B1B1 B0AFB2B1 AEAFB0B3 B2B2B1B3 AEADB5AF B0AFB1B2 B5B1ADAD B3B100B0
0x0AA0  ADB3B1B4 B5B0AEB3 B1B2B0B2 B1B3B0B2 B4B4B1B1 B0B5B0B1 B0B4B3B1 AFB3B0B0
0x0AC0  B2AFB2B4 B4B4AFAE AFB1B1B0 ADB0B2B0 B4AEAFB3 B2AEB4B2 B0B3B1B2 AEB1B3B0
0x0AE0  B0AEB0B2 B4AC00B0 B0AFB2B0 B2AFB4B2 AFACAAB1 AEB6B2B1 B3B4B1B0 B4AFB3B5
0x0B00  B3B0B3B0 B1B10000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0B80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

```
0x0BA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0BC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0BE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0C80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0CA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0CC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0CE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0D80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0DE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0E80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0EE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0F60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x0F80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FA0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FC0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x0FE0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

Related Commands

Command	Description
show controllers integrated-cable rf-channel prof-order	Displays information about the profile downgrade ordering on a given OFDM channel.
show cable modem phy ofdm-profile	Displays information about the profiles that are associated with the cable modems (CMs).

show cable modem qos

To display the quality of service (QoS) and service flow information for a particular cable modem (CM), use the **show cable modem qos** command in privileged EXEC mode.

show cable modem {*ip-addressmac-address* | **name** *fqdn*} **qos** [**service-class** | **verbose**]

Cisco cBR-8 Converged Broadband Router
show cable modem {*ip-addressmac-address*} **qos** [**service-class** | **verbose**]

Syntax Description

ip-address	IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This option is not supported on the Cisco cBR-8 router.
service-class	(Optional) Displays the service class names associated with each service flow for a specific cable modem.
verbose	(Optional) Displays detailed information for each service flow ID (SFID) for the CM.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3XA	This command was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCC	The command output was modified to display the traffic peak rate value for a specific service flow.
12.2(33)SCF	This command was modified. The service-class keyword was added to display the service class names for each service flow for a specific cable modem.
12.2(33)SCG	The command output was modified to display the scheduling type as “N/A” for all downstream service flows.

Release	Modification
12.2(33)SCI1	The command output was modified to display the IP ToS Overwrite [AND-mask, OR-mask] for the downstream service flow.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **name** variable was removed.

Usage Guidelines

This command displays the service flows currently in use by a CM. The default form of the display shows one service flow per line, while the **verbose** keyword displays complete information for each flow.



Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.



Note Starting with Cisco IOS Release 12.2(33)SCG, the output of the show cable modem qos command displays the scheduling type of all downstream service flows (DS-SF) as “N/A” to indicate that the DS-SFs do not have any scheduling type.

Examples

The following example is a sample output of the **show cable modem qos** command for a specific CM identified by its MAC address:

```
Router# show cable modem 0010.7bb3.fcd1 qos
```

```
Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst   MinRsvRate  Throughput
          State       Type
3     US  act   1     BE     7    2000000     1522      100000      0
4     DS  act   N/A   BE     0    4000000     1522      0           0
```

Example of the show cable modem qos Command for a Cable Modem Specified by IP Address

The following example is a sample output of the **show cable modem qos** command for a specific CM identified by its IP address:

```
Router# show cable modem 22.1.1.10 qos

Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst   MinRsvRate  Throughput
          State       Type
7     US  act   3     BE     0    0           3044      0           0
9     US  act   4     BE     0    1000000     65224     0           0
10    US  act   5     BE     0    1000000     65224     0           0
8     DS  act   N/A   BE     0    0           3044      0           0
```

Example of the show cable modem qos verbose Command for a Cable Modem Specified by IP Address

The following example is a sample output for the **verbose** form of the **show cable modem qos** command for a specific CM identified by its IP address:

```
Router# show cable modem 22.1.1.10 qos verbose

Sfid                                  : 7
Current State                         : Active
Sid                                   : 3
Traffic Priority                      : 0
Maximum Sustained rate                : 0 bits/sec
Maximum Burst                         : 3044 bytes
Mimimum Reserved rate                 : 0 bits/sec
Minimum Packet Size                   : 64 bytes
Admitted QoS Timeout                  : 200 seconds
Active QoS Timeout                    : 0 seconds
Maximum Concatenated Burst            : 1522 bytes
Scheduling Type                       : Best Effort
Request/Transmission policy           : 0x0
IP ToS Overwrite[AND-mask, OR-mask]   : 0xFF, 0x0
Current Throughput                    : 0 bits/sec, 0 packets/sec
Sfid                                  : 9
Current State                         : Active
Sid                                   : 4
Traffic Priority                      : 0
Maximum Sustained rate                : 1000000 bits/sec
Maximum Burst                         : 65224 bytes
Mimimum Reserved rate                 : 0 bits/sec
Minimum Packet Size                   : 64 bytes
Admitted QoS Timeout                  : 0 seconds
Active QoS Timeout                    : 0 seconds
Maximum Concatenated Burst            : 1522 bytes
Scheduling Type                       : Best Effort
Request/Transmission policy           : 0x0
IP ToS Overwrite[AND-mask, OR-mask]   : 0xFF, 0x0
Current Throughput                    : 0 bits/sec, 0 packets/sec
Sfid                                  : 10
```

```
Current State                           : Active
Sid                                     : 5
Traffic Priority                        : 0
Maximum Sustained rate                  : 1000000 bits/sec
Maximum Burst                           : 65224 bytes
Mimimum Reserved rate                   : 0 bits/sec
Minimum Packet Size                     : 64 bytes
Admitted QoS Timeout                    : 0 seconds
Active QoS Timeout                      : 0 seconds
Maximum Concatenated Burst              : 1522 bytes
Scheduling Type                         : Best Effort
Request/Transmission policy             : 0x0
IP ToS Overwrite[AND-mask, OR-mask]     : 0xFF, 0x0
Current Throughput                      : 0 bits/sec, 0 packets/sec
Sfid                                    : 8
Current State                           : Active
Sid                                     : N/A
Traffic Priority                        : 0
Maximum Sustained rate                  : 0 bits/sec
Maximum Burst                           : 3044 bytes
Mimimum Reserved rate                   : 0 bits/sec
Minimum Packet Size                     : 64 bytes
Admitted QoS Timeout                    : 200 seconds
Active QoS Timeout                      : 0 seconds
Maximum Latency                         : 0 usecs
Current Throughput                      : 0 bits/sec, 0 packets/sec
```

The following example is a sample output for the **verbose** form of the **show cable modem qos** command indicating the traffic peak rate value for a specific service flow.

```
Router# show cable modem 22.1.1.10 qos verbose

Sfid                                    : 40
Current State                           : Active
Sid                                     : 35
Traffic Priority                        : 4
Maximum Sustained rate                  : 20000000 bits/sec
Maximum Burst                           : 20000000 bytes
Minimum Reserved rate                   : 0 bits/sec
Minimum Packet Size                     : 0 bytes
Admitted QoS Timeout                    : 200 seconds
Active QoS Timeout                      : 0 seconds
Maximum Concatenated Burst              : 65535 bytes
Scheduling Type                         : Best Effort
Request/Transmission policy             : 0x0
IP ToS Overwrite[AND-mask, OR-mask]     : 0xFF, 0x0
Peak Rate                               : 50000000 bits/sec
Current Throughput                      : 0 bits/sec, 0 packets/sec
```

Example of the show cable modem qos service-class Command for a Cable Modem in Cisco IOS Release 12.2(33)SCF

Effective from Cisco IOS Release 12.2(33)SCF, the **service-class** keyword is supported.

The following example is a sample output of the **service-class** option of the **show cable modem qos** command for a specific CM identified by its IP address:

```
Router# show cable modem 22.1.1.10 qos service-class
Sfid  Dir Sched  MaxSusRate  MaxBrst     MinRsvRate  SrvClassName
          Type
```

```
33     US  BE     0           3044        0          us_srvclass_ts1
35     US  BE     0           3044        0          us_srvclass_ts2
34     DS  BE     0           3044        0          ds_srvclass_ts1
36     DS  BE     0           3044        0          ds_srvclass_ts2
```

Table below describes the major fields shown in the **show cable modem qos** displays:

Table 133: Descriptions for the show cable modem qos Fields

Field	Description
Sfid	Identifies the Service Flow ID (SFID) for this service flow.
Dir	Identifies whether the service flow applies to the downstream (DS) or upstream (US) direction.
Curr State	Current State—Identifies the current state of the service flow: Active or Inactive.
Sid	Identifies the Service ID (SID) associated with this SFID.
Sched Type	Identifies this service flow's scheduling type: • BE—Best-Effort • NRTPS—Non-Real-Time Polling Service • N/A—Scheduling type is not applicable to a service flow. • RTPS—Real-Time Polling Service • RSVD—Reserved but not yet in use • UGS_AD—Unsolicited Grant Service with Activity Detection • UGS—Unsolicited Grant Service • UNDEF—Not yet defined.
Prio	Traffic priority (0 to 7) given to this service flow.
MaxSusRate	Maximum sustained rate value, in bits per second.
MaxBrst	Maximum burst value, in bytes.
MinRsvRate	Minimum reserved rate, in bits per second.
Throughput	Current Throughput for this service flow, in packets per second.
SrvClassName	Service class name associated with this service flow.
Minimum Packet Size	Assumed minimum reserved rate packet size on this service flow, in bytes.
Admitted QoS Timeout	Timeout for admitted QoS parameters, in seconds, which specifies the length of time that the CMTS must reserve resources for a service flow's admitted Qos parameter set, when they exceed the resources allowed by the active QoS parameter set.
Active QoS Timeout	Timeout for active Qos parameters, in seconds, which specifies the maximum amount of time that resources can remained unused on an active service flow.
Maximum Latency	Maximum downstream latency allowed for packets using this service flow, in microseconds.

Examples for Cisco cBR-8 Converged Broadband Router

This example shows the output of the**show cable modem qos service-class** command on the Cisco cBR-8 router:

```
Router#show cable modem 209.165.200.227 qos service-class
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 12:54:01.136 PST Thu May 7 2015

Sfid  Dir Sched  MaxSusRate  MaxBrst     MinRsvRate  SrvClassName
          Type
7     US  BE     0           3044        0
8     DS  N/A    0           3044        0

Router#
```

This example shows the output of the**show cable modem qos verbose** command on the Cisco cBR-8 router:

```
Router#show cable modem 209.165.200.227 qos verbose
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 12:58:21.820 PST Thu May 7 2015

Sfid                                  : 7
Current State                         : Active
Sid                                   : 1
Service Class Name                    :
Traffic Priority                      : 7
Maximum Sustained rate                : 0 bits/sec
Maximum Burst                         : 3044 bytes
Minimum Reserved rate                 : 0 bits/sec
Minimum Packet Size                   : 0 bytes
Admitted QoS Timeout                  : 0 seconds
Active QoS Timeout                    : 0 seconds
Maximum Concatenated Burst            : 1522 bytes
Scheduling Type                       : Best Effort
Request/Transmission policy           : 0x0
IP ToS Overwrite[AND-mask, OR-mask]   : 0xFF, 0x0
Peak Rate                             : 0 bits/sec
Current Throughput                    : 308 bits/sec, 0 packets/sec

Sfid                                  : 8
Current State                         : Active
Sid                                   : N/A
Low Latency App                       : No
Service Class Name                    :
Traffic Priority                      : 0
Maximum Sustained rate                : 0 bits/sec
Maximum Burst                         : 3044 bytes
Minimum Reserved rate                 : 0 bits/sec
Minimum Packet Size                   : 0 bytes
Admitted QoS Timeout                  : 200 seconds
Active QoS Timeout                    : 0 seconds
Maximum Latency                       : 0 usecs
Peak Rate                             : 0 bits/sec
Current Throughput                    : 0 bits/sec, 0 packets/sec

Router#
```

Related Commands

Command	Description
cable qos permission	Specifies permission for updating the cable router QoS table.
cable qos profile	Configures a QoS profiles.
cable service-flow inactivity-timeout	Sets the amount of time a dynamic service flow can be present in the system without any activity.
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.
show cable modem calls	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem registered	Displays a list of the CMs that are marked as registered with the Cisco CMTS router.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modem unregistered	Displays a list of the CMs that are marked as unregistered with the Cisco CMTS router.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable qos paramset	Displays the DOCSIS 1.1 QoS parameter sets.
show interface cable sid	Displays cable interface information.
show cable qos profile	Displays quality-of-service (QoS) profiles for a Cisco CMTS router.

show cable modem reduction-mode energy-management-mode

To verify which CM is in EM mode and to get the original wideband and upstream channel information, use the **show cable modem reduction-mode energy-management-mode** command in the privileged EXEC mode.

show cable modem reduction-mode energy-management-mode

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable modem reduction-mode energy-management-mode** command shows which CM is in energy management mode and provides the original wideband and upstream channel information.

```
show cable modem reduction-mode energy-management-mode

                                Orig BG     Orig US                    Curr BG
I/F     MAC Address    ID        I/F        bitmap   RFs     ID          I/F        Upstream
------- -------------- ---------------- -------- ----------------------------------------
C7/0/0  0025.2eaf.843e 897  Wi7/0/0:0     0x3B     4      252        Wi7/0/0:1      US0
C7/0/0  0025.2eaf.8356 897  Wi7/0/0:0     0x3B     4      252        Wi7/0/0:1      US0

C7/0/0  0015.d176.5199 897  Wi7/0/0:0     0x3B     4      252        Wi7/0/0:1      US0
```

show cable modem reduction-mode energy-management-param

To verify the configuration parameters used in the CM configuration file, use the **show cable modem reduction-mode energy-management-param** command.

show cable modem *mac_address* **reduction-mode energy-management-param**

Syntax Description

mac_address	MAC address of the cable modem.

Command Default

None.

Command Modes

Privileged EXEC (#).

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable modem reduction-mode energy-management-param** command is used to verify the configuration parameters used in the cable modem configuration file.

show cable modem *54d4.6ffb.2e21* **reduction-mode energy-management-param**

```
Energy Management feature enable : Y
DS entry bitrate threshold(bps)  : 100000
DS entry time threshold(s)       : 120
DS exit bitrate threshold(bps)   : 200000
DS exit time threshold(s)        : 2
US entry bitrate threshold(bps)  : 100000
US entry time threshold(s)       : 120
US exit bitrate threshold(bps)   : 200000
US exit time threshold(s)        : 2
cycle period(s)                  : 300
```

show cable modem reduction-mode energy-management-status

To view the basic statistics for all energy management receive request events for a specific cable modem, use the **show cable modem reduction-mode energy-management-status** command.

show cable modem {*cable if* | *mac_address* | *ip_address*} **reduction-mode energy-management-status**

Syntax Description

cable if	I/F of the cable modem.
mac address	MAC address of the cable modem.
ip address	IP address of the cable modem.

Command Default

None.

Command Modes

Privileged EXEC (#).

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable modem reduction-mode energy-management-status** command shows the basic statistics for all energy management receive request events for a specific cable modem.

```
show cable modem c8/0/0 reduction-mode energy-management-status

I/F    MAC Address    Event          TID Count Error Dups   Time
C8/0/0 54d4.6ffb.2e21 Enter EM mode   1   1     0     1    Jul 16 21:38:18
                      Exit EM mode    1   1     0     0    Jul 16 21:38:39
C8/0/0 602a.d07c.4ec6 Enter EM mode   1   1     0     0    Jul 16 21:40:57
                      Exit EM mode    1   1     0     0    Jul 16 21:41:17
```

show cable modem reduction-mode mta-battery

To display the channel bonding downgrade information for cable modems in battery backup mode, use **show cable modem reduction-mode mta-battery** command in privileged EXEC mode.

show cable modem reduction-mode mta-battery

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
12.2(33)SCI2	This command was introduced.
IOS-XE 3.16.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable modem reduction-mode mta-battery** command to verify the configuration for channel bonding downgrade in battery backup mode. This command will display channel bonding downgrade information for cable modems in battery backup mode.

Examples

The following example displays the channel bonding downgrade information for cable modems in battery backup mode:

```
Router# show cable modem reduction-mode mta-battery
Load for five secs: 2%/0%; one minute: 3%; five minutes: 2%
Time source is NTP, *13:36:15.619 CST Thu Jul 16 2015
Orig BG Curr BG
I/F MAC Address ID I/F RFs ID I/F Upstream
------- -------------- ---- ----------- --- ---- ----------- --------
C8/0/1 7cb2.1b0f.ea58 6146 Wi8/0/0:1 8 6165 Wi8/0/0:20 US0
C8/0/1 7cb2.1b9c.8ed4 6146 Wi8/0/0:1 8 6173 Wi8/0/0:28 US1
C8/0/1 0025.2eaf.6f44 6146 Wi8/0/0:1 8 6173 Wi8/0/0:28 US0

Router#
```

Related Commands

Command	Description
cable reduction-mode mta-battery	Configures channel bonding downgrade for cable modems in battery backup mode.

show cable modem registered

To display a list of the cable modems (CMs) that have registered with the Cisco CMTS, use the **show cable modem registered** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **registered**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*port* | *slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **registered**

Cisco cBR-8 Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot*/*subslot*/*cable-interface-index*] **registered**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. For Cisco cBR-8 router—The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.

upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. This option is not supported on the Cisco cBR-8 router.
logical-channel-index	(Optional) Displays the logical channel index. Valid values are 0 and 1. This option is not supported on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This option is not supported on the Cisco cBR-8 router.
registered	Displays a list of the cable modems that have registered with the Cisco CMTS.

Command Default

Displays a list of all registered CMs on the Cisco CMTS router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.2(4)BC1	Support for the Cisco uBR10012 router was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM. • The alignment of output fields has been changed.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** and **upstream** keywords were removed. The *logical-channel-index* is removed.

Usage Guidelines

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address*

command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Examples

The following example shows sample output for the default form of the **show cable modem registered** command in Cisco IOS Release 12.2(33)SCA:

```
Router# show cable modem registered
Interface Prim Online       Timing  Rec   QoS CPE IP address      MAC address
          Sid  State        Offset Power
C3/0/U0   1    online(pt)   2024    0.00  5   0   10.74.1.60      0000.cadb.0bae
C3/0/U0   2    online(pt)   2032    0.00  5   0   10.74.1.58      0000.cadb.0512
C3/0/U0   3    online(pt)   2024    0.50  5   0   10.74.1.61      0000.cadb.04b2
C3/0/U0   4    online(pt)   3079    0.00  5   0   10.74.1.48      0003.e3a6.7f71
C3/0/U0   5    online(pt)   2558    -1.00 5   0   10.74.1.50      0010.7b6b.77ed
C3/0/U0   6    online(pt)   3083    -0.50 5   0   10.74.1.42      0030.80bc.22b9
```

The following example shows sample output for the default form of the **show cable modem registered** command for Cisco IOS Release 12.2(33)BC.

```
Router# show cable modem registered

Interface   Prim Online    Timing Rec    QoS CPE IP address      MAC address
            Sid  State     Offset Power
Cable3/0/U0 1    online     2812   -0.25  5   1   10.18.1.5       0030.80bc.2303
Cable3/0/U0 2    online     2804    0.50  5   0   10.18.1.9       0006.2854.73f5
```

The following example shows sample output for the **show cable modem registered** command for a particular cable interface:

```
Router# show cable modem c8/1/0 registered

Interface Prim Online      Timing Rec     QoS CPE IP address      MAC address
          Sid  State       Offset Power
C8/1/0/U1 1    online       1548   0.00   5   0   10.1.1.11       0050.7366.1243
```

```
C8/1/0/U4 2    online       1925   0.00   5   0   10.1.1.10       0002.b970.0027
C8/1/0/U4 3    online       1918   -0.50  2   0   10.1.1.10       0006.5314.858d
```

The following example shows sample output for the **show cable modem registered** command for a single CM, as identified by its IP address:

```
Router# show cable modem 22.1.1.10 registered

Interface Prim Online      Timing Rec     QoS CPE IP address      MAC address
          Sid  State       Offset Power
C8/1/0/U4 3    online       1918   -0.75  2   0   10.1.1.10       0006.5314.858d
```

The following example shows sample output for the **show cable modem registered** command for a single CM, as identified by its MAC address:

```
Router# show cable modem 0006.5314.858d registered

Interface Prim Online      Timing Rec     QoS CPE IP address      MAC address
          Sid  State       Offset Power
C8/1/0/U4 3    online       1918   -0.25  2   0   10.1.1.10       0006.5314.858d
```

Note An asterisk (*) in the Receive Power column indicates that a power adjustment has been made for that CM. An exclamation point (!) in the Receive Power column indicates that the CM has reached its maximum power transmit level and cannot increase its power level further. An exclamation point (!) in the Timing Offset column indicates that the CM has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. A pound sign (#) in the MAC State column indicates that the **cable tftp-enforce mark-only** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so (Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases).

Tip The **show cable modem** command displays the CM timing offset in DOCSIS ticks, while other commands, such as **cable map-advance**, display the offset in microseconds. Use the following method to convert microseconds to DOCSIS ticks: ticks = microseconds*64/6.25 .

Table below describes the major fields shown in the **show cable modem registered** displays:

Table 134: Descriptions for the show cable modem registered Fields

Field	Description
Interface	The cable interface line card providing the upstream for this CM.
Prim SID	The primary SID assigned to this CM.
Online State	The current state of the MAC layer. Should show “online” for registered CMs.

Field	Description
Timing Offset	The timing offset for the CM, in ticks, as recognized on the CMTS. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. **Note** An exclamation point (!) in the Timing Offset column indicates that the CM has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. **Note** The timing offset shown here is typically smaller than the TX Time Offset value shown by the **show cable modem remote-query** command, because the latter value is the offset as recognized on the CM (which will include any internal delay between when the CM software begins the transmission and when the bits actually appear on the local cable interface).
Rec Power	The received power level (in dB) for the CM. **Note** An asterisk (*) in the RxPwr column indicates that a power adjustment has been made for that CM. An exclamation point (!) indicates that the CM has reached its maximum power transmit level and cannot increase its power level further.
QoS	Displays the QoS profile assigned to the CM (DOCSIS 1.1 and DOCSIS 2.0 CMs only).
CPE	Indicates the number of CPE devices for which the CM is providing services.
IP Address	The IP address that the DHCP server has assigned to the CM.
MAC Address	The MAC address for the CM.

The following examples show the output of the **show cable modem registered** command with specific IP Address, MAC Address and cable interface.

```
Router#show cable modem 192.180.2.26 reg
Router#show cable modem 192.180.2.26 registered
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 13:24:27.869 PST Thu May 7 2015
Interface    Prim Online        Timing Rec   QoS CPE IP address      MAC address
             Sid  State         Offset Power
C6/0/1/UB    1    w-online(pt)  1769   -1.50 2   0   192.180.2.26    c8fb.26a7.e6fe


Router#show cable modem c8fb.26a7.e6fe registered
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 13:24:02.590 PST Thu May 7 2015
Interface    Prim Online        Timing Rec   QoS CPE IP address      MAC address
             Sid  State         Offset Power
C6/0/1/UB    1    w-online(pt)  1769   -1.50 2   0   192.180.2.26    c8fb.26a7.e6fe


Router#show cable modem c6/0/1 registered
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is NTP, 13:24:58.402 PST Thu May 7 2015
Interface    Prim Online        Timing Rec   QoS CPE IP address      MAC address
             Sid  State         Offset Power
C6/0/1/UB    1    w-online(pt)  1769   -1.50 2   0   192.180.2.26    c8fb.26a7.e6fe
```

```
C6/0/1/UB    2    w-online(pt)  1771   -1.00 2   0   192.180.2.24    c8fb.26a7.ef06
C6/0/1/UB    3    w-online(pt)  1772   -0.50 2   0   192.180.2.34    c8fb.26a8.067c
C6/0/1/UB    4    w-online(pt)  1771   -2.00 2   0   192.180.2.11    c8fb.26a8.08ca
C6/0/1/UB    6    w-online(pt)  1773   -1.50 2   0   192.180.2.68    c8fb.26a8.08d6
C6/0/1/UB    7    w-online(pt)  1771   -1.50 2   0   192.180.2.23    c8fb.26a7.ef0c
C6/0/1/UB    8    w-online(pt)  1769   -1.50 2   0   192.180.2.50    c8fb.26a7.fd72
C6/0/1/UB    9    w-online(pt)  1770   -1.50 2   0   192.180.2.48    c8fb.26a8.0688
C6/0/1/UB    10   w-online(pt)  1771   -1.50 2   0   192.180.2.14    c8fb.26a7.e6dc
C6/0/1/UB    11   w-online(pt)  1773   -1.00 2   0   192.180.2.64    c8fb.26a8.08b8
C6/0/1/UB    12   w-online(pt)  1770   -0.50 2   0   192.180.2.56    c8fb.26a8.060a
C6/0/1/UB    13   w-online(pt)  1770   -1.50 2   0   192.180.2.20    c8fb.26a7.ef00
C6/0/1/UB    14   w-online(pt)  1772   -1.00 2   1   192.180.2.16    c8fb.26a7.ef08
C6/0/1/UB    15   w-online(pt)  1767   -1.00 2   0   192.180.2.27    c8fb.26a7.eef6
C6/0/1/UB    16   w-online(pt)  1772   -0.50 2   0   192.180.2.43    c8fb.26a8.05b2
C6/0/1/UB    17   w-online(pt)  1768   -1.50 2   0   192.180.2.39    c8fb.26a8.0606
C6/0/1/UB    18   w-online(pt)  1771   -1.00 2   0   192.180.2.49    c8fb.26a8.0682
C6/0/1/UB    20   w-online(pt)  1771   -1.50 2   0   192.180.2.55    c8fb.26a8.0a0c
C6/0/1/UB    21   w-online(pt)  1771   -1.00 2   0   192.180.2.59    c8fb.26a8.0604
C6/0/1/UB    22   w-online(pt)  1781   -1.00 2   0   192.180.2.7     c8fb.2633.8c94
C6/0/1/UB    23   w-online(pt)  1771   -0.50 2   0   192.180.2.46    c8fb.26a8.05c0
C6/0/1/UB    24   w-online(pt)  1770   -0.50 2   0   192.180.2.19    c8fb.26a7.eefc
C6/0/1/UB    25   w-online(pt)  1770   -1.00 2   0   192.180.2.69    c8fb.26a8.09ee
C6/0/1/UB    26   w-online(pt)  1771   -0.50 2   0   192.180.2.31    c8fb.26a8.05c6
C6/0/1/UB    27   w-online(pt)  1771   -1.50 2   0   192.180.2.70    c8fb.26a8.08d4
C6/0/1/UB    28   w-online(pt)  1773   -1.50 2   0   192.180.2.57    c8fb.26a8.05b8
C6/0/1/UB    29   w-online(pt)  1770   -1.50 2   0   192.180.2.42    c8fb.26a8.05c4
C6/0/1/UB    30   w-online(pt)  2087   -0.50 2   0   192.180.2.9     54d4.6f88.5cd8
C6/0/1/UB    31   w-online(pt)  1772   -1.50 2   0   192.180.2.36    c8fb.26a8.0678
C6/0/1/UB    32   w-online(pt)  1771   -0.50 2   0   192.180.2.67    c8fb.26a8.09ec
C6/0/1/UB    33   w-online(pt)  1768   -1.00 2   0   192.180.2.41    c8fb.26a8.05b6
C6/0/1/UB    34   w-online(pt)  1773   -0.50 2   0   192.180.2.45    c8fb.26a8.051a
C6/0/1/UB    35   w-online(pt)  1771   -1.00 2   0   192.180.2.52    c8fb.26a8.067a
C6/0/1/UB    36   w-online(pt)  1773   -1.00 2   0   192.180.2.51    c8fb.26a8.0684
C6/0/1/UB    37   w-online(pt)  1770   -1.50 2   0   192.180.2.47    c8fb.26a7.fd76
C6/0/1/UB    38   w-online(pt)  1773   -1.00 2   0   192.180.2.35    c8fb.26a8.0a04
C6/0/1/UB    39   w-online(pt)  1770   -1.50 2   0   192.180.2.72    c8fb.26a8.0a0a
C6/0/1/UB    40   w-online(pt)  1769   -0.50 2   0   192.180.2.38    c8fb.26a8.05bc
C6/0/1/UB    41   w-online(pt)  1773   -0.50 2   0   192.180.2.33    c8fb.26a8.0674
C6/0/1/UB    42   w-online(pt)  1773   -1.00 2   0   192.180.2.40    c8fb.26a8.067e
C6/0/1/UB    43   w-online(pt)  1772   -1.50 2   0   192.180.2.66    c8fb.26a8.09f8
C6/0/1/UB    44   w-online(pt)  1768   -1.50 2   0   192.180.2.12    c8fb.26a8.0610
C6/0/1/UB    45   w-online(pt)  1768   -2.00 2   0   192.180.2.21    c8fb.26a7.ef0e
C6/0/1/UB    46   w-online(pt)  1768   -2.00 2   0   192.180.2.25    c8fb.26a7.e6d8
C6/0/1/UB    47   w-online(pt)  1771   -2.00 2   0   192.180.2.15    c8fb.26a7.e6da
C6/0/1/UB    48   w-online(pt)  1772   -1.00 2   0   192.180.2.29    c8fb.26a7.e636
C6/0/1/UB    49   w-online(pt)  1770   -1.50 2   0   192.180.2.44    c8fb.26a8.0676
C6/0/1/UB    50   w-online(pt)  1769   -1.00 2   0   192.180.2.28    c8fb.26a7.ef20
C6/0/1/UB    51   w-online(pt)  1770   -1.50 2   0   192.180.2.71    c8fb.26a8.09e2
C6/0/1/UB    52   w-online(pt)  1769   -1.00 2   0   192.180.2.6     c8fb.26a8.09e0
C6/0/1/UB    53   w-online(pt)  1769   -1.00 2   0   192.180.2.37    c8fb.26a8.0690
C6/0/1/UB    54   w-online(pt)  1771   -1.00 2   0   192.180.2.22    c8fb.26a7.e680
C6/0/1/UB    55   w-online(pt)  1772   -1.50 2   0   192.180.2.58    c8fb.26a8.0a02
C6/0/1/UB    56   w-online(pt)  1769   -1.00 2   0   192.180.2.53    c8fb.26a8.04fe
C6/0/1/UB    57   w-online(pt)  1768   -2.00 2   0   192.180.2.32    c8fb.26a7.fd78
C6/0/1/UB    58   w-online(pt)  1771   -1.00 2   0   192.180.2.13    c8fb.26a8.08c4
C6/0/1/UB    61   w-online(pt)  1777   -1.00 2   0   192.180.2.119   0023.bee1.eb54
C6/0/1/UB    62   w-online(pt)  1772   -1.50 2   0   192.180.2.17    c8fb.26a7.ef10
C6/0/1/UB    63   w-online(pt)  1772   -1.50 2   0   192.180.2.30    c8fb.26a7.ef0a
C6/0/1/U1    19   w-online(pt)  1772   -1.00 0   0   192.180.2.18    0019.474a.d5ae
C6/0/1/U0    5    online(pt)    1769   -1.00 0   0   192.180.2.8     0016.924f.8200

Router#
```

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.
show cable modem calls	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem offline	Displays a list of the CMs that are marked as offline with the Cisco CMTS.
show cable modem unregistered	Displays a list of the CMs that are marked as unregistered with the Cisco CMTS.
show cable modem vendor	Displays the vendor name or Organizational Unique Identifier (OUI) for the CMs on each cable interface.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem remote-query

To display information collected by the remote-query feature, use the **show cable modem remote-query** command in privileged EXEC mode.

show cable modem remote-query

Syntax Description

This command has no keywords or arguments.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(7)XR, 12.1(2)T	This command was introduced.
12.1(2)EC1	Support for this command was added to the 12.1 EC train.
12.2(4)BC1b	Support for this command was added to the 12.2 BC train.
12.3(23)BC	Support was added for displaying status of modems during an SNMP request.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command shows the statistics collected when the remote-query feature has been enabled and configured by the **cable modem remote-query** command.

Note In Cisco IOS Release 12.1 CX, Cisco IOS Release 12.2 BC, and later, use the **show cable modem phy** command instead of the **show cable modem remote-query** command.

Tip The information shown by this command can also be displayed by querying the attributes in the CISCO-DOCS-REMOTE-QUERY-MIB.

Note Also see the information about this command's behavior in a Hot Standby Connection-to-Connection Protocol (HCCP) configuration.

Examples

The following example shows typical output from the **show cable modem remote-query** command. In this example, the final CM (IP address of 10.200.71.2) has not been configured with an SNMP community string that allows access to the remote-query feature.

```
Router# show cable modem remote-query
Remote Query Polling State : Active
```

```
IP address      MAC address     S/N    US     DS    Tx Time  Micro (dB) Modem
                                Ratio  Power  Power Offset   Reflection  State
10.200.71.8     0001.9659.47af  36.6   31.0    0.0  12352     17         online
10.200.71.4     0001.9659.47c7  36.6   37.0    0.0  12352     17         online
10.200.71.6     0001.9611.b9a3  36.6   37.0    0.0  12353     15         online
10.200.71.3     0001.9659.47a9  36.6   37.0    0.0  12351     16         online
10.200.71.2     0001.9659.47c1   0.0    0.0    0.0  0         0          online
```

In the following example, the SNMP Request column shows cable modems being offline when an SNMP request using the cable modem remote query command is not received. The modems are either offline or are not responding to the SNMP request.

```
Router# show cable modem remote-query
Remote Query Polling State : Inactive
IP address      MAC address     S/N    US     DS    Tx Time SNMP
                                Ratio  Power  Power Offset  Request
80.51.1.4       0018.f826.3453   0.0    0.0    0.0  0        CM offline
80.51.1.2       000c.e5f6.0c40   0.0    0.0    0.0  0        CM offline
80.51.1.8       0019.474a.d4fe   0.0    0.0    0.0  0        CM offline
80.51.1.3       0018.6852.82fa   0.0    0.0    0.0  0        CM offline
80.51.1.5       0019.474a.c1ae   0.0    0.0    0.0  0        CM offline
```

Table below shows the fields displayed by the **show cable modem remote-query** command.

Table 135: Descriptions for the show cable modem remote-query Fields

Field	Description
IP Address	The IP address that the DHCP server has assigned to the CM.
MAC Address	The MAC address for the CM.
S/N Ratio	The current signal-to-noise ratio (SNR) on the downstream, as seen by the CM.
US Power	The current operational transmit power level, in dBmV, as seen by the CM.
DS Power	The received power level, in dBmV, as seen by the CM. This field is set to zero if the CM does not support power level measurements.
TX Time Offset	The timing offset for the CM, in ticks, as recognized on the CM. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. The CM value includes any internal delay between when the CM software begins the transmission and when the bits actually appear on the local cable interface. **Note** The timing offset shown here is typically larger than the Time Offset value shown by the **show cable modem** command, because the latter value is the offset as recognized on the CMTS (which does not include the internal delay on the CM).

Field	Description
Micro (dB) Reflection	The approximate number of total microreflections (including in-channel responses) on the downstream, measured in dBc below the signal level, as seen by the CM. Microreflections are a type of impairment that is caused by impedance mismatches between amplifiers, couples, cables, and other equipment in the cable plant. Microreflections create copies of a signal that arrive at the receiver with different amounts of delay and attenuation, generating intersymbol interference (ISI) that can cause the receiver to improperly detect the amplitude and phase of the incoming signal. **Note** This value is not exact but provides an approximate indication of the microreflections that have been received.
Modem State	The current state of the MAC layer for the CM.

The following example shows typical output from the **show cable modem remote-query** command.

```
Router# show cable modem remote-query

IP address      MAC address     S/N    US     DS    Tx Time Micro (dB) Modem
                                Ratio  Power  Power Offset  Reflection State
10.118.4.194    0007.0e04.5ba9  33.4   42.3  - 1.0  8794    1          online
10.118.4.156    0003.6b1b.e8c9  34.0   44.0  - 1.0  8795    3          online(d)
Router#
```

The following example shows typical output from the **show cable modem remote-query** command when the remote-query feature has not been configured.

```
Router# show cable modem remote-query

Remote Query Polling State : Inactive
IP address      MAC address     S/N    US     DS    Tx Time  Micro (dB) Modem
                               Ratio  Power  Power Offset   Reflection  State
10.200.71.8     0001.9659.47af   0.0    0.0    0.0  0          0         online
10.200.71.4     0001.9659.47c7   0.0    0.0    0.0  0          0         online
10.200.71.6     0001.9611.b9a3   0.0    0.0    0.0  0          0         online
10.200.71.3     0001.9659.47a9   0.0    0.0    0.0  0          0         online
10.200.71.2     0001.9659.47c1   0.0    0.0    0.0  0          0         online
10.200.71.10    00d0.5904.5321   0.0    0.0    0.0  0          0         offline
10.200.71.11    0050.f112.5123   0.0    0.0    0.0  0          0         offline
Router#
```



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples for Cisco cBR-8 Converged Broadband Router

This example shows the output of the **show cable modem remote-query** command:

```
Router#show cable modem  remote-query
Remote Query Polling State : Inactive
```

MAC address	S/N Ratio	US Power	DS Power	Tx Time Offset	SNMP Request	IP address/IPv6 address
1859.334d.6622	0.0	0.0	0.0	0	NO	10.10.0.4
1859.334d.7cd2	0.0	0.0	0.0	0	NO	10.10.0.9
1859.334d.7db2	0.0	0.0	0.0	0	NO	10.10.0.10
1859.334d.7e64	0.0	0.0	0.0	0	NO	10.10.0.17
1859.334d.f658	0.0	0.0	0.0	0	NO	10.10.0.20
1859.334d.f9d0	0.0	0.0	0.0	0	NO	10.10.0.23
1859.334d.774c	0.0	0.0	0.0	0	NO	10.10.0.25
1859.334d.f628	0.0	0.0	0.0	0	NO	10.10.0.28
1859.334d.f60e	0.0	0.0	0.0	0	NO	10.10.0.33
1859.334d.fa36	0.0	0.0	0.0	0	NO	10.10.0.35
1859.334d.667e	0.0	0.0	0.0	0	NO	10.10.0.36
1859.334d.fb1e	0.0	0.0	0.0	0	NO	10.10.0.37
1859.334d.7d8e	0.0	0.0	0.0	0	NO	10.10.0.42
1859.334d.f604	0.0	0.0	0.0	0	NO	10.10.0.52
1859.334d.fc64	0.0	0.0	0.0	0	NO	10.10.0.57
1859.334d.f696	0.0	0.0	0.0	0	NO	10.10.0.61
1859.334d.fce6	0.0	0.0	0.0	0	NO	10.10.0.78
1859.334d.f9b0	0.0	0.0	0.0	0	NO	10.10.0.97
1859.334d.fa8c	0.0	0.0	0.0	0	NO	10.10.0.116
1859.334d.71e0	0.0	0.0	0.0	0	NO	10.10.0.123
1859.334d.7e34	0.0	0.0	0.0	0	NO	10.10.0.134
1859.334d.7e9e	0.0	0.0	0.0	0	NO	10.10.0.150
1859.334d.7cf0	0.0	0.0	0.0	0	NO	10.10.0.164
1859.334d.f96e	0.0	0.0	0.0	0	NO	10.10.0.167
1859.334d.7b68	0.0	0.0	0.0	0	NO	10.10.0.188
1859.334d.7aec	0.0	0.0	0.0	0	NO	10.10.0.176
1859.334d.fce8	0.0	0.0	0.0	0	NO	10.10.0.180
1859.334d.f62a	0.0	0.0	0.0	0	NO	10.10.0.191
1859.334d.fabc	0.0	0.0	0.0	0	NO	10.10.0.217
1859.334d.7d00	0.0	0.0	0.0	0	NO	10.10.0.224
1859.334d.6778	0.0	0.0	0.0	0	NO	10.10.0.247
1859.334d.7306	0.0	0.0	0.0	0	NO	10.10.1.18
1859.334d.65d4	0.0	0.0	0.0	0	NO	10.10.1.5
1859.334d.6604	0.0	0.0	0.0	0	NO	10.10.1.49
1859.334d.7a10	0.0	0.0	0.0	0	NO	10.10.1.51
1859.334d.7d38	0.0	0.0	0.0	0	NO	10.10.1.75
1859.334d.6434	0.0	0.0	0.0	0	NO	10.10.1.55
1859.334d.7ace	0.0	0.0	0.0	0	NO	10.10.1.78
1859.334d.7b5a	0.0	0.0	0.0	0	NO	10.10.1.61
1859.334d.7d16	0.0	0.0	0.0	0	NO	10.10.1.60
1859.334d.7c78	0.0	0.0	0.0	0	NO	10.10.1.93
1859.334d.65b0	0.0	0.0	0.0	0	NO	10.10.1.81
1859.334d.7c40	0.0	0.0	0.0	0	NO	10.10.1.82
1859.334d.804a	0.0	0.0	0.0	0	NO	10.10.1.87
1859.334d.7b2a	0.0	0.0	0.0	0	NO	10.10.1.98
1859.334d.7d04	0.0	0.0	0.0	0	NO	10.10.1.100
1859.334d.7e42	0.0	0.0	0.0	0	NO	10.10.1.107
1859.334d.6e1a	0.0	0.0	0.0	0	NO	10.10.1.109
1859.334d.7be8	0.0	0.0	0.0	0	NO	10.10.1.113
1859.334d.7a5a	0.0	0.0	0.0	0	NO	10.10.1.129
1859.334d.6584	0.0	0.0	0.0	0	NO	10.10.1.128
1859.334d.7ad2	0.0	0.0	0.0	0	NO	10.10.1.130
1859.334d.660e	0.0	0.0	0.0	0	NO	10.10.1.132
1859.334d.7b4c	0.0	0.0	0.0	0	NO	10.10.1.134
1859.334d.6688	0.0	0.0	0.0	0	NO	10.10.1.136
1859.334d.7cc0	0.0	0.0	0.0	0	NO	10.10.1.141
1859.334d.6742	0.0	0.0	0.0	0	NO	10.10.1.153
1859.334d.7aac	0.0	0.0	0.0	0	NO	10.10.1.172
1859.334d.f968	0.0	0.0	0.0	0	NO	10.10.1.177
1859.334d.7908	0.0	0.0	0.0	0	NO	10.10.1.187
1859.334d.7aa8	0.0	0.0	0.0	0	NO	10.10.1.197

```
1859.334d.7d14   0.0    0.0   0.0   0        NO        10.10.1.214
1859.334d.6602   0.0    0.0   0.0   0        NO        10.10.1.216
1859.334d.7c7e   0.0    0.0   0.0   0        NO        10.10.1.217
1859.334d.f97a   0.0    0.0   0.0   0        NO        10.10.1.219
```

Related Commands

Command	Description
cable modem remote-query	Enables and configures the remote-query feature to gather CM performance statistics on the CMTS.
debug cable remote-query	Turns on debugging to gather information from remote CMs.
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
snmp-server enable traps cable	Enables traps that are sent when the remote polling of CMs has been completed.

show cable modem resiliency

To display the resiliency status of the cable modems in resiliency mode on the Cisco CMTS router, use the **show cable modem resiliency** command in privileged EXEC mode.

show cable modem resiliency

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router.

Examples

The following example shows a sample output of the **show cable modem resiliency** command:

```
Router# show cable modem resiliency
                                Orig BG                 Curr BG
I/F     MAC Address    ID   I/F           RFs ID   I/F           RFs
------- -------------- ---- ------------------- ---- ---------------------
C7/0/0  0025.2eaf.843e 897  Wi7/0/0:0     4   898  Wi7/0/0:1     3
C7/0/0  0025.2eaf.8356 897  Wi7/0/0:0     4   899  Wi7/0/0:2     3
C7/0/0  0015.d176.5199 897  Wi7/0/0:0     4   720  In7/0/0:0
```

Table below describes the significant fields shown in the display.

Table 136: show cable modem resiliency Field Descriptions

Field	Description
I/F	Modem host interface.
MAC Address	MAC address of the cable modem.
Orig BG ID	Original wideband (WB) interface bonding group ID.
I/F	Original bonding group (BG) WB interface.
RFs	Number of RFs originally assigned.
Curr BG ID	Currently assigned bonding group ID.
I/F	Assigned interface (dynamic WB or narrowband).
RFs	Number of RFs in the interface (if assigned to a WB interface).

This example shows the output of the **show cable modem resiliency** command on the Cisco cBR router:

```
Router# show cable modem resiliency
                                Orig BG                  Curr BG
I/F     MAC Address    ID    I/F           RFs ID    I/F           RFs
------- -------------- ----------------------- ----------------------
c1/0/0  0025.2eaf.843e 897  Wi7/0/0:0     4   898  Wi7/0/0:1     3
C1/0/0  0025.2eaf.8356 897  Wi7/0/0:0     4   899  Wi7/0/0:2     3
C1/0/0  0015.d176.5199 897  Wi7/0/0:0     4   720  In7/0/0:0
```

Related Commands

Command	Description
cable resiliency ds-bonding	Enables the Downstream Resiliency Bonding Group feature on the Cisco CMTS router.
cable ds-resiliency	Reserves a resiliency bonding group for a line card on the Cisco CMTS router.
show cable resiliency	Displays all information about resiliency bonding groups on the Cisco CMTS router.

show cable modem rogue

To display a list of cable modems that have been marked, locked, or rejected because they failed the dynamic shared-secret authentication checks, use the **show cable modem rogue** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **rogue**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot*/*subslot*/*port* | *slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **rogue**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot*/*subslot*/*cable-interface-index*] **rogue**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. Cisco cBR-8 router—The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.

upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. This option is not supported on the Cisco cBR-8 router.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This option is not supported on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This option is not supported on the Cisco cBR-8 router.
rogue	Displays a list of cable modems that have been marked, locked, or rejected.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • Support for specifying the IPv6 address of a CM or CPE device was added. • The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** and **name** keywords, and the *logical-channel-index* variable were removed.

Usage Guidelines

This command displays a list of cable modems that attempted to register with a DOCSIS configuration file that does not pass the authentication required by the **cable dynamic-secret** command. After a cable modem is added to the rogue list, it remains in the rogue list until one of the following occurs:

- The cable modem remains offline, without attempting to reregister, for 24 hours. It is then removed from all of the CMTS internal databases, including the rogue list.
- An administrator manually deletes the cable modem from the CMTS internal databases, using the **clear cable modem delete** command.
- An administrator unlocks the cable modem using the **clear cable modem lock** command.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

The following sample output from the **show cable modem rogue** command.

```
Router# show cable modem rogue
                                      Spoof TFTP
MAC Address    Vendor     Interface  Count Dnld Dynamic Secret
AAAA.7b43.aa7f Vendor1    C4/0/U5        2  Yes  45494DC933F8F47A398F69EE6361B017
AAAA.7b43.aa7f Vendor1    C4/0/U5        2  Yes  D47BCBB5494E9936D51CB0EB66EF0B0A
BBBB.7b43.aa7f Vendor2    C4/0/U5        2  No   8EB196423170B26684BF6730C099D271
AAAA.7b43.aa7f Vendor1    C4/0/U5        2  No   DF8FE30203010001A326302430120603
BBBB.7b43.aa7f Vendor2    C4/0/U5        2  No   300E0603551D0F0101FF040403020106
AAAA.7b43.aa7f Vendor1    C4/0/U5        2  Yes  820101002D1A264CE212A1BB6C1728B3
DDDD.7b43.aa7f Vendor4    C4/0/U5        2  Yes  7935B694DCA90BC624AC92A519C214B9
AAAA.7b43.aa7f Vendor1    C4/0/U5        2  No   3AB096D00D56ECD07D9B7AB662451CFF
Router#
```

Table below describes the fields shown by the **show cable modem rogue** command.

Table 137: show cable modem Field Descriptions

Field	Description
MAC Address	The MAC address for the CM.
Vendor	Vendor name for this cable modem, as configured using the **cable modem vendor** command.

Field	Description
Interface	The cable interface line card providing the upstream for this CM.
Spoof Count	Number of times that this cable modem has attempted to register with an invalid dynamic shared-secret value. **Note** To account for possible network problems, such as loss of packets and congestion, the Cisco CMTS will allow a cable modem to attempt to register twice before marking it as having failed the dynamic shared-secret authentication checks.
TFTP Dnld	Whether TFT downloads are enforced, as configured by the **cable tftp-enforce** command.
Dynamic Secret	The dynamic shared-secret for this cable modem.

Related Commands

Command	Description
cable dynamic-secret	Enables the Dynamic Shared Secret feature, so that DOCSIS configuration files are verified with a Message Integrity Check (MIC) that has been created with a dynamically generated shared secret.
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
cable shared-secondary-secret	Configures one or more secondary shared secret keys that CMs can use to successfully process the DOCSIS configuration file and register with the CMTS.
cable shared-secret	Configures an authentication shared secret key that CMs must use to successfully process the DOCSIS configuration file and register with the CMTS.
cable tftp-enforce	Requires that all CMs on a cable interface attempt to download a DOCSIS configuration file using the Trivial File Transfer Protocol (TFTP) through the cable interface before being allowed to register and come online.
clear cable modem lock	Resets the lock on one or more CMs, and reinitializes them, so that they can reregister with a valid DOCSIS configuration file.
show cable modem	Displays information for the registered and unregistered CMs.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays the SID information for a CM.

show cable modem rbg-activity

To view CM RBG usage statistics, use the **show cable modem rbg-activity** command in privileged EXEC mode.

show cable modem ip-address mac-address cable { *slot* / *subslot* / *cable-interface-index* } **rbg-activity** { **max** | **sort-by-move-count** | **sort-by-create-count** }

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific cable modem. If you specify the IP address for a CPE behind a cable modem, the output displays information for that cable modem.
mac-address	(Optional) MAC address of a specific cable modem. If you specify the MAC address for a CPE behind a cable modem, the output displays information for that cable modem.
cable	(Optional) Displays the modems on a specific cable interface.
slot	Slot where the line card resides. The valid range is 0–3 and 6–9.
subslot	Secondary slot number of the cable interface line card. The valid value is 0.
port	Downstream port number. The valid range is 0–4 (depending on the cable interface).
cable-interface-index	The downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. The valid range is 0–15.
rbg-activity	Displays CM RBG usage statistics. The following information is shown: • Total number of times CM are moved to any RBG. • Number of RBGs that are created for this CM. • Recent RBG move history with timestamps. • Indication if CM has currently reached **cm-max-rbg-moves** limit.
max	Sort the command output information by number of **cm-max-rbg-moves**.
sort-by-move-count	Sort the command output information by number of times CM are moved to any RBG.
sort-by-create-count	Sort the command output information by number of RBGs that are created for this CM.

Command Modes

Privileged EXEC (#)

Release	Modification
Cisco IOS XE Dublin 17.12.1w	This command is introduced for the Cisco cBR Series Converged Broadband routers.

Example

The following example shows sample output of the **show cable modem Cable1/0/0 rbg-activity** command:

```
Router#show cable modem Cable1/0/0 rbg-activity
                                          Number of        CM At
         Number of Times    RBG Created   cm-max-rbg-moves
I/F      MAC Address    Moved to RBG      For This CM       Limit
-------------------------------------------------------------------------------
C1/0/0 206a.9454.30a4     2                  1               no
C1/0/0 0025.2e2d.7648     2                  1               no
C1/0/0 a84e.3f37.0e9a     3                  2               no
C1/0/0 0025.2e2d.76f4     3                  1               no
```

Related Commands

Command	Description
cable resiliency cm-max-rbg-moves	Configure the maximum number of times a CM can be moved to any RBG within the configured interval.

show cable modem rpd

To display the cable modem information associated with a specific Cisco Remote PHY Devices (RPD), use the **show cable modem rpd** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable modem rpd { *mac-address ip-address* | **id** *identifier* | **name** *name* } { **docsis** { **device-class** { **withip** } | **version** { **d31-capable** { **not-operational** | **operational** } } } | **flap** | **offline** | **partial-service** | **phy** { **normalized** | **ofdm-profile** { **upstream** | **downstream** } } | **primary-channel** { **non-bondng-capable** { **legacy-ranging** } | **sup** | **wideband** { **registered-traditional-docsis** } } | **registered** | **unregistered** | **verbose** { **normalized** | **sup** } | **wideband** { **channel** | **forwarding-summary** | **phy** | **registered-traditional-docsis** } } [**all** | { **summary** | [**total**] }]

Syntax Description

mac-adderss	(Optional) MAC address of the RPD.
ip-address	(Optional) IP address of the RPD.
id *identifier*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
all	(Optional) Displays all information on cable modems associated with a specific RPD.
summary	(Optional) Displays the summary information of cable modems associated with a specific RPD.
summary total	(Optional) Displays the summary and total information of cable modems associated with a specific RPD.
docsis version	(Optional) Displays the DOCSIS version information for cable modems.
docsis version d31-capable	(Optional) Displays the DOCSIS 3.1 version information for cable modems.
docsis device-class	(Optional) Displays the DOCSIS device-class information for cable modems.

docsis device-class withip	(Optional) Displays docsis device-class with IP addresses of the cable modems. The following two columns are displayed in the output:
	• DIP—Displays IP version configuration
	  • Y—CM is configured to dual IP.
	  • N—CM is configured with either IPv4 or IPv6.
	• IP Address—Displays the IPv6 address if the CM is configured with only IPv6. Otherwise, it displays IPv4 address.

flap	(Optional) Displays the flap list statistics for cable modems.
offline	(Optional) Displays a list of cable modems (CMs) marked as offline.

partial-service	(Optional) Displays a list of cable modems (CMs) in partial service.
phy	(Optional) Displays the DOCSIS PHY layer information for cable modems.
phy normalized	(Optional) Displays the normalized DOCSIS PHY layer information for cable modems.
phy ofdm-profile upstream	(Optional) Displays the upstream channel OFDM profiles associated with the cable modems (CMs).
phy ofdm-profile downstream	(Optional) Displays the downstream channel OFDM profiles associated with the cable modems (CMs).
primary-channel	(Optional) Display the primary-channel and host interface for cable modems (CMs).
non-bonding-capable	(Optional) Displays the cable modems and primary downstreams of the cable modems that aren't capable of bonding.
legacy-ranging	(Optional) Displays modems that access with legacy INIT-RNG-REQ.
registered-traditional-docsis	(Optional) Displays wideband cable modems registered in traditional pre DOCSIS3.0 mode.
registered	(Optional) Displays a list of cable modems (CMs) marked as registered.
unregistered	(Optional) Displays a list of the cable modems marked as unregistered.
wideband	(Optional) Displays the information for registered and unregistered wideband cable modems (CMs).
channel	(Optional) Displays the number of downstream (DS) and upstream (US) channels used by a cable modem.
forwarding-summary	(Optional) Displays the following details: • FrwdIF—The wideband interface that each modem is using. • BG DS Config—Number of downstreams in the wideband interface • Bonded State—Number of downstreams the modem is currently bonded on. • CM DS Capab—Number of downstreams the modem is capable of bonding on.
verbose	(Optional) Displays detailed information of the cable modems (CMs).

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Release	Modification
Cisco IOS XE Gibraltar 16.12.1z	The **docsis, flap, offline, partial-service, phy, primary-channel, registered, unregistered, verbose,** and **wideband** keywords were added to the command.

Usage Guidelines

Use this command to verify the cable modem information associated with a specific RPD.

The following example shows the sample output for the **show cable modem rpd** *mac-address* command:

```
Router# show cable modem rpd 0000.5e00.0091
                                                                                D
MAC Address    IP Address      I/F           MAC               Prim  RxPwr  Timing Num I
                                             State             Sid   (dBmv) Offset CPE P
0000.5e00.1522 192.0.2.102     C9/0/0/UB     w-online          21    -0.50  1327   0   N
0000.5e00.14ba 192.0.2.108     C9/0/0/UB     w-online          22    0.00   1264   0   N
0000.5e00.14e2 192.0.2.99      C9/0/0/UB     w-online          23    0.00   1264   0   N
0000.5e00.1422 192.0.2.100     C9/0/0/UB     w-online          24    0.50   1302   0   N
0000.5e00.1526 192.0.2.109     C9/0/0/UB     w-online          25    0.00   1274   0   N
0000.5e00.8d1e 192.0.2.51      C9/0/0/UB     w-online          26    0.50   869    0   N
0000.5e00.148a 192.0.2.98      C9/0/0/UB     w-online          27    0.00   1187   0   N
0000.5e00.2b5e 192.0.2.78      C9/0/0/UB     w-online          35    0.50   871    0   N
0000.5e00.1512 192.0.2.101     C9/0/0/UB     w-online          37    0.00   1302   0   N
0000.5e00.80aa 192.0.2.50      C9/0/0/UB     w-online          39    0.00   1462   0   N
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* command:

```
Router# show cable modem rpd 192.0.2.80
                                                                                D
MAC Address    IP Address      I/F           MAC               Prim  RxPwr  Timing Num I
                                             State             Sid   (dBmv) Offset CPE P
0000.5e00.1522 192.0.2.102     C9/0/0/UB     w-online          21    -0.50  1327   0   N
0000.5e00.14ba 192.0.2.108     C9/0/0/UB     w-online          22    0.00   1264   0   N
0000.5e00.14e2 192.0.2.99      C9/0/0/UB     w-online          23    0.00   1264   0   N
0000.5e00.1422 192.0.2.100     C9/0/0/UB     w-online          24    0.50   1302   0   N
0000.5e00.1526 192.0.2.109     C9/0/0/UB     w-online          25    0.00   1274   0   N
0000.5e00.8d1e 192.0.2.51      C9/0/0/UB     w-online          26    0.50   869    0   N
0000.5e00.148a 192.0.2.98      C9/0/0/UB     w-online          27    0.00   1187   0   N
0000.5e00.2b5e 192.0.2.78      C9/0/0/UB     w-online          35    0.50   871    0   N
0000.5e00.1512 192.0.2.101     C9/0/0/UB     w-online          37    0.00   1302   0   N
0000.5e00.80aa 192.0.2.50      C9/0/0/UB     w-online          39    0.00   1462   0   N
```

The following example shows the sample output for the **show cable modem rpd name***name* command:

```
Router# show cable modem rpd name P2_MATE
                                                                                D
MAC Address    IP Address      I/F           MAC               Prim  RxPwr  Timing Num I
                                             State             Sid   (dBmv) Offset CPE P
0000.5e00.1522 192.0.2.102     C9/0/0/UB     w-online          21    -0.50  1327   0   N
0000.5e00.14ba 192.0.2.108     C9/0/0/UB     w-online          22    0.00   1264   0   N
0000.5e00.14e2 192.0.2.99      C9/0/0/UB     w-online          23    0.00   1264   0   N
0000.5e00.1422 192.0.2.100     C9/0/0/UB     w-online          24    0.50   1302   0   N
0000.5e00.1526 192.0.2.109     C9/0/0/UB     w-online          25    0.00   1274   0   N
```

```
0000.5e00.8d1e 192.0.2.51      C9/0/0/UB     w-online          26    0.50   869    0   N
0000.5e00.148a 192.0.2.98      C9/0/0/UB     w-online          27    0.00   1187   0   N
0000.5e00.2b5e 192.0.2.78      C9/0/0/UB     w-online          35    0.50   871    0   N
0000.5e00.1512 192.0.2.101     C9/0/0/UB     w-online          37    0.00   1302   0   N
0000.5e00.80aa 192.0.2.50      C9/0/0/UB     w-online          39    0.00   1462   0   N
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* command:

```
Router# show cable modem rpd id 0000.5e00.0091
                                                                                    D
MAC Address    IP Address      I/F           MAC               Prim  RxPwr  Timing Num I
                                             State             Sid   (dBmv) Offset CPE P
0000.5e00.1522 192.0.2.102     C9/0/0/UB     w-online          21    0.00   1327   0   N
0000.5e00.14ba 192.0.2.108     C9/0/0/UB     w-online          22    0.00   1264   0   N
0000.5e00.14e2 192.0.2.99      C9/0/0/UB     w-online          23    0.00   1264   0   N
0000.5e00.1422 192.0.2.100     C9/0/0/UB     w-online          24    0.50   1302   0   N
0000.5e00.1526 192.0.2.109     C9/0/0/UB     w-online          25    0.00   1276   0   N
0000.5e00.8d1e 192.0.2.51      C9/0/0/UB     w-online          26    0.50   869    0   N
0000.5e00.148a 192.0.2.98      C9/0/0/UB     w-online          27    0.00   1187   0   N
0000.5e00.2b5e 192.0.2.78      C9/0/0/UB     w-online          35    0.50   871    0   N
0000.5e00.1512 192.0.2.101     C9/0/0/UB     w-online          37    0.00   1302   0   N
0000.5e00.80aa 192.0.2.50      C9/0/0/UB     w-online          39    0.00   1462   0   N
```

The following example shows the sample output for the **show cable modem rpd** *mac-address***docsis version** command:

```
Router#show cable modem rpd 0000.5e00.5100 docsis version
MAC Address    I/F            MAC               Prim Reg QoS  US Phy DS Chl
                              State             Sid  Ver Prov Mode   Mode
0000.5e00.c49c C3/0/1/UB      w-online          35   3.0 1.1  atdma* WB
0000.5e00.bfc4 C3/0/1/UB      w-online          36   3.0 1.1  atdma* WB
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **docsis version d31-capable** command:

```
Router#show cable modem rpd 0000.5e00.5100 docsis version d31-capable
MAC Address    I/F            MAC               Reg Oper DSxUS DS   RCC   US
                              State             Ver Ver        OFDM ID    OFDMA
0000.5e00.17ae C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
0000.5e00.1556 C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
0000.5e00.18da C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **docsis device-class** command:

```
Router#show cable modem rpd 0000.5e00.5100 docsis device-class
MAC Address    I/F            MAC               Prim Reg      Device Class      Reg
                              State             Sid  Ver  --------------------  Priv
0000.5e00.952c C2/0/4/p       w-online(pt)      1    3.0  CM            RTR     BPI+
0000.5e00.2dce C2/0/4/p       w-online(pt)      2    3.0  CM            RTR     BPI+
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **docsis device-class withip** command:

```
Router#show cable modem rpd 0000.5e00.5100 docsis device-class withip
                                                                                D

MAC Address    I/F           MAC               Prim Reg      Device Class      Reg  I IP
Address
                             State             Sid  Ver  --------------------  Priv P

0000.5e00.952c C2/0/4/p      w-online(pt)      1    3.0  CM            RTR     BPI+ N
192.0.2.165
0000.5e00.2dce C2/0/4/p      w-online(pt)      2    3.0  CM            RTR     BPI+ N
192.0.2.169
0000.5e00.91c3 C2/0/4/p      w-online(pt)      3    3.0  CM            RTR     BPI+ N
192.0.2.170
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **flap** command:

```
Router#show cable modem rpd 0000.5e00.5100 flap
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0000.5e00.c08e C3/0/1/UB     0     83    0     0      0      0
0000.5e00.c57a C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c66a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:49
0000.5e00.c49c C3/0/1/UB     0     81    0     0      0      0
0000.5e00.c112 C3/0/1/UB     0     82    0     0      0      0
0000.5e00.c4b0 C3/0/1/UB     0     84    0     0     !0      0
0000.5e00.c668 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c660 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf64 C3/0/1/UB     0     81    0     0      0      0
0000.0275.dee6 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c49a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:54
0000.5e00.c4da C3/0/1/UB     0     82    0     0     !0      0
0000.5e00.bb3b C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b565 C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b61c C3/0/1/UB     0     79    0     0      0      0
0000.5e00.c612 C3/0/1/UB     0     83    0     0     !0      0
0000.5e00.c5c8 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf68 C3/0/1/UB     0     78    0     0      0      0
0000.5e00.c53c C3/0/1/UB     0     78    0     0     !1      1     Mar 23 21:50:54
0000.5e00.bf16 C3/0/1/UB     0     85    0     0     !1      1     Mar 23 21:47:34
0000.5e00.bfcc C3/0/1/UB     0     77    0     0     !1      1     Mar 23 21:51:14
0000.5e00.c43a C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c078 C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c588 C3/0/1/UB     0     80    0     0     !0      0
0000.5e00.c4b4 C3/0/1/UB     0     82    0     0     !1      1     Mar 23 21:48:44
0000.5e00.c412 C3/0/1/UB     0     83    0     0     !1      1     Mar 23 21:48:04
0000.5e00.c67c C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:29
0000.5e00.c17a C3/0/1/UB     0     79    0     0     !0      0
0000.5e00.bfc4 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c022 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c4cc C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c5c6 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c178 C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:39
0000.5e00.c56e C3/0/1/UB     0     80    0     0     !0      0
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **offline** command:

```
Router#show cable modem rpd 0000.5e00.5100 offline
Interface     MAC address    Prim Previous    Offline          Rx      Rx    SM
                             Sid  State       Time             Power   SNR   Exhaust
                                                                            Count
C3/0/1/UB     0000.5e00.c08e 1    w-online(pt)Mar 23 22:12:32  0.00    27.2  0
```

```
C3/0/1/UB     0000.5e00.c57a 2    w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c66a 3    w-online(pt)Mar 23 22:12:32  -0.50  25.4  0
C3/0/1/UB     0000.5e00.c49c 4    w-online(pt)Mar 23 22:12:32  -0.50  25.3  0
C3/0/1/UB     0000.5e00.c112 5    w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c4b0 6    w-online(pt)Mar 23 22:12:32  -0.50  27.4  0
C3/0/1/UB     0000.5e00.c668 7    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c660 8    w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.bf64 9    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.0275.dee6 10   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c49a 11   w-online(pt)Mar 23 22:12:32  -0.50  24.7  0
C3/0/1/UB     0000.5e00.c4da 12   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.bb3b 13   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
C3/0/1/UB     0000.5e00.b565 14   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.b61c 15   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c612 16   w-online(pt)Mar 23 22:12:32  0.00   26.1  0
C3/0/1/UB     0000.5e00.c5c8 17   w-online(pt)Mar 23 22:12:32  0.50   27.9  0
C3/0/1/UB     0000.5e00.bf68 18   w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.c53c 19   w-online(pt)Mar 23 22:12:32  0.00   24.9  0
C3/0/1/UB     0000.5e00.bf16 20   w-online(pt)Mar 23 22:12:32  -0.50  26.6  0
C3/0/1/UB     0000.5e00.bfcc 21   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c43a 22   w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c078 23   w-online(pt)Mar 23 22:12:32  0.00   24.4  0
C3/0/1/UB     0000.5e00.c588 24   w-online(pt)Mar 23 22:12:32  -0.50  26.7  0
C3/0/1/UB     0000.5e00.c4b4 25   w-online(pt)Mar 23 22:12:32  0.00   24.2  0
C3/0/1/UB     0000.5e00.c412 26   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c67c 27   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c17a 28   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.bfc4 29   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.c022 30   w-online(pt)Mar 23 22:12:32  0.00   27.4  0
C3/0/1/UB     0000.5e00.c4cc 31   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.c5c6 32   w-online(pt)Mar 23 22:12:32  -0.50  25.4  0
C3/0/1/UB     0000.5e00.c178 33   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c56e 34   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **partial-service** command:

```
Router#show cable modem rpd 0000.5e00.5100 partial-service
MAC Address    IP Address      I/F           MAC              DSxUS  Impaired    Impaired
                                             State            State  DS          US

0000.5e00.c660 192.0.2.4       C3/0/1/UB     p-online         7x1    3/0/0:7

0000.5e00.c43a 192.0.2.26      C3/0/1/UB     p-online         7x1    3/0/0:6
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **phy** command:

```
Router#show cable modem rpd 0000.5e00.5100 phy
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  29.13 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.22 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.39 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  29.24 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.09 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  25.14 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  24.28 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.56 861     0.00  -----  atdma* 1.1
```

```
0000.5e00.c66a C3/0/1/U2     3     23.50  25.14 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U0     4     23.50  27.90 866     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U1     4     23.75  27.74 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U3     4     23.75  26.11 867     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U0     5     24.00  28.81 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U1     5     24.00  28.16 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U2     5     24.00  27.99 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U3     5     23.75  25.61 876     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U0     6     23.50  28.16 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U1     6     23.75  27.67 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U2     6     23.50  26.58 866     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U3     6     23.25  24.89 867     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U0     7     24.00  28.16 864     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U1     7     24.00  27.29 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U2     7     24.50  26.63 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U3     7     23.75  25.75 862     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U0     8     23.50  29.13 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U1     8     23.75  28.24 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U2     8     23.50  25.75 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U3     8     23.75  24.60 870     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **phy ofdm-profile** command:

```
Router#show cable modem rpd 0000.5e00.5100 phy ofdm-profile
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **phy ofdm-profile downstream** command:

```
Router#show cable modem rpd 0000.5e00.5100 phy ofdm-profile downstream
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **phy normalized** command:

```
Router#show cable modem rpd 0000.5e00.5100 phy normalized
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  28.92 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.09 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.23 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  27.99 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.74 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  27.09 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  23.74 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.65 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U2     3     23.50  26.45 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U0     4     23.50  28.81 866     0.00  -----  atdma* 1.1
```

```
0000.5e00.c49c C3/0/1/U1     4     23.75  29.24 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U3     4     23.75  25.41 867     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **primary-channel** command:

```
Router#show cable modem rpd 0000.5e00.5100 primary-channel
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **primary-channel wideband registered-traditional-docsis** command:

```
Router#show cable modem rpd 0000.5e00.5100 primary-channel wideband
registered-traditional-docsis
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.952c 192.0.2.165     C2/0/4/U6     online(pt)        1     0   Do2/0/28:28
23580
0000.5e00.2dce 192.0.2.169     C2/0/4/U2     online(pt)        2     0   Do2/0/28:28
23580
0000.5e00.91c3 192.0.2.170     C2/0/4/U6     online(pt)        3     0   Do2/0/28:28
23580
0000.5e00.9ec9 192.0.2.162     C2/0/4/U1     online(pt)        4     0   Do2/0/28:4
23556
0000.5e00.21e0 192.0.2.168     C2/0/4/U2     online(pt)        5     0   Do2/0/28:20
23572
0000.5e00.a940 192.0.2.164     C2/0/4/U4     online(pt)        6     0   Do2/0/28:20
23572
0000.5e00.91bd 192.0.2.166     C2/0/4/U0     online(pt)        7     0   Do2/0/28:24
23576
0000.5e00.9190 192.0.2.163     C2/0/4/U2     online(pt)        8     0   Do2/0/28:16
23568
0000.5e00.9f5f 192.0.2.161     C2/0/4/U0     online(pt)        9     0   Do2/0/28:0
23552
0000.5e00.91ba 192.0.2.171     C2/0/4/U3     online(pt)        10    0   Do2/0/28:16
23568
0000.5e00.a8cb 192.0.2.167     C2/0/4/U1     online(pt)        11    0   Do2/0/28:16
23568
0000.5e00.17ae 192.0.2.156     C2/0/4/U2     init6(t)          29    0   Do2/0/28:20
23572
0000.5e00.1556 ---             C2/0/4/U5     init(r1)          30    0   Do2/0/28:16
23568
0000.5e00.18da ---             C2/0/4/U4     init(rc)          31    0   Do2/0/28:16
23568
0000.5e00.196e 192.0.2.157     C2/0/4/U3     init6(t)          32    0   Do2/0/28:16
23568
0000.5e00.18ce ---             C2/0/4/U0     init(rc)          53    0   Do2/0/28:16
23568
0000.5e00.18f6 ---             C2/0/4/U5     init6(s)          59    0   Do2/0/28:20
2357
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **primary-channel wideband** command:

```
Router#show cable modem rpd 0000.5e00.5100 primary-channel wideband
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **primary-channel non-bonding-capable** command:

```
Router#show cable modem rpd 0000.5e00.5100 primary-channel non-bonding-capable
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c588 192.0.2.27      C3/0/1/U0     init(o)           187   0   Do3/0/0:6
24582
0000.5e00.c57a 192.0.2.55      C3/0/1/U3     init(o)           188   0   Do3/0/0:0
24576
0000.5e00.c112 192.0.2.11      C3/0/1/U3     init(o)           189   0   Do3/0/0:3
24579
0000.5e00.c078 192.0.2.88      C3/0/1/U1     init(t)           190   0   Do3/0/0:0
24576
0000.5e00.c178 ---             C3/0/1/U1     init(io)          191   0   Do3/0/0:7
24583
0000.5e00.c4da ---             C3/0/1/U3     init(io)          192   0   Do3/0/0:5
24581
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **primary-channel sup** command:

```
Router#show cable modem rpd 0000.5e00.5100 primary-channel sup
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.bfcc 192.0.2.19      C3/0/1        online            1     0   Do3/0/0:4
24580
0000.0275.dee6 192.0.2.12      C3/0/1        online            2     0   Do3/0/0:0
24576
0000.5e00.c612 192.0.2.10      C3/0/1        online            3     0   Do3/0/0:0
24576
0000.5e00.c49c 192.0.2.3       C3/0/1        online            4     0   Do3/0/0:6
24582
0000.5e00.c53c 192.0.2.8       C3/0/1        online            5     0   Do3/0/0:0
24576
0000.5e00.c08e 192.0.2.21      C3/0/1        online            6     0   Do3/0/0:1
24577
0000.5e00.c588 192.0.2.27      C3/0/1        online            7     0   Do3/0/0:1
24577
0000.5e00.c4cc 192.0.2.24      C3/0/1        online            8     0   Do3/0/0:6
24582
0000.5e00.c660 192.0.2.4       C3/0/1        online            9     0   Do3/0/0:0
24576
0000.5e00.c022 192.0.2.22      C3/0/1        online            10    0   Do3/0/0:3
24579
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **primary-channel summary total** command:

```
Router#show cable modem rpd 0000.5e00.5100 primary-channel summary total
                              Cable Modem
              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO

Local Primary Narrowband:
Do3/0/0:0     7     7     7     0     0       0        0      0     0      0
Do3/0/0:1     4     4     4     0     0       0        0      0     0      0
Do3/0/0:2     1     1     1     0     0       0        0      0     0      0
Do3/0/0:3     2     2     2     0     0       0        0      0     0      0
Do3/0/0:4     14    14    14    0     0       0        0      0     0      0
Do3/0/0:5     2     2     2     0     0       0        0      0     0      0
Do3/0/0:6     3     3     3     0     0       0        0      0     0      0
Do3/0/0:7     1     1     1     0     0       0        0      0     0      0
Subtotal:     34    34    34    0     0       0        0      0     0      0

Local Primary Wideband:
Subtotal:     0     0     0     0     0       0        0      0     0      0

Total:        34    34    34    0     0       0        0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **registered** command:

```
Router#show cable modem rpd 0000.5e00.5100 registered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/UB    1    w-online(pt)      876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/UB    2    w-online(pt)      872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/UB    3    w-online(pt)      860    -0.50 2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/UB    4    w-online(pt)      866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/UB    5    w-online(pt)      876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/UB    6    w-online(pt)      866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/UB    7    w-online(pt)      864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/UB    8    w-online(pt)      870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/UB    9    w-online(pt)      873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/UB    10   w-online(pt)      1293   0.00  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **unregistered** command:

```
Router#show cable modem rpd 0000.5e00.5100 unregistered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/U1    1    offline           876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/U1    2    offline           872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/U2    3    offline           860    0.00  2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/U0    4    offline           866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/U3    5    offline           876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/U2    6    offline           866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/U0    7    offline           864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/U2    8    offline           870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/U0    9    offline           873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/U1    10   offline           1293   0.50  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **wideband** command:

```
Router#show cable modem rpd 0000.5e00.5100 wideband
MAC Address    IP Address      I/F           MAC              Prim  RCC  MD-DS-SG/
                                             State            Sid   ID   MD-US-SG
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)     1     5    4 / 4
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)     2     5    4 / 4
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **wideband channel** command:

```
Router#show cable modem rpd 0000.5e00.5100 wideband channel
MAC Address    IP Address      I/F           MAC              DSxUS Primary
                                             State                  WB
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)     8x4   Wi3/0/0:0
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)     8x4   Wi3/0/0:0
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **wideband forwarding-summary** command:

```
Router#show cable modem rpd 0000.5e00.5100 wideband forwarding-summary
MAC Address    IP Address      Primary       FrwdIF         BG DS  Bonded CM DS
                               Downstream                   Config State  Capab
0000.5e00.c08e 192.0.2.21      Do3/0/0:7     Wi3/0/0:0      8      8      8
0000.5e00.c57a 192.0.2.55      Do3/0/0:2     Wi3/0/0:0      8      8      8
0000.5e00.c66a 192.0.2.25      Do3/0/0:4     Wi3/0/0:0      8      8      8
0000.5e00.c49c 192.0.2.3       Do3/0/0:1     Wi3/0/0:0      8      8      8
0000.5e00.c112 192.0.2.11      Do3/0/0:6     Wi3/0/0:0      8      8      8
0000.5e00.c4b0 192.0.2.54      Do3/0/0:5     Wi3/0/0:0      8      8      8
0000.5e00.c668 192.0.2.20      Do3/0/0:4     Wi3/0/0:0      8      8      8
0000.5e00.c660 192.0.2.4       Do3/0/0:1     Wi3/0/0:0      8      8      8
0000.5e00.bf64 192.0.2.59      Do3/0/0:6     Wi3/0/0:0      8      8      8
0000.5e00.dee6 192.0.2.12      Do3/0/0:0     Wi3/0/0:1      24     24     24
0000.5e00.c49a 192.0.2.9       Do3/0/0:1     Wi3/0/0:0      8      8      8
0000.5e00.c4da 192.0.2.16      Do3/0/0:0     Wi3/0/0:0      8      8      8
0000.5e00.bb3b 192.0.2.15      Do3/0/0:0     Wi3/0/0:1      24     24     24
0000.5e00.b565 192.0.2.6       Do3/0/0:0     Wi3/0/0:1      24     24     24
0000.5e00.b61c 192.0.2.13      Do3/0/0:1     Wi3/0/0:1      24     24     24
0000.5e00.c612 192.0.2.10      Do3/0/0:6     Wi3/0/0:0      8      8      8
0000.5e00.c5c8 192.0.2.2       Do3/0/0:5     Wi3/0/0:0      8      8      8
0000.5e00.bf68 192.0.2.18      Do3/0/0:7     Wi3/0/0:0      8      8      8
0000.5e00.c53c 192.0.2.8       Do3/0/0:2     Wi3/0/0:0      8      8      8
0000.5e00.bf16 192.0.2.56      Do3/0/0:6     Wi3/0/0:0      8      8      8
0000.5e00.bfcc 192.0.2.19      Do3/0/0:2     Wi3/0/0:0      8      8      8
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **wideband phy** command:

```
Router#show cable modem name node1 wideband phy
MAC Address    IP Address      I/F           MAC              Chan   Frq    SNR    Pwr
                                             State            Desc   (MHZ)  (db)   (dBmV)
0000.5e00.c08e 192.0.2.21     C3/0/1/UB     w-online(pt)     dsPri   495   -----   0.00
                                                            dsSec   453    N/A    N/A
                                                            dsSec   459    N/A    N/A
                                                            dsSec   465    N/A    N/A
                                                            dsSec   471    N/A    N/A
                                                            dsSec   477    N/A    N/A
                                                            dsSec   483    N/A    N/A
                                                            dsSec   489    N/A    N/A
                                                             us0     13   29.13  31.75
                                                             us1     14   27.22  32.00
                                                             us2     16   27.90  32.50
                                                             us3     18   24.72  32.50
```

```
0000.5e00.c57a 192.0.2.55     C3/0/1/UB     w-online(pt)       dsPri   465  -----   0.00
                                                               dsSec   453    N/A    N/A
                                                               dsSec   459    N/A    N/A
                                                               dsSec   471    N/A    N/A
                                                               dsSec   477    N/A    N/A
                                                               dsSec   483    N/A    N/A
                                                               dsSec   489    N/A    N/A
                                                               dsSec   495    N/A    N/A
                                                                us0     13  27.09  24.25
                                                                us1     14  28.16  24.25
                                                                us2     16  26.00  24.00
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **wideband registered-traditional-docsis** command:

```
Router#show cable modem name node1 wideband registered-traditional-docsis
MAC Address    IP Address      I/F           MAC               Prim  RCC  MD-DS-SG/
                                             State             Sid   ID   MD-US-SG
0000.5e00.bfcc 192.0.2.19      C3/0/1/U1     online            1     0    2 / N/A
0000.5e00.dee6 192.0.2.12      C3/0/1/U0     online            2     0    2 / N/A
0000.5e00.c612 192.0.2.10      C3/0/1/U3     online            3     0    2 / N/A
0000.5e00.c49c 192.0.2.3       C3/0/1/U3     online            4     0    2 / N/A
0000.5e00.c53c 192.0.2.8       C3/0/1/U0     online            5     0    2 / N/A
0000.5e00.c08e 192.0.2.21      C3/0/1/U2     online            6     0    2 / N/A
0000.5e00.c588 192.0.2.27      C3/0/1/U0     online            7     0    2 / N/A
0000.5e00.c4cc 192.0.2.24      C3/0/1/U2     online            8     0    2 / N/A
0000.5e00.c660 192.0.2.4       C3/0/1/U1     online            9     0    2 / N/A
0000.5e00.c022 192.0.2.22      C3/0/1/U0     online            10    0    2 / N/A
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **verbose** command:

```
Router#show cable modem rpd 0000.5e00.5100 verbose

MAC Address                       : 0000.5e00.c08e
IP Address                        : 192.0.2.21
IPv6 Address                      : ---
Dual IP                           : N
Prim Sid                          : 1
QoS Profile Index                 : 2
Host Interface                    : C3/0/1/U1
RPD ID                            : 1004.9fb1.4000
MD-DS-SG / MD-US-SG               : 4 / N/A
MD-CM-SG                          : 0x910404
Primary Downstream                : Do3/0/0:7 (RfId : 24583, SC-QAM)
Wideband Capable                  : Y
DS Tuner Capability               : 8
RCP Index                         : 3
RCP ID                            : 00 10 00 00 08
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
UDC Enabled                       : N
US Frequency Range Capability     : Standard (5-42 MHz)
Extended Upstream Transmit Power  : 0dB
Multi-Transmit Channel Mode       : N
Upstream Channel                  :
Device ID                         :
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **verbose normalized** command:

```
Router#show cable modem rpd 0000.5e00.5100 verbose normalized

MAC Address                          : 0000.5e00.c08e
IP Address                           : 192.0.2.21
IPv6 Address                         : ---
Dual IP                              : N
Prim Sid                             : 1
Host Interface                       : C3/0/1/UB
RPD ID                               : 1004.9fb1.4000
MD-DS-SG / MD-US-SG                  : 4 / 4
MD-CM-SG                             : 0x910404
Primary Wideband Channel ID          : 24577 (Wi3/0/0:0)
Primary Downstream                   : Do3/0/0:7 (RfId : 24583, SC-QAM)
Wideband Capable                     : Y
DS Tuner Capability                  : 8
RCP Index                            : 3
RCP ID                               : 00 10 00 00 08
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
Downstream Channel DCID RF Channel : 1     3/0/0:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     3/0/0:1 (SC-QAM)
Downstream Channel DCID RF Channel : 3     3/0/0:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     3/0/0:3 (SC-QAM)
Downstream Channel DCID RF Channel : 5     3/0/0:4 (SC-QAM)
Downstream Channel DCID RF Channel : 6     3/0/0:5 (SC-QAM)
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **verbose sup** command:

```
Router#show cable modem rpd 0000.5e00.5100 verbose sup
MAC Address                          : 0000.5e00.91ba
IP Address                           : 192.0.2.171
IPv6 Address                         : ---
Dual IP                              : N
Prim Sid                             : 10
Host Interface                       : C2/0/4
MD-DS-SG / MD-US-SG                  : 7 / 8
Primary Wideband Channel ID          : 23569 (Wi2/0/28:16)
Primary Downstream                   : Do2/0/28:16 (RfId : 23568)
Wideband Capable                     : Y
DS Tuner Capability                  : 24
RCP Index                            : 3
RCP ID                               : 00 10 00 00 18
MAC Version                          : DOC3.0
Operational Version                  : DOC1.1
QoS Provisioned Mode                 : DOC1.1
Enable DOCSIS2.0 Mode                : Y
Modem Status                         : {Modem= w-online(pt), Security=assign(tek)}
Tag                                  :
Service Type ID                      :
Service Type ID in config file       :
Ranging Class ID                     : 0x0


UPSTREAM SERVICE FLOW DETAIL:
Sfid                      : 45
Sid                       : 10
State                     : Admitted
Type                      : Primary
Schedule Type             : 2
Hfid                      : 131071
Service Class Name        :
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **summary** command:

```
Router# show cable modem rpd 0000.5e00.5100 summary
Interface                    Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd** *mac-address* **summary total** command:

```
Router# show cable modem rpd 0000.5e00.5100 summary total
Interface                    Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0

Total:        10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **docsis version** command:

```
Router#show cable modem rpd 192.0.2.11 docsis version
MAC Address    I/F            MAC               Prim Reg QoS  US Phy DS Chl
                              State             Sid  Ver Prov Mode   Mode
0000.5e00.c49c C3/0/1/UB      w-online          35   3.0 1.1  atdma* WB
0000.5e00.bfc4 C3/0/1/UB      w-online          36   3.0 1.1  atdma* WB
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **docsis version d31-capable** command:

```
Router#show cable modem rpd 192.0.2.11 docsis version d31-capable
MAC Address    I/F            MAC               Reg Oper DSxUS DS   RCC   US
                              State             Ver Ver        OFDM ID    OFDMA
0000.5e00.17ae C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
0000.5e00.1556 C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
0000.5e00.18da C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **docsis device-class** command:

```
Router#show cable modem rpd 192.0.2.11 docsis device-class
MAC Address    I/F            MAC               Prim Reg      Device Class      Reg
                              State             Sid  Ver  --------------------  Priv
0000.5e00.952c C2/0/4/p       w-online(pt)      1    3.0  CM            RTR     BPI+
0000.5e00.2dce C2/0/4/p       w-online(pt)      2    3.0  CM            RTR     BPI+
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **docsis device-class withip** command:

```
Router#show cable modem rpd 192.0.2.11 docsis device-class withip
                                                                          D
```

```
MAC Address    I/F           MAC               Prim Reg      Device Class      Reg  I IP
Address
                             State             Sid  Ver  --------------------  Priv P

0000.5e00.952c C2/0/4/p      w-online(pt)      1    3.0  CM            RTR     BPI+ N
192.0.2.165
0000.5e00.2dce C2/0/4/p      w-online(pt)      2    3.0  CM            RTR     BPI+ N
192.0.2.169
0000.5e00.91c3 C2/0/4/p      w-online(pt)      3    3.0  CM            RTR     BPI+ N
192.0.2.170
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **flap** command:

```
Router#show cable modem rpd 192.0.2.11 flap
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0000.5e00.c08e C3/0/1/UB     0     83    0     0      0      0
0000.5e00.c57a C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c66a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:49
0000.5e00.c49c C3/0/1/UB     0     81    0     0      0      0
0000.5e00.c112 C3/0/1/UB     0     82    0     0      0      0
0000.5e00.c4b0 C3/0/1/UB     0     84    0     0     !0      0
0000.5e00.c668 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c660 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf64 C3/0/1/UB     0     81    0     0      0      0
0000.0275.dee6 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c49a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:54
0000.5e00.c4da C3/0/1/UB     0     82    0     0     !0      0
0000.5e00.bb3b C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b565 C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b61c C3/0/1/UB     0     79    0     0      0      0
0000.5e00.c612 C3/0/1/UB     0     83    0     0     !0      0
0000.5e00.c5c8 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf68 C3/0/1/UB     0     78    0     0      0      0
0000.5e00.c53c C3/0/1/UB     0     78    0     0     !1      1     Mar 23 21:50:54
0000.5e00.bf16 C3/0/1/UB     0     85    0     0     !1      1     Mar 23 21:47:34
0000.5e00.bfcc C3/0/1/UB     0     77    0     0     !1      1     Mar 23 21:51:14
0000.5e00.c43a C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c078 C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c588 C3/0/1/UB     0     80    0     0     !0      0
0000.5e00.c4b4 C3/0/1/UB     0     82    0     0     !1      1     Mar 23 21:48:44
0000.5e00.c412 C3/0/1/UB     0     83    0     0     !1      1     Mar 23 21:48:04
0000.5e00.c67c C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:29
0000.5e00.c17a C3/0/1/UB     0     79    0     0     !0      0
0000.5e00.bfc4 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c022 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c4cc C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c5c6 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c178 C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:39
0000.5e00.c56e C3/0/1/UB     0     80    0     0     !0      0
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **offline** command:

```
Router#show cable modem rpd 192.0.2.11 offline
Interface     MAC address    Prim Previous    Offline         Rx      Rx    SM
                             Sid  State       Time            Power   SNR   Exhaust
                                                                            Count
C3/0/1/UB     0000.5e00.c08e 1    w-online(pt)Mar 23 22:12:32  0.00    27.2  0
C3/0/1/UB     0000.5e00.c57a 2    w-online(pt)Mar 23 22:12:32  0.00    25.1  0
C3/0/1/UB     0000.5e00.c66a 3    w-online(pt)Mar 23 22:12:32  -0.50   25.4  0
```

```
C3/0/1/UB     0000.5e00.c49c 4    w-online(pt)Mar 23 22:12:32  -0.50  25.3  0
C3/0/1/UB     0000.5e00.c112 5    w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c4b0 6    w-online(pt)Mar 23 22:12:32  -0.50  27.4  0
C3/0/1/UB     0000.5e00.c668 7    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c660 8    w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.bf64 9    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.0275.dee6 10   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c49a 11   w-online(pt)Mar 23 22:12:32  -0.50  24.7  0
C3/0/1/UB     0000.5e00.c4da 12   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.bb3b 13   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
C3/0/1/UB     0000.5e00.b565 14   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.b61c 15   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c612 16   w-online(pt)Mar 23 22:12:32  0.00   26.1  0
C3/0/1/UB     0000.5e00.c5c8 17   w-online(pt)Mar 23 22:12:32  0.50   27.9  0
C3/0/1/UB     0000.5e00.bf68 18   w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.c53c 19   w-online(pt)Mar 23 22:12:32  0.00   24.9  0
C3/0/1/UB     0000.5e00.bf16 20   w-online(pt)Mar 23 22:12:32  -0.50  26.6  0
C3/0/1/UB     0000.5e00.bfcc 21   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c43a 22   w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c078 23   w-online(pt)Mar 23 22:12:32  0.00   24.4  0
C3/0/1/UB     0000.5e00.c588 24   w-online(pt)Mar 23 22:12:32  -0.50  26.7  0
C3/0/1/UB     0000.5e00.c4b4 25   w-online(pt)Mar 23 22:12:32  0.00   24.2  0
C3/0/1/UB     0000.5e00.c412 26   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c67c 27   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c17a 28   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.bfc4 29   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.c022 30   w-online(pt)Mar 23 22:12:32  0.00   27.4  0
C3/0/1/UB     0000.5e00.c4cc 31   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.c5c6 32   w-online(pt)Mar 23 22:12:32  -0.50  25.4  0
C3/0/1/UB     0000.5e00.c178 33   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c56e 34   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **partial-service** command:

```
Router#show cable modem rpd 192.0.2.11 partial-service
MAC Address    IP Address      I/F           MAC              DSxUS  Impaired    Impaired
                                             State            State  DS          US

0000.5e00.c660 192.0.2.4       C3/0/1/UB     p-online         7x1    3/0/0:7

0000.5e00.c43a 192.0.2.26      C3/0/1/UB     p-online         7x1    3/0/0:6
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **phy** command:

```
Router#show cable modem rpd 192.0.2.11 phy
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                 (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  29.13 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.22 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.39 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  29.24 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.09 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  25.14 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  24.28 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.56 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U2     3     23.50  25.14 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
```

```
0000.5e00.c49c C3/0/1/U0     4     23.50  27.90 866     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U1     4     23.75  27.74 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U3     4     23.75  26.11 867     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U0     5     24.00  28.81 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U1     5     24.00  28.16 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U2     5     24.00  27.99 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U3     5     23.75  25.61 876     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U0     6     23.50  28.16 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U1     6     23.75  27.67 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U2     6     23.50  26.58 866     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U3     6     23.25  24.89 867     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U0     7     24.00  28.16 864     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U1     7     24.00  27.29 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U2     7     24.50  26.63 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U3     7     23.75  25.75 862     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U0     8     23.50  29.13 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U1     8     23.75  28.24 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U2     8     23.50  25.75 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U3     8     23.75  24.60 870     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **phy ofdm-profile** command:

```
Router#show cable modem rpd 192.0.2.11 phy ofdm-profile
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **phy ofdm-profile downstream** command:

```
Router#show cable modem rpd 192.0.2.11 phy ofdm-profile downstream
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **phy normalized** command:

```
Router#show cable modem rpd 192.0.2.11 phy normalized
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  28.92 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.09 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.23 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  27.99 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.74 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  27.09 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  23.74 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.65 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U2     3     23.50  26.45 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U0     4     23.50  28.81 866     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U1     4     23.75  29.24 867     0.00  -----  atdma* 1.1
```

```
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U3     4     23.75  25.41 867     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **primary-channel** command:

```
Router#show cable modem rpd 192.0.2.11 primary-channel
MAC Address    IP Address      Host          MAC              Prim  Num Primary        DS
                               Interface     State            Sid   CPE Downstream
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)     1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)     2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **primary-channel wideband registered-traditional-docsis** command:

```
Router#show cable modem rpd 192.0.2.11 primary-channel wideband registered-traditional-docsis
MAC Address    IP Address      Host          MAC              Prim  Num Primary        DS
                               Interface     State            Sid   CPE Downstream
RfId
0000.5e00.952c 192.0.2.165     C2/0/4/U6     online(pt)       1     0   Do2/0/28:28
23580
0000.5e00.2dce 192.0.2.169     C2/0/4/U2     online(pt)       2     0   Do2/0/28:28
23580
0000.5e00.91c3 192.0.2.170     C2/0/4/U6     online(pt)       3     0   Do2/0/28:28
23580
0000.5e00.9ec9 192.0.2.162     C2/0/4/U1     online(pt)       4     0   Do2/0/28:4
23556
0000.5e00.21e0 192.0.2.168     C2/0/4/U2     online(pt)       5     0   Do2/0/28:20
23572
0000.5e00.a940 192.0.2.164     C2/0/4/U4     online(pt)       6     0   Do2/0/28:20
23572
0000.5e00.91bd 192.0.2.166     C2/0/4/U0     online(pt)       7     0   Do2/0/28:24
23576
0000.5e00.9190 192.0.2.163     C2/0/4/U2     online(pt)       8     0   Do2/0/28:16
23568
0000.5e00.9f5f 192.0.2.161     C2/0/4/U0     online(pt)       9     0   Do2/0/28:0
23552
0000.5e00.91ba 192.0.2.171     C2/0/4/U3     online(pt)       10    0   Do2/0/28:16
23568
0000.5e00.a8cb 192.0.2.167     C2/0/4/U1     online(pt)       11    0   Do2/0/28:16
23568
0000.5e00.17ae 192.0.2.156     C2/0/4/U2     init6(t)         29    0   Do2/0/28:20
23572
0000.5e00.1556 ---             C2/0/4/U5     init(r1)         30    0   Do2/0/28:16
23568
0000.5e00.18da ---             C2/0/4/U4     init(rc)         31    0   Do2/0/28:16
23568
0000.5e00.196e 192.0.2.157     C2/0/4/U3     init6(t)         32    0   Do2/0/28:16
23568
0000.5e00.18ce ---             C2/0/4/U0     init(rc)         53    0   Do2/0/28:16
23568
0000.5e00.18f6 ---             C2/0/4/U5     init6(s)         59    0   Do2/0/28:20
2357
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **primary-channel wideband** command:

```
Router#show cable modem rpd 192.0.2.11 primary-channel wideband
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **primary-channel non-bonding-capable** command:

```
Router#show cable modem rpd 192.0.2.11 primary-channel non-bonding-capable
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c588 192.0.2.27      C3/0/1/U0     init(o)           187   0   Do3/0/0:6
24582
0000.5e00.c57a 192.0.2.55      C3/0/1/U3     init(o)           188   0   Do3/0/0:0
24576
0000.5e00.c112 192.0.2.11      C3/0/1/U3     init(o)           189   0   Do3/0/0:3
24579
0000.5e00.c078 192.0.2.88      C3/0/1/U1     init(t)           190   0   Do3/0/0:0
24576
0000.5e00.c178 ---             C3/0/1/U1     init(io)          191   0   Do3/0/0:7
24583
0000.5e00.c4da ---             C3/0/1/U3     init(io)          192   0   Do3/0/0:5
24581
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **primary-channel sup** command:

```
Router#show cable modem rpd 192.0.2.11 primary-channel sup
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.bfcc 192.0.2.19      C3/0/1        online            1     0   Do3/0/0:4
24580
0000.0275.dee6 192.0.2.12      C3/0/1        online            2     0   Do3/0/0:0
24576
0000.5e00.c612 192.0.2.10      C3/0/1        online            3     0   Do3/0/0:0
24576
0000.5e00.c49c 192.0.2.3       C3/0/1        online            4     0   Do3/0/0:6
24582
0000.5e00.c53c 192.0.2.8       C3/0/1        online            5     0   Do3/0/0:0
24576
0000.5e00.c08e 192.0.2.21      C3/0/1        online            6     0   Do3/0/0:1
24577
0000.5e00.c588 192.0.2.27      C3/0/1        online            7     0   Do3/0/0:1
24577
0000.5e00.c4cc 192.0.2.24      C3/0/1        online            8     0   Do3/0/0:6
24582
0000.5e00.c660 192.0.2.4       C3/0/1        online            9     0   Do3/0/0:0
24576
0000.5e00.c022 192.0.2.22      C3/0/1        online            10    0   Do3/0/0:3
24579
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **primary-channel summary total** command:

```
Router#show cable modem rpd 192.0.2.11 primary-channel summary total
                                Cable Modem
              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO

Local Primary Narrowband:
Do3/0/0:0     7     7     7     0     0       0        0      0     0      0
Do3/0/0:1     4     4     4     0     0       0        0      0     0      0
Do3/0/0:2     1     1     1     0     0       0        0      0     0      0
Do3/0/0:3     2     2     2     0     0       0        0      0     0      0
Do3/0/0:4     14    14    14    0     0       0        0      0     0      0
Do3/0/0:5     2     2     2     0     0       0        0      0     0      0
Do3/0/0:6     3     3     3     0     0       0        0      0     0      0
Do3/0/0:7     1     1     1     0     0       0        0      0     0      0
Subtotal:     34    34    34    0     0       0        0      0     0      0

Local Primary Wideband:
Subtotal:     0     0     0     0     0       0        0      0     0      0

Total:        34    34    34    0     0       0        0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **registered** command:

```
Router#show cable modem rpd 192.0.2.11 registered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/UB    1    w-online(pt)      876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/UB    2    w-online(pt)      872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/UB    3    w-online(pt)      860    -0.50 2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/UB    4    w-online(pt)      866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/UB    5    w-online(pt)      876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/UB    6    w-online(pt)      866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/UB    7    w-online(pt)      864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/UB    8    w-online(pt)      870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/UB    9    w-online(pt)      873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/UB    10   w-online(pt)      1293   0.00  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **unregistered** command:

```
Router#show cable modem rpd 192.0.2.11 unregistered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/U1    1    offline           876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/U1    2    offline           872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/U2    3    offline           860    0.00  2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/U0    4    offline           866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/U3    5    offline           876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/U2    6    offline           866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/U0    7    offline           864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/U2    8    offline           870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/U0    9    offline           873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/U1    10   offline           1293   0.50  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **wideband** command:

```
Router#show cable modem rpd 192.0.2.11 wideband
MAC Address    IP Address      I/F           MAC              Prim  RCC  MD-DS-SG/
                                             State            Sid   ID   MD-US-SG
```

```
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)       1     5     4 / 4
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)       2     5     4 / 4
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **wideband channel** command:

```
Router#show cable modem rpd 192.0.2.11 wideband channel
MAC Address    IP Address      I/F           MAC                DSxUS Primary
                                             State                    WB
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)       8x4   Wi3/0/0:0
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)       8x4   Wi3/0/0:0
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **wideband forwarding-summary** command:

```
Router#show cable modem rpd 192.0.2.11 wideband forwarding-summary
MAC Address    IP Address      Primary        FrwdIF         BG DS  Bonded CM DS
                               Downstream                    Config State  Capab
0000.5e00.c08e 192.0.2.21      Do3/0/0:7      Wi3/0/0:0      8      8      8
0000.5e00.c57a 192.0.2.55      Do3/0/0:2      Wi3/0/0:0      8      8      8
0000.5e00.c66a 192.0.2.25      Do3/0/0:4      Wi3/0/0:0      8      8      8
0000.5e00.c49c 192.0.2.3       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.c112 192.0.2.11      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.c4b0 192.0.2.54      Do3/0/0:5      Wi3/0/0:0      8      8      8
0000.5e00.c668 192.0.2.20      Do3/0/0:4      Wi3/0/0:0      8      8      8
0000.5e00.c660 192.0.2.4       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.bf64 192.0.2.59      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.dee6 192.0.2.12      Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.c49a 192.0.2.9       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.c4da 192.0.2.16      Do3/0/0:0      Wi3/0/0:0      8      8      8
0000.5e00.bb3b 192.0.2.15      Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.b565 192.0.2.6       Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.b61c 192.0.2.13      Do3/0/0:1      Wi3/0/0:1      24     24     24
0000.5e00.c612 192.0.2.10      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.c5c8 192.0.2.2       Do3/0/0:5      Wi3/0/0:0      8      8      8
0000.5e00.bf68 192.0.2.18      Do3/0/0:7      Wi3/0/0:0      8      8      8
0000.5e00.c53c 192.0.2.8       Do3/0/0:2      Wi3/0/0:0      8      8      8
0000.5e00.bf16 192.0.2.56      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.bfcc 192.0.2.19      Do3/0/0:2      Wi3/0/0:0      8      8      8
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **wideband phy** command:

```
Router#show cable modem name node1 wideband phy
MAC Address    IP Address      I/F           MAC                Chan   Frq    SNR    Pwr
                                             State              Desc   (MHZ)  (db)   (dBmV)
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)       dsPri   495   -----  0.00
                                                                dsSec   453    N/A    N/A
                                                                dsSec   459    N/A    N/A
                                                                dsSec   465    N/A    N/A
                                                                dsSec   471    N/A    N/A
                                                                dsSec   477    N/A    N/A
                                                                dsSec   483    N/A    N/A
                                                                dsSec   489    N/A    N/A
                                                                 us0     13   29.13  31.75
                                                                 us1     14   27.22  32.00
                                                                 us2     16   27.90  32.50
                                                                 us3     18   24.72  32.50
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)       dsPri   465   -----  0.00
                                                                dsSec   453    N/A    N/A
                                                                dsSec   459    N/A    N/A
```

```
dsSec   471    N/A    N/A
dsSec   477    N/A    N/A
dsSec   483    N/A    N/A
dsSec   489    N/A    N/A
dsSec   495    N/A    N/A
 us0     13  27.09  24.25
 us1     14  28.16  24.25
 us2     16  26.00  24.00
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **wideband registered-traditional-docsis** command:

```
Router#show cable modem name node1 wideband registered-traditional-docsis
MAC Address    IP Address      I/F           MAC              Prim  RCC  MD-DS-SG/
                                             State            Sid   ID   MD-US-SG
0000.5e00.bfcc 192.0.2.19      C3/0/1/U1     online           1     0    2 / N/A
0000.5e00.dee6 192.0.2.12      C3/0/1/U0     online           2     0    2 / N/A
0000.5e00.c612 192.0.2.10      C3/0/1/U3     online           3     0    2 / N/A
0000.5e00.c49c 192.0.2.3       C3/0/1/U3     online           4     0    2 / N/A
0000.5e00.c53c 192.0.2.8       C3/0/1/U0     online           5     0    2 / N/A
0000.5e00.c08e 192.0.2.21      C3/0/1/U2     online           6     0    2 / N/A
0000.5e00.c588 192.0.2.27      C3/0/1/U0     online           7     0    2 / N/A
0000.5e00.c4cc 192.0.2.24      C3/0/1/U2     online           8     0    2 / N/A
0000.5e00.c660 192.0.2.4       C3/0/1/U1     online           9     0    2 / N/A
0000.5e00.c022 192.0.2.22      C3/0/1/U0     online           10    0    2 / N/A
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **verbose** command:

```
Router#show cable modem rpd 192.0.2.11 verbose

MAC Address                         : 0000.5e00.c08e
IP Address                          : 192.0.2.21
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 1
QoS Profile Index                   : 2
Host Interface                      : C3/0/1/U1
RPD ID                              : 1004.9fb1.4000
MD-DS-SG / MD-US-SG                 : 4 / N/A
MD-CM-SG                            : 0x910404
Primary Downstream                  : Do3/0/0:7 (RfId : 24583, SC-QAM)
Wideband Capable                    : Y
DS Tuner Capability                 : 8
RCP Index                           : 3
RCP ID                              : 00 10 00 00 08
Downstream Channel DCID RF Channel  : 8     3/0/0:7 (SC-QAM)
UDC Enabled                         : N
US Frequency Range Capability       : Standard (5-42 MHz)
Extended Upstream Transmit Power    : 0dB
Multi-Transmit Channel Mode         : N
Upstream Channel                    :
Device ID                           :
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **verbose normalized** command:

```
Router#show cable modem rpd 192.0.2.11 verbose normalized

MAC Address                         : 0000.5e00.c08e
IP Address                          : 192.0.2.21
```

```
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 1
Host Interface                      : C3/0/1/UB
RPD ID                              : 1004.9fb1.4000
MD-DS-SG / MD-US-SG                 : 4 / 4
MD-CM-SG                            : 0x910404
Primary Wideband Channel ID         : 24577 (Wi3/0/0:0)
Primary Downstream                  : Do3/0/0:7 (RfId : 24583, SC-QAM)
Wideband Capable                    : Y
DS Tuner Capability                 : 8
RCP Index                           : 3
RCP ID                              : 00 10 00 00 08
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
Downstream Channel DCID RF Channel : 1     3/0/0:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     3/0/0:1 (SC-QAM)
Downstream Channel DCID RF Channel : 3     3/0/0:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     3/0/0:3 (SC-QAM)
Downstream Channel DCID RF Channel : 5     3/0/0:4 (SC-QAM)
Downstream Channel DCID RF Channel : 6     3/0/0:5 (SC-QAM)
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **verbose sup** command:

```
Router#show cable modem rpd 192.0.2.11 verbose sup
MAC Address                         : 0000.5e00.91ba
IP Address                          : 192.0.2.171
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 10
Host Interface                      : C2/0/4
MD-DS-SG / MD-US-SG                 : 7 / 8
Primary Wideband Channel ID         : 23569 (Wi2/0/28:16)
Primary Downstream                  : Do2/0/28:16 (RfId : 23568)
Wideband Capable                    : Y
DS Tuner Capability                 : 24
RCP Index                           : 3
RCP ID                              : 00 10 00 00 18
MAC Version                         : DOC3.0
Operational Version                 : DOC1.1
QoS Provisioned Mode                : DOC1.1
Enable DOCSIS2.0 Mode               : Y
Modem Status                        : {Modem= w-online(pt), Security=assign(tek)}
Tag                                 :
Service Type ID                     :
Service Type ID in config file      :
Ranging Class ID                    : 0x0


UPSTREAM SERVICE FLOW DETAIL:
Sfid                      : 45
Sid                       : 10
State                     : Admitted
Type                      : Primary
Schedule Type             : 2
Hfid                      : 131071
Service Class Name        :
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **summary** command:

```
Router# show cable modem rpd 192.0.2.11 summary
Interface                     Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd** *ip-address* **summary total** command:

```
Router# show cable modem rpd 192.0.2.11 summary total
Interface                     Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0

Total:        10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **docsis version** command:

```
Router#show cable modem rpd id 0000.5e00.5100 docsis version
MAC Address    I/F            MAC              Prim Reg QoS  US Phy DS Chl
                              State            Sid  Ver Prov Mode   Mode
0000.5e00.c49c C3/0/1/UB      w-online         35   3.0 1.1  atdma* WB
0000.5e00.bfc4 C3/0/1/UB      w-online         36   3.0 1.1  atdma* WB
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **docsis version d31-capable** command:

```
Router#show cable modem rpd id 0000.5e00.5100 docsis version d31-capable
MAC Address    I/F            MAC              Reg Oper DSxUS DS   RCC   US
                              State            Ver Ver        OFDM ID    OFDMA
0000.5e00.17ae C2/0/4/UB      w-online(pt)     3.1 3.1  33x8  1    19    0
0000.5e00.1556 C2/0/4/UB      w-online(pt)     3.1 3.1  33x8  1    19    0
0000.5e00.18da C2/0/4/UB      w-online(pt)     3.1 3.1  33x8  1    19    0
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **docsis device-class** command:

```
Router#show cable modem rpd id 0000.5e00.5100 docsis device-class
MAC Address    I/F            MAC              Prim Reg      Device Class      Reg
                              State            Sid  Ver  --------------------  Priv
0000.5e00.952c C2/0/4/p       w-online(pt)     1    3.0  CM            RTR     BPI+
0000.5e00.2dce C2/0/4/p       w-online(pt)     2    3.0  CM            RTR     BPI+
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **docsis device-class withip** command:

```
Router#show cable modem rpd id 0000.5e00.5100 docsis device-class withip
                                                                                D

MAC Address    I/F            MAC              Prim Reg      Device Class      Reg  I IP
Address
```

```
                              State             Sid  Ver  --------------------  Priv P

0000.5e00.952c C2/0/4/p       w-online(pt)      1    3.0  CM            RTR     BPI+ N
192.0.2.165
0000.5e00.2dce C2/0/4/p       w-online(pt)      2    3.0  CM            RTR     BPI+ N
192.0.2.169
0000.5e00.91c3 C2/0/4/p       w-online(pt)      3    3.0  CM            RTR     BPI+ N
192.0.2.170
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **flap** command:

```
Router#show cable modem rpd id 0000.5e00.5100 flap
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0000.5e00.c08e C3/0/1/UB     0     83    0     0      0      0
0000.5e00.c57a C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c66a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:49
0000.5e00.c49c C3/0/1/UB     0     81    0     0      0      0
0000.5e00.c112 C3/0/1/UB     0     82    0     0      0      0
0000.5e00.c4b0 C3/0/1/UB     0     84    0     0     !0      0
0000.5e00.c668 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c660 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf64 C3/0/1/UB     0     81    0     0      0      0
0000.0275.dee6 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c49a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:54
0000.5e00.c4da C3/0/1/UB     0     82    0     0     !0      0
0000.5e00.bb3b C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b565 C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b61c C3/0/1/UB     0     79    0     0      0      0
0000.5e00.c612 C3/0/1/UB     0     83    0     0     !0      0
0000.5e00.c5c8 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf68 C3/0/1/UB     0     78    0     0      0      0
0000.5e00.c53c C3/0/1/UB     0     78    0     0     !1      1     Mar 23 21:50:54
0000.5e00.bf16 C3/0/1/UB     0     85    0     0     !1      1     Mar 23 21:47:34
0000.5e00.bfcc C3/0/1/UB     0     77    0     0     !1      1     Mar 23 21:51:14
0000.5e00.c43a C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c078 C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c588 C3/0/1/UB     0     80    0     0     !0      0
0000.5e00.c4b4 C3/0/1/UB     0     82    0     0     !1      1     Mar 23 21:48:44
0000.5e00.c412 C3/0/1/UB     0     83    0     0     !1      1     Mar 23 21:48:04
0000.5e00.c67c C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:29
0000.5e00.c17a C3/0/1/UB     0     79    0     0     !0      0
0000.5e00.bfc4 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c022 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c4cc C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c5c6 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c178 C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:39
0000.5e00.c56e C3/0/1/UB     0     80    0     0     !0      0
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **offline** command:

```
Router#show cable modem rpd id 0000.5e00.5100 offline
Interface     MAC address    Prim Previous    Offline          Rx      Rx    SM
                             Sid  State       Time             Power   SNR   Exhaust
                                                                            Count
C3/0/1/UB     0000.5e00.c08e 1    w-online(pt)Mar 23 22:12:32  0.00    27.2  0
C3/0/1/UB     0000.5e00.c57a 2    w-online(pt)Mar 23 22:12:32  0.00    25.1  0
C3/0/1/UB     0000.5e00.c66a 3    w-online(pt)Mar 23 22:12:32  -0.50   25.4  0
C3/0/1/UB     0000.5e00.c49c 4    w-online(pt)Mar 23 22:12:32  -0.50   25.3  0
C3/0/1/UB     0000.5e00.c112 5    w-online(pt)Mar 23 22:12:32  0.00    27.2  0
C3/0/1/UB     0000.5e00.c4b0 6    w-online(pt)Mar 23 22:12:32  -0.50   27.4  0
```

```
C3/0/1/UB     0000.5e00.c668 7    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c660 8    w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.bf64 9    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.0275.dee6 10   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c49a 11   w-online(pt)Mar 23 22:12:32  -0.50  24.7  0
C3/0/1/UB     0000.5e00.c4da 12   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.bb3b 13   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
C3/0/1/UB     0000.5e00.b565 14   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.b61c 15   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c612 16   w-online(pt)Mar 23 22:12:32  0.00   26.1  0
C3/0/1/UB     0000.5e00.c5c8 17   w-online(pt)Mar 23 22:12:32  0.50   27.9  0
C3/0/1/UB     0000.5e00.bf68 18   w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.c53c 19   w-online(pt)Mar 23 22:12:32  0.00   24.9  0
C3/0/1/UB     0000.5e00.bf16 20   w-online(pt)Mar 23 22:12:32  -0.50  26.6  0
C3/0/1/UB     0000.5e00.bfcc 21   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c43a 22   w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c078 23   w-online(pt)Mar 23 22:12:32  0.00   24.4  0
C3/0/1/UB     0000.5e00.c588 24   w-online(pt)Mar 23 22:12:32  -0.50  26.7  0
C3/0/1/UB     0000.5e00.c4b4 25   w-online(pt)Mar 23 22:12:32  0.00   24.2  0
C3/0/1/UB     0000.5e00.c412 26   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c67c 27   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c17a 28   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.bfc4 29   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.c022 30   w-online(pt)Mar 23 22:12:32  0.00   27.4  0
C3/0/1/UB     0000.5e00.c4cc 31   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.c5c6 32   w-online(pt)Mar 23 22:12:32  -0.50  25.4  0
C3/0/1/UB     0000.5e00.c178 33   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c56e 34   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **partial-service** command:

```
Router#show cable modem rpd id 0000.5e00.5100 partial-service
MAC Address    IP Address      I/F           MAC              DSxUS  Impaired    Impaired
                                             State            State  DS          US

0000.5e00.c660 192.0.2.4       C3/0/1/UB     p-online         7x1    3/0/0:7

0000.5e00.c43a 192.0.2.26      C3/0/1/UB     p-online         7x1    3/0/0:6
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **phy** command:

```
Router#show cable modem rpd id 0000.5e00.5100 phy
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)         (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  29.13 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.22 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.39 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  29.24 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.09 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  25.14 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  24.28 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.56 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U2     3     23.50  25.14 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U0     4     23.50  27.90 866     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U1     4     23.75  27.74 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
```

```
0000.5e00.c49c C3/0/1/U3     4     23.75  26.11 867     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U0     5     24.00  28.81 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U1     5     24.00  28.16 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U2     5     24.00  27.99 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U3     5     23.75  25.61 876     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U0     6     23.50  28.16 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U1     6     23.75  27.67 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U2     6     23.50  26.58 866     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U3     6     23.25  24.89 867     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U0     7     24.00  28.16 864     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U1     7     24.00  27.29 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U2     7     24.50  26.63 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U3     7     23.75  25.75 862     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U0     8     23.50  29.13 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U1     8     23.75  28.24 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U2     8     23.50  25.75 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U3     8     23.75  24.60 870     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **phy ofdm-profile** command:

```
Router#show cable modem rpd id 0000.5e00.5100 phy ofdm-profile
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **phy ofdm-profile downstream** command:

```
Router#show cable modem rpd id 0000.5e00.5100 phy ofdm-profile downstream
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **phy normalized** command:

```
Router#show cable modem rpd id 0000.5e00.5100 phy normalized
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  28.92 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.09 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.23 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  27.99 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.74 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  27.09 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  23.74 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.65 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U2     3     23.50  26.45 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U0     4     23.50  28.81 866     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U1     4     23.75  29.24 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U3     4     23.75  25.41 867     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **primary-channel** command:

```
Router#show cable modem rpd id 0000.5e00.5100 primary-channel
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **primary-channel wideband registered-traditional-docsis** command:

```
Router#show cable modem rpd id 0000.5e00.5100 primary-channel wideband
registered-traditional-docsis
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.952c 192.0.2.165     C2/0/4/U6     online(pt)        1     0   Do2/0/28:28
23580
0000.5e00.2dce 192.0.2.169     C2/0/4/U2     online(pt)        2     0   Do2/0/28:28
23580
0000.5e00.91c3 192.0.2.170     C2/0/4/U6     online(pt)        3     0   Do2/0/28:28
23580
0000.5e00.9ec9 192.0.2.162     C2/0/4/U1     online(pt)        4     0   Do2/0/28:4
23556
0000.5e00.21e0 192.0.2.168     C2/0/4/U2     online(pt)        5     0   Do2/0/28:20
23572
0000.5e00.a940 192.0.2.164     C2/0/4/U4     online(pt)        6     0   Do2/0/28:20
23572
0000.5e00.91bd 192.0.2.166     C2/0/4/U0     online(pt)        7     0   Do2/0/28:24
23576
0000.5e00.9190 192.0.2.163     C2/0/4/U2     online(pt)        8     0   Do2/0/28:16
23568
0000.5e00.9f5f 192.0.2.161     C2/0/4/U0     online(pt)        9     0   Do2/0/28:0
23552
0000.5e00.91ba 192.0.2.171     C2/0/4/U3     online(pt)        10    0   Do2/0/28:16
23568
0000.5e00.a8cb 192.0.2.167     C2/0/4/U1     online(pt)        11    0   Do2/0/28:16
23568
0000.5e00.17ae 192.0.2.156     C2/0/4/U2     init6(t)          29    0   Do2/0/28:20
23572
0000.5e00.1556 ---             C2/0/4/U5     init(r1)          30    0   Do2/0/28:16
23568
0000.5e00.18da ---             C2/0/4/U4     init(rc)          31    0   Do2/0/28:16
23568
0000.5e00.196e 192.0.2.157     C2/0/4/U3     init6(t)          32    0   Do2/0/28:16
23568
0000.5e00.18ce ---             C2/0/4/U0     init(rc)          53    0   Do2/0/28:16
23568
0000.5e00.18f6 ---             C2/0/4/U5     init6(s)          59    0   Do2/0/28:20
2357
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **primary-channel wideband** command:

```
Router#show cable modem rpd id 0000.5e00.5100 primary-channel wideband
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
```

```
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **primary-channel non-bonding-capable** command:

```
Router#show cable modem rpd id 0000.5e00.5100 primary-channel non-bonding-capable
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c588 192.0.2.27      C3/0/1/U0     init(o)           187   0   Do3/0/0:6
24582
0000.5e00.c57a 192.0.2.55      C3/0/1/U3     init(o)           188   0   Do3/0/0:0
24576
0000.5e00.c112 192.0.2.11      C3/0/1/U3     init(o)           189   0   Do3/0/0:3
24579
0000.5e00.c078 192.0.2.88      C3/0/1/U1     init(t)           190   0   Do3/0/0:0
24576
0000.5e00.c178 ---             C3/0/1/U1     init(io)          191   0   Do3/0/0:7
24583
0000.5e00.c4da ---             C3/0/1/U3     init(io)          192   0   Do3/0/0:5
24581
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **primary-channel sup** command:

```
Router#show cable modem rpd id 0000.5e00.5100 primary-channel sup
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.bfcc 192.0.2.19      C3/0/1        online            1     0   Do3/0/0:4
24580
0000.0275.dee6 192.0.2.12      C3/0/1        online            2     0   Do3/0/0:0
24576
0000.5e00.c612 192.0.2.10      C3/0/1        online            3     0   Do3/0/0:0
24576
0000.5e00.c49c 192.0.2.3       C3/0/1        online            4     0   Do3/0/0:6
24582
0000.5e00.c53c 192.0.2.8       C3/0/1        online            5     0   Do3/0/0:0
24576
0000.5e00.c08e 192.0.2.21      C3/0/1        online            6     0   Do3/0/0:1
24577
0000.5e00.c588 192.0.2.27      C3/0/1        online            7     0   Do3/0/0:1
24577
0000.5e00.c4cc 192.0.2.24      C3/0/1        online            8     0   Do3/0/0:6
24582
0000.5e00.c660 192.0.2.4       C3/0/1        online            9     0   Do3/0/0:0
24576
0000.5e00.c022 192.0.2.22      C3/0/1        online            10    0   Do3/0/0:3
24579
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **primary-channel summary total** command:

```
Router#show cable modem rpd id 0000.5e00.5100 primary-channel summary total
                             Cable Modem
             Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
```

```
Local Primary Narrowband:
Do3/0/0:0     7     7     7     0     0       0        0      0     0      0
Do3/0/0:1     4     4     4     0     0       0        0      0     0      0
Do3/0/0:2     1     1     1     0     0       0        0      0     0      0
Do3/0/0:3     2     2     2     0     0       0        0      0     0      0
Do3/0/0:4     14    14    14    0     0       0        0      0     0      0
Do3/0/0:5     2     2     2     0     0       0        0      0     0      0
Do3/0/0:6     3     3     3     0     0       0        0      0     0      0
Do3/0/0:7     1     1     1     0     0       0        0      0     0      0
Subtotal:     34    34    34    0     0       0        0      0     0      0

Local Primary Wideband:
Subtotal:     0     0     0     0     0       0        0      0     0      0

Total:        34    34    34    0     0       0        0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **registered** command:

```
Router#show cable modem rpd id 0000.5e00.5100 registered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/UB    1    w-online(pt)      876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/UB    2    w-online(pt)      872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/UB    3    w-online(pt)      860    -0.50 2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/UB    4    w-online(pt)      866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/UB    5    w-online(pt)      876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/UB    6    w-online(pt)      866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/UB    7    w-online(pt)      864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/UB    8    w-online(pt)      870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/UB    9    w-online(pt)      873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/UB    10   w-online(pt)      1293   0.00  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **unregistered** command:

```
Router#show cable modem rpd id 0000.5e00.5100 unregistered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/U1    1    offline           876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/U1    2    offline           872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/U2    3    offline           860    0.00  2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/U0    4    offline           866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/U3    5    offline           876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/U2    6    offline           866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/U0    7    offline           864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/U2    8    offline           870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/U0    9    offline           873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/U1    10   offline           1293   0.50  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **wideband** command:

```
Router#show cable modem rpd id 0000.5e00.5100 wideband
MAC Address    IP Address      I/F           MAC              Prim  RCC  MD-DS-SG/
                                             State            Sid   ID   MD-US-SG
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)     1     5    4 / 4
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)     2     5    4 / 4
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **wideband channel** command:

```
Router#show cable modem rpd id 0000.5e00.5100 wideband channel
MAC Address    IP Address      I/F           MAC               DSxUS Primary
                                             State                   WB
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      8x4   Wi3/0/0:0
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      8x4   Wi3/0/0:0
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **wideband forwarding-summary** command:

```
Router#show cable modem rpd id 0000.5e00.5100 wideband forwarding-summary
MAC Address    IP Address      Primary        FrwdIF         BG DS  Bonded CM DS
                               Downstream                    Config State  Capab
0000.5e00.c08e 192.0.2.21      Do3/0/0:7      Wi3/0/0:0      8      8      8
0000.5e00.c57a 192.0.2.55      Do3/0/0:2      Wi3/0/0:0      8      8      8
0000.5e00.c66a 192.0.2.25      Do3/0/0:4      Wi3/0/0:0      8      8      8
0000.5e00.c49c 192.0.2.3       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.c112 192.0.2.11      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.c4b0 192.0.2.54      Do3/0/0:5      Wi3/0/0:0      8      8      8
0000.5e00.c668 192.0.2.20      Do3/0/0:4      Wi3/0/0:0      8      8      8
0000.5e00.c660 192.0.2.4       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.bf64 192.0.2.59      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.dee6 192.0.2.12      Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.c49a 192.0.2.9       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.c4da 192.0.2.16      Do3/0/0:0      Wi3/0/0:0      8      8      8
0000.5e00.bb3b 192.0.2.15      Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.b565 192.0.2.6       Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.b61c 192.0.2.13      Do3/0/0:1      Wi3/0/0:1      24     24     24
0000.5e00.c612 192.0.2.10      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.c5c8 192.0.2.2       Do3/0/0:5      Wi3/0/0:0      8      8      8
0000.5e00.bf68 192.0.2.18      Do3/0/0:7      Wi3/0/0:0      8      8      8
0000.5e00.c53c 192.0.2.8       Do3/0/0:2      Wi3/0/0:0      8      8      8
0000.5e00.bf16 192.0.2.56      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.bfcc 192.0.2.19      Do3/0/0:2      Wi3/0/0:0      8      8      8
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **wideband phy** command:

```
Router#show cable modem name node1 wideband phy
MAC Address    IP Address      I/F           MAC               Chan   Frq    SNR    Pwr
                                             State             Desc   (MHZ)  (db)   (dBmV)
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      dsPri   495  -----   0.00
                                                               dsSec   453    N/A    N/A
                                                               dsSec   459    N/A    N/A
                                                               dsSec   465    N/A    N/A
                                                               dsSec   471    N/A    N/A
                                                               dsSec   477    N/A    N/A
                                                               dsSec   483    N/A    N/A
                                                               dsSec   489    N/A    N/A
                                                                us0     13  29.13  31.75
                                                                us1     14  27.22  32.00
                                                                us2     16  27.90  32.50
                                                                us3     18  24.72  32.50
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      dsPri   465  -----   0.00
                                                               dsSec   453    N/A    N/A
                                                               dsSec   459    N/A    N/A
                                                               dsSec   471    N/A    N/A
                                                               dsSec   477    N/A    N/A
                                                               dsSec   483    N/A    N/A
```

```
dsSec   489    N/A    N/A
dsSec   495    N/A    N/A
 us0     13  27.09  24.25
 us1     14  28.16  24.25
 us2     16  26.00  24.00
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **wideband registered-traditional-docsis** command:

```
Router#show cable modem name node1 wideband registered-traditional-docsis
MAC Address    IP Address      I/F           MAC              Prim  RCC  MD-DS-SG/
                                             State            Sid   ID   MD-US-SG
0000.5e00.bfcc 192.0.2.19      C3/0/1/U1     online           1     0    2 / N/A
0000.5e00.dee6 192.0.2.12      C3/0/1/U0     online           2     0    2 / N/A
0000.5e00.c612 192.0.2.10      C3/0/1/U3     online           3     0    2 / N/A
0000.5e00.c49c 192.0.2.3       C3/0/1/U3     online           4     0    2 / N/A
0000.5e00.c53c 192.0.2.8       C3/0/1/U0     online           5     0    2 / N/A
0000.5e00.c08e 192.0.2.21      C3/0/1/U2     online           6     0    2 / N/A
0000.5e00.c588 192.0.2.27      C3/0/1/U0     online           7     0    2 / N/A
0000.5e00.c4cc 192.0.2.24      C3/0/1/U2     online           8     0    2 / N/A
0000.5e00.c660 192.0.2.4       C3/0/1/U1     online           9     0    2 / N/A
0000.5e00.c022 192.0.2.22      C3/0/1/U0     online           10    0    2 / N/A
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **verbose** command:

```
Router#show cable modem rpd id 0000.5e00.5100 verbose

MAC Address                       : 0000.5e00.c08e
IP Address                        : 192.0.2.21
IPv6 Address                      : ---
Dual IP                           : N
Prim Sid                          : 1
QoS Profile Index                 : 2
Host Interface                    : C3/0/1/U1
RPD ID                            : 1004.9fb1.4000
MD-DS-SG / MD-US-SG               : 4 / N/A
MD-CM-SG                          : 0x910404
Primary Downstream                : Do3/0/0:7 (RfId : 24583, SC-QAM)
Wideband Capable                  : Y
DS Tuner Capability               : 8
RCP Index                         : 3
RCP ID                            : 00 10 00 00 08
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
UDC Enabled                       : N
US Frequency Range Capability     : Standard (5-42 MHz)
Extended Upstream Transmit Power  : 0dB
Multi-Transmit Channel Mode       : N
Upstream Channel                  :
Device ID                         :
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **verbose normalized** command:

```
Router#show cable modem rpd id 0000.5e00.5100 verbose normalized

MAC Address                       : 0000.5e00.c08e
IP Address                        : 192.0.2.21
IPv6 Address                      : ---
Dual IP                           : N
Prim Sid                          : 1
```

```
Host Interface                     : C3/0/1/UB
RPD ID                             : 1004.9fb1.4000
MD-DS-SG / MD-US-SG                : 4 / 4
MD-CM-SG                           : 0x910404
Primary Wideband Channel ID        : 24577 (Wi3/0/0:0)
Primary Downstream                 : Do3/0/0:7 (RfId : 24583, SC-QAM)
Wideband Capable                   : Y
DS Tuner Capability                : 8
RCP Index                          : 3
RCP ID                             : 00 10 00 00 08
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
Downstream Channel DCID RF Channel : 1     3/0/0:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     3/0/0:1 (SC-QAM)
Downstream Channel DCID RF Channel : 3     3/0/0:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     3/0/0:3 (SC-QAM)
Downstream Channel DCID RF Channel : 5     3/0/0:4 (SC-QAM)
Downstream Channel DCID RF Channel : 6     3/0/0:5 (SC-QAM)
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **verbose sup** command:

```
Router#show cable modem rpd id 0000.5e00.5100 verbose sup
MAC Address                        : 0000.5e00.91ba
IP Address                         : 192.0.2.171
IPv6 Address                       : ---
Dual IP                            : N
Prim Sid                           : 10
Host Interface                     : C2/0/4
MD-DS-SG / MD-US-SG                : 7 / 8
Primary Wideband Channel ID        : 23569 (Wi2/0/28:16)
Primary Downstream                 : Do2/0/28:16 (RfId : 23568)
Wideband Capable                   : Y
DS Tuner Capability                : 24
RCP Index                          : 3
RCP ID                             : 00 10 00 00 18
MAC Version                        : DOC3.0
Operational Version                : DOC1.1
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Modem Status                       : {Modem= w-online(pt), Security=assign(tek)}
Tag                                :
Service Type ID                    :
Service Type ID in config file     :
Ranging Class ID                   : 0x0


UPSTREAM SERVICE FLOW DETAIL:
Sfid                      : 45
Sid                       : 10
State                     : Admitted
Type                      : Primary
Schedule Type             : 2
Hfid                      : 131071
Service Class Name        :
```

The following example shows the sample output for the **show cable modem rpd id** *identifier* **summary** command:

```
Router# show cable modem rpd id 0000.5e00.5100 summary
Interface                    Cable Modem                                    Description
```

```
              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd id** *identidier* **summary total** command:

```
Router# show cable modem rpd id 0000.5e00.5100 summary total
Interface                    Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0

Total:        10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **docsis version** command:

```
Router#show cable modem rpd name node1 docsis version
MAC Address    I/F            MAC               Prim Reg QoS  US Phy DS Chl
                              State             Sid  Ver Prov Mode   Mode
0000.5e00.c49c C3/0/1/UB      w-online          35   3.0 1.1  atdma* WB
0000.5e00.bfc4 C3/0/1/UB      w-online          36   3.0 1.1  atdma* WB
```

The following example shows the sample output for the **show cable modem rpd name** *name* **docsis version d31-capable** command:

```
Router#show cable modem rpd name node1 docsis version d31-capable
MAC Address    I/F            MAC               Reg Oper DSxUS DS   RCC   US
                              State             Ver Ver        OFDM ID    OFDMA
0000.5e00.17ae C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
0000.5e00.1556 C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
0000.5e00.18da C2/0/4/UB      w-online(pt)      3.1 3.1  33x8  1    19    0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **docsis device-class** command:

```
Router#show cable modem rpd name node1 docsis device-class
MAC Address    I/F            MAC               Prim Reg      Device Class      Reg
                              State             Sid  Ver  --------------------  Priv
0000.5e00.952c C2/0/4/p       w-online(pt)      1    3.0  CM            RTR     BPI+
0000.5e00.2dce C2/0/4/p       w-online(pt)      2    3.0  CM            RTR     BPI+
```

The following example shows the sample output for the **show cable modem rpd name** *name* **docsis device-class withip** command:

```
Router#show cable modem rpd name node1 docsis device-class withip
                                                                                D

MAC Address    I/F            MAC               Prim Reg      Device Class      Reg  I IP
Address
                              State             Sid  Ver  --------------------  Priv P

0000.5e00.952c C2/0/4/p       w-online(pt)      1    3.0  CM            RTR     BPI+ N
192.0.2.165
```

```
0000.5e00.2dce C2/0/4/p       w-online(pt)      2    3.0  CM            RTR     BPI+ N
192.0.2.169
0000.5e00.91c3 C2/0/4/p       w-online(pt)      3    3.0  CM            RTR     BPI+ N
192.0.2.170
```

The following example shows the sample output for the **show cable modem rpd name** *name* **flap** command:

```
Router#show cable modem rpd name node1 flap
MAC Address    I/F           Ins   Hit   Miss  CRC   P-Adj   Flap  Time
0000.5e00.c08e C3/0/1/UB     0     83    0     0      0      0
0000.5e00.c57a C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c66a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:49
0000.5e00.c49c C3/0/1/UB     0     81    0     0      0      0
0000.5e00.c112 C3/0/1/UB     0     82    0     0      0      0
0000.5e00.c4b0 C3/0/1/UB     0     84    0     0     !0      0
0000.5e00.c668 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c660 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf64 C3/0/1/UB     0     81    0     0      0      0
0000.0275.dee6 C3/0/1/UB     0     80    0     0      0      0
0000.5e00.c49a C3/0/1/UB     0     87    0     0     !1      1     Mar 23 21:46:54
0000.5e00.c4da C3/0/1/UB     0     82    0     0     !0      0
0000.5e00.bb3b C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b565 C3/0/1/UB     0     79    0     0      0      0
0000.5e00.b61c C3/0/1/UB     0     79    0     0      0      0
0000.5e00.c612 C3/0/1/UB     0     83    0     0     !0      0
0000.5e00.c5c8 C3/0/1/UB     0     81    0     0      0      0
0000.5e00.bf68 C3/0/1/UB     0     78    0     0      0      0
0000.5e00.c53c C3/0/1/UB     0     78    0     0     !1      1     Mar 23 21:50:54
0000.5e00.bf16 C3/0/1/UB     0     85    0     0     !1      1     Mar 23 21:47:34
0000.5e00.bfcc C3/0/1/UB     0     77    0     0     !1      1     Mar 23 21:51:14
0000.5e00.c43a C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c078 C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c588 C3/0/1/UB     0     80    0     0     !0      0
0000.5e00.c4b4 C3/0/1/UB     0     82    0     0     !1      1     Mar 23 21:48:44
0000.5e00.c412 C3/0/1/UB     0     83    0     0     !1      1     Mar 23 21:48:04
0000.5e00.c67c C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:29
0000.5e00.c17a C3/0/1/UB     0     79    0     0     !0      0
0000.5e00.bfc4 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c022 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c4cc C3/0/1/UB     0     77    0     0      0      0
0000.5e00.c5c6 C3/0/1/UB     0     76    0     0      0      0
0000.5e00.c178 C3/0/1/UB     0     76    0     0     !1      1     Mar 23 21:51:39
0000.5e00.c56e C3/0/1/UB     0     80    0     0     !0      0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **offline** command:

```
Router#show cable modem rpd name node1 offline
Interface     MAC address    Prim Previous    Offline         Rx      Rx    SM
                             Sid  State       Time            Power   SNR   Exhaust
                                                                            Count
C3/0/1/UB     0000.5e00.c08e 1    w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c57a 2    w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c66a 3    w-online(pt)Mar 23 22:12:32  -0.50  25.4  0
C3/0/1/UB     0000.5e00.c49c 4    w-online(pt)Mar 23 22:12:32  -0.50  25.3  0
C3/0/1/UB     0000.5e00.c112 5    w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c4b0 6    w-online(pt)Mar 23 22:12:32  -0.50  27.4  0
C3/0/1/UB     0000.5e00.c668 7    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c660 8    w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.bf64 9    w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.0275.dee6 10   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
```

```
C3/0/1/UB     0000.5e00.c49a 11   w-online(pt)Mar 23 22:12:32  -0.50  24.7  0
C3/0/1/UB     0000.5e00.c4da 12   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.bb3b 13   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
C3/0/1/UB     0000.5e00.b565 14   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.b61c 15   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c612 16   w-online(pt)Mar 23 22:12:32  0.00   26.1  0
C3/0/1/UB     0000.5e00.c5c8 17   w-online(pt)Mar 23 22:12:32  0.50   27.9  0
C3/0/1/UB     0000.5e00.bf68 18   w-online(pt)Mar 23 22:12:32  0.00   27.9  0
C3/0/1/UB     0000.5e00.c53c 19   w-online(pt)Mar 23 22:12:32  0.00   24.9  0
C3/0/1/UB     0000.5e00.bf16 20   w-online(pt)Mar 23 22:12:32  -0.50  26.6  0
C3/0/1/UB     0000.5e00.bfcc 21   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c43a 22   w-online(pt)Mar 23 22:12:32  0.00   28.1  0
C3/0/1/UB     0000.5e00.c078 23   w-online(pt)Mar 23 22:12:32  0.00   24.4  0
C3/0/1/UB     0000.5e00.c588 24   w-online(pt)Mar 23 22:12:32  -0.50  26.7  0
C3/0/1/UB     0000.5e00.c4b4 25   w-online(pt)Mar 23 22:12:32  0.00   24.2  0
C3/0/1/UB     0000.5e00.c412 26   w-online(pt)Mar 23 22:12:32  -0.50  27.2  0
C3/0/1/UB     0000.5e00.c67c 27   w-online(pt)Mar 23 22:12:32  0.00   27.2  0
C3/0/1/UB     0000.5e00.c17a 28   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.bfc4 29   w-online(pt)Mar 23 22:12:32  0.00   25.8  0
C3/0/1/UB     0000.5e00.c022 30   w-online(pt)Mar 23 22:12:32  0.00   27.4  0
C3/0/1/UB     0000.5e00.c4cc 31   w-online(pt)Mar 23 22:12:32  0.00   27.0  0
C3/0/1/UB     0000.5e00.c5c6 32   w-online(pt)Mar 23 22:12:32  -0.50  25.4  0
C3/0/1/UB     0000.5e00.c178 33   w-online(pt)Mar 23 22:12:32  0.00   25.1  0
C3/0/1/UB     0000.5e00.c56e 34   w-online(pt)Mar 23 22:12:32  0.00   27.7  0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **partial-service** command:

```
Router#show cable modem rpd name node1 partial-service
MAC Address    IP Address      I/F           MAC              DSxUS  Impaired    Impaired
                                             State            State  DS          US

0000.5e00.c660 192.0.2.4       C3/0/1/UB     p-online         7x1    3/0/0:7

0000.5e00.c43a 192.0.2.26      C3/0/1/UB     p-online         7x1    3/0/0:6
```

The following example shows the sample output for the **show cable modem rpd name** *name* **phy** command:

```
Router#show cable modem rpd name node1 phy
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                 (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  29.13 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.22 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.39 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  29.24 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.09 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  25.14 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  24.28 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.56 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U2     3     23.50  25.14 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U0     4     23.50  27.90 866     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U1     4     23.75  27.74 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U3     4     23.75  26.11 867     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U0     5     24.00  28.81 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U1     5     24.00  28.16 874     0.00  -----  atdma* 1.1
0000.5e00.c112 C3/0/1/U2     5     24.00  27.99 874     0.00  -----  atdma* 1.1
```

```
0000.5e00.c112 C3/0/1/U3     5     23.75  25.61 876     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U0     6     23.50  28.16 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U1     6     23.75  27.67 867     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U2     6     23.50  26.58 866     0.00  -----  atdma* 1.1
0000.5e00.c4b0 C3/0/1/U3     6     23.25  24.89 867     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U0     7     24.00  28.16 864     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U1     7     24.00  27.29 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U2     7     24.50  26.63 862     0.00  -----  atdma* 1.1
0000.5e00.c668 C3/0/1/U3     7     23.75  25.75 862     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U0     8     23.50  29.13 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U1     8     23.75  28.24 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U2     8     23.50  25.75 870     0.00  -----  atdma* 1.1
0000.5e00.c660 C3/0/1/U3     8     23.75  24.60 870     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd name** *name* **phy ofdm-profile** command:

```
Router#show cable modem rpd name node1 phy ofdm-profile
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd name** *name* **phy ofdm-profile downstream** command:

```
Router#show cable modem rpd name node1 phy ofdm-profile downstream
MAC Address    I/F           Chan          DCID  Curr  Recm  Dwngd  Unfit
                                                 Prof  Prof  Prof   Prof
0000.5e00.17ae C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
0000.5e00.1556 C2/0/4/UB     Do2/0/28:158  159   4     4     2      N/A
```

The following example shows the sample output for the **show cable modem rpd name** *name* **phy normalized** command:

```
Router#show cable modem rpd name node1 phy normalized
MAC Address    I/F           Sid   USPwr  USMER Timing DSPwr  DSMER  Mode   DOCSIS
                                   (dBmV) (SNR) Offset (dBmV) (SNR)         Prov
                                          (dB)                (dB)
0000.5e00.c08e C3/0/1/U0     1     31.75  28.92 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U1     1     31.50  27.09 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U2     1     32.50  26.23 876     0.00  -----  atdma* 1.1
0000.5e00.c08e C3/0/1/U3     1     32.25  25.23 876     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U0     2     24.25  27.99 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U1     2     24.00  27.74 872     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U2     2     24.25  27.09 873     0.00  -----  atdma* 1.1
0000.5e00.c57a C3/0/1/U3     2     24.75  24.98 874     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U0     3     19.25  23.74 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U1     3     19.25  23.65 861     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U2     3     23.50  26.45 860     0.00  -----  atdma* 1.1
0000.5e00.c66a C3/0/1/U3     3     27.00  28.24 861     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U0     4     23.50  28.81 866     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U1     4     23.75  29.24 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U2     4     23.75  26.39 867     0.00  -----  atdma* 1.1
0000.5e00.c49c C3/0/1/U3     4     23.75  25.41 867     0.00  -----  atdma* 1.1
```

The following example shows the sample output for the **show cable modem rpd name** *name* **primary-channel** command:

```
Router#show cable modem rpd name node1 primary-channel
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd name** *name* **primary-channel wideband registered-traditional-docsis** command:

```
Router#show cable modem rpd name node1 primary-channel wideband registered-traditional-docsis
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.952c 192.0.2.165     C2/0/4/U6     online(pt)        1     0   Do2/0/28:28
23580
0000.5e00.2dce 192.0.2.169     C2/0/4/U2     online(pt)        2     0   Do2/0/28:28
23580
0000.5e00.91c3 192.0.2.170     C2/0/4/U6     online(pt)        3     0   Do2/0/28:28
23580
0000.5e00.9ec9 192.0.2.162     C2/0/4/U1     online(pt)        4     0   Do2/0/28:4
23556
0000.5e00.21e0 192.0.2.168     C2/0/4/U2     online(pt)        5     0   Do2/0/28:20
23572
0000.5e00.a940 192.0.2.164     C2/0/4/U4     online(pt)        6     0   Do2/0/28:20
23572
0000.5e00.91bd 192.0.2.166     C2/0/4/U0     online(pt)        7     0   Do2/0/28:24
23576
0000.5e00.9190 192.0.2.163     C2/0/4/U2     online(pt)        8     0   Do2/0/28:16
23568
0000.5e00.9f5f 192.0.2.161     C2/0/4/U0     online(pt)        9     0   Do2/0/28:0
23552
0000.5e00.91ba 192.0.2.171     C2/0/4/U3     online(pt)        10    0   Do2/0/28:16
23568
0000.5e00.a8cb 192.0.2.167     C2/0/4/U1     online(pt)        11    0   Do2/0/28:16
23568
0000.5e00.17ae 192.0.2.156     C2/0/4/U2     init6(t)          29    0   Do2/0/28:20
23572
0000.5e00.1556 ---             C2/0/4/U5     init(r1)          30    0   Do2/0/28:16
23568
0000.5e00.18da ---             C2/0/4/U4     init(rc)          31    0   Do2/0/28:16
23568
0000.5e00.196e 192.0.2.157     C2/0/4/U3     init6(t)          32    0   Do2/0/28:16
23568
0000.5e00.18ce ---             C2/0/4/U0     init(rc)          53    0   Do2/0/28:16
23568
0000.5e00.18f6 ---             C2/0/4/U5     init6(s)          59    0   Do2/0/28:20
2357
```

The following example shows the sample output for the **show cable modem rpd name** *name* **primary-channel wideband** command:

```
Router#show cable modem rpd name node1 primary-channel wideband
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)      1     0   Do3/0/0:7
24583
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)      2     0   Do3/0/0:2
24578
```

The following example shows the sample output for the **show cable modem rpd name** *name* **primary-channel non-bonding-capable** command:

```
Router#show cable modem rpd name node1 primary-channel non-bonding-capable
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.c588 192.0.2.27      C3/0/1/U0     init(o)           187   0   Do3/0/0:6
24582
0000.5e00.c57a 192.0.2.55      C3/0/1/U3     init(o)           188   0   Do3/0/0:0
24576
0000.5e00.c112 192.0.2.11      C3/0/1/U3     init(o)           189   0   Do3/0/0:3
24579
0000.5e00.c078 192.0.2.88      C3/0/1/U1     init(t)           190   0   Do3/0/0:0
24576
0000.5e00.c178 ---             C3/0/1/U1     init(io)          191   0   Do3/0/0:7
24583
0000.5e00.c4da ---             C3/0/1/U3     init(io)          192   0   Do3/0/0:5
24581
```

The following example shows the sample output for the **show cable modem rpd name** *name* **primary-channel sup** command:

```
Router#show cable modem rpd name node1 primary-channel sup
MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
0000.5e00.bfcc 192.0.2.19      C3/0/1        online            1     0   Do3/0/0:4
24580
0000.0275.dee6 192.0.2.12      C3/0/1        online            2     0   Do3/0/0:0
24576
0000.5e00.c612 192.0.2.10      C3/0/1        online            3     0   Do3/0/0:0
24576
0000.5e00.c49c 192.0.2.3       C3/0/1        online            4     0   Do3/0/0:6
24582
0000.5e00.c53c 192.0.2.8       C3/0/1        online            5     0   Do3/0/0:0
24576
0000.5e00.c08e 192.0.2.21      C3/0/1        online            6     0   Do3/0/0:1
24577
0000.5e00.c588 192.0.2.27      C3/0/1        online            7     0   Do3/0/0:1
24577
0000.5e00.c4cc 192.0.2.24      C3/0/1        online            8     0   Do3/0/0:6
24582
0000.5e00.c660 192.0.2.4       C3/0/1        online            9     0   Do3/0/0:0
24576
0000.5e00.c022 192.0.2.22      C3/0/1        online            10    0   Do3/0/0:3
24579
```

The following example shows the sample output for the **show cable modem rpd name** *name* **primary-channel summary total** command:

```
Router#show cable modem rpd name node1 primary-channel summary total
                              Cable Modem
              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO

Local Primary Narrowband:
Do3/0/0:0     7     7     7     0     0       0        0      0     0      0
Do3/0/0:1     4     4     4     0     0       0        0      0     0      0
Do3/0/0:2     1     1     1     0     0       0        0      0     0      0
Do3/0/0:3     2     2     2     0     0       0        0      0     0      0
Do3/0/0:4     14    14    14    0     0       0        0      0     0      0
```

```
Do3/0/0:5     2     2     2     0     0       0        0      0      0      0
Do3/0/0:6     3     3     3     0     0       0        0      0      0      0
Do3/0/0:7     1     1     1     0     0       0        0      0      0      0
Subtotal:     34    34    34    0     0       0        0      0      0      0

Local Primary Wideband:
Subtotal:     0     0     0     0     0       0        0      0      0      0

Total:        34    34    34    0     0       0        0      0      0      0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **registered** command:

```
Router#show cable modem rpd name node1 registered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/UB    1    w-online(pt)      876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/UB    2    w-online(pt)      872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/UB    3    w-online(pt)      860    -0.50 2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/UB    4    w-online(pt)      866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/UB    5    w-online(pt)      876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/UB    6    w-online(pt)      866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/UB    7    w-online(pt)      864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/UB    8    w-online(pt)      870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/UB    9    w-online(pt)      873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/UB    10   w-online(pt)      1293   0.00  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd name** *name* **unregistered** command:

```
Router#show cable modem rpd name node1 unregistered
Interface    Prim Online            Timing Rec   QoS CPE IP address      MAC address
             Sid  State             Offset Power
C3/0/1/U1    1    offline           876    -0.50 2   0   192.0.2.21      0000.5e00.c08e
C3/0/1/U1    2    offline           872    -0.50 2   0   192.0.2.55      0000.5e00.c57a
C3/0/1/U2    3    offline           860    0.00  2   0   192.0.2.25      0000.5e00.c66a
C3/0/1/U0    4    offline           866    0.00  2   0   192.0.2.3       0000.5e00.c49c
C3/0/1/U3    5    offline           876    0.00  2   0   192.0.2.11      0000.5e00.c112
C3/0/1/U2    6    offline           866    -0.50 2   0   192.0.2.54      0000.5e00.c4b0
C3/0/1/U0    7    offline           864    0.00  2   0   192.0.2.20      0000.5e00.c668
C3/0/1/U2    8    offline           870    -0.50 2   0   192.0.2.4       0000.5e00.c660
C3/0/1/U0    9    offline           873    0.00  2   0   192.0.2.59      0000.5e00.bf64
C3/0/1/U1    10   offline           1293   0.50  2   0   192.0.2.12      0000.5e00.dee6
```

The following example shows the sample output for the **show cable modem rpd name** *name* **wideband** command:

```
Router#show cable modem rpd name node1 wideband
MAC Address    IP Address      I/F           MAC              Prim  RCC  MD-DS-SG/
                                             State            Sid   ID   MD-US-SG
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)     1     5    4 / 4
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)     2     5    4 / 4
```

The following example shows the sample output for the **show cable modem rpd name** *name* **wideband channel** command:

```
Router#show cable modem rpd name node1 wideband channel
MAC Address    IP Address      I/F           MAC              DSxUS Primary
                                             State                  WB
```

```
0000.5e00.c08e 192.0.2.21      C3/0/1/UB     w-online(pt)       8x4   Wi3/0/0:0
0000.5e00.c57a 192.0.2.55      C3/0/1/UB     w-online(pt)       8x4   Wi3/0/0:0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **wideband forwarding-summary** command:

```
Router#show cable modem rpd name node1 wideband forwarding-summary
MAC Address    IP Address      Primary        FrwdIF         BG DS  Bonded CM DS
                               Downstream                    Config State  Capab
0000.5e00.c08e 192.0.2.21      Do3/0/0:7      Wi3/0/0:0      8      8      8
0000.5e00.c57a 192.0.2.55      Do3/0/0:2      Wi3/0/0:0      8      8      8
0000.5e00.c66a 192.0.2.25      Do3/0/0:4      Wi3/0/0:0      8      8      8
0000.5e00.c49c 192.0.2.3       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.c112 192.0.2.11      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.c4b0 192.0.2.54      Do3/0/0:5      Wi3/0/0:0      8      8      8
0000.5e00.c668 192.0.2.20      Do3/0/0:4      Wi3/0/0:0      8      8      8
0000.5e00.c660 192.0.2.4       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.bf64 192.0.2.59      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.dee6 192.0.2.12      Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.c49a 192.0.2.9       Do3/0/0:1      Wi3/0/0:0      8      8      8
0000.5e00.c4da 192.0.2.16      Do3/0/0:0      Wi3/0/0:0      8      8      8
0000.5e00.bb3b 192.0.2.15      Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.b565 192.0.2.6       Do3/0/0:0      Wi3/0/0:1      24     24     24
0000.5e00.b61c 192.0.2.13      Do3/0/0:1      Wi3/0/0:1      24     24     24
0000.5e00.c612 192.0.2.10      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.c5c8 192.0.2.2       Do3/0/0:5      Wi3/0/0:0      8      8      8
0000.5e00.bf68 192.0.2.18      Do3/0/0:7      Wi3/0/0:0      8      8      8
0000.5e00.c53c 192.0.2.8       Do3/0/0:2      Wi3/0/0:0      8      8      8
0000.5e00.bf16 192.0.2.56      Do3/0/0:6      Wi3/0/0:0      8      8      8
0000.5e00.bfcc 192.0.2.19      Do3/0/0:2      Wi3/0/0:0      8      8      8
```

The following example shows the sample output for the **show cable modem rpd name** *name* **wideband phy** command:

```
Router#show cable modem name node1 wideband phy
MAC Address    IP Address      I/F          MAC              Chan   Frq    SNR    Pwr
                               State        Desc   (MHZ)  (db)   (dBmV)
0000.5e00.c08e 192.0.2.21      C3/0/1/UB    w-online(pt)     dsPri   495  -----   0.00
                                                             dsSec   453    N/A    N/A
                                                             dsSec   459    N/A    N/A
                                                             dsSec   465    N/A    N/A
                                                             dsSec   471    N/A    N/A
                                                             dsSec   477    N/A    N/A
                                                             dsSec   483    N/A    N/A
                                                             dsSec   489    N/A    N/A
                                                              us0     13  29.13  31.75
                                                              us1     14  27.22  32.00
                                                              us2     16  27.90  32.50
                                                              us3     18  24.72  32.50
0000.5e00.c57a 192.0.2.55      C3/0/1/UB    w-online(pt)     dsPri   465  -----   0.00
                                                             dsSec   453    N/A    N/A
                                                             dsSec   459    N/A    N/A
                                                             dsSec   471    N/A    N/A
                                                             dsSec   477    N/A    N/A
                                                             dsSec   483    N/A    N/A
                                                             dsSec   489    N/A    N/A
                                                             dsSec   495    N/A    N/A
                                                              us0     13  27.09  24.25
                                                              us1     14  28.16  24.25
                                                              us2     16  26.00  24.00
```

The following example shows the sample output for the **show cable modem rpd name** *name* **wideband registered-traditional-docsis** command:

```
Router#show cable modem name node1 wideband registered-traditional-docsis
MAC Address    IP Address      I/F           MAC               Prim  RCC  MD-DS-SG/
                                             State             Sid   ID   MD-US-SG
0000.5e00.bfcc 192.0.2.19      C3/0/1/U1     online            1     0    2 / N/A
0000.5e00.dee6 192.0.2.12      C3/0/1/U0     online            2     0    2 / N/A
0000.5e00.c612 192.0.2.10      C3/0/1/U3     online            3     0    2 / N/A
0000.5e00.c49c 192.0.2.3       C3/0/1/U3     online            4     0    2 / N/A
0000.5e00.c53c 192.0.2.8       C3/0/1/U0     online            5     0    2 / N/A
0000.5e00.c08e 192.0.2.21      C3/0/1/U2     online            6     0    2 / N/A
0000.5e00.c588 192.0.2.27      C3/0/1/U0     online            7     0    2 / N/A
0000.5e00.c4cc 192.0.2.24      C3/0/1/U2     online            8     0    2 / N/A
0000.5e00.c660 192.0.2.4       C3/0/1/U1     online            9     0    2 / N/A
0000.5e00.c022 192.0.2.22      C3/0/1/U0     online            10    0    2 / N/A
```

The following example shows the sample output for the **show cable modem rpd name** *name* **verbose** command:

```
Router#show cable modem rpd name node1 verbose

MAC Address                         : 0000.5e00.c08e
IP Address                          : 192.0.2.21
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 1
QoS Profile Index                   : 2
Host Interface                      : C3/0/1/U1
RPD ID                              : 1004.9fb1.4000
MD-DS-SG / MD-US-SG                 : 4 / N/A
MD-CM-SG                            : 0x910404
Primary Downstream                  : Do3/0/0:7 (RfId : 24583, SC-QAM)
Wideband Capable                    : Y
DS Tuner Capability                 : 8
RCP Index                           : 3
RCP ID                              : 00 10 00 00 08
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
UDC Enabled                         : N
US Frequency Range Capability       : Standard (5-42 MHz)
Extended Upstream Transmit Power    : 0dB
Multi-Transmit Channel Mode         : N
Upstream Channel                    :
Device ID                           :
```

The following example shows the sample output for the **show cable modem rpd name** *name* **verbose normalized** command:

```
Router#show cable modem rpd name node1 verbose normalized

MAC Address                         : 0000.5e00.c08e
IP Address                          : 192.0.2.21
IPv6 Address                        : ---
Dual IP                             : N
Prim Sid                            : 1
Host Interface                      : C3/0/1/UB
RPD ID                              : 1004.9fb1.4000
MD-DS-SG / MD-US-SG                 : 4 / 4
MD-CM-SG                            : 0x910404
Primary Wideband Channel ID         : 24577 (Wi3/0/0:0)
Primary Downstream                  : Do3/0/0:7 (RfId : 24583, SC-QAM)
```

```
Wideband Capable                  : Y
DS Tuner Capability               : 8
RCP Index                         : 3
RCP ID                            : 00 10 00 00 08
Downstream Channel DCID RF Channel : 8     3/0/0:7 (SC-QAM)
Downstream Channel DCID RF Channel : 1     3/0/0:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     3/0/0:1 (SC-QAM)
Downstream Channel DCID RF Channel : 3     3/0/0:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     3/0/0:3 (SC-QAM)
Downstream Channel DCID RF Channel : 5     3/0/0:4 (SC-QAM)
Downstream Channel DCID RF Channel : 6     3/0/0:5 (SC-QAM)
```

The following example shows the sample output for the **show cable modem rpd name** *name* **verbose sup** command:

```
Router#show cable modem rpd name node1 verbose sup
MAC Address                       : 0000.5e00.91ba
IP Address                        : 192.0.2.171
IPv6 Address                      : ---
Dual IP                           : N
Prim Sid                          : 10
Host Interface                    : C2/0/4
MD-DS-SG / MD-US-SG               : 7 / 8
Primary Wideband Channel ID       : 23569 (Wi2/0/28:16)
Primary Downstream                : Do2/0/28:16 (RfId : 23568)
Wideband Capable                  : Y
DS Tuner Capability               : 24
RCP Index                         : 3
RCP ID                            : 00 10 00 00 18
MAC Version                       : DOC3.0
Operational Version               : DOC1.1
QoS Provisioned Mode              : DOC1.1
Enable DOCSIS2.0 Mode             : Y
Modem Status                      : {Modem= w-online(pt), Security=assign(tek)}
Tag                               :
Service Type ID                   :
Service Type ID in config file    :
Ranging Class ID                  : 0x0


UPSTREAM SERVICE FLOW DETAIL:
Sfid                     : 45
Sid                      : 10
State                    : Admitted
Type                     : Primary
Schedule Type            : 2
Hfid                     : 131071
Service Class Name       :
```

The following example shows the sample output for the **show cable modem rpd name** *name* **summary** command:

```
Router# show cable modem rpd name node1 summary
Interface                    Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **summary total** command:

```
Router# show cable modem rpd name node1 summary total
Interface                    Cable Modem                                    Description

              Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C9/0/0/UB     10    10    10    0     0       10       0      0     0      0

Total:        10    10    10    0     0       10       0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd name** *name* **summary** command when there's no description configured under RPD us-port:

```
Router# show cable modem rpd name node1 summary

Interface                          Cable Modem
Description
                Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C1/0/2/U0         1     1     1     0     0       0        0      0     0      0
      UC1/0/1:U0
C1/0/2/U1         1     1     1     0     0       0        0      0     0      0
      UC1/0/1:U0

Total             2     2     2     0     0       0        0      0     0      0
```

The following example shows the sample output for the **show cable modem rpd all summary total** command when there's a description configured under RPD us-port:

```
Router# show cable modem rpd all summary total
RPD ID: 1111.1111.1111
Interface                          Cable Modem
Description
               Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C1/0/0/U0       1     1     1     0     0       0        0      0     0      0
      RPD_X_PORT_0
C1/0/0/U1       1     1     1     0     0       0        0      0     0      0
      RPD_X_PORT_1
RPD ID: 2222.2222.2222
Interface                          Cable Modem
Description
               Total Reg   Oper  Unreg Offline Wideband initRC initD initIO initO
C1/0/0/U0       2     2     2     0     0       0        0      0     0      0
      RPD_Y_PORT_0
C1/0/0/U1       2     2     2     0     0       0        0      0     0      0
      RPD_Y_PORT_1
```

show cable modem rpd all summary

To display a summary of cable modems with the per RPD us port description on one or more cable interfaces, use the **show cable modem rpd all summary** command in privileged EXEC mode.

show cable modem rpd all summary [**total**]

Command History

Release	Modification
Cisco IOS-XE 4.1.0	This command was introduced.

Usage Guidelines

This command displays a summary of cable modems with the per RPD us port description on one or more cable interfaces:

- **show cable modem rpd summary total**—Displays a summary and a total for all CMs with the per RPD us port description on the chassis.



Note The length of the configurable limitation is 20 characters while there are 80 characters reserved.

show cable modem select

This command is a SQL query string for a faster search, filtering, ordering, grouping, and some calculation of the available records.

show cable modem select [**mac** | **ip**]

Syntax Description

ip	Specifies the IPv4 address of a specific CM to be displayed.
mac	Identifies the MAC address of a specific CM to be displayed.
ipv6	IPv6 address of the cable modem to be displayed.
intf	Name of the host interface.
dip	Dual IP Support of dual IP for both IPv4 and IPv6 addressing.
sid	Primary SID assigned to this CM.
st	Displays cable modem status events.
dssg	MD-DS-SG for cable modem.
ussg	MD-US-SG for cable modem.
cmsg	MD-CM-SG for cable modem.
mtc	Multi-Transmit Channel Mode. Cable modem is in MTC mode or not.
macver	Displays the maximum supported version of DOCSIS that the cable modem supports (DOCSIS 1.0, DOCSIS 1.1, DOCSIS 2.0, DOCSIS 3.01).
opver	Operational mode.
qos	Displays the version of DOCSIS that the CM currently is provisioned and registered for (DOCSIS 1.0 and DOCSIS 1.1).

timing	Timing offset for the CM, in ticks, as recognized on the CMTS. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. **Note** An exclamation point (!) in the Timing Offset column indicates that the cable modem has exceeded the maximum delay and timing offset specified by the cable map-advance command. **Note** The timing offset shown here is typically smaller than the TX Time Offset value shown by the show cable modem remote-query command. This is because the latter value is the offset as recognized on the cable modem (which will include any internal delay between when the cable modem software begins the transmission and when the bits actually appear on the local cable interface).
cpe	CPE number.
rxpwr	Receive power (dBmV).
voicena	Voice enabled.
primds	Primary downstream.
tag	Shows various states of the CM. By default, the value is null. • *—Modem has failed the BPI-plus-policy. • #—Modem did not use TFTP downloaded CM config file. • !—Modem failed DMIC calculation multiple times. • &—Modem uses self-signed certificate to authenticate itself.
impds	Impaired downstream.
impus	Impaired upstream.
dsxus	Downstream and upstream.
rcc	RCC ID.
usphy	Phy operating mode.
rpdid	RPD ID if this modem is on the RPD.
sysdes	System description
txpwr	The reported Tx power.
cpev4	CPE IPv4 address

cpev6	CPE IPv6 address

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	The **show cable modem select usphy** command is enhanced such that if a modem is assigned with multiple upstream bonded channel, the best operating mode is used in usphy. The priority order for usphy operating mode of bonded upstreams is ofdma, atdma, and tdma.
Cisco IOS XE Everest 16.12.1	Four new fields—sysdes, txpwr, cpev4, and cpev6 are introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable modem select** is updated. Four new fields—sysdes, txpwr, cpev4, and cpev6 are added. This is a sample output of the **show cable modem select mac, cpev4, txpwr, cpev6** command:

```
Router#show cable modem select mac,cpev4,cpev6,ip,txpwr where mac='7cb2.1b0b.e742'
Load for five secs: 10%/0%; one minute: 15%; five minutes: 15%
Time source is NTP, *12:24:52.397 CST Tue Jul 2 2019
 mac            | cpev4           | cpev6                                  | ip
    | txpwr
=============================================================================================

 7cb2.1b0b.e742 | 198.51.100.1    | 2001:100:113:0:41C8:1B36:9979:D490     | 209.165.200.225
 |  52.00   51.50   51.75   50.25


                |                 | 2001:100:113:0:DC6F:B35:AD34:39B4      |
    |
```

This is a sample output of the **show cable modem select mac, ip, sysdes** command:

```
Router#scm select mac, ip, sysdes where mac='34bd.fa0f.4946'
Load for five secs: 5%/0%; one minute: 8%; five minutes: 7%
No time source, 12:29:48.632 PDT Thu Sep 27 2018
 mac            | ip              | sysdes
=====================================
 34bd.fa0f.4946 | 209.165.200.225 | Cisco DPC3008 DOCSIS 3.0 Cable Modem <<HW_REV: 1.0;
VENDOR: Cisco; BOOTR: 2.3.1_R3; SW_R
```

Usage Guidelines

The **show cable modem select** command shows the details filtered by a SQL query statement. The output displays the following columns:

- MacAddress

- IPV6Address
- IPV4Address
- HostIF
- DualIP
- CMTransPower
- ChanTransPower

These parameters show the value from modems that satisfy the following two conditions at the same time. The ChanTransPower values are displayed in an ascending order:

- MacAddress ending with 46a or having dual IP
- CMTransPower larger than 40

Examples

The following is a sample output of the **show cable modem select ip,mac** command:

```
Router#show cable modem select ip,mac
ip           | mac
================================
30.101.12.2  | 4800.33ef.1562
30.101.12.3  | 4800.33ef.17de
30.101.12.4  | 4800.33ef.1dd2
30.101.12.5  | 4800.33ef.1756
30.101.12.6  | 4800.33ef.1dce
30.101.12.9  | 1859.3356.88c0
30.101.12.7  | 4800.33ef.1546
30.101.12.8  | 4800.33ef.1d3e
30.101.12.10 | f45f.d4a2.f608
30.101.12.13 | 4458.2945.20d6
30.101.12.11 | 4458.2945.2bf6
30.101.12.15 | bcc8.1087.d71e
30.101.12.14 | 7cb2.1b9c.8340
30.101.12.12 | 4800.33ef.1cea
30.101.12.16 | 4458.2945.2c2e
30.101.12.17 | f45f.d4a2.f2ae
30.101.12.18 | 7cb2.1b9c.8660
30.101.12.19 | 4458.2945.38a2


Router# show cable modem SELECT MacAddress, IPV6Address, IPV4Address,
  HostIF, DualIP, CMTransPower, ChanTransPower WHERE
 (MacAddress LIKE '%46a' OR DualIP = 'Y') AND
 CMTransPower > 40 ORDER BY ChanTransPower ASC
```

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The command output has been updated to display impaired downstream channels (IMPDs) for up to 60 channels.

```
Router# show cable modem select ip,mac,intf,macver,opver,st,dsxus,impus,impds where macver
 like '%3.1' and intf like 'C1/0/6%'
  ip          | mac            | intf      | macver | opver  | st           | dsxus | impus
 | impds
```

```
 55.32.1.39 | b42a.0e85.4959 | C2/0/0/UB | DOC3.1 | DOC3.1 | p-online(pt) | 9x8   |
| 2/0/0:16 :17 :18 :19 :20 :21 :22
 55.32.1.38 | b42a.0e85.4e59 | C2/0/0/UB | DOC3.1 | DOC3.1 | w-online(pt) | 9x8   |
|
 55.32.1.40 | b42a.0e85.4dd9 | C2/0/0/UB | DOC3.1 | DOC3.1 | w-online(pt) | 9x8   |
|
 55.32.1.14 | b42a.0e85.4d65 | C2/0/0/UB | DOC3.1 | DOC3.1 | w-online(pt) | 9x8   |
|
 55.32.1.12 | b42a.0e85.4dc9 | C2/0/0/UB | DOC3.1 | DOC3.1 | w-online(pt) | 9x8   |
|
 55.32.1.19 | b42a.0e85.4e29 | C2/0/0/UB | DOC3.1 | DOC3.1 | w-online(pt) | 9x8   |
|
 55.32.1.8  | b42a.0e85.4e11 | C2/0/0/UB | DOC3.1 | DOC3.1 | w-online(pt) | 9x8   |
|
```

The following is a sample output of the **show cable modem select intf as hostinterface, count(mac) as number group by intf** command:

```
Router# show cable modem select intf as hostinterface, count(mac) as number group by intf
hostinterface | number
=========================
C6/0/2/UB     | 18
```

The following is a sample output of the **show cable modem select ip,mac,st,sid order by sid desc** command:

```
Router# show cable modem select ip,mac,st,sid order by sid desc
ip           | mac            | st           | sid
=============================================================
30.101.12.19 | 4458.2945.38a2 | w-online(pt) | 35
30.101.12.18 | 7cb2.1b9c.8660 | w-online(pt) | 31
30.101.12.17 | f45f.d4a2.f2ae | w-online(pt) | 30
30.101.12.16 | 4458.2945.2c2e | w-online(pt) | 28
30.101.12.12 | 4800.33ef.1cea | w-online(pt) | 22
30.101.12.14 | 7cb2.1b9c.8340 | w-online(pt) | 21
30.101.12.15 | bcc8.1087.d71e | w-online(pt) | 19
30.101.12.11 | 4458.2945.2bf6 | w-online(pt) | 18
30.101.12.13 | 4458.2945.20d6 | w-online(pt) | 17
30.101.12.10 | f45f.d4a2.f608 | w-online(pt) | 9
30.101.12.8  | 4800.33ef.1d3e | w-online(pt) | 8
30.101.12.7  | 4800.33ef.1546 | w-online(pt) | 7
30.101.12.9  | 1859.3356.88c0 | w-online(pt) | 6
30.101.12.6  | 4800.33ef.1dce | w-online(pt) | 5
30.101.12.5  | 4800.33ef.1756 | w-online(pt) | 4
30.101.12.4  | 4800.33ef.1dd2 | w-online(pt) | 3
30.101.12.3  | 4800.33ef.17de | w-online(pt) | 2
30.101.12.2  | 4800.33ef.1562 | w-online(pt) | 1
```

The following is a sample output of the **show cable modem select ip where sid=1** command:

```
Router# show cable modem select ip where sid=1
ip
=============
30.101.12.2
```

The following is a sample output of the **show cable modem select ip,st where st like '%online%'** command:

```
Router#show cable modem select ip,st where st like '%online%'
ip           | st
============================
30.101.12.2  | w-online(pt)
30.101.12.3  | w-online(pt)
```

```
30.101.12.4  | w-online(pt)
30.101.12.5  | w-online(pt)
30.101.12.6  | w-online(pt)
30.101.12.9  | w-online(pt)
30.101.12.7  | w-online(pt)
30.101.12.8  | w-online(pt)
30.101.12.10 | w-online(pt)
30.101.12.13 | w-online(pt)
30.101.12.11 | w-online(pt)
30.101.12.15 | w-online(pt)
30.101.12.14 | w-online(pt)
30.101.12.12 | w-online(pt)
30.101.12.16 | w-online(pt)
30.101.12.17 | w-online(pt)
30.101.12.18 | w-online(pt)
30.101.12.19 | w-online(pt)
```

The following is a sample output of the **show cable modem select ip,st,intf,mac where sid<10 and st like '%online%'** order by mac command:

```
Router# show cable modem select ip,st,intf,mac where sid<10 and st like '%online%' order
by mac
ip           | st           | intf      | mac
=============================================================
30.101.12.9  | w-online(pt) | C6/0/2/UB | 1859.3356.88c0
30.101.12.7  | w-online(pt) | C6/0/2/UB | 4800.33ef.1546
30.101.12.2  | w-online(pt) | C6/0/2/UB | 4800.33ef.1562
30.101.12.5  | w-online(pt) | C6/0/2/UB | 4800.33ef.1756
30.101.12.3  | w-online(pt) | C6/0/2/UB | 4800.33ef.17de
30.101.12.8  | w-online(pt) | C6/0/2/UB | 4800.33ef.1d3e
30.101.12.6  | w-online(pt) | C6/0/2/UB | 4800.33ef.1dce
30.101.12.4  | w-online(pt) | C6/0/2/UB | 4800.33ef.1dd2
30.101.12.10 | w-online(pt) | C6/0/2/UB | f45f.d4a2.f608
```

The following is a sample output of a modem configured with 5 bonded us channel, including ofdma and atdma.

```
Router# show cable modem 4800.33ee.e502 verbose | include Phy
Phy Operating Mode                 : atdma*     atdma*     atdma*     atdma*
Phy Operating Mode                 : ofdma
```

The following is a sample output of the preceding configuration **show cable modem select mac,usphy where mac like "%4800.33ee.e502%"**

```
Router# show cable modem select mac,usphy where mac like "%4800.33ee.e502%"
Load for five secs: 4%/0%; one minute: 6%; five minutes: 8%
Time source is NTP, *12:59:05.892 CTS Wed Mar 23 2022
mac            | usphy
==============================
4800.33ee.e502 | ofdma
```

Related Commands

None.

show cable modem service-type-id

To display the modems having the service type id, use the **show cable modem service-type-id** command in privileged EXEC mode.

show cable modem service-type-id [*service-type-id*]

Syntax Description

service-type-id	Specifies the name of the service type identifier.

Command Default

If no service type identifier is specified, this command will show all the CMs with their respective service-type-id.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command shows CMs having specified service-type-id.

Examples

The following example shows sample output for the **show cable modem service-type-id** command:

```
Router# show cable modem service-type-id
                                                                    B D
MAC Address    IP Address      I/F       MAC         Prim Service-type-id    P I
                                         State       Sid                     I P
0018.6812.29ae 41.42.2.212    C6/1/4/U2 offline      3838 commercial         N N
0018.6811.f9f8 41.42.0.140    C6/1/4/U2 offline      3225 commercial         N N
0018.6811.fba6 41.42.5.169    C6/1/4/U2 offline      3439 commercial         N N
0018.6812.225a 41.42.3.210    C6/1/4/U2 offline      3355 commercial         N N
0018.6811.fa8c 41.42.1.133    C6/1/4/U2 offline      3091 commercial         N N
0018.6812.37e8 41.42.0.136    C6/1/4/U2 offline      7439 commercial         N N
0018.6811.fbca 41.42.2.255    C6/1/4/U2 offline      6263 commercial         N N
0018.6811.fb44 41.42.2.17     C6/1/4/U2 offline      2996 commercial         N N
0018.6812.2f20 41.42.0.100    C6/1/4/U2 offline      3544 commercial         N N
```

Table below describes the significant fields shown in the display.

Table 138: show cable modem service-type-id Field Descriptions

Field	Description
MAC Address	Hardware (MAC-layer) address of the cable modem or CPE device.
IP Address	IP address of the cable modem or CPE device.
I/F	The cable interface line card providing the upstream for this CM.

Field	Description
MAC State	The current state of the MAC layer.
Prim Sid	Primary Service ID (SID) of the device.
Service Type Id	Service Type identifier.
BPI	Indicates whether or not Baseline Privacy Interface (BPI) or BPI Plus (BPI+) encryption is enabled for the CM.
DIP	Dual IP flag. Identifies whether or not (“Y” or “N”) the CM or CPE supports both IPv4 and IPv6 addressing.

Related Commands

Command	Description
clear cable modem service-type-id	This command clears the cable modem service type id.

show cable modem service-flow

To display information about all service flows associated with a particular modem, use the **show cable modem service-flow** command in privileged EXEC mode.

show cable modem {*ip-addressmac-address*} **service-flow** [**verbose** | **ds-hardware**]

Cisco cBR-8 Converged Broadband Router
show cable modem {*ip-addressmac-address*} **service-flow** [**verbose** | **ds-hardware** | **upstream**]

Syntax Description

ip-address	Specifies the IPv4 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	Identifies the MAC address of a specific CM to be displayed. You can also specify the MAC address for a CPE device behind a CM, and information for that CM will be displayed.
service-flow	Displays summary of relevant parameters and statistics for all service flows associated with a particular modem.
verbose	(Optional) Displays comprehensive details for all service flows associated with a particular modem. In addition, it displays the active cable-filter group for the cable modem.
ds-hardware	(Optional) Displays details of Baseline Privacy Interface (BPI), Payload Header Suppression (PHS), Downstream Service Identifier (DSID) and other statistical data.
upstream	Displays summary of relevant parameters and statistics for upstream service flows with a particular modem for a Cisco cBR-8 router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB1	This command is introduced for Cisco uBR7200 series and Cisco uBR10012 routers in Cisco IOS Release 12.2(33)SCB1.
12.3(23)BC7	This command is integrated into Cisco IOS Release 12.3(23)BC7.
12.2(33)SCE	This command is modified. The **ds-hardware** keyword is added.
12.2(33)SCF2	This command is modified. The command output is enhanced to display upstream buffer control parameters.
IOS-XE 3.15.0S	This command is implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** keyword is added.
IOS-XE 3.18.1SP	This command is modified. The command output for the verbose option is enhanced to display the active cable filter groups for the cable modem.
Cisco IOS XE Cupertino 17.9.1x	This command is modified to support Low Latency DOCSIS Capable information.

Usage Guidelines

The **show cable modem service-flow** command has a verbose and a non-verbose option. The non-verbose command supports live debugging and provides a summary of relevant parameters and statistics for all service flows of a particular modem. The verbose option of the command provides comprehensive details for all service flows associated with a particular modem.

The optional ds-hardware keyword is used to display per service flow BPI, PHS, DSID and stats data obtained directly from the hardware on the line card or SPA.

Note The output data for unconfigured or non applicable features are not always displayed.

The following is a sample output of the **show cable modem service-flow** command without the verbose option:

```
Router# show cable modem 40.30.0.5 service-flow

SUMMARY:
MAC Address    IP Address      Host      MAC          Prim  Num  Primary    DS
                               Interface State        Sid   CPE  Downstream RfId
001a.c30c.7eec 40.30.0.5       C7/0/0/U0 online       15    0    C7/0/0     Local
Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst   MinRsvRate  Throughput
          State       Type
31    US  act   15    BE     0    0           3044      0           0
32    DS  act   N/A   BE     0    0           3044      0           0
UPSTREAM SERVICE FLOW DETAIL:
SFID  SID   Requests   Polls      Grants     Delayed    Dropped    Packets
                                             Grants     Grants
31    15    0          0          0          0          0          0
DOWNSTREAM SERVICE FLOW DETAIL:
SFID  RP_SFID QID    Flg Policer               Scheduler             FrwdIF
                         Xmits      Drops      Xmits      Drops
32    32817   131124     0          0          0          0          Ca7/0/0
Flags Legend:
$: Low Latency Queue (aggregated)
~: CIR Queue
```

The following is a sample output of the **show cable modem service-flow** command with the verbose option:

```
Router# show cable modem c8fb.26a5.55f2 service-flow verbose
SUMMARY:

MAC Address    IP Address      Host          MAC               Prim  Num Primary        DS
                               Interface     State             Sid   CPE Downstream
RfId
c8fb.26a5.55f2 30.133.41.3     C1/0/1/UB     w-online(pt)      62    3   In1/0/1:4
8452


Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughput
          State       Type
177   US  act   62    BE     7    0           3044        0           863
178   DS  act   N/A   N/A    7    0           3044        0           122
212   DS  act   N/A   N/A    0    0           3044        0           0


CfrId  SFID     CM Mac Address  Direction  State    Priority  Matches
```

```
UPSTREAM SERVICE FLOW DETAIL:
Sfid     : 177
Hfid     : 54
Mac Address    : c8fb.26a5.55f2
Type     : Primary
Direction    : Upstream
Current State    : Active
Current QoS Indexes [Prov, Adm, Act] : [3, 3, 3]
Active Time    : 01:03
Required Attributes   : 0x00000000
Forbidden Attributes   : 0x00000000
Aggregate Attributes   : 0x00000000
Sid     : 62
Service Class Name   :
Traffic Priority   : 7
Maximum Sustained rate   : 0 bits/sec
Maximum Burst    : 3044 bytes
Minimum Reserved Rate   : 0 bits/sec
Minimum Packet Size   : 0 bytes
Minimum Buffer Size   : 0 bytes
Target Buffer Size   : 0 bytes
Maximum Buffer Size   : 0 bytes
Peak Rate    : 0 bits/sec
Admitted QoS Timeout   : 200 seconds
Active QoS Timeout   : 0 seconds
Packets     : 27
Bytes     : 8582
Rate Limit Delayed Grants  : 0
Rate Limit Dropped Grants  : 0
Current Throughput   : 863 bits/sec, 0 packets/sec
Application Priority   : 0
US Bonded    : YES
Upstream Bonding Group   : UBG-1
Transmit Channel Set   : 0xF
Sid Cluster    : SC-0, Sid [ 62 62 62 62 ]
Upstream PCH    : 0 1 2 3
Segments Valid    : 27
Segments Discarded   : 0
Segments Lost    : 0
BPI US Index    : 53
SID Cluster Switching Information
Total Bytes Requested   : 0
Total Time    : 0
Outstanding Bytes   : 0
Max Requests    : 255
Classifiers: NONE
Sid                            : 62
Request polls issued           : 0
BWReqs {Cont,Pigg,RPoll,Other} : 28, 0, 0, 0
Grants issued                  : 28
Packets received               : 27
Bytes received                 : 9273
Queue-indicator bit statistics : 0 set, 0 granted
Good Codewords rx              : 18
Corrected Codewords rx         : 48
Uncorrectable Codewords rx     : 0
Concatenated headers received  : 0
Fragmentation headers received : 0
Fragmentation headers discarded: 0
ARP Requests Received          : 5

DOWNSTREAM SERVICE FLOW DETAIL:
Sfid     : 178
Mac Address    : c8fb.26a5.55f2
```

```
Type     : Primary
Direction    : Downstream
Current State    : Active
Current QoS Indexes [Prov, Adm, Act] : [4, 4, 4]
Active Time    : 01:03
Required Attributes   : 0x00000000
Forbidden Attributes   : 0x00000000
Aggregate Attributes   : 0x00000000
Sid     : N/A
Service Class Name   :
Traffic Priority   : 7
Maximum Sustained rate   : 0 bits/sec
Maximum Burst    : 3044 bytes
Minimum Reserved Rate   : 0 bits/sec
Minimum Packet Size   : 0 bytes
Maximum Latency    : 0 usecs
Minimum Buffer Size   : 0 bytes
Target Buffer Size   : 0 bytes
Maximum Buffer Size   : 0 bytes
Peak Rate    : 0 bits/sec
Admitted QoS Timeout   : 200 seconds
Active QoS Timeout   : 0 seconds
Packets     : 5
Bytes     : 494
Rate Limit Dropped Packets  : 0
Current Throughput   : 122 bits/sec, 0 packets/sec
Application Priority   : 0
Low Latency App    : No
DS HW Flow Index   : 2942
DS WCM mode    : 3
DS Bonded          : YES
DSID     : 131125
Forwarding BG ID   : 8457
Forwarding Interface   : Wi1/0/1:8
Classifiers: NONE
DS HW Header Len = 16
DS HW Header = 00 00 00 01 00 2D F8 00 00 01 B8 00 00 00 00 00

app_type=7, source=0
app_priority=0, sched_type=0

QOS Forwarding Client Data:

Docsis SFID: 178  CM SF Reference: 1  NumCFRs: 0:
Primary: TRUE  LowLatency: FALSE  Dynamic: FALSE
Priority: 7  MinRate: 0 bps  MaxRate: 0 bps
WfqWeight: 32
QueueSize: 511 packets
Burst: 3044 bytes  PeakRate: 0 bps
BurstThresh: 1000000 bytes, Ds-max-burst: FALSE
ForwardingInterface: Wideband-Cable1/0/1:8
FlowHeader: 0x 00-00-00-01-00-2D-F8-00-00-01-B8-00-00-00-00-00

Police Xmits         : 0
Police Xmits drops   : 0
Scheduler Xmitsi     : 5
Scheduler Xmits drops: 0

Sfid     : 212
Mac Address    : c8fb.26a5.55f2
Type     : Secondary(Static)
Direction    : Downstream
Current State    : Active
Current QoS Indexes [Prov, Adm, Act] : [5, 5, 5]
```

```
Active Time    : 01:03
Required Attributes   : 0x00000000
Forbidden Attributes   : 0x00000000
Aggregate Attributes   : 0x00000000
Sid                : N/A
Service Class Name   : test_tos
Traffic Priority   : 0
Maximum Sustained rate   : 0 bits/sec
Maximum Burst    : 3044 bytes
Minimum Reserved Rate   : 0 bits/sec
Minimum Packet Size   : 0 bytes
Maximum Latency    : 0 usecs
Minimum Buffer Size   : 0 bytes
Target Buffer Size   : 0 bytes
Maximum Buffer Size   : 0 bytes
Peak Rate    : 0 bits/sec
Admitted QoS Timeout   : 200 seconds
Active QoS Timeout   : 0 seconds
Packets     : 0
Bytes     : 0
Rate Limit Dropped Packets  : 0
Current Throughput   : 0 bits/sec, 0 packets/sec
Application Priority   : 0
Low Latency App    : No
DS HW Flow Index   : 2943
DS WCM mode    : 3
DS Bonded    : YES
DSID     : 131125
Forwarding BG ID   : 8457
Forwarding Interface   : Wi1/0/1:8
Classifiers: NONE
DS HW Header Len = 16
DS HW Header = 00 00 00 01 00 2D FC 00 00 01 B8 00 00 00 00 00

app_type=7, source=0
app_priority=0, sched_type=0

QOS Forwarding Client Data:

Docsis SFID: 212  CM SF Reference: 2  NumCFRs: 0:
Primary: FALSE  LowLatency: FALSE  Dynamic: FALSE
Priority: 0  MinRate: 0 bps  MaxRate: 0 bps
WfqWeight: 4
QueueSize: 511 packets
Burst: 3044 bytes  PeakRate: 0 bps
BurstThresh: 1000000 bytes, Ds-max-burst: FALSE
ForwardingInterface: Wideband-Cable1/0/1:8
FlowHeader: 0x 00-00-00-01-00-2D-FC-00-00-01-B8-00-00-00-00-00

Police Xmits         : 0
Police Xmits drops   : 0
Scheduler Xmitsi     : 0
Scheduler Xmits drops: 0


Reg Info Requests Rx        : 15
Reg Info TLV len            : 199

Active Cable Filter:
  CM Upstream Filter Group          : 2
  CM Downstream Filter Group        : 1
  STB Upstream Filter Group         : 13
  STB Downstream Filter Group       : 12
  MTA Upstream Filter Group         : 7
```

```
  MTA Downstream Filter Group        : 5
  PS Upstream Filter Group           : 11
  PS Downstream Filter Group         : 9
  CPE Upstream Filter Group          : 4
  CPE Downstream Filter Group        : 3
```

The following is a sample output of the **show cable modem service-flow** command with the verbose option, for Cisco IOS Release 12.2(33)SCF2:

```
Router# show cable modem 0022.cea5.02ba service-flow verbose
SUMMARY:
MAC Address    IP Address      Host          MAC           Prim  Num Primary
DS
                               Interface     State         Sid   CPE Downstrea
RfId
0022.cea5.02ba 5.60.122.132    C7/1/0/UB     w-online      10    0   In7/1/0:0
840
Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughp
          State       Type
29    US  act   10    BE     0    100000      3044        0           0
30    DS  act   N/A   BE     0    200000      3044        0           0
CfrId  SFID     CM Mac Address  Direction  State    Priority  Matches
Reg Info Requests Tx        : 2
Reg Info TLV len            : 152
UPSTREAM SERVICE FLOW DETAIL:
Sfid                                  : 29
Mac Address                           : 0022.cea5.02ba
Type                                  : Primary
Direction                             : Upstream
Current State                         : Active
Current QoS Indexes [Prov, Adm, Act]  : [3, 4, 4]
Active Time                           : 03:45
Required Attributes                   : 0x00000000
Forbidden Attributes                  : 0x00000000
Aggregate Attributes                  : 0x00000000
Sid                                   : 10
Service Class Name                    : REG-US
Traffic Priority                      : 0
Maximum Sustained rate                : 100000 bits/sec
Maximum Burst                         : 3044 bytes
Minimum Reserved Rate                 : 0 bits/sec
Minimum Packet Size                   : 0 bytes
!Upstream Buffer Control Parameters
Minimum Buffer Size                   : 1000 bytes
Target Buffer Size                    : 1500 bytes
Maximum Buffer Size                   : 2000 bytes
Peak Rate                             : 0 bits/sec
Admitted QoS Timeout                  : 200 seconds
Active QoS Timeout                    : 0 seconds
Packets                               : 3
Bytes                                 : 1020
Rate Limit Dropped Grants             : 0
Current Throughput                    : 0 bits/sec, 0 packets/sec
Application Priority                  : 0
US Bonded                             : YES
Upstream Bonding Group                : UBG-1
Transmit Channel Set                  : 0x6
Sid Cluster                           : SC-0, Sid [ 10 10 ]
Segments Valid                        : 3
Segments Discarded                    : 0
Segments Lost                         : 0
SID Cluster Switching Information
Total Bytes Requested                 : 0
```

```
Total Time                              : 0
Outstanding Bytes                       : 0
Max Requests                            : 1
Classifiers: NONE
Sid                            : 10
Request polls issued           : 0
BWReqs {Cont,Pigg,RPoll,Other} : 4, 0, 0, 0
No grant buf BW request drops  : 0, where:0
Rate exceeded BW request drops : 0
Grants issued                  : 4
Packets received               : 4
Bytes received                 : 1488
rate-adapt                     : Disabled
rate-adapt {rcvd, Consec-PB}   : 0, 0
Fragment reassembly completed  : 0
Fragment reassembly incomplete : 0
Concatenated packets received  : 0
Queue-indicator bit statistics : 0 set, 0 granted
Good Codewords rx              : 8
Corrected Codewords rx         : 0
Uncorrectable Codewords rx     : 0
Concatenated headers received  : 0
Fragmentation headers received : 0
Fragmentation headers discarded: 0
ARP Requests Received          : 2
```

Examples

The following is a sample output of the **show cable modem service-flow ds-hardware** command on the narrow band modem on a legacy interface:

```
Router# show cable modem 50.3.112.12 service-flow ds-hardware

LC SFID:15 RP SFID: 32999
KeyIndex: 6 PHSIndex: 0
TX Pkts: 9 TX Bytes: 636
BPI -
Said: 0x1 KeySeq:0x1
Even Key: 15DC474264C81500 Even Iv: 2619043723FB046B
Odd Key: 07A89421B4458B00 Odd Iv: 1FB0253D0D1C1643
PHS -
PHSM: 0000-0000-0000-0000
Ctrl: 0x0 PHSI: 0x0 PHSS: 0x0 Count: 0x0
```

The following is a sample output of the **show cable modem service-flow ds-hardware** command on the narrow band modem with a modena remote primary channel:

```
Router# show cable modem
 50.3.112.6 service-flow ds-hardware
LC SFID:7 RP SFID: 33007 StatIndex: 13
KeyIndex: 7 PHSIndex: 0
TX Pkts: 8 TX Bytes: 592
BPI -
KeyNum: 0x7 Control: 0xC001 KeySeq: 0x1
Even Key: 10F4-6BE1-D944-B0 Even Iv: 04B3-1CCD-25DA-163E
Odd Key: 0818-8A00-9D01-1E Odd Iv: 1C58-1967-16BC-0BD0
PHS -
PHSM: 0000-0000-0000-0000
Ctrl: 0x0 PHSI: 0x0 PHSS: 0x0 Count: 0x0
```

The following is a sample output of the **show cable modem service-flow ds-hardware** command on the wideband modem on a remote modena:

```
Router# show cable modem
 50.3.112.28 service-flow ds-hardware
LC SFID:9 RP SFID: 33001 StatIndex: 7
KeyIndex: 4 PHSIndex: 0
TX Pkts: 13 TX Bytes: 962
DSID: 0x11E Priority: 0x0 SCC: 0 Seqnum: 0xD
BPI -
KeyNum: 0x4 Control: 0xC002 KeySeq: 0x1
Even Key: 01B8-5830-9246-66 Even Iv: 0BAB-1CA8-0145-1AB9
Odd Key: 0720-8C81-FD04-6F Odd Iv: 0D80-13F1-0E32-083B
PHS -
PHSM: 0000-0000-0000-0000
Ctrl: 0x0 PHSI: 0x0 PHSS: 0x0 Count: 0x0
```

The following is a sample output of the **show cable modem service-flow ds-hardware** command on the narrowband modem on an integrated interface:

```
Router# show cable modem 80.36.0.3 service-flow ds-hardware

LC SFID:50 RP SFID: 33150 StatIndex: 21
KeyIndex: 8 PHSIndex: 0
TX Pkts: 4 TX Bytes: 648
BPI (DES) -
KeyNum: 0x3 Said: 0x16 KeySeq:0x1
Even Key: 0A3C-5BC0-C9C0-9F Even Iv: 0204-25F7-07A1-026E
Odd Key: 0448-0392-26C4-55 Odd Iv: 087F-0B13-237A-1F89
PHS -
PHSM: 0000-0000-0000-0000
Ctrl: 0x0 PHSI: 0x0 PHSS: 0x0 Count: 0x0
```

The following is a sample output of the **show cable modem service-flow ds-hardware** command on the wideband modem on a bonded local interface:

```
Router# show cable modem 80.36.0.122 service-flow ds-hardware

LC SFID:46 RP SFID: 33148 StatIndex: 19
KeyIndex: 7 PHSIndex: 0
TX Pkts: 200 TX Bytes: 23600
DSID: 0x152 Priority: 0x0 Seqnum: 0xC8
Enabled: 0x1 DPV Enabled: 0x0 SeqNum Change Cnt: 0x0
BPI (DES) -
KeyNum: 0x3 Said: 0x14 KeySeq:0x1
Even Key: 08E0-8C51-8AC2-A5 Even Iv: 0EA2-1FA8-1C32-2685
Odd Key: 12F4-3980-C984-53 Odd Iv: 0DA1-0BA2-0E4F-0864
PHS -
PHSM: 0000-0000-0000-0000
Ctrl: 0x0 PHSI: 0x0 PHSS: 0x0 Count: 0x0
```

Table below describes the significant fields shown in the output.

Table 139: show cable mode service-flow Field Descriptions

Field	Description
MAC Address	Hardware (MAC-layer) address of the cable modem or CPE device.
IP Address	IP address of the cable modem or CPE device.
Host Interface	Host interface name.

Field	Description
MAC State	Current state of the MAC layer.
Prim Sid	Primary SID assigned to this CM.
Num CPE	Number of CPE devices for which the CM is providing services.
Primary Downstream	Primary downstream channel assigned to the CM.
DS RfId	Downstream RF identifier.
SFID	Service flow identifier.
SID	Service ID (SID) of the device.
Requests	Number of requests.
Polls	Number of polls.
Grants	Number of grants.
Delayed Grants	Number of delayed grants.
Dropped Grants	Number of dropped grants.
Packets	Number of packets.
RP_SFID	Route processor SFID.
QID	Link queue identification number.
Flg	Indicates whether the queue is low latency or CIR.
Policer Xmits	Packets transmitted out of the policer.
Drops	Packets dropped by the policer.
Scheduler Xmits	Packets transmitted out of the scheduler.
Drops	Packets dropped by the scheduler.
FrwdIF	Forwarding interface.
LC SFID	Line card SFID.
KeyIndex	Per flow index to BPI data.
PHSIndex	Per flow index to PHS data.
TX Pkts	Number of packets the router has transmitted on this service flow.
TX Bytes	Number of bytes the router has transmitted on this service flow.
BPI	Indicates whether or not Baseline Privacy Interface (BPI) encryption is enabled for the CM.

Field	Description
Said	Security association identifier.
KeySeq	Downstream traffic key sequence number.
Even Key	Even traffic encryption key (TEK) value.
Even Iv	Value of the even Initialization Vector (IV).
Odd Key	Odd TEK key value.
Odd Iv	Odd IV value.
PHS	Payload header suppression.
PHSM	PHS Mask. 5-bit PHS mask that defines the header bytes that should be suppressed.
Ctrl	Control block.
PHSI	PHS Index. Number that uniquely references the PHS rule.
PHSS	PHS Size. 8-bit value specifying the number of header bytes to be suppressed.
Count	PHS rule usage count.

Examples for Cisco cBR-8 Converged Broadband Router

This example shows the output of the **show cable modem service-flow** command.

```
Router#show cable modem 0010.18de.8134 service-flow

SUMMARY:
MAC Address    IP Address      Host          MAC           Prim  Num Primary        DS
                               Interface     State         Sid   CPE Downstream     RfId
0010.18de.8134 80.17.150.66    C9/0/4/UB     w-online      2     1   In1/0/0:0      29696


Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughput
          State       Type
9     US  act   2     BE     7    0           3044        0           0
10    DS  act   N/A   N/A    7    0           3044        0           0


UPSTREAM SERVICE FLOW DETAIL:
SFID  SID   Requests   Polls      Grants     Packets
9     2     361        0          377        209


DOWNSTREAM SERVICE FLOW DETAIL:

SFID  Flg Policer              Scheduler             FrwdIF
          Xmits      Drops      Xmits      Drops
10        0          0          164        0          Wi9/0/4:1

Flags Legend:
```

```
$: Low Latency Queue (aggregated)
~: CIR Queue


Router#
```

This example shows the output of the **upstream** keyword.

```
Router#show cable modem 0010.18de.8134 service-flow upstream


UPSTREAM SERVICE FLOW DETAIL:
SFID  SID   Requests   Polls      Grants     Packets
9     2     359        0          375        207
```

This example shows the output of the **ds-hardware** keyword.

```
Router#show cable modem 0010.18de.8134 service-flow upstream ds-hardware
No DS BPI Index allocated.

SFID: 10  DS HW Flow Index: 2625 DSID: 917520
Valid        : TRUE
DSID         :       131088 [   0x20010]
Priority     :            0
Bonding Group:           29 [      0x1d]
Channel      :        65535 [    0xffff]
DS-EH        :            3 [       0x3]
Profile 1    :            0 [         0]
Profile 2    :            0 [         0]
No Sniff Enabled.


Jib4DS DSID entry for DSID 131088 [Bufsz 8000]:
SCC Bit         = 0x0
Sequence Number = 162
```

This example shows the output of the **verbose** keyword.

```
Router#show cable modem 0010.18de.8134 service-flow upstream verbose

SUMMARY:

MAC Address    IP Address      Host          MAC           Prim  Num Primary        DS
                               Interface     State         Sid   CPE Downstream     RfId
0010.18de.8134 80.17.150.66    C9/0/4/UB     w-online      2     1   In1/0/0:0      29696


Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughput
          State       Type
9     US  act   2     BE     7    0           3044        0           0
10    DS  act   N/A   N/A    7    0           3044        0           0


CfrId  SFID     CM Mac Address  Direction  State    Priority  Matches
```

```
UPSTREAM SERVICE FLOW DETAIL:
Sfid                                    : 9
Hfid                                    : 17
Mac Address                             : 0010.18de.8134
Type                                    : Primary
Direction                               : Upstream
Current State                           : Active
Current QoS Indexes [Prov, Adm, Act]    : [4, 4, 4]
Active Time                             : 11h42m
Required Attributes                     : 0x00000000
Forbidden Attributes                    : 0x00000000
Aggregate Attributes                    : 0x00000000
Sid                                     : 2
Service Class Name                      :
Traffic Priority                        : 7
Maximum Sustained rate                  : 0 bits/sec
Maximum Burst                           : 3044 bytes
Minimum Reserved Rate                   : 0 bits/sec
Minimum Packet Size                     : 0 bytes
Minimum Buffer Size                     : 0 bytes
Target Buffer Size                      : 0 bytes
Maximum Buffer Size                     : 0 bytes
Peak Rate                               : 0 bits/sec
Admitted QoS Timeout                    : 200 seconds
Active QoS Timeout                      : 0 seconds
Packets                                 : 211
Bytes                                   : 13670
Rate Limit Dropped Grants               : 0
Current Throughput                      : 0 bits/sec, 0 packets/sec
Application Priority                    : 0
US Bonded                               : YES
Upstream Bonding Group                  : UBG-1
Transmit Channel Set                    : 0x7
Sid Cluster                             : SC-0, Sid [ 2 2 2 ]
Upstream PCH                            : 36    37      38
Segments Valid                          : 211
Segments Discarded                      : 0
Segments Lost                           : 0
BPI US Index                            : N/A
SID Cluster Switching Information
Total Bytes Requested                   : 0
Total Time                              : 0
Outstanding Bytes                       : 0
Max Requests                            : 1
Classifiers: NONE
Sid                             : 2
Request polls issued            : 0
BWReqs {Cont,Pigg,RPoll,Other} : 363, 0, 0, 0
Grants issued                   : 379
Packets received                : 211
Bytes received                  : 30751
Queue-indicator bit statistics : 0 set, 0 granted
Good Codewords rx               : 2579
Corrected Codewords rx          : 0
Uncorrectable Codewords rx      : 0
Concatenated headers received   : 0
Fragmentation headers received : 0
Fragmentation headers discarded: 0
ARP Requests Received           : 60

DOWNSTREAM SERVICE FLOW DETAIL:
Sfid                                    : 10
Mac Address                             : 0010.18de.8134
Type                                    : Primary
```

```
Direction                                : Downstream
Current State                            : Active
Current QoS Indexes [Prov, Adm, Act]     : [5, 5, 5]
Active Time                              : 11h42m
Required Attributes                      : 0x00000000
Forbidden Attributes                     : 0x00000000
Aggregate Attributes                     : 0x00000000
Sid                                      : N/A
Service Class Name                       :
Traffic Priority                         : 7
Maximum Sustained rate                   : 0 bits/sec
Maximum Burst                            : 3044 bytes
Minimum Reserved Rate                    : 0 bits/sec
Minimum Packet Size                      : 0 bytes
Maximum Latency                          : 0 usecs
Minimum Buffer Size                      : 0 bytes
Target Buffer Size                       : 0 bytes
Maximum Buffer Size                      : 0 bytes
Peak Rate                                : 0 bits/sec
Admitted QoS Timeout                     : 200 seconds
Active QoS Timeout                       : 0 seconds
Packets                                  : 166
Bytes                                    : 12284
Rate Limit Dropped Packets               : 0
Current Throughput                       : 0 bits/sec, 0 packets/sec
Application Priority                     : 0
Low Latency App                          : No
DS HW Flow Index                         : 2625
DS Bonded                                : YES
DSID                                     : 917520
Forwarding BG ID                         : 29698
Forwarding Interface                     : Wi9/0/4:1
Classifiers: NONE
DS HW Header Len = 16
DS HW Header = 00 00 00 09 10 29 04 00 00 00 00 00 00 00 00 00

app_type=7, source=0
app_priority=0, sched_type=0

QOS Forwarding Client Data:

Docsis SFID: 10  CM SF Reference: 1  NumCFRs: 0:
Primary: TRUE  LowLatency: FALSE  Dynamic: FALSE
Priority: 7  MinRate: 0 bps  MaxRate: 0 bps
WfqWeight: 32
QueueSize: 575 packets
Burst: 3044 bytes  PeakRate: 0 bps
BurstThresh: 1000000 bytes, Ds-max-burst: FALSE
ForwardingInterface: Wideband-Cable9/0/4:1
FlowHeader: 0x 00-00-00-09-10-29-04-00-00-00-00-00-00-00-00-00

Police Xmits         : 0
Police Xmits drops   : 0
Scheduler Xmitsi     : 166
Scheduler Xmits drops: 0


Reg Info Requests Rx        : 9
Reg Info TLV len            : 163
Router#
```

This example shows the output of the **show cable modem service-flow** on **Cisco IOS XE Cupertino 17.9.1x** or later for a Low Latency DOCSIS capable CM using both a DS and US ASF..

```
Router# show cable modem 206a.9454.30a4 service-flow

SUMMARY:
MAC Address    IP Address      Host      MAC          Prim  Num  Primary    DS
                               Interface State        Sid   CPE  Downstream RfId
206a.9454.30a4 10.5.8.9        C1/0/0/UB w-online(pt)  17    0   Inl/0/0:0  8192

Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst   MinRsvRate  Throughput
          State       Type
28    US  act   17    BE     1    100000000   1800000   0           0
45    US  act   30    BE     6    0           6800000   800000      0
46    US  pro   0     RSVD   0    0           0         0           0
29    DS  act   N/A   N/A    4    0           3211      0           0
47    DS  act   N/A   N/A    0    400000000   3044      0           0
48    DS  act   N/A   N/A    0    350000000   3044      0           0
49    DS  pro   N/A   ASF    0    0           3044      0           0
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.
show cable modem calls	Displays displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem counters	Displays downstream and upstream traffic counters for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem domain-name	Updates the cable-specific DNS cache and display the domain name for specified CMs and CPE behind a CM on a Cisco CMTS router.
show cable modem errors	Displays error statistics for one or more CMs.
show cable modem flap	Displays flap list statistics for one or more CMs.
show cable modem ipv6	Displays IPv6 information for specified CMs and CPE behind a CM on a Cisco CMTS router.
show cable modem mac	Displays MAC layer information for one or more CMs.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more CMs.

Command	Description
show cable modem offline	Displays a list of the CMs that are marked as offline with the Cisco CMTS.
show cable modem phy	Displays the DOCSIS PHY layer information for one or more CMs.
show cable modem qos	Displays quality of service (QoS) and service flow information for a particular CM.
show cable modem registered	Displays a list of the CMs that are marked as registered with the Cisco CMTS.
show cable modem remote-query	Displays information collected by the remote-query feature.

show cable modem smp

To display detailed subscriber management information of cable modems, use the **show cable modem** *mac-address* **smp** command in privileged EXEC mode.

show cable modem *mac-address* **smp**

Syntax Description

mac-address	MAC address of a specific cable modem. If you specify the MAC address for a CPE behind a cable modem, the output displays information for that cable modem.
smp	Display detailed subscriber management information of cable modems.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Example

This example shows the output of the **show cable modem** *mac-address* **smp** command:

```
Router# show cable modem cdf3.c8ff.ed7e smp
Load for five secs: 4%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 11:21:30.427 EDT Wed Jul 24 2024

US SMP INFO:
  Mac: 54d4.6f08.de37,  sfid: 13
  enf_name: hfc300aks_US,  Type: doc11,  Mode: legacy
  reg_ser: hfc300aks,  enf_ser: hfc300aks_BEUS

  enf_config_time: 845,  smp_config_time: 845
  enf_weekend: NO,  smp_weekend: NO
  enf_penalty_off: OFF,  smp_penalty_off: OFF
  array_size: 1,  array_ndx: 1,  array_sw: 0
  sample_attempts: 0,  monitor_octets: 0
  curr_time: 1237,  next_sample_time: 1450

  penalty_period: 5
  last_detect_time: 0,  pen_life_time: 0
  penalty_rate: 0,  over_consumed: NO
  penalty_enforced: NO,  penalty_status: NO
  if_threshold: 3,  if_switch: ON
```

show cable modem subscriber

On the Cisco cBR Series Converged Broadband Router, to view the subscriber information, use the **show cable modem subscriber** command.

show cable modem subscriber

Syntax Description

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Router

Usage Guidelines

The **show cable modem subscriber** command is introduced to provide the subscriber information for the Cisco cBR router

Example for Cisco cBR Router

This example shows the output of the **show cable modem subscriber** command on the Cisco cBR router:

```
Router#show cable modem subscriber

MAC Address                       : 0025.2e2d.75be
IP Address                        : 100.1.2.4
IPv6 Address                      : 2001:420:3800:909:4C0E:7623:3EDE:DDB1
Routing Table                     :
Dual IP                           : Y
Prim Sid                          : 1
Host Interface                    : C3/0/0
Modem Vendor                      : 00.25.2E
sysDescr                          :
MAC Version                       : DOC3.0
Modem Status                      :  online
Modem ACL                         : N/A
Modem Device Class                : CM
Spoof Attempts                    : 0
Clone Attempts                    : 0
Number of CPEs                    : 0(Max = 16)
Number of CPE IPv4 Addresses      : 0(Max = 16)
Number of CPE IPv6 Addresses      : 0(0 LLA, 0 GUA, 0 PREFIX, Max = 16)
Source Address Verification       :
 Group Name                       :
 Packet Drops                     : 0
Submgmt Learnable                 : TRUE
Total Time Online                 : 1h44m   (1h44m    since last counter reset)

MAC Address                       : 0025.2eaf.7f38
IP Address                        : 100.1.2.7
IPv6 Address                      : 2001:420:3800:909:2541:C9AD:9CB3:6B6D
```

```
Routing Table                       :
Dual IP                             : Y
Prim Sid                            : 2
Host Interface                      : C3/0/0
Modem Vendor                        : 00.25.2E
sysDescr                            :
MAC Version                         : DOC3.0
Modem Status                        :  online
Modem ACL                           : N/A
Modem Device Class                  : CM
Spoof Attempts                      : 0
Clone Attempts                      : 0
Number of CPEs                      : 1(Max = 16)
Number of CPE IPv4 Addresses        : 1(Max = 16)
Number of CPE IPv6 Addresses        : 1(0 LLA, 0 GUA, 1 PREFIX, Max = 16)
Source Address Verification         :
 Group Name                         :
 Packet Drops                       : 0
Submgmt Learnable                   : TRUE
Total Time Online                   : 1d1h18m (1d1h18m  since last counter reset)

MAC Address                         : 0025.2eaf.82f4
IP Address                          : 100.1.2.9
IPv6 Address                        : 2001:420:3800:909:D0C9:4EC6:1765:99C2
Routing Table                       :
Dual IP                             : Y
Prim Sid                            : 3
Host Interface                      : C3/0/0
Modem Vendor                        : 00.25.2E
sysDescr                            :
MAC Version                         : DOC3.0
Modem Status                        :  online
Modem ACL                           : N/A
Modem Device Class                  : CM
Spoof Attempts                      : 0
Clone Attempts                      : 0
Number of CPEs                      : 0(Max = 16)
Number of CPE IPv4 Addresses        : 0(Max = 16)
Number of CPE IPv6 Addresses        : 0(0 LLA, 0 GUA, 0 PREFIX, Max = 16)
Source Address Verification         :
 Group Name                         :
 Packet Drops                       : 0
Submgmt Learnable                   : TRUE
Total Time Online                   : 1d1h17m (1d1h17m  since last counter reset)
```

show cable modem summary

To display a summary of CMs on one or more cable interfaces, use the **show cable modem summary** command in privileged EXEC mode.

show cable modem summary [**total**]
show cable modem summary *interface1* [*interface2*] **total**
show cable modem summary *interface1* [*interface2*] **upstream** *port1 port2* **total**
show cable modem cable {*slot*/*port* | *slot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] **summary**
show cable modem cable {*slot*/*subslot*/*port* | *slot*/*subslot*/*cable-interface-index*} [**upstream** *port* [*logical-channel-index*]] **summary**

Cisco cBR-8 Converged Broadband Router
show cable modem summary *interface1* [*interface2*] **total**

Syntax Description

total	(Optional) Displays a footer line showing the totals for each column.

interface1	(Optional) Cable interface to be summarized. The *interface1* parameter can take the following forms: • **cable** {*slot /port* | *slot /cable-interface-index* } • **cable** {*slot/ subslot /port* | *slot/subslot /cable-interface-index* } where, • *slot* —Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9. • *subslot* — • (Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. • Cisco cBR-8 router—The valid subslot is 0. • *port* —Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface). • *cable-interface-index*—Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20, Cisco uBR-MC3GX60V and Cisco cBR-8 line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.
interface2	(Optional) Second cable interface, specifying a range of cable interfaces to be summarized. The *interface2* parameter has the same form as *interface1* . **Note** When specifying a range of cable interfaces, *interface1* must be the lower-numbered interface and *interface2* must be the higher-numbered interface.
upstream*port1 port2*	(Optional) Specifies a range of upstream ports on the cable interfaces to be summarized. The *port1* and *port2* parameters can start at 0, and *port2* must be a higher-numbered port than *port1* .

upstream*upstream-channel-ID 1 upstream-channel-ID 2*	(Optional) For Cisco cBR-8 router—Specifies a range of upstream channel IDs on the cable interfaces to be summarized. The *upstream-channel-ID 1* and *upstream-channel-ID 2* parameters can start at 0, and *upstream-channel-ID 2* must be a higher-numbered port than *upstream-channel-ID 1* . The valid range is from 0 to 15.
upstream *port*	(Optional) Specifies a specific upstream port to be summarized. This option can be specified only when summarizing a single cable interface. This option is not supported on the Cisco cBR-8 router.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This option is not supported on the Cisco cBR-8 router.
summary	Displays a summary of CMs on one or more cable interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3XA	This command was introduced.
12.1(4)CX and 12.2(4)BC1	Support was added for the Cisco uBR10012 router.
12.1(6)EC	The **total** option was supported for the Cisco uBR7100 series and Cisco uBR7200 series routers.
12.1(11b)EC	The upstream Description field was added to the **show cable modem summary** display in Cisco IOS Release 12.1 EC.
12.2(8)BC1	The **total** option was supported for the Cisco uBR10012 universal broadband router.
12.2(15)BC2	The upstream Description field was added to the **show cable modem summary** display in Cisco IOS Release 12.2 BC.
12.3(21)BC	Support was added for wideband cable modem output.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The *upstream-channel-id* variable was added. The *logical-channel-index* is removed.

Usage Guidelines

This command displays a summary of CMs for a single cable interface or upstream, or for a range of cable interfaces or upstreams. The following possible combinations are possible for this command:

- **show cable modem summary total**—Displays a summary and a total for all CMs on the chassis.
- **show cable modem summary** *cable x/0* **total**—Displays a summary of CMs on a specified card.
- **show cable modem summary** *cable x/0* **upstream** *port1 port2* **total**—Displays a summary of CMs on the specified card and specified range of ports. The *port1* value must be less than the *port2* value.
- **show cable modem summary** *cable x/0 cable y/0* **total**—Displays a summary of CMs on the specified range of cards.
- **show cable modem summary** *cable x/0 cable y/0* **upstream** *port1 port2* **total**—Displays a summary of CMs on the specified range of ports on the specified range of cards.

Note Also see the information about this command's behavior in a Hot Standby Connection-to-Connection Protocol (HCCP) configuration, see the "Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration" in the Cisco IOS CMTS Cable Command Reference.

Examples

The following example shows typical output for the default form of the **show cable modem summary** command on a Cisco uBR7200 series router:

```
Router# show cable modem summary

Interface     Total      Active      Registered   Description
              Modems     Modems      Modems
Cable3/0/U0   165         141         141         Line 32/1
Cable3/0/U1   209         172         170         Line 32/2
Cable3/0/U2   262         207         203         Line 32/3
Cable3/0/U3   256         194         188         Line 32/4
Cable5/0/U0   746         714         711         Line 41/1
Cable6/0/U0   806         764         759         Line 42/2
Router#
```

Note The Description field appears in Cisco IOS Release 12.1(11b)EC, 12.2(15)BC2, and later releases, and shows the string configured for the upstream using the **cable upstream description** command.

The following example shows typical output for the **show cable modem summary** command with the **total** option on a Cisco uBR7200 series router:

```
Router# show cable modem summary total

Interface     Total      Active      Registered   Description
              Modems     Modems      Modems
Cable5/0/U0     746        714         711        Node1
Cable6/0/U1     806        764         759        Node3
Total:         1552       1478        1470
Router#
```

The following example shows sample output for the **show cable modem summary** command with the **total** option for a Cisco uBR10012 router:

```
Router# show cable modem summary total
```

```
Interface                        Cable Modem                    Description
            Total Reg   Unreg Offline Wideband initRC initD initIO initO
C5/0/0/U0   84    84    0     0       84       0      0     0      0
C5/0/0/U1   84    84    0     0       84       0      0     0      0
C5/0/0/U2   83    83    0     0       83       0      0     0      0
C5/0/0/U3   83    83    0     0       83       0      0     0      0
<<output omitted>>
Total:      8020  8020  0     0       8016     0      0     0      0
Router#
```

The following example shows sample output for the **show cable modem summary total** command for a range of interfaces on the Cisco uBR10012 router:

```
Router# show cable modem summary c5/1/1 c5/1/2 total
Interface                        Cable Modem                    Description
            Total Reg   Unreg Offline Wideband initRC initD initIO initO
C5/1/1/U0   84    84    0     0       84       0      0     0      0
C5/1/1/U1   84    84    0     0       83       0      0     0      0
C5/1/1/U2   83    83    0     0       83       0      0     0      0
C5/1/1/U3   83    83    0     0       83       0      0     0      0
C5/1/2/U0   84    84    0     0       84       0      0     0      0
C5/1/2/U1   84    84    0     0       84       0      0     0      0
C5/1/2/U2   83    83    0     0       83       0      0     0      0
C5/1/2/U3   83    83    0     0       83       0      0     0      0
Total:      668   668   0     0       667      0      0     0      0
Router#
```

The following example shows sample output for the **show cable modem summary total** command for a range of interfaces and upstreams on the Cisco uBR10012 router:

```
Router# show cable modem summary c5/1/1 c5/1/2 upstream 0 1 total
Interface                        Cable Modem                    Description
            Total Reg   Unreg Offline Wideband initRC initD initIO initO
C5/1/1/U0   84    84    0     0       84       0      0     0      0
C5/1/1/U1   84    84    0     0       83       0      0     0      0
C5/1/2/U0   84    84    0     0       84       0      0     0      0
C5/1/2/U1   84    84    0     0       84       0      0     0      0
Total:      336   336   0     0       335      0      0     0      0
Router#
```



Note When displaying a summary for a range of ports or cable interfaces, the first port or cable interface (for example, u0 or c4/0) must be lower-numbered than the second port or interface (for example, u6 or c6/0). If you specify the higher-numbered port or interface first, the display shows no CMs connected.

Table below describes the fields shown in the **show cable modem summary** displays:

Table 140: Descriptions for the show cable modem summary Fields

Field	Description
Interface	The cable interface line card providing the upstream for the CMs.
Total Modems or Total	Total number of CMs, registered, unregistered, and offline for this interface.

Field	Description
Registered Modems or Reg	Total number of CMs that have registered and are online on this interface. This number might be different from the Total Modems number if some modems are offline or not fully registered.
Unregistered Modems	Total number of CMs that are either offline and not currently communicating with the CMTS, or attempting to come online but are not yet registered.
Offline	Total number of CMs that were online or attempted to register but are no longer communicating with the CMTS.
Wideband	CM is registered as a wideband CM.
init(rc)	MAC state of CM is init(rc).
init(d)	MAC state of CM is init(d).
init(io)	MAC state of CM is init(io).
init(o)	MAC state of CM is init(o).
Description	Description entered for this upstream using the cable upstream description command.



Note For information on MAC states, see the show cable modem command.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.
show cable modem calls	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem counters	Displays downstream and upstream traffic counters for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.

Command	Description
show cable modem offline	Displays a list of the CMs that are marked as offline with the Cisco CMTS.
show cable modem registered	Displays a list of the CMs that are marked as registered with the Cisco CMTS.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modem unregistered	Displays a list of the CMs that are marked as unregistered with the Cisco CMTS.
show cable modem vendor	Displays the vendor name or Organizational Unique Identifier (OUI) for the CMs on each cable interface.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.
show cable modem wideband	Displays information for a wideband CMs.

show cable modem summary scn

To display the summary of cable modem interfaces by a service class name, use the **show cable modem summary scn** command in privileged EXEC mode. Maximum of four service class names are listed.

show cable modem summary scn {*service class name list*}

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCJ1	This command was introduced in Cisco uBR Series router.
3.18.1SP	This command was introduced in Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable modem summary scn** command:

```
Router# show cable modem summary scn ds1 ds2 us1 us2
Interface ds1 ds2 us1 us2
C7/0/0/UB 8   8   8   8
C7/0/0/U2 1   1   1   1
```

Related Commands

Command	Description
show cable modem summary	Displays a summary of CMs on one or more cable interfaces.

show cable modem summary wb-rf

To display the number of RF channels that are down on a cable interface, use the **show cable modem summary wb-rf** command in privileged EXEC mode.

show cable modem [**cable** *slot /subslot /port*] **summary wb-rf** [**modular-cable** *slot /bay/port* **:***nb-channel-number*]

Cisco cBR-8 Converged Broadband Router
show cable modem [**cable** *slot /subslot /port*]**summary wb-rfs** *slot /subslot/portWB-RF-channel-number*

Syntax Description

cable *slot /subslot /port*	(Optional) Specifies the cable interface. The following are the valid values: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid values are 5to 8. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Specifies the port number. Valid values are 0 to 4 (depending on the cable interface). This option is not supported on the Cisco cBR-8 router.
slot /subslot /port	(Optional) Specifies the cable interface on the Cisco cBR-8 router. The following are the valid values: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid values are 0 to 3 and 6 to 9. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslot is 0. • *port* —Specifies the port number. Valid values are 0 to 7.
WB-RF-channel-number	(Optional) Specifies the cable interface on the Cisco cBR-8 router. The valid values 0 to 163.
modular-cable *slot/bay/port:nb-channel-number*	(Optional) Specifies the modular cable interface. The following are the valid values: • *slot* —The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs. • bay—The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay). • *port* —Specifies the interface number on the SPA. • *nb-channel-number* —Specifies the narrowband channel number. This option is not supported on the Cisco cBR-8 router.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **modular-cable** keyword and the *port* variable were removed.

Examples

The following is a sample output of the **show cable modem summary wb-rf** command on the cable interface at slot/subslot/port 8/0/0:

```
Router# show cable modem cable 8/0/0 summary wb-rfs
Total     Total    Percent
RF        w-online  RF down  RF down
--------  --------  -------  -------
1/0/0 0   4         0        0
      1   6         0        0
      2   7         0        0
```

The following is a sample output of the **show cable modem summary wb-rf** command on the modular cable interface at slot/bay/port and narrowband channel 1/0/0 18:

```
Router# show cable modem c8/0/0 summary wb-rfs modular-cable 1/0/0 18
Total     Total    Percent
RF        w-online  RF down  RF down
--------  --------  -------  -------
1/0/0 18  0         0        0
```

Example for Cisco cBR-8 Converged Broadband Router

This example shows the output of the **show cable modem summary wb-rf** command:

```
Router#show cable modem summary wb-rfs

         Total     Total    Percent
RF        w-online  RF down  RF down
--------  --------  -------  -------
1/0/1 0   7         0        0
      1   6         0        0
      2   7         0        0
      3   1         0        0
      32  1         0        0
      33  1         0        0
      35  1         0        0
1/0/4 1   2         0        0
      2   2         0        0
      3   2         0        0
      4   1         0        0
      5   1         0        0
      6   1         0        0
      7   1         0        0
      158 1         0        0

Router#
```

```
Router#show cable modem c1/0/1 summary wb-rfs

          Total     Total    Percent
RF        w-online  RF down  RF down
--------  --------  -------  -------
1/0/1 0   6         0        0
      1   6         0        0
      2   7         0        0
      3   2         1        50
      32  1         0        0
      33  1         0        0
      35  1         0        0
```

```
Router#show cable modem c1/0/1 summary wb-rfs 1/0/1 0

          Total     Total    Percent
RF        w-online  RF down  RF down
--------  --------  -------  -------
1/0/1 0   6         0        0
```

Related Commands

Command	Description
show cable modem summary	Displays a summary of CMs on one or more cable interfaces.

show cable modem sysDescr

To display the system description of a particular cable modem (CM) on the Cisco CMTS router, use the **show cable modem sysDescr** command in privileged EXEC mode.

show cable modem {*ip-addressipv6-addressmac-address*} **sysDescr** [**community** *community-name*]

Syntax Description

ip-address	IPv4 address of the cable modem to be displayed.
ipv6-address	IPv6 address of the cable modem to be displayed.
mac-address	MAC address of the cable modem to be displayed.
sysDescr	Displays cable modem system description.
community *community-name*	(Optional) Specifies the cable modem community name provided in the cable modem configuration file. The *community-name* should match the cable modem's community name in cable modem configuration file.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG2	This command was introduced.
12.2(33)SCH 12.2(33)SCG5	This command is supported for IPv6 cable modems.
12.2(33)SCH	This command was modified. The variable *ipv6-address* was added for IPv6 support.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router.

Usage Guidelines

You must enable the Simple Network Management Protocol (SNMP) manager process using the **snmp-server manager** command in global configuration mode before using the **show cable modem sysDescr** command. The **show cable modem sysDescr** command displays result for IPv4 cable modems only.

Note Effective with Cisco IOS Release 12.2(33)SCH and 12.2(33)SCG5, the **show cable modem sysDescr** command displays results for IPv6 cable modems.

In Cisco IOS Release 12.2(33)SCG1 and earlier, you cannot view the system description of a single cable modem. Instead, you can view system descriptions of all the cable modems connected to the Ciso CMTS router. To view the system descriptions of all cable modems, enable the **remote-query** functionality on the Cisco CMTS router using the **cable modem remote-query** command in global configuration mode. Then, run the **show cable modem verbose | include sysDescr** command.

Note The **remote-query** functionality might impact system performance because it queries all the cable modems connected to the Cisco CMTS router.

A community name string is configured in the CMTS for the cable modems using the **snmp-server community***community-string* command or by enabling the cable modem remote-query feature using the **cable modem remote-query** *community-string* command.

The CMTS uses the default community name *public* if you do not specify the **community** option when you use the **show cable modem sysDescr** command.

Note Ensure that the *community-name* specified in the **show cable modem sysDescr** command matches the community name configured in the cable modem's configuration file. Also ensure that *public* is configured as a community name in the cable modem configuration file in case you do not specify the **community** string in this **show** command.

If the community name specified in this **show** command does not match the community names configured in the cable modem's configuration file , then the **show cable modem sysDescr** command output does not provide any system description and the output is as follows:

```
Router#show cable modem 602a.d001.faa0 sysdescr
Querying remote CM...
Timeout
```

Examples

The following is a sample output of the **show cable modem sysDescr** command that displays system description of the specified cable modem:

```
Router# show cable modem 001c.ea37.9b52 sysDescr
Querying remote CM...
Response received
00:26:53 edt Fri Jan 4 2013
Last Poll
        Started:00:26:53 edt Fri Jan 4 2013
        Ended:  00:26:53 edt Fri Jan 4 2013
    I/F     IP Address       MAC Address     sysDescr
----------  ---------------  --------------  ---------
Cable7/1/2  40.101.0.7      001c.ea37.9b52  S-A DOCSIS CABLE MODEM <<HW_REV: 1.0;VENDOR:S-A;
 BOOTR: 2.1.7c; SW_REV: v202r1061-061016;              MODEL: DPC2505>>
```

Table 141: show cable modem sysDescr Field Descriptions

Field	Description
I/F	Cable interface.
IP Address	IPv4 or IPv6 address of the CM.
MAC Address	MAC address of the CM.
sysDescr	Cable modem system description.

This example shows the output of the **show cable modem sysDescr** command on the Cisco cBR-8 router:

```
Router# show cable modem 1859.334d.fa14 sysdescr
Querying remote CM...
Response received
21:17:10 PDT Sat Dec 31 2011

Last Poll
        Started:21:17:09 PDT Sat Dec 31 2011
        Ended:  21:17:10 PDT Sat Dec 31 2011
    I/F         IP Address       MAC Address     sysDescr
--------------  ---------------  --------------  ---------
Cable3/0/1      10.10.1.221      1859.334d.fa14  Cisco DPC3010 DOCSIS 3.0 Cable Modem
<<HW_REV: 1.0;
 VENDOR: Cisco; BOOTR: 2.3.0_R1; SW_REV: d3000-v302r125573-130625a; MODEL: DPC3010>>
      MODEL: DPC2505>>
```

Related Commands

Command	Description
cable modem remote-query	Enables the remote query functionality on the Cisco CMTS router to gather cable modem performance statistics.
snmp-server manager	Enables the SNMP manager process.

show cable modem tcs summary

To display transmit channel set (TCS) information on the Cisco CMTS router, use the **show cable modem tcs summary** command in privileged EXEC mode.

show cable modem tcs summary

Syntax Description

There are no keywords or arguments.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router.

Examples

This example is the output of the **show cable modem tcs summary** command:

```
Router# show cable modem tcs summary

Interface                          Cable Modem
                                Total Reg   Oper  Unreg Offline Wideband TCS   USCB
C7/0/0/U0-3                     8     8     8     0     0       8         3840  1,2
C7/0/0/U0                       3     3     3     0     0       2
C7/0/0/U1                       2     2     2     0     0       2
C7/0/0/U3                       5     5     5     0     0       0
C7/1/0/U3                       1     1     1     0     0       0
C7/1/1/U0                       1     0     0     1     1       0
C8/0/0/U0-1,2.0,3              3     3     3     0     0       3         3840  1,2,3,4,5,6,7,8
Total:                          23    22    22    1     1       15
```

Note In the above example, the interface value indicates the upstream channels of the TCS. The interface is displayed as *U0-1 3 5-7* when the TCS is U0, U1, U3, U5, U6, U7 and if it is a logical channel, the interface is displayed as *U0.0,1.0,3.0* .

Table below describes the significant fields shown in the display:

Table 142: show cable modem tcs summary Field Descriptions

Field	Description
Interface	Cable interface line card providing the upstream for the CMs.
Total Modems or Total	Total number of CMs, registered, unregistered, and offline for this interface.

Field	Description
Registered Modems or Reg	Total number of CMs that have registered and are online on this interface. This number might be different from the Total Modems number if some modems are offline or not fully registered.
Oper	Total number of CMs that are operational.
Unregistered Modems or Unreg	Total number of CMs that are either offline and not currently communicating with the Cisco CMTS, or attempting to come online but are not yet registered.
Offline	Total number of CMs that were online or attempted to register but are no longer communicating with the Cisco CMTS.
Wideband	CM is registered as a wideband CM.
TCS	TCS ID.
USCB	Upstream bonding group ID.

This example is the output of the **show cable modem tcs summary** command for the Cisco cBR Series Converged Broadband Router router:

```
Router#show cable modem tcs summary
Interface                                  Cable Modem
                                  Total Reg   Oper  Unreg Offline Wideband TCS
USCB
Ca3/0/1/U0                        8     1     1     7     1       0        1
Ca3/0/1/U1                        8     0     0     8     1       0        2
Ca3/0/1/U2                        48    0     0     48    2       0        3
Ca3/0/1/U4                        57    26    26    31    12      0        5
Ca3/0/1/U5                        14    0     0     14    1       0        6
Ca3/0/1/U6                        9     0     0     9     0       0        7
Ca3/0/2/U0                        28    4     4     24    10      0        1
Ca3/0/2/U1                        50    50    50    0     0       0        2
Ca3/0/2/U5                        72    72    72    0     0       0        6
Ca3/0/3/U1                        94    94    94    0     0       0        2
Ca3/0/3/U2                        59    59    59    0     0       0        3
Ca3/0/4/U0                        29    0     0     29    6       0        1
Ca3/0/4/U1                        20    2     2     18    7       0        2
Ca3/0/4/U2                        14    0     0     14    4       0        3
Ca3/0/4/U4                        57    10    10    47    39      0        5
Ca3/0/4/U5                        17    1     1     16    13      0        6
Ca3/0/4/U6                        6     6     6     0     0       0        7
Ca3/0/5/U0                        3     3     3     0     0       0        1
Ca3/0/5/U1                        74    74    74    0     0       0        2
Ca3/0/5/U2                        3     3     3     0     0       0        3
Ca3/0/5/U5                        77    77    77    0     0       0        6
Ca3/0/6/U4                        4     4     4     0     0       0        5
Ca3/0/6/U5                        1     0     0     1     1       0        6
Ca3/0/6/U6                        2     1     1     1     0       0        7
Ca3/0/6/U4                        4     4     4     0     0       4        4096
65540
Ca3/0/6/U5                        1     1     0     0     0       1        8192
65541
Ca3/0/6/U6                        3     3     3     0     0       3        16384
65542
Ca3/0/7/U0                        2     0     0     2     2       0        1
```

```
Ca3/0/7/U1                      1     0     0     1     0     0     2
Ca3/0/7/U2                      29    0     0     29    23    0     3
Ca3/0/7/U4                      43    0     0     43    40    0     5
Ca3/0/7/U5                      27    0     0     27    25    0     6
Ca3/0/7/U6                      24    0     0     24    20    0     7

Total:                          888   495   494   393   207   8

Router#
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs on the Cisco CMTS router.
show interface cable modem	Displays information about the CMs connected to a particular cable interface on the Cisco CMTS router.
show cable modem wideband	Displays information for a wideband CM on the Cisco CMTS router.

show cable modem tftp

To display a single CM's configuration file related information by MAC/IPv4 address /IPv6 address, use the **show cable modem tftp** command in privileged EXEC configuration mode.

show cable modem *[cm-mac|cm-ip|cm-ipv6]* **tftp**

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS XE Gibraltar 16.12.1	This command was introduced in Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable modem tftp** command, it displays a CM's configuration file related information by IPv6 address.

```
Router# show cable modem 34bd.fa0f.4418 tftp
Host Interface : C1/0/0
MAC Address : 34bd.fa0f.4418
IP Address : 50.13.0.4
IPv6 Address : 2001:50:13:0:74E3:4197:E2F2:8162
Modem Status : w-online(pt)
TFTP Server Address : 2001:1:38::25:3
Modem Configuration File Name : cbr8/cm.bin
Timestamp : 02:16:02 CST Tue May 21 2019
```

If no MAC/IPv4 address /IPv6 address is specified, it will display configuration file related information for all CMs on the CMTS.

```
Router#show cable modem tftp
Host Interface : C1/0/0
MAC Address : 34bd.fa0f.4418
IP Address : 50.13.0.4
IPv6 Address : 2001:50:13:0:74E3:4197:E2F2:8162
Modem Status : w-online(pt)
TFTP Server Address : 2001:1:38::25:3
Modem Configuration File Name : cbr8/cm.bin
Timestamp : 02:16:02 CST Tue May 21 2019
Host Interface : C1/0/0
MAC Address : 34bd.fa0f.3850
IP Address : 50.13.0.38
IPv6 Address : 2001:50:13:0:7DF4:56AD:6F3A:231B
Modem Status : w-online(pt)
TFTP Server Address : 2001:1:38::25:3
Modem Configuration File Name : cbr8/cm.bin
Timestamp : 02:16:10 CST Tue May 21 2019
Host Interface : C1/0/1
MAC Address : 34bd.fa0f.4448
IP Address : 50.13.0.26
IPv6 Address : ---
Modem Status : w-online(pt)
TFTP Server Address : 1.38.25.3
```

```
Modem Configuration File Name : cbr8/cm.bin
Timestamp : 02:20:14 CST Tue May 21 2019
```

show cable modem timeline

To display the history for cable modem state transition, use the **show cable modem timeline** command in privileged EXEC mode.

show cable modem { *ip-address mac-address* } **timeline** [**dynamic** | **verbose**]

Syntax Description

dynamic	Displays CM timeline of dynamic events.
verbose	Display CM dynamic and registration events in chronological order.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1x	This command was updated on the Cisco cBR Series Converged Broadband Router. The **dynamic** and **verbose** keywords are added.

Examples

This example shows sample output for the **show cable modem timeline** command:

```
Router#show cable modem 385f.6673.6a40 timeline
Load for five secs: 6%/0%; one minute: 6%; five minutes: 6%
Time source is NTP, .21:16:13.017 EST Tue Jan 18 2022
cable modem timeline in sup :
TIMESTAMP               OLD STATE    EVENT                    NEW STATE    IPv6

Jan 18 20:40:55.600     w-online     cm state update          w-online(pt) ---
                          sup received cm evt
Jan 18 20:40:55.396     init(o)      cm state update          w-online(d)  ---
                          sup received cm evt
Jan 18 20:40:51.905     init(o)      tftpv4 request           init(o)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:51.895     init(o)      tftpv4 request           init(o)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:51.887     init(t)      tftpv4 request           init(o)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:49.151     init(dr)     dhcpv4 ack               init(i)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:49.149     init(io)     dhcpv4 request           init(dr)     ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:20.871     init(d)      dhcpv4 offer             init(io)     ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:20.870     init(rc)     dhcpv4 discover          init(d)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:17.083     offline      init CM instance         init(rc)     ---
                          C2/0/1/U2  rfid:16644

cable modem timeline in clc :
TIMESTAMP               OLD STATE    EVENT                    NEW STATE    IPv6

Jan 18 20:40:54.325     init(o)      register ack             w-online     ---
                          C2/0/1/UB  rfid:16644
Jan 18 20:40:51.456     init(o)      register request         init(o)      ---
```

```
                          handle reg-req-mp
Jan 18 20:40:50.821     init(t)      cm state update          init(o)      ---
                          clc received cm evt
Jan 18 20:40:50.481     init(i)      cm state update          init(t)      ---
                          clc received cm evt
Jan 18 20:40:48.085     init(dr)     cm state update          init(i)      ---
                          clc received cm evt
Jan 18 20:40:48.083     init(io)     cm state update          init(dr)     ---
                          clc received cm evt
Jan 18 20:40:19.805     init(d)      cm state update          init(io)     ---
                          clc received cm evt
Jan 18 20:40:19.805     init(rc)     cm state update          init(d)      ---
                          clc received cm evt
Jan 18 20:40:17.034     init(r1)     ranging request          init(rc)     ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:16.014     offline      bond initial ranging     init(r1)     ---
                          C2/0/1/U2  rfid:16644


Router#show cable modem 385f.6673.6a40 timeline dynamic
Load for five secs: 6%/0%; one minute: 6%; five minutes: 6%
Time source is NTP, .21:16:25.102 EST Tue Jan 18 2022

cable modem dynamic event timeline in clc :
TIMESTAMP               OLD STATE    EVENT                    NEW STATE
Jan 18 20:41:04.073     w-online(pt) ds resiliency            p-online(pt)  dcid: 2


Router#show cable modem 385f.6673.6a40 timeline verbose
Load for five secs: 7%/0%; one minute: 6%; five minutes: 6%
Time source is NTP, .21:16:31.992 EST Tue Jan 18 2022
cable modem verbose timeline in sup :
TIMESTAMP               OLD STATE    EVENT                    NEW STATE    IPv6

Jan 18 20:40:55.601     w-online     cm state update          w-online(pt) ---
                          sup received cm evt
Jan 18 20:40:55.397     init(o)      cm state update          w-online(d)  ---
                          sup received cm evt
Jan 18 20:40:51.906     init(o)      tftpv4 request           init(o)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:51.896     init(o)      tftpv4 request           init(o)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:51.888     init(t)      tftpv4 request           init(o)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:49.152     init(dr)     dhcpv4 ack               init(i)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:49.150     init(io)     dhcpv4 request           init(dr)     ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:20.872     init(d)      dhcpv4 offer             init(io)     ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:20.871     init(rc)     dhcpv4 discover          init(d)      ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:17.084     offline      init CM instance         init(rc)     ---
                          C2/0/1/U2  rfid:16644

cable modem verbose timeline in clc :
TIMESTAMP               OLD STATE    EVENT                    NEW STATE    IPv6

Jan 18 20:41:04.074     w-online(pt) ds resiliency            p-online(pt) ---
                          dcid: 2
Jan 18 20:40:54.324     init(o)      register ack             w-online     ---
                          C2/0/1/UB  rfid:16644
Jan 18 20:40:51.456     init(o)      register request         init(o)      ---
                          handle reg-req-mp
```

```
Jan 18 20:40:50.821     init(t)      cm state update          init(o)      ---
                          clc received cm evt
Jan 18 20:40:50.481     init(i)      cm state update          init(t)      ---
                          clc received cm evt
Jan 18 20:40:48.085     init(dr)     cm state update          init(i)      ---
                          clc received cm evt
Jan 18 20:40:48.083     init(io)     cm state update          init(dr)     ---
                          clc received cm evt
Jan 18 20:40:19.805     init(d)      cm state update          init(io)     ---
                          clc received cm evt
Jan 18 20:40:19.805     init(rc)     cm state update          init(d)      ---
                          clc received cm evt
Jan 18 20:40:17.034     init(r1)     ranging request          init(rc)     ---
                          C2/0/1/U2  rfid:16644
Jan 18 20:40:16.014     offline      bond initial ranging     init(r1)     ---
                          C2/0/1/U2  rfid:16644
```

show cable modem type

To display cable modem (CM) provisioning information for all CMs, such as boot mode configuration and MAC and IP address information, use the **show cable modem type** command in privileged EXEC configuration mode.

Cisco uBR7246VXR Router and Cisco uBR7225VXR Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *port* | *slot* / *cable-interface-index* } [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **type**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index* } [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **type**

Cisco cBR Series Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot* / *subslot* / *cable-interface-index* [**upstream** *port*]] **type**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) MAC address of a specific CM to be displayed. If you specify the MAC address for a CPE device behind a CM, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. Cisco cBR-8 router—The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for port begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This option is not supported on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This option is not supported on the Cisco cBR-8 router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **name** keyword and the *logical-channel-index* variable were removed.

Usage Guidelines

In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Examples

The following example shows sample output for the **show cable modem type** command :

```
Router# show cable modem type
Boot Mode configuration:
P - Primary Boot mode (IPv6 or IPv4)
D - Dual Stack (Yes/No)
A - Alternative Provisioning Mode (Yes/No)
MAC Address    Interface P/D/A  IPv4 address    IPv6 Address
0004.27a5.b761 C6/0/2/U1 v6/N/N 10.7.0.161      ---
```

```
0007.0e01.d9a1 C6/0/2/U0 v6/N/N 10.7.0.162      ---
0006.2854.7275 C6/0/2/U1 v6/Y/N 10.7.0.3        2001:ODB8:3800:80B:7565:5B87:1D7D:5AD5
0018.6835.27dd C6/0/U0   v6/N/N ---             2001:0DB8:3800:803:41D7:DECC:F15D:133
```

Table below describes the significant fields shown in the display.

Table 143: show cable modem type Field Descriptions

Field	Description
MAC Address	MAC address of this CM.
Interface	Cable line card interface and upstream associated with this CM.
P/D/A	String of 3 values representing the boot mode configuration of the CM as follows: • P—Primary Boot Mode, where "v4" or "v6" indicates IPv4 or IPv6 as the primary addressing mode. • D—Dual Stack, where "Y" or "N" indicates whether or not both IPv4 and IPv6 addressing modes are supported. • A—Alternative Provisioning Mode (APM), where "Y" or "N" indicates whether or not APM is supported. **Note** APM is not supported by the Cisco CMTS routers in Cisco IOS Release 12.2(33)SCA.
IPv4 address	IPv4 address acquired by the CM. Prior to acquisition of the IP address, or if the CM fails IPv4 registration, the following output is shown: • IPv4 address not yet acquired—"0.0.0.0" • CM fails IPv4 registration, but online with IPv6 address: "---" • IPv4 address of an IPv6-only CM: "---"
IPv6 Address	IPv6 address acquired by the CM. Prior to acquisition of the IP address, or if the CM fails IPv6 registration, the following output is shown: • IPv6 address not yet acquired—"::" • CM fails IPv6 registration, but online with IPv4 address "---" • IPv6 address of IPv4-only CM: "---"

This example shows the output of the **show cable modem type** command on the Cisco cBR Series Converged Broadband Router router:

```
Router#show cable modem type
Boot Mode configuration:
P - Primary Boot mode (IPv6 or IPv4)
D - Dual Stack (Yes/No)
A - Alternative Provisioning Mode (Yes/No)

MAC Address    Interface    P/D/A  IPv4 address    IPv6 Address
1859.334d.6622 C3/0/1       v4/N/N 10.10.0.4       ---
1859.334d.7cd2 C3/0/1       v4/N/N 10.10.0.9       ---
1859.334d.7db2 C3/0/1       v4/N/N 10.10.0.10      ---
1859.334d.7e64 C3/0/1       v4/N/N 10.10.0.17      ---
1859.334d.f658 C3/0/1       v4/N/N 10.10.0.20      ---
1859.334d.f9d0 C3/0/1       v4/N/N 10.10.0.23      ---
1859.334d.774c C3/0/1       v4/N/N 10.10.0.25      ---
1859.334d.f628 C3/0/1       v4/N/N 10.10.0.28      ---
```

```
1859.334d.f60e C3/0/1       v4/N/N 10.10.0.33      ---
1859.334d.fa36 C3/0/1       v4/N/N 10.10.0.35      ---
1859.334d.667e C3/0/1       v4/N/N 10.10.0.36      ---
1859.334d.fb1e C3/0/1       v4/N/N 10.10.0.37      ---
1859.334d.7d8e C3/0/1       v4/N/N 10.10.0.42      ---
1859.334d.f604 C3/0/1       v4/N/N 10.10.0.52      ---
1859.334d.fc64 C3/0/1       v4/N/N 10.10.0.57      ---
1859.334d.f696 C3/0/1       v4/N/N 10.10.0.61      ---
1859.334d.fce6 C3/0/1       v4/N/N 10.10.0.78      ---
1859.334d.f9b0 C3/0/1       v4/N/N 10.10.0.97      ---
1859.334d.fa8c C3/0/1       v4/N/N 10.10.0.116     ---
1859.334d.71e0 C3/0/1       v4/N/N 10.10.0.123     ---
1859.334d.7e34 C3/0/1       v4/N/N 10.10.0.134     ---
1859.334d.7e9e C3/0/1       v4/N/N 10.10.0.150     ---
1859.334d.7cf0 C3/0/1       v4/N/N 10.10.0.164     ---
1859.334d.f96e C3/0/1       v4/N/N 10.10.0.167     ---
1859.334d.7b68 C3/0/1       v4/N/N ---             ---
1859.334d.7aec C3/0/1       v4/N/N 10.10.0.176     ---
1859.334d.fce8 C3/0/1       v4/N/N 10.10.0.180     ---
1859.334d.f62a C3/0/1       v4/N/N 10.10.0.191     ---
1859.334d.fabc C3/0/1       v4/N/N 10.10.0.217     ---
1859.334d.7d00 C3/0/1       v4/N/N 10.10.0.224     ---
1859.334d.6778 C3/0/1       v4/N/N 10.10.0.247     ---
1859.334d.7306 C3/0/1       v4/N/N 10.10.1.18      ---
1859.334d.65d4 C3/0/1       v4/N/N 10.10.1.5       ---
1859.334d.6604 C3/0/1       v4/N/N 10.10.1.49      ---
1859.334d.7a10 C3/0/1       v4/N/N 10.10.1.51      ---
1859.334d.7d38 C3/0/1       v4/N/N 10.10.1.75      ---
1859.334d.6434 C3/0/1       v4/N/N 10.10.1.55      ---
1859.334d.7ace C3/0/1       v4/N/N 10.10.1.78      ---
1859.334d.7b5a C3/0/1       v4/N/N 10.10.1.61      ---
1859.334d.7d16 C3/0/1       v4/N/N 10.10.1.60      ---
1859.334d.7c78 C3/0/1       v4/N/N 10.10.1.93      ---
1859.334d.65b0 C3/0/1       v4/N/N 10.10.1.81      ---
1859.334d.7c40 C3/0/1       v4/N/N 10.10.1.82      ---
1859.334d.804a C3/0/1       v4/N/N 10.10.1.87      ---
1859.334d.7b2a C3/0/1       v4/N/N 10.10.1.98      ---
1859.334d.7d04 C3/0/1       v4/N/N 10.10.1.100     ---
1859.334d.7e42 C3/0/1       v4/N/N 10.10.1.107     ---
1859.334d.6e1a C3/0/1       v4/N/N 10.10.1.109     ---
1859.334d.7be8 C3/0/1       v4/N/N 10.10.1.113     ---
1859.334d.7a5a C3/0/1       v4/N/N 10.10.1.129     ---
1859.334d.6584 C3/0/1       v4/N/N 10.10.1.128     ---
1859.334d.7ad2 C3/0/1       v4/N/N 10.10.1.130     ---
1859.334d.660e C3/0/1       v4/N/N 10.10.1.132     ---
1859.334d.7b4c C3/0/1       v4/N/N 10.10.1.134     ---
1859.334d.6688 C3/0/1       v4/N/N 10.10.1.136     ---
1859.334d.7cc0 C3/0/1       v4/N/N 10.10.1.141     ---
1859.334d.6742 C3/0/1       v4/N/N 10.10.1.153     ---
1859.334d.7c32 C3/0/1       v4/N/N ---             ---
1859.334d.7aac C3/0/1       v4/N/N 10.10.1.172     ---
1859.334d.f968 C3/0/1       v4/N/N 10.10.1.177     ---
```

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.

show cable modem unregistered

To display a list of the cable modems (CMs) that are marked as unregistered with the Cisco CMTS, use the **show cable modem unregistered** command in privileged EXEC mode.

Cisco uBR7100 Series and Cisco uBR7200 Series Routers
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *port* | *slot* / *cable-interface-index* } [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **unregistered**

Cisco uBR10012 Router
show cable modem [*ip-addressmac-address* | **cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index* } [**upstream** *port* [*logical-channel-index*]] | **name** *fqdn*] **unregistered**

Cisco cBR-8 Converged Broadband Router
show cable modem [*ip-addressmac-address* | **cable** *slot* / *subslot* / *cable-interface-index*] **unregistered**

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific cable modem to be displayed. If you specify the IP address for a CPE device behind a cable modem, information for that cable modem is displayed.
mac-address	(Optional) MAC address of a specific cable modem to be displayed. If you specify the MAC address for a CPE device behind a cable modem, information for that CM is displayed.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. For the Cisco uBR10012 router—The valid subslots are 0 or 1. Cisco cBR-8 router—The valid subslot is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface). This option is not supported on the Cisco cBR-8 router.

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using the specified upstream port. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports supported by the cable interface line card. This option is not supported on the Cisco cBR-8 router.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This option is not supported on the Cisco cBR-8 router.
name *fqdn*	(Optional) Specifies the fully qualified domain name (FQDN) of the cable device to be displayed. This option is only available if the **show cable modem domain-name** command has been run for the first time to update the cable DNS cache on the CMTS router. This option is not supported on the Cisco cBR-8 router.

Command Default

Displays a list of all unregistered CMs on the Cisco CMTS router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.2(4)BC1	This command was introduced on the Cisco uBR10012 router.

Release	Modification

12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes:
	• Support for the Cisco uBR7225VXR router was added.
	• Support for specifying the IPv6 address of a cable modem or CPE device was added.
	• The **name** keyword option was added for specifying the fully-qualified domain name of a CM.
	• The following new initialization states were added to show initialization of CMs and CPEs supporting IPv6:
	  • init6(s)—CMTS router has seen SOLICIT message.
	  • init6(a)—CMTS router has seen ADVERTISE message.
	  • init6(r)—CMTS router has seen REQUEST message.
	  • init6(i)—CMTS router has seen REPLY message.
	  • init6(o)—CMTS router has seen version 6 TFTP request.
	  • init6(t)—CMTS router has seen version 6 TOD request.

12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The **upstream** and **name** keywords and the *logical-channel-index* variable were removed.

Usage Guidelines

Operation with Hot Standby Connection-to-Connection Protocol (HCCP) Configuration

If you are using Hot Standby Connection-to-Connection Protocol (HCCP) 1+1 or 1:n (N+1) redundancy, the new primary processor after a switchover automatically creates a new database of the online cable modems. This means that the **show cable modem** *ip-address* command might not show a particular cable modem until the CMTS receives IP traffic from that cable modem. You can force IP traffic by using the **ping** *ip-address* command, and then the **show cable modem** *ip-address* command will show the cable modem. You can also display any particular cable modem by using the **show cable modem | include** *ip-address* command.

In addition, when HCCP redundancy has been configured, the Cisco IOS software automatically synchronizes the secondary, backup cards whenever the configuration is changed. The cards can also be synchronized manually, using the **hccp resync** command. When a SYNC event command is occurring, CLI commands might be very slow to respond. In particular, if you enter the **show cable modem** command at the same time a SYNC event is occurring, the command might respond produce a blank display, or it might display an error message similar to the following:

```
%No response from slot 6/1. Command aborted
```

If this occurs, wait a minute or so and retry the command.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Note In Cisco IOS Release 12.2(33)SCA, the **show cable modem domain-name** command must be run first on the route processor (RP) of the CMTS router before any domain name can be used as part of a cable command.

Examples

The following example shows sample output for the default form of the **show cable modem unregistered** command.

```
Router# show cable modem unregistered

Interface   Prim Online    Timing Rec    QoS CPE IP address      MAC address
            Sid  State     Offset Power
Cable3/0/U0 1    online     2812   -0.25  5   1   3.18.1.5        0030.80bc.2303
Cable3/0/U0 2    online     2804    0.50  5   0   3.18.1.9        0006.2854.73f5
C6/0/U0     6    init6(i)   1532   -0.50  2   0   0.0.0.0         0018.6835.27dd
```

The following example shows sample output for the **show cable modem unregistered** command for a particular cable interface:

```
Router# show cable modem c8/1/0 unregistered

Interface Prim Online      Timing Rec     QoS CPE IP address      MAC address
          Sid  State       Offset Power
C8/1/0/U1 1    online       1548   0.00   5   0   22.1.1.11       0050.7366.1243
C8/1/0/U4 2    online       1925   0.00   5   0   23.1.1.10       0002.b970.0027
C8/1/0/U4 3    online       1918   -0.50  2   0   22.1.1.10       0006.5314.858d
```

The following example shows sample output for the **show cable modem unregistered** command for a single cable modem, as identified by its IP address:

```
Router# show cable modem 22.1.1.10 unregistered

Interface Prim Online      Timing Rec     QoS CPE IP address      MAC address
          Sid  State       Offset Power
C8/1/0/U4 3    online       1918   -0.75  2   0   22.1.1.10       0006.5314.858d
```

The following example shows sample output for the **show cable modem unregistered** command for a single cable modem, as identified by its MAC address:

```
Router# show cable modem 0006.5314.858d unregistered

Interface Prim Online      Timing Rec     QoS CPE IP address      MAC address
          Sid  State       Offset Power
C8/1/0/U4 3    online       1918   -0.25  2   0   22.1.1.10       0006.5314.858d
```

Note An asterisk (*) in the Receive Power column indicates that a power adjustment has been made for that CM. An exclamation point (!) in the Receive Power column indicates that the cable modem has reached its maximum power transmit level and cannot increase its power level further. An exclamation point (!) in the Timing Offset column indicates that the cable modem has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. A pound sign (#) in the MAC State column indicates that the **cable tftp-enforce mark-only** command has been used to require that a cable modem attempt a TFTP download of the DOCSIS configuration file before registering, but the cable modem did not do so (Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases).

Tip The **show cable modem** command displays the cable modem timing offset in DOCSIS ticks, while other commands, such as **cable map-advance**, display the offset in microseconds. Use the following method to convert microseconds to DOCSIS ticks: ticks = microseconds*64/6.25 .

Table below describes the major fields shown in the **show cable modem unregistered** displays:

Table 144: Descriptions for the show cable modem unregistered Fields

Field	Description
Interface	The cable interface line card providing the upstream for this CM.
Prim SID	The primary SID assigned to this CM.
Online State	The current state of the MAC layer.
Timing Offset	The timing offset for the cable modem, in ticks, as recognized on the CMTS. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. **Note** An exclamation point (!) in the Timing Offset column indicates that the cable modem has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. **Note** The timing offset shown here is typically smaller than the TX Time Offset value shown by the **show cable modem remote-query** command, because the latter value is the offset as recognized on the cable modem (which will include any internal delay between when the cable modem software begins the transmission and when the bits actually appear on the local cable interface).
Rec Power	The received power level (in dB) for the CM. **Note** An asterisk (*) in the RxPwr column indicates that a power adjustment has been made for that CM. An exclamation point (!) indicates that the cable modem has reached its maximum power transmit level and cannot increase its power level further.

Field	Description
QoS	Displays the QoS profile assigned to the cable modem (DOCSIS 1.1 and DOCSIS 2.0 CMs only).
CPE	Indicates the number of CPE devices for which the cable modem is providing services.
IP Address	The IP address that the DHCP server has assigned to the CM.
MAC Address	The MAC address for the CM.

Table below shows the possible values for the Online State field:

Table 145: Descriptions for the Online State Field

MAC State Value[17]	Description
Registration and Provisioning Status Conditions for Devices Using IPv4 Addressing	
init(r1)	The cable modem sent initial ranging.
init(r2)	The cable modem is ranging. The CMTS received initial ranging from the cable modem and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed. **Note** If a cable modem appears to be stuck in this state, it could be that the cable modem is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the cable modem to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the **cable load-balance group** commands.
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a cable modem appears to be stuck in this state, the cable modem has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.

MAC State Value[17]	Description
init(o)	The cable modem has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the cable modem remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
resetting	The cable modem is being reset and will shortly restart the registration process.
Registration and Provisioning Status Conditions for Devices Using IPv6 Addressing	
init6(s)	The Cisco CMTS router has seen the DHCPv6 SOLICIT message from the CM.
init6(a)	The Cisco CMTS router has seen the ADVERTISE message from the DHCPv6 server to the CM.
init6(r)	The Cisco CMTS router has seen the REQUEST response from the cable modem to the DHCPv6 server.
init6(i)	The Cisco CMTS router has seen the REPLY message from the DHCPv6 server to the CM.
init6(o)	The Cisco CMTS router has seen the REQEST message from the cable modem to the TFTP server.
init6(t)	The Cisco CMTS router has seen the REQUEST message from the cable modem to the TOD server.
Non-error Status Conditions	
cc(r1)	The cable modem had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The cable modem has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the cable modem is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
cc(r2)	This state should normally follow cc(r1) and indicates that the cable modem has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the cable modem is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	The cable modem is considered offline (disconnected or powered down).
online	The cable modem has registered and is enabled to pass data on the network.

MAC State Value[17]	Description
online(d)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. The cable modem does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the cable modem using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the cable modem, assume that the cable modem is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.
online(ptd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	The cable modem registered, BPI is enabled and KEK is assigned.
online(pt)	The cable modem registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the cable modem, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.
Note If an exclamation point (!) appears in front of one of the online states, it indicates that the **cable dynamic-secret** command has been used with either the **mark** or **reject** option, and that the cable modem has failed the dynamic secret authentication check.	
expire(pk)	The cable modem registered, BPI is enabled, KEK was assigned, but the current KEK expired before the cable modem could successfully renew a new KEK value.

MAC State Value[17]	Description
expire(pkd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the cable modem could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	The cable modem registered, BPI is enabled, TEK was assigned, but the current TEK expired before the cable modem could successfully renew a new KEK value.
expire(ptd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the cable modem could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	
reject(m)	The cable modem attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the **cable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a cable modem attempt a TFTP download of the DOCSIS configuration file before registering, but the cable modem did not do so.
reject(c)	The cable modem attempted to register, but registration was refused due to a a number of possible errors: • The cable modem attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • The cable modem has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The cable modem attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The cable modem failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the cable modem and CMTS.)
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.

MAC State Value[17]	Description
reject(pkd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	The cable modem registered, but network access for CPE devices using this cable modem has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
Note In Cisco IOS Release 12.1(20)EC, Cisco IOS Release 12.2(15)BC1, and earlier releases, when network access is disabled in the DOCSIS configuration file sent to the cable modem, the network disabled status takes precedence, and the MAC status field shows online(d) even if BPI encryption fails. Use the **show cable modem** *mac-address* command to confirm whether BPI is enabled or disabled for a particular cable modem.	
reject(ts)	The cable modem attempted to register, but registration failed because the TFTP server timestamp in the cable modem registration request did not match the timestamp maintained by the CMTS. This might indicate that the cable modem attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	The cable modem attempted to register, but registration failed because the IP address in the cable modem request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
reject(na)	The cable modem attempted to register, but registration failed because the cable modem did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.

[17] The cable modem MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtsCmStatusValue object in the CISCO-DOCS-EXT-MIB.

Note For the complete list of the cable modem status, see Table 100: Descriptions for the MAC State Field , on page 1892.

Cisco cBR-8 Converged Broadband Router

This example shows the output for the **show cable modem unregistered** command:

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem access-group	Displays the access groups for the CMs on a particular cable interface.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem offline	Displays a list of the CMs that are marked as offline with the Cisco CMTS.
show cable modem registered	Displays a list of the CMs that are marked as registered with the Cisco CMTS.
show cable modem vendor	Displays the vendor name or Organizational Unique Identifier (OUI) for the CMs on each cable interface.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem vendor

To display the vendor name or Organizational Unique Identifier (OUI) for the CMs on each cable interface, use the **show cable modem vendor** command in privileged EXEC mode.

show cable modem [**cable** {*slot* / *subslot* / *port* | *slot* / *subslot* / *cable-interface-index* } [**upstream** *port* [*logical-channel-index*]]] **vendor** [**summary**]

Cisco cBR Series Converged Broadband Router
show cable modem vendor [**summary**]
show cable modem [**cable** *slot* / *subslot* / *cable-interface-index* [**upstream** *port*]] **vendor**

Syntax Description

slot	Slot where the line card resides. The valid range is from 5 to 8. Cisco cBR-8 router—The valid range is from 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. Cisco cBR-8 router—The valid subslot is 0.
port	Downstream port number. The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using this specific upstream. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports on the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1. This option is not supported on the Cisco cBR-8 router.
summary	(Optional) Displays the total numbers for each vendor and OUI, along with the total numbers of those vendor's CMs that are currently registered with the CMTS, unregistered, or offline.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7100 series, Cisco uBR7200 series, and Cisco uBR10012 routers.

Release	Modification
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The *logical-channel-index* argument was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR-8 Converged Broadband Router. The *logical-channel-index* variable was removed.

Usage Guidelines

This command displays the vendor name for each CM. If the vendor name has not been defined by the **cable modem vendor** command, the command displays the OUI value for the modem's vendor.

Note The Institute of Electrical and Electronics Engineers (IEEE) is the official issuer of OUI values.

Note Also see the information about this command's behavior in a Hot Standby Connection-to-Connection Protocol (HCCP) configuration.

Examples

The following example shows typical output for the **show cable modem vendor** command:

```
Router# show cable modem vendor

Vendor     MAC Address    I/F       MAC         Prim  RxPwr  Timing  Num BPI
                                    State       Sid   (db)   Offset  CPE Enb
Cisco      0001.9659.519f C1/0/U0   init(rc)    16    0.75    2738  0    N
Cisco      0002.b96f.fdbb C1/0/U0   online      20    1.00    2738  1    N
Cisco      0002.b96f.fdf9 C1/0/U0   online      21    0.50    2737  1    N
Cisco      0002.b96f.fff7 C1/0/U0   online      12    0.50    2737  1    N
Cisco      0002.fdfa.1163 C1/0/U0   online      1     0.00    2734  1    N
Cisco      0002.fdfa.12d5 C1/0/U0   online      14    0.00    2737  1    N
Cisco      0002.fdfa.12db C1/0/U0   online      18    0.25    2736  1    N
Cisco      0002.fdfa.12e9 C1/0/U0   online      13    0.25    2737  1    N
Cisco      0006.28dc.37fd C1/0/U0   offline     7     0.25    2734  0    N
Cisco      0006.28e9.81c9 C1/0/U0   online      2     0.75    2735  1    N
Motorola   0020.28f9.9d19 C1/0/U0   online      28    -0.25   2733  1    N
Motorola   0020.4006.b010 C1/0/U0   online      19    0.00    2728  1    N
00.C0.FF   00c0.FF78.8bea C1/0/U0   offline     10    1.25    2732  0    N
Cisco      00b0.6478.ae8d C1/0/U0   offline     10    1.50    2735  0    N
Cisco      00d0.bad3.c0cd C1/0/U0   online      26    0.25    2214  1    N
Cisco      00d0.bad3.c0d5 C1/0/U0   online      27    0.00    2215  1    N
Router#
```

The following example shows typical output for the **show cable modem vendor** command on the Cisco uBR10012 router:

```
Router# show cable modem vendor

Vendor     MAC Address    I/F       MAC         Prim  RxPwr  Timing  Num BPI
                                    State       Sid   (db)   Offset  CPE Enb
Thomson    0010.9507.01db C5/1/0/U5 online      1     0.00     938   1    N
Ericsson   0080.37b8.e99b C5/1/0/U5 online      2     -0.25   1268   0    N
```

```
Cisco      0002.fdfa.12ef C6/1/0/U0 online      13    0.00    1920  1    N
Cisco      0002.fdfa.137d C6/1/0/U0 online      16    -0.50   1920  1    N
Cisco      0003.e38f.e9ab C6/1/0/U0 online      3     -0.25   1926  1    N
Cisco      0003.e3a6.7f69 C6/1/0/U0 online      15    0.50    1927  1    N
Cisco      0003.e3a6.816d C6/1/0/U0 online      4     0.00    1929  1    N
Cisco      0006.28f9.8be5 C6/1/0/U0 online      12    0.75    1922  1    N
Cisco      0001.9659.519f C6/1/1/U2 online      26    0.25    1930  1    N
Cisco      0002.b96f.fdbb C6/1/1/U2 online      29    -0.75   1929  1    N
Cisco      0002.b96f.fdf9 C6/1/1/U2 online      39    -0.50   1931  1    N
Cisco      0002.b96f.fff7 C6/1/1/U2 online      38    0.00    1928  1    N
Cisco      0002.fdfa.1163 C6/1/1/U2 online      15    0.00    1923  1    N
Cisco      0002.fdfa.12d5 C6/1/1/U2 online      35    0.25    1923  1    N
Cisco      0002.fdfa.12e9 C6/1/1/U2 online      5     -0.25   1925  1    N
Cisco      0050.7302.3d73 C6/1/1/U2 online      58    0.25    1553  1    N
Cisco      0002.fdfa.12db C7/0/0/U0 online      15    -0.75   1914  1    N
Cisco      0002.fdfa.138d C7/0/0/U5 online      4     0.25    1917  1    N
Cisco      0003.e38f.e85b C7/0/0/U5 online      17    0.25    1919  1    N
Cisco      0003.e38f.f4cb C7/0/0/U5 online      16    0.00    1922  1    N
Cisco      0003.e3a6.7fd9 C7/0/0/U5 online      1     0.25    1922  0    N
Motorola   0020.4005.3f06 C7/0/0/U0 online      2     0.00    1901  1    N
Motorola   0020.4006.b010 C7/0/0/U5 online      3     0.25    1901  1    N
Cisco      0050.7302.3d83 C7/0/0/U0 online      18    -0.25   1543  1    N
Cisco      00b0.6478.ae8d C7/0/0/U5 online      44    0.50    1920  21   N
Cisco      00d0.bad3.c0cd C7/0/0/U5 online      19    0.00    1543  1    N
Cisco      00d0.bad3.c0cf C7/0/0/U0 online      13    0.00    1546  1    N
Cisco      00d0.bad3.c0d5 C7/0/0/U0 online      12    -0.50   1546  1    N
Router#
```

Tip The **show cable modem vendor** command displays the CM timing offset in DOCSIS ticks, while other commands, such as **cable map-advance**, display the offset in microseconds. Use the following method to convert microseconds to DOCSIS ticks: ticks = microseconds*64/6.25 .

Table below describes the major fields shown in the **show cable modem vendor** displays:

Table 146: Descriptions for the show cable modem vendor Fields

Field	Description
Vendor	The vendor name for the indicated CM, as specified by the **cable modem vendor** command. If no name for this vendor has been specified, displays the modem's OUI value.
MAC Address	The MAC address for the CM.
I/F	The cable interface line card providing the upstream for this CM.
MAC State	The current state of the MAC layer.
Prim SID	The primary SID assigned to this CM.

Field	Description
RxPwr	The received power level (in dB) for the CM. **Note** An asterisk (*) in the RxPwr column indicates that a power adjustment has been made for that CM. An exclamation point (!) indicates that the CM has reached its maximum power transmit level and cannot increase its power level further. **Note** RxPwr field is not supported on Cisco cBR-8 router.
Timing Offset	The timing offset for the CM, in ticks, as recognized on the CMTS. (A tick, as used here, is 6.25/64 microseconds.) This is the delay between when a particular cable modem is scheduled to make a transmission and when the CMTS actually receives it. **Note** An exclamation point (!) in the Timing Offset column indicates that the CM has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. **Note** The timing offset shown here is typically smaller than the TX Time Offset value shown by the **show cable modem remote-query** command, because the latter value is the offset as recognized on the CM (which will include any internal delay between when the CM software begins the transmission and when the bits actually appear on the local cable interface). **Note** Timing Offset field is not supported on Cisco cBR-8 router.
Num CPE	Indicates the number of CPE devices for which the CM is providing services.
BPI Enbld	Indicates whether Baseline Privacy Interface (BPI) or BPI Plus (BPI+) encryption is enabled for the CM.



Note An asterisk (*) in the RxPwr column indicates that a power adjustment has been made for that CM. An exclamation point (!) in the Receive Power column indicates that the CM has reached its maximum power transmit level and cannot increase its power level further. An exclamation point (!) in the Timing Offset column indicates that the CM has exceeded the maximum delay and timing offset specified by the **cable map-advance** command. A pound sign (#) in the MAC State column indicates that the cable tftp-enforce mark-only command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so (Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases).

The following example shows typical output for the **show cable modem vendor summary** command, displaying the total numbers for each vendor and OUI, along with the total numbers of those vendor's CMs that are currently registered with the CMTS, unregistered, or offline.

```
Router# show cable modem vendor summary

  Vendor     OUI                  Cable Modem
                        Total Registered Unregistered Offline
  00.02.B2   00.02.B2  4288  3997       291          259
```

```
  00.0A.73   00.0A.73  4105  3938       167          108
  00.0B.06   00.0B.06  1060  1001       59           48
  00.40.7B   00.40.7B  216   211        5            2
  00.50.04   00.50.04  701   684        17           15
  00.50.DA   00.50.DA  737   706        31           26
  00.D0.DD   00.D0.DD  2     0          2            2
  3Com       00.01.03  669   645        24           21
  3Com       00.04.75  10    10         0            0
  Ambit      00.D0.59  1     1          0            0
  BestData   00.E0.CA  1     1          0            0
  Cisco      00.04.C1  1     1          0            0
  LinkSys    00.06.25  15    13         2            2
  Motorola   00.04.BD  705   676        29           21
  Motorola   00.08.0E  762   734        28           16
  Motorola   00.20.40  1504  1444       60           45
  Powercom   00.30.3B  3     2          1            1
  SMC        00.04.E2  1     1          0            0
  Terayon    00.E0.6F  652   612        40           25
  Thomson    00.10.95  127   121        6            5
  Toshiba    00.00.39  1     1          0            0
  Turbo      00.90.83  4     4          0            0
  Zoom       00.40.36  1     1          0            0
Router#
```

Tip You can add a timestamp to this command using the **exec prompt timestamp** command in line configuration mode.

Examples for the Cisco cBR-8 Router

This example shows the output for the **show cable modem vendor** command on the Cisco cBR-8 router:

```
Router#show cable modem c1/0/1 vendor
                                                                  B D
Vendor     MAC Address    I/F           MAC            Prim Num P I
                                        State          Sid  CPE I P
18.59.33   1859.334d.6622 c1/0/1        init(i)        1    0   N N
18.59.33   1859.334d.7cd2 c1/0/1        offline        2    0   N N
18.59.33   1859.334d.7db2 c1/0/1        online(pt)     3    0   Y N
18.59.33   1859.334d.7e64 c1/0/1        offline        4    0   N N
18.59.33   1859.334d.f658 c1/0/1        online(pt)     5    0   Y N
18.59.33   1859.334d.f9d0 c1/0/1        online(pt)     6    0   Y N
18.59.33   1859.334d.774c c1/0/1        init(i)        7    0   N N
18.59.33   1859.334d.f628 c1/0/1        offline        8    0   N N
18.59.33   1859.334d.f60e c1/0/1        online(pt)     9    0   Y N
18.59.33   1859.334d.fa36 c1/0/1        init(i)        10   0   N N
18.59.33   1859.334d.667e c1/0/1        online(pt)     11   0   Y N
18.59.33   1859.334d.fb1e c1/0/1        online(pt)     12   0   Y N
18.59.33   1859.334d.7d8e c1/0/1        online(pt)     13   0   Y N
18.59.33   1859.334d.f604 c1/0/1        online(pt)     14   0   Y N
18.59.33   1859.334d.fc64 c1/0/1        online(pt)     15   0   Y N
18.59.33   1859.334d.f696 c1/0/1        online(pt)     16   0   Y N
18.59.33   1859.334d.fce6 c1/0/1        online(pt)     17   0   Y N
18.59.33   1859.334d.f9b0 c1/0/1        init(i)        18   0   N N
18.59.33   1859.334d.fa8c c1/0/1        offline        19   0   N N
18.59.33   1859.334d.71e0 c1/0/1        init(i)        20   0   N N
18.59.33   1859.334d.7e34 c1/0/1        online(pt)     21   0   Y N
```

```
18.59.33   1859.334d.7e9e c1/0/1        online(pt)    22   0   Y N
18.59.33   1859.334d.7cf0 c1/0/1        init(i)       23   0   N N
18.59.33   1859.334d.f96e c1/0/1        offline       24   0   N N
18.59.33   1859.334d.7b68 c1/0/1        init(rc)      25   0   N N
18.59.33   1859.334d.7aec c1/0/1        init(i)       26   0   N N
18.59.33   1859.334d.fce8 c1/0/1        init(i)       27   0   N N
18.59.33   1859.334d.f62a c1/0/1        online(pt)    28   0   Y N
18.59.33   1859.334d.fabc c1/0/1        offline       29   0   N N
18.59.33   1859.334d.7d00 c1/0/1        online(pt)    30   0   Y N
18.59.33   1859.334d.6778 c1/0/1        init(i)       31   0   N N
18.59.33   1859.334d.7306 c1/0/1        offline       32   0   N N
18.59.33   1859.334d.65d4 c1/0/1        init(i)       33   0   N N
18.59.33   1859.334d.6604 c1/0/1        offline       34   0   N N
18.59.33   1859.334d.7a10 c1/0/1        online(pt)    35   0   Y N
18.59.33   1859.334d.7d38 c1/0/1        init(i)       36   0   N N
18.59.33   1859.334d.6434 c1/0/1        init(i)       37   0   N N
18.59.33   1859.334d.7ace c1/0/1        init(i)       38   0   N N
18.59.33   1859.334d.7b5a c1/0/1        offline       39   0   N N
18.59.33   1859.334d.7d16 c1/0/1        offline       40   0   N N
18.59.33   1859.334d.7c78 c1/0/1        init(rc)      41   0   N N
18.59.33   1859.334d.65b0 c1/0/1        online(pt)    42   0   Y N
18.59.33   1859.334d.7c40 c1/0/1        init(i)       43   0   N N
18.59.33   1859.334d.804a c1/0/1        online(pt)    44   0   Y N
18.59.33   1859.334d.7b2a c1/0/1        init(i)       45   0   N N
18.59.33   1859.334d.7d04 c1/0/1        online(pt)    46   0   Y N
18.59.33   1859.334d.7e42 c1/0/1        offline       47   0   N N
18.59.33   1859.334d.6e1a c1/0/1        offline       48   0   N N
18.59.33   1859.334d.7be8 c1/0/1        offline       49   0   N N
18.59.33   1859.334d.7a5a c1/0/1        init(i)       50   0   N N
18.59.33   1859.334d.6584 c1/0/1        online(pt)    51   0   Y N
18.59.33   1859.334d.7ad2 c1/0/1        init(i)       52   0   N N
18.59.33   1859.334d.660e c1/0/1        init(i)       53   0   N N
18.59.33   1859.334d.7b4c c1/0/1        init(i)       54   0   N N
18.59.33   1859.334d.6688 c1/0/1        init(i)       55   0   N N
18.59.33   1859.334d.7cc0 c1/0/1        init(i)       56   0   N N
18.59.33   1859.334d.6742 c1/0/1        init(i)       57   0   N N
18.59.33   1859.334d.7c32 c1/0/1        offline       58   0   N N
18.59.33   1859.334d.7aac c1/0/1        init(i)       59   0   N N
18.59.33   1859.334d.f968 c1/0/1        online(pt)    60   0   Y N
18.59.33   1859.334d.7908 c1/0/1        init(i)       61   0   N N
18.59.33   1859.334d.7aa8 c1/0/1        offline       62   0   N N
18.59.33   1859.334d.7d14 c1/0/1        init(i)       63   0   N N
18.59.33   1859.334d.6602 c1/0/1        online(pt)    64   0   Y N

Router#
```

Related Commands

Command	Description
cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem cpe	Displays the CPE devices accessing the cable interface through a particular CM.
show cable modem remote-query	Displays information collected by the remote-query feature.

Command	Description
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem verbose

To display detailed information of cable modems, use the **show cable modem verbose** command in privileged EXEC mode.

show cable modem verbose [**ip-address** | **mac-address** | **cable** { *slot* / *subslot* / *cable-interface-index* }]

Syntax Description

ip-address	(Optional) IPv4 or IPv6 address of a specific cable modem. If you specify the IP address for a CPE behind a cable modem, the output displays information for that cable modem.
mac-address	(Optional) MAC address of a specific cable modem. If you specify the MAC address for a CPE behind a cable modem, the output displays information for that cable modem.
cable	(Optional) Displays the modems on a specific cable interface.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is 3–6. • Cisco uBR10012 router—The valid range is 5–8. • Cisco cBR router—The valid range is 0–3 and 6–9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only—The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is 0–4 (depending on the cable interface).
cable-interface-index	The downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is 0–4. The valid range for the Cisco uBR-MC3GX60V line card is 0–14. • Cisco cBR router—The valid range is 0–15.
verbose	Displays detailed information of the cable modems.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The output of the command is updated to display the RPD Alias (RPD Name) information.
Cisco IOS XE Dublin 17.12.1x	The output of the command is updated to display D40 cable modem Capabilities.
Cisco IOS XE Cupertino 17.9.1x	This command is modified to support Low Latency DOCSIS Capable information.
Cisco IOS XE Bengaluru 17.6.1z	The output of the command is updated to display **UGS Service Flow Limit**.
Cisco IOS XE Amsterdam 17.3.1w	The output of the command is updated with partial-mode information.

Example

This example shows the output of the **show cable modem ccf3.c8ff.ed7e verbose** . (**Cisco IOS XE Cupertino 17.15.1w** or later).

```
Router# show cable modem b42a.0e85.4425 verbose
Load for five secs: 3%/0%; one minute: 5%; five minutes: 5%
No time source, *07:09:03.592 EDT Fri Sep 13 2024


MAC Address                          : b42a.0e85.4425
IP Address                           : 55.33.1.18
IPv6 Address                         : ---
Dual IP                              : N
Prim Sid                             : 7
Host Interface                       : C8/0/1/UB
RPD ID                               : 246c.84f4.1a60
RPD Name                             : RPD_dev2
MD-DS-SG / MD-US-SG                  : 1 / 1
MD-CM-SG                             : 0x1210101
Primary Wideband Channel ID          : 49414 (Wi8/0/1:5)
Primary Downstream                   : Do8/0/1:6 (RfId : 49414, SC-QAM)
Wideband Capable                     : Y
DS Tuner Capability                  : 32
Downstream Channel DCID RF Channel : 7     8/0/1:6 (SC-QAM)
Downstream Channel DCID RF Channel : 1     8/0/1:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     8/0/1:1 (SC-QAM)
Downstream Channel DCID RF Channel : 3     8/0/1:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     8/0/1:3 (SC-QAM)
Downstream Channel DCID RF Channel : 5     8/0/1:4 (SC-QAM)
Downstream Channel DCID RF Channel : 6     8/0/1:5 (SC-QAM)
Downstream Channel DCID RF Channel : 8     8/0/1:7 (SC-QAM)
Downstream Channel DCID RF Channel : 9     8/0/1:8 (SC-QAM)
Downstream Channel DCID RF Channel : 10    8/0/1:9 (SC-QAM)
Downstream Channel DCID RF Channel : 11    8/0/1:10 (SC-QAM)
Downstream Channel DCID RF Channel : 12    8/0/1:11 (SC-QAM)
Downstream Channel DCID RF Channel : 13    8/0/1:12 (SC-QAM)
Downstream Channel DCID RF Channel : 14    8/0/1:13 (SC-QAM)
Downstream Channel DCID RF Channel : 15    8/0/1:14 (SC-QAM)
Downstream Channel DCID RF Channel : 16    8/0/1:15 (SC-QAM)
```

```
Downstream Channel DCID RF Channel : 17    8/0/1:16 (SC-QAM)
Downstream Channel DCID RF Channel : 18    8/0/1:17 (SC-QAM)
Downstream Channel DCID RF Channel : 19    8/0/1:18 (SC-QAM)
Downstream Channel DCID RF Channel : 20    8/0/1:19 (SC-QAM)
Downstream Channel DCID RF Channel : 21    8/0/1:20 (SC-QAM)
Downstream Channel DCID RF Channel : 22    8/0/1:21 (SC-QAM)
Downstream Channel DCID RF Channel : 23    8/0/1:22 (SC-QAM)
Downstream Channel DCID RF Channel : 24    8/0/1:23 (SC-QAM)
Downstream Channel DCID RF Channel : 25    8/0/1:24 (SC-QAM)
Downstream Channel DCID RF Channel : 26    8/0/1:25 (SC-QAM)
Downstream Channel DCID RF Channel : 27    8/0/1:26 (SC-QAM)
Downstream Channel DCID RF Channel : 28    8/0/1:27 (SC-QAM)
Downstream Channel DCID RF Channel : 29    8/0/1:28 (SC-QAM)
Downstream Channel DCID RF Channel : 30    8/0/1:29 (SC-QAM)
Downstream Channel DCID RF Channel : 31    8/0/1:30 (SC-QAM)
Downstream Channel DCID RF Channel : 32    8/0/1:31 (SC-QAM)
Downstream Channel DCID RF Channel : 159   8/0/1:158 (OFDM)
Downstream OFDM DCID                : 159
  Downstream OFDM Profile (config)     : 0 1
  Downstream OFDM Profile (REG-RSP-MP) : 0 1
  Downstream OFDM Profile (DBC-REQ)    : N/A
  Downstream OFDM Profile (in-use)     : 1  [1024-QAM]
  Downstream OFDM Profile (dwngrd)     : 0
  Downstream OFDM Profile (recomm)     : 1
  Downstream OFDM Profile (unfit)      : N/A
UDC Enabled                         : N
US Frequency Range Capability       : Extended (5-85 MHz)
Extended Upstream Transmit Power    : 0dB
Max CM Transmit Power (dBmV)        : 65.00
Neq 1.6MHz Transmit Channels        : 8
US Power Display Bandwidth Units    : 1.6 MHz
Max Transmit Channel Power (dBmV)   : 53.20
Multi-Transmit Channel Mode         : Y
Max US SC-QAMs Supported            : 8
Number of US in UBG                 : 4
Minimum power load in DRW (dB)      : 9.25
Max Dynamic ranging window (dBmV)   : 43.75
Min Dynamic ranging window (dBmV)   : 31.75
Upstream Channel                    : US0        US1        US2        US3
Upstream Channel Width (MHz)        : 3.2        3.2        3.2        3.2
Device ID                           : 0          0          0          0
Ranging Status                      : sta        sta        sta        sta
Upstream SNR (dB)                   : 42.14      42.14      42.14      42.14
Upstream Data SNR (dB)              : 43.32      46.33      43.32      46.33
Received Power Delta (dBmV)         : 0.00       0.00       0.00       -0.50
Config Received Power(dBmV@chw)     : 1.00       1.00       1.00       1.00
Received Power(dBmV@chw)            : 1.00       1.00       1.00       0.50
Config Received Power(dBmV@1.6MHz)  : -2.00      -2.00      -2.00      -2.00
Received Power(dBmV@1.6MHz)         : -2.00      -2.00      -2.00      -2.50
Data Burst resiliency suspended     : N          N          N          N
Reported Transmit Power (dBmV)      : 43.00      43.50      43.50      43.25
Commanded Transmit Power (dBmV)     : 43.00      43.50      43.50      43.75
Minimum Transmit Power (dBmV)       : 17.00      17.00      17.00      17.00
Power Load (dB)                     : 10.20      9.45       9.45       9.70
Timing Offset              (97.6 ns): 1034       1034       1032       1034
Initial Timing Offset               : 1034       1034       1033       1034
Rng Timing Adj Moving Avg(0.381 ns): -248       -257       128        -256
Rng Timing Adj Lt Moving Avg        : -238       -256       0          -256
Rng Timing Adj Minimum              : -512       -512       -1024      -512
Rng Timing Adj Maximum              : 0          0          1024       0
Pre-EQ Good                         : 0          0          0          0
Pre-EQ Scaled                       : 0          0          0          0
Pre-EQ Impulse                      : 0          0          0          0
Pre-EQ Direct Loads                 : 0          0          0          0
```

```
Total Codewords rx                : 733        120        140        120
Good Codewords rx                 : 733        120        140        120
Corrected Codewords rx            : 0          0          0          0
Uncorrectable Codewords rx        : 0          0          0          0
Phy Operating Mode                : atdma*     atdma*     atdma*     atdma*
sysDescr                          :
Downstream Power                  : 0.00 dBmV (SNR = ----- dB)
MAC Version                       : DOC3.1
Operational Version               : DOC3.1
QoS Provisioned Mode              : DOC1.1
Enable DOCSIS2.0 Mode             : Y
Service Flow Priority             : N
Modem Status                      : {Modem= w-online(pt), Security=assign(tek)}
Capabilities                      : {Frag=N, Concat=N, PHS=N}
Security Capabilities             : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                : {L2VPN=Y, eSAFE=N}
L2VPN type                        : {CLI=N, DOCSIS=N}
Sid/Said Limit                    : {Max US Sids=16, Max DS Saids=63}
UGS Service Flow Limit            : {Max UGS Service Flows=0}
Optional Filtering Support        : {802.1P=N, 802.1Q=N, DUT=Y}
Transmit Equalizer Support        : {Taps/Symbol= 1, Num of Taps= 24}
Extended Pkt Len Capability       : Max len of PDU = 2000 bytes, CMTS sent 2000
OFDM MRC Support                  : Max num of DS OFDM channels = 2
OFDMA MTC Support                 : Max num of US OFDMA channels = 2
DS OFDM Profile Support           : Max num of DS OFDM profile per channel = 5
DS OFDM QAM Modulation Support    : 0x1FD4{|QPSK|16|64|128|256|512|1024|2048|4096 QAM}
US OFDMA QAM Modulation Support   : 0x1FFC{|QPSK|8|16|32|64|128|256|512|1024|2048|4096
QAM}
DS Lower Band Edge                : 0x1{108 MHz}
DS Upper Band Edge                : 0x1{1218 MHz}
Diplex Upper Band Edge            : 2(85 MHz)
DTP mode                          : 0(DTP Op not supported)
DTP performance                   : 0(DTP mode not supported)
Diplexer DS Lower Band Edge Cap   : 0x0{ MHz}
Diplexer DS Upper Band Edge Cap   : 0x0{ MHz}
Diplexer US Upper Band Edge Cap   : 0x0{ MHz}
OUDP Leak Test                    : N/A
CM Capability Reject              : {1,3,15,22,23,35,38,44,57,58}
CM STATUS ACK Support             : Y
Flaps                             : 0()
Errors                            : 0 CRCs, 0 HCSes
Stn Mtn Failures                  : 0 aborts, 0 exhausted
Total US Flows                    : 1(1 active)
Total DS Flows                    : 1(1 active)
Total US Data                     : 292 packets, 110184 bytes
Total US Throughput               : 0 bits/sec, 0 packets/sec
Total DS Data                     : 0 packets, 0 bytes
Total DS Throughput               : 0 bits/sec, 0 packets/sec
LB group ID assigned              : 2147631618
LB group ID in config file        : N/A
LB policy ID                      : 0
LB policy ID in config file       : 0
LB priority                       : 0
Tag                               :
Required DS Attribute Mask        : 0x0
Forbidden DS Attribute Mask       : 0x0
Required US Attribute Mask        : 0x0
Forbidden US Attribute Mask       : 0x0
Low Latency Capable               : 0
Low Latency ASF Supported         : 0
Absolute Queue-Depth Req Support  : 0
Service Type ID                   :
Service Type ID in config file    :
Ranging Class ID                  : 0x6
```

```
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
DS Change Times                    : 0
Boolean Services                   : 22
CM Energy Management Capable       : Y
CM Enable Energy Management        : N
CM Enter Energy Management         : NO
Battery Mode                       : N
Battery Mode Status                : AC_POWER_MODE
Number of Multicast DSIDs Support  : 32
MDF Capability Mode                : 2
IGMP/MLD Version                   : IGMPv3
FCType10 Forwarding Support        : Y
IPv6 Support                       : Y
Features Bitmask                   : 0x0
Ext SF SID Cluster Assignment      : 0
Total Time Online                  : 2h38m   (2h38m    since last counter reset)
CM Initialization Reason           : NO_PRIM_SF_USCHAN
CM_CTRL   req/rsp                  : 0/0
CM_STATUS                          : 0
DBC       req/rsp/ack              : 0/0/0
DCC       req/rsp/ack              : 0/0/0
DSA_US    req/rsp/ack              : 0/0/0
DSA_DS    req/rsp/ack              : 0/0/0
DSC_US    req/rsp/ack              : 0/0/0
DSC_DS    req/rsp/ack              : 0/0/0
DSD_US    req/rsp                  : 0/0
DSD_DS    req/rsp                  : 0/0
REG       req/rsp/ack              : 1/1/1
EM        req/rsp                  : 0/0
ODS       req/rsp                  : 0/0
OPT       req/rsp/ack              : 0/12/0
UCC       req/rsp                  : 0/0
Fiber-node ID                      : 3
```

Example

This example shows the output of the **show cable modem ccf3.c8ff.ed7e verbose** . (**Cisco IOS XE Dublin 17.12.1x** or later).

```
Router# show cable modem ccf3.c8ff.ed7e verbose
MAC Address                        : ccf3.c8ff.ed7e
IP Address                         : 9.15.1.29
IPv6 Address                       : ---
Dual IP                            : N
Prim Sid                           : 5
Host Interface                     : C7/0/1/UB
RPD ID                             : acbc.d98d.e37e
MD-DS-SG / MD-US-SG                : 1 / 3
MD-CM-SG                           : 0xF10103
Primary Wideband Channel ID        : 41219 (Wi7/0/1:2)
Primary Downstream                 : Do7/0/1:17 (RfId : 41233, SC-QAM)
Wideband Capable                   : Y
DS Tuner Capability                : 32
Downstream Channel DCID RF Channel : 18    7/0/1:17 (SC-QAM)
Downstream Channel DCID RF Channel : 1     7/0/1:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     7/0/1:1 (SC-QAM)
```

```
Downstream Channel DCID RF Channel : 3     7/0/1:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     7/0/1:3 (SC-QAM)
Downstream Channel DCID RF Channel : 5     7/0/1:4 (SC-QAM)
Downstream Channel DCID RF Channel : 6     7/0/1:5 (SC-QAM)
Downstream Channel DCID RF Channel : 7     7/0/1:6 (SC-QAM)
Downstream Channel DCID RF Channel : 8     7/0/1:7 (SC-QAM)
Downstream Channel DCID RF Channel : 9     7/0/1:8 (SC-QAM)
Downstream Channel DCID RF Channel : 10    7/0/1:9 (SC-QAM)
Downstream Channel DCID RF Channel : 11    7/0/1:10 (SC-QAM)
Downstream Channel DCID RF Channel : 12    7/0/1:11 (SC-QAM)
Downstream Channel DCID RF Channel : 13    7/0/1:12 (SC-QAM)
Downstream Channel DCID RF Channel : 14    7/0/1:13 (SC-QAM)
Downstream Channel DCID RF Channel : 15    7/0/1:14 (SC-QAM)
Downstream Channel DCID RF Channel : 16    7/0/1:15 (SC-QAM)
Downstream Channel DCID RF Channel : 17    7/0/1:16 (SC-QAM)
Downstream Channel DCID RF Channel : 19    7/0/1:18 (SC-QAM)
Downstream Channel DCID RF Channel : 20    7/0/1:19 (SC-QAM)
Downstream Channel DCID RF Channel : 21    7/0/1:20 (SC-QAM)
Downstream Channel DCID RF Channel : 22    7/0/1:21 (SC-QAM)
Downstream Channel DCID RF Channel : 23    7/0/1:22 (SC-QAM)
Downstream Channel DCID RF Channel : 24    7/0/1:23 (SC-QAM)
Downstream Channel DCID RF Channel : 25    7/0/1:24 (SC-QAM)
Downstream Channel DCID RF Channel : 26    7/0/1:25 (SC-QAM)
Downstream Channel DCID RF Channel : 27    7/0/1:26 (SC-QAM)
Downstream Channel DCID RF Channel : 28    7/0/1:27 (SC-QAM)
Downstream Channel DCID RF Channel : 29    7/0/1:28 (SC-QAM)
Downstream Channel DCID RF Channel : 30    7/0/1:29 (SC-QAM)
Downstream Channel DCID RF Channel : 31    7/0/1:30 (SC-QAM)
Downstream Channel DCID RF Channel : 32    7/0/1:31 (SC-QAM)
Downstream Channel DCID RF Channel : 159   7/0/1:158 (OFDM)
Downstream Channel DCID RF Channel : 160   7/0/1:159 (OFDM)
Downstream OFDM DCID                : 159
  Downstream OFDM Profile (config)     : 0 1 2 3
  Downstream OFDM Profile (REG-RSP-MP) : 0 1 2 3
  Downstream OFDM Profile (DBC-REQ)    : N/A
  Downstream OFDM Profile (in-use)     : 3  [4096-QAM]
  Downstream OFDM Profile (dwngrd)     : 2
  Downstream OFDM Profile (recomm)     : 3
  Downstream OFDM Profile (unfit)      : N/A
Downstream OFDM DCID                : 160
  Downstream OFDM Profile (config)     : 0 1 2 3
  Downstream OFDM Profile (REG-RSP-MP) : 0 1 2 3
  Downstream OFDM Profile (DBC-REQ)    : N/A
  Downstream OFDM Profile (in-use)     : 3  [4096-QAM]
  Downstream OFDM Profile (dwngrd)     : 2
  Downstream OFDM Profile (recomm)     : 3
  Downstream OFDM Profile (unfit)      : N/A
UDC Enabled                         : N
US Frequency Range Capability       : Extended (5-85 MHz)
Extended Upstream Transmit Power    : 0dB
Max CM Transmit Power (dBmV)        : 65.00
Neq 1.6MHz Transmit Channels        : 13
US Power Display Bandwidth Units    : 1.6 MHz
Max Transmit Channel Power (dBmV)   : 53.20
Multi-Transmit Channel Mode         : Y
Max US SC-QAMs Supported            : 8
Number of US in UBG                 : 6
Minimum power load in DRW (dB)      : 6.75
Max Dynamic ranging window (dBmV)   : 46.25
Min Dynamic ranging window (dBmV)   : 34.25
Upstream Channel                    : US0        US1        US2        US3
Device ID                           : 0          0          0          0
Ranging Status                      : sta        sta        sta        sta
Upstream SNR (dB)                   : 45.15      45.15      45.15      45.15
```

```
Upstream Data SNR (dB)             : 43.32      43.32      43.32      46.33
Received Power (dBmV)              : 4.50       5.00       5.00       5.00
Configured Received Power (dBmV)   : 5.00       5.00       5.00       5.00
Actual Received Power (dBmV)       : -0.50      0.00       0.00       0.00
Data Burst resiliency suspended    : N          N          N          N
Reported Transmit Power (dBmV)     : 45.75      46.25      46.00      43.75
Commanded Transmit Power (dBmV)    : 46.25      46.25      46.00      43.75
Minimum Transmit Power (dBmV)      : 17.00      17.00      17.00      17.00
Power Load (dB)                    : 7.45       6.95       7.20       9.45
Timing Offset             (97.6 ns): 1123       1123       1123       1122
Initial Timing Offset              : 1123       1123       1123       1122
Rng Timing Adj Moving Avg(0.381 ns): 0          256        0          256
Rng Timing Adj Lt Moving Avg       : 0          249        0          84
Rng Timing Adj Minimum             : 0          0          0          0
Rng Timing Adj Maximum             : 0          256        0          256
Pre-EQ Good                        : 0          0          0          0
Pre-EQ Scaled                      : 0          0          0          0
Pre-EQ Impulse                     : 0          0          0          0
Pre-EQ Direct Loads                : 0          0          0          0
Total Codewords rx                 : 1494       1311       1222       1715
Good Codewords rx                  : 1494       1311       1222       1715
Corrected Codewords rx             : 0          0          0          0
Uncorrectable Codewords rx         : 0          0          0          0
Phy Operating Mode                 : atdma*     atdma*     atdma*     atdma*
Upstream Channel                   : US4        US5
Device ID                          : 0          0
Ranging Status                     : sta        sta
Upstream SNR (dB)                  :  N/A        N/A
Upstream Data SNR (dB)             :  N/A        N/A
Received Power (dBmV)              : 0.00       0.00
Configured Received Power (dBmV)   : 0.00       0.00
Actual Received Power (dBmV)       : 0.00       0.00
Data Burst resiliency suspended    : N          N
Reported Transmit Power (dBmV)     : 37.00      36.75
Commanded Transmit Power (dBmV)    : 37.00      36.75
Minimum Transmit Power (dBmV)      : 17.00      17.00
Power Load (dB)                    : 16.20      16.45
Timing Offset             (97.6 ns): 808        808
OFDMA Timing Offset       (4.88 ns): 16176      16176
Initial Timing Offset              : 1218       1218
Rng Timing Adj Moving Avg(0.381 ns): -1         -1
Rng Timing Adj Lt Moving Avg       : -7         -7
Rng Timing Adj Minimum             : -104857    -104857
Rng Timing Adj Maximum             : 0          0
Pre-EQ Good                        : 0          0
Pre-EQ Scaled                      : 0          0
Pre-EQ Impulse                     : 0          0
Pre-EQ Direct Loads                : 0          0
Total Codewords rx                 : 43812      2567
Good Codewords rx                  : 43812      2567
Corrected Codewords rx             : 0          0
Uncorrectable Codewords rx         : 0          0
Phy Operating Mode                 : ofdma      ofdma
OFDMA Profile in Use               : 13         13
OFDMA IUC assignment               : 13         13
sysDescr                          : BFC cablemodem reference design <<HW_REV: V1.0; VENDOR:
 Broadcom; BOOTR: 2.8.44alpha0; SW_REV: Prod_23.1-mainline_gen2-PC_NB_2023-02-10_09-35-26;
 MODEL: BCM933940DCWVG>>
Downstream Power                   : 18.30 dBmV (SNR = 49.70 dB)
MAC Version                        : DOC4.0
Operational Version                : DOC3.1
QoS Provisioned Mode               : DOC1.1
Enable DOCSIS2.0 Mode              : Y
Service Flow Priority              : N
```

```
Modem Status                          : {Modem= w-online(pt), Security=assign(tek)}
Capabilities                          : {Frag=N, Concat=N, PHS=N}
Security Capabilities                 : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                    : {L2VPN=N, eSAFE=N}
L2VPN type                            : {CLI=N, DOCSIS=N}
Sid/Said Limit                        : {Max US Sids=16, Max DS Saids=63}
UGS Service Flow Limit                : {Max UGS Service Flows=16}
Optional Filtering Support            : {802.1P=N, 802.1Q=N, DUT=N}
Transmit Equalizer Support            : {Taps/Symbol= 1, Num of Taps= 24}
Extended Pkt Len Capability           : Max len of PDU = 2000 bytes, CMTS sent 2000
OFDM MRC Support                      : Max num of DS OFDM channels = 5
OFDMA MTC Support                     : Max num of US OFDMA channels = 8
DS OFDM Profile Support               : Max num of DS OFDM profile per channel = 5
DS OFDM QAM Modulation Support        : 0x1FD4{|QPSK|16|64|128|256|512|1024|2048|4096 QAM}
US OFDMA QAM Modulation Support       : 0x1FFC{|QPSK|8|16|32|64|128|256|512|1024|2048|4096
QAM}
DS Lower Band Edge                    : 0x2{258 MHz}
DS Upper Band Edge                    : 0x2{1788 MHz}
Diplex Upper Band Edge                : 4(204 MHz)
DTP mode                              : 0(DTP Op not supported)
DTP performance                       : 0(DTP mode not supported)
Diplexer DS Lower Band Edge Cap       : 0x0{ MHz}
Diplexer DS Upper Band Edge Cap       : 0x0{ MHz}
Diplexer US Upper Band Edge Cap       : 0x0{ MHz}
D40: Advanced Band Plan Cap           : 0x4{FDD}
D40: Advanced DS Lower Band Edge      : 0
D40: Advanced DS Upper Band Edge      : 0
D40: Advanced US Upper Band Edge      : 0
D40: Adv DS Lower Band Edge Options: [108|300|492]
D40: Adv DS Upper Band Edge Options: [1002|1218|1794]
D40: Adv US Upper Band Edge Options: [42|65|85|117|204]
D40: Extendec Power Options           : 0
D40: FDX Switching SW Uncertainty     : 0(microseconds)
D40: FDX DS to US Switching Time      : 0(microseconds)
D40: FDX US to DS Switching Time      : 0(microseconds)
D40: CWT RxMER Convergence Time       : 0(milliseconds)
D40: CWT Simultaneous Data Tx Cap     : 0
D40: EC RBA sub-band Dir Sets         : 0
OUDP Leak Test                        : N/A
CM Capability Reject                  : {1,3,15,22,23,35,38,44,57,58}
CM STATUS ACK Support                 : Y
Flaps                                 : 643(Jan 19 00:17:20)
Errors                                : 0 CRCs, 0 HCSes
Stn Mtn Failures                      : 0 aborts, 0 exhausted
Total US Flows                        : 1(1 active)
Total DS Flows                        : 1(1 active)
Total US Data                         : 21231 packets, 10176511 bytes
Total US Throughput                   : 1869 bits/sec, 0 packets/sec
Total DS Data                         : 10776 packets, 993142 bytes
Total DS Throughput                   : 0 bits/sec, 0 packets/sec
LB group ID assigned                  : 2147607343
LB group ID in config file            : N/A
LB policy ID                          : 0
LB policy ID in config file           : 0
LB priority                           : 0
Tag                                   :
Required DS Attribute Mask            : 0x0
Forbidden DS Attribute Mask           : 0x0
Required US Attribute Mask            : 0x0
Forbidden US Attribute Mask           : 0x0
Low Latency Capable                   : 1
Low Latency ASF Supported             : 2
Absolute Queue-Depth Req Support      : 0
Service Type ID                       :
```

```
Service Type ID in config file     :
Ranging Class ID                   : 0x6
Active Classifiers                 : 0 (Max = NO LIMIT)
CM Upstream Filter Group           : 0
CM Downstream Filter Group         : 0
CPE Upstream Filter Group          : 0
CPE Downstream Filter Group        : 0
DSA/DSX messages                   : permit all
Voice Enabled                      : NO
DS Change Times                    : 0
Boolean Services                   : 22
CM Energy Management Capable       : Y
CM Enable Energy Management        : N
CM Enter Energy Management         : NO
Battery Mode                       : N
Battery Mode Status                : AC_POWER_MODE
Number of Multicast DSIDs Support  : 32
MDF Capability Mode                : 2
IGMP/MLD Version                   : IGMPv3
FCType10 Forwarding Support        : Y
IPv6 Support                       : Y
Features Bitmask                   : 0x0
Ext SF SID Cluster Assignment      : 1
Total Time Online                  : 21h19m  (21h19m   since last counter reset)
CM Initialization Reason           : POWER_ON
CM_CTRL   req/rsp                  : 0/0
CM_STATUS                          : 0
DBC       req/rsp/ack              : 0/0/0
DCC       req/rsp/ack              : 0/0/0
DSA_US    req/rsp/ack              : 0/0/0
DSA_DS    req/rsp/ack              : 0/0/0
DSC_US    req/rsp/ack              : 0/0/0
DSC_DS    req/rsp/ack              : 0/0/0
DSD_US    req/rsp                  : 0/0
DSD_DS    req/rsp                  : 0/0
REG       req/rsp/ack              : 1/1/1
EM        req/rsp                  : 0/0
ODS       req/rsp                  : 0/0
OPT       req/rsp/ack              : 0/7154/1022
UCC       req/rsp                  : 0/0
```

Note The above CLI output displays modems that register in D4.0. The following lines in the CLI output show the D4.0 modem capabilities

```
...
...
...
MAC Version                        : DOC4.0
...
...
...
D40: Advanced Band Plan Cap        : 0x4{FDD}
D40: Advanced DS Lower Band Edge   : 0
D40: Advanced DS Upper Band Edge   : 0
D40: Advanced US Upper Band Edge   : 0
D40: Adv DS Lower Band Edge Options: [108|300|492]
D40: Adv DS Upper Band Edge Options: [1002|1218|1794]
D40: Adv US Upper Band Edge Options: [42|65|85|117|204]
D40: Extendec Power Options        : 0
D40: FDX Switching SW Uncertainty  : 0(microseconds)
```

```
D40: FDX DS to US Switching Time   : 0(microseconds)
D40: FDX US to DS Switching Time   : 0(microseconds)
D40: CWT RxMER Convergence Time    : 0(milliseconds)
D40: CWT Simultaneous Data Tx Cap  : 0
D40: EC RBA sub-band Dir Sets      : 0
...
...
...
```

Example

This example shows the output of the **show cable modem verbose | s Low Latency** *206a.9454.30a4* **verbose**. (**Cisco IOS XE Cupertino 17.9.1x** or later).

```
Router# show cable modem 206a.9454.30a4 verbose | s Low Latency
Low Latency Enabled                         :1
Low Latency ASF Supported                   :4
```

Example

The following example shows a sample output of the **show cable modem verbose** command when the modem is in partial-mode.

```
Router#show cable modem 5c76.953e.8ba0 verbose
MAC Address                       : 5c76.953e.8ba0
IP Address                        : 10.38.8.30
IPv6 Address                      : ---
Dual IP                           : N
Prim Sid                          : 8
Host Interface                    : C1/0/2/UB
MD-DS-SG / MD-US-SG               : 6 / 2
MD-CM-SG                          : 0x320602
Primary Wideband Channel ID       : 8705 (Wi1/0/2:0)
Primary Downstream                : In1/0/2:8 (RfId : 8712, SC-QAM)
Wideband Capable                  : Y
DS Tuner Capability               : 32
Downstream Channel DCID RF Channel : 9     1/0/2:8 (SC-QAM)
Downstream Channel DCID RF Channel : 1     1/0/2:0 (SC-QAM)
Downstream Channel DCID RF Channel : 2     1/0/2:1 (SC-QAM)
Downstream Channel DCID RF Channel : 3     1/0/2:2 (SC-QAM)
Downstream Channel DCID RF Channel : 4     1/0/2:3 (SC-QAM)
Downstream Channel DCID RF Channel : 5     1/0/2:4 (SC-QAM)
Downstream Channel DCID RF Channel : 6     1/0/2:5 (SC-QAM)
Downstream Channel DCID RF Channel : 7     1/0/2:6 (SC-QAM)
Downstream Channel DCID RF Channel : 8     1/0/2:7 (SC-QAM)
Downstream Channel DCID RF Channel : 10    1/0/2:9 (SC-QAM)
Downstream Channel DCID RF Channel : 11    1/0/2:10 (SC-QAM)
Downstream Channel DCID RF Channel : 12    1/0/2:11 (SC-QAM)
Downstream Channel DCID RF Channel : 13    1/0/2:12 (SC-QAM)
Downstream Channel DCID RF Channel : 14    1/0/2:13 (SC-QAM)
Downstream Channel DCID RF Channel : 15    1/0/2:14 (SC-QAM)
Downstream Channel DCID RF Channel : 16    1/0/2:15 (SC-QAM)
Downstream Channel DCID RF Channel : 17    1/0/2:16 (SC-QAM)
Downstream Channel DCID RF Channel : 18    1/0/2:17 (SC-QAM)
Downstream Channel DCID RF Channel : 19    1/0/2:18 (SC-QAM)
Downstream Channel DCID RF Channel : 20    1/0/2:19 (SC-QAM)
Downstream Channel DCID RF Channel : 21    1/0/2:20 (SC-QAM)
Downstream Channel DCID RF Channel : 22    1/0/2:21 (SC-QAM)
Downstream Channel DCID RF Channel : 23    1/0/2:22 (SC-QAM)
Downstream Channel DCID RF Channel : 24    1/0/2:23 (SC-QAM)
```

```
Downstream Channel DCID RF Channel : 25    1/0/2:24 (SC-QAM)
Downstream Channel DCID RF Channel : 26    1/0/2:25 (SC-QAM)
Downstream Channel DCID RF Channel : 27    1/0/2:26 (SC-QAM)
Downstream Channel DCID RF Channel : 28    1/0/2:27 (SC-QAM)
Downstream Channel DCID RF Channel : 29    1/0/2:28 (SC-QAM)
Downstream Channel DCID RF Channel : 30    1/0/2:29 (SC-QAM)
Downstream Channel DCID RF Channel : 31    1/0/2:30 (SC-QAM)
Downstream Channel DCID RF Channel : 32    1/0/2:31 (SC-QAM)
Downstream Channel DCID RF Channel : 159   1/0/2:158 (OFDM)
Downstream Channel DCID RF Channel : 160   1/0/2:159 (OFDM)
Downstream OFDM DCID               : 159
  Downstream OFDM Profile (config)     : 0 1 2 3 4 5
  Downstream OFDM Profile (REG-RSP-MP) : 0 1 2 3
  Downstream OFDM Profile (DBC-REQ)    : 0 3 4 5
  Downstream OFDM Profile (in-use)     : 5  [4096-QAM]
  Downstream OFDM Profile (dwngrd)     : 4
  Downstream OFDM Profile (recomm)     : 5
  Downstream OFDM Profile (unfit)      : N/A
Downstream OFDM DCID               : 160
  Downstream OFDM Profile (config)     : 0 1 2 3 4 5
  Downstream OFDM Profile (REG-RSP-MP) : 0 1 2 3
  Downstream OFDM Profile (DBC-REQ)    : 0 3 4 5
  Downstream OFDM Profile (in-use)     : 5  [4096-QAM]
  Downstream OFDM Profile (dwngrd)     : 4
  Downstream OFDM Profile (recomm)     : 5
  Downstream OFDM Profile (unfit)      : N/A
UDC Enabled                        : N
US Frequency Range Capability          : Extended (5-85 MHz)
Extended Upstream Transmit Power       : 0dB
Max CM Transmit Power (dBmV)           : 65.00
Neq 1.6MHz Transmit Channels           : 8
US Power Display Bandwidth Units       : 1.6 MHz
Max Transmit Channel Power (dBmV)      : 53.20
Multi-Transmit Channel Mode            : Y
Max US SC-QAMs Supported               : 8
Number of US in UBG                    : 1
Minimum power load in DRW (dB)         : 13.00
Max Dynamic ranging window (dBmV)      : 40.00
Min Dynamic ranging window (dBmV)      : 28.00
Upstream Channel                       : US6
Ranging Status                         : sta
Upstream SNR (dB)                      :  N/A
Upstream Data SNR (dB)                 :  N/A
Upstream Channel Width (MHz)           : 1.6 3.2 3.2 6.4
Received Power delta (dBmV)            : 0.00 0.00 0.00 0.00
Configured Received Power (dBmV@chw)   : -4.00 -1.00 -1.00 2.00
Received Power (dBmV@chw)              : -4.00 -1.00 -1.00 2.00
Configured Received Power (dBmV@1.6MHz): -4.00 -4.00 -4.00 -4.00
Received Power (dBmV@1.6MHz)           : -4.00 -4.00 -4.00 -4.00
Actual Received Power (dBmV)           : 0.00
Data Burst resiliency suspended        : N
Reported Transmit Power (dBmV)         : 40.00
Commanded Transmit Power (dBmV)        : 40.00
Minimum Transmit Power (dBmV)          : 17.00
Power Load (dB)                        : 13.20
Timing Offset             (97.6 ns)    : 2343
OFDMA Timing Offset       (4.88 ns)    : 46872
Initial Timing Offset                  : 2548
Rng Timing Adj Moving Avg(0.381 ns)    : -1
Rng Timing Adj Lt Moving Avg           : -7
Rng Timing Adj Minimum                 : -52428
Rng Timing Adj Maximum                 : 0
Pre-EQ Good                            : 0
Pre-EQ Scaled                          : 0
```

```
Pre-EQ Impulse                          : 0
Pre-EQ Direct Loads                     : 0
Total Codewords rx                      : 114195
Good Codewords rx                       : 73649
Corrected Codewords rx                  : 40546
Uncorrectable Codewords rx              : 0
Phy Operating Mode                      : ofdma
OFDMA Profile in Use                    : 5
OFDMA IUC assignment                    : 5, 13
sysDescr                                : Technicolor E31T2V1 DOCSIS 3.1 2-PORT Voice Modem
 <<HW_REV: 1.0; VENDOR: Technicolor; BOOTR: 2.7.0alpha4; SW_REV:
E31T2D-P20-20-c2000r1910-201016-TWC; MODEL: E31T2V1>> AVS:0
Downstream Power                        : -0.40 dBmV (SNR = 45.50 dB)
MAC Version                             : DOC3.1
Operational Version                     : DOC3.1
QoS Provisioned Mode                    : DOC1.1
Enable DOCSIS2.0 Mode                   : Y
Service Flow Priority                   : N
Modem Status                            : {Modem= w-online(pt), Security=assign(tek)}
Capabilities                            : {Frag=N, Concat=N, PHS=N}
Security Capabilities                   : {Priv=BPI+, EAE=Y, Key_len=56,128}
L2VPN Capabilities                      : {L2VPN=Y, eSAFE=N}
L2VPN type                              : {CLI=N, DOCSIS=N}
Sid/Said Limit                          : {Max US Sids=16, Max DS Saids=63}
UGS Service Flow Limit                  : {Max UGS Service Flows=16}
Optional Filtering Support              : {802.1P=N, 802.1Q=N, DUT=Y}
Transmit Equalizer Support              : {Taps/Symbol= 1, Num of Taps= 24}
Extended Pkt Len Capability             : Max len of PDU = 2000 bytes, CMTS sent 2000
OFDM MRC Support                        : Max num of DS OFDM channels = 2
OFDMA MTC Support                       : Max num of US OFDMA channels = 2
DS OFDM Profile Support                 : Max num of DS OFDM profile per channel = 5
DS OFDM QAM Modulation Support          : 0x1FD4{|QPSK|16|64|128|256|512|1024|2048|4096 QAM}
US OFDMA QAM Modulation Support         : 0x1FFC{|QPSK|8|16|32|64|128|256|512|1024|2048|4096
 QAM}
DS Lower Band Edge                      : 0x2{258 MHz}
DS Upper Band Edge                      : 0x1{1218 MHz}
Diplex Upper Band Edge                  : 0(42 MHz)
DTP mode                                : 0(DTP Op not supported)
DTP performance                         : 0(DTP mode not supported)
Diplexer DS Lower Band Edge Cap         : 0x0{ MHz}
Diplexer DS Upper Band Edge Cap         : 0x0{ MHz}
Diplexer US Upper Band Edge Cap         : 0x0{ MHz}
OUDP Leak Test                          : N/A
CM Capability Reject                    : {1,3,15,22,23,35,38,44,47}
CM STATUS ACK Support                   : Y
Flaps                                   : 0()
Errors                                  : 0 CRCs, 0 HCSes
Stn Mtn Failures                        : 0 aborts, 0 exhausted
Total US Flows                          : 2(2 active)
Total DS Flows                          : 1(1 active)
Total US Data                           : 59679 packets, 7597095 bytes
Total US Throughput                     : 589 bits/sec, 0 packets/sec
Total DS Data                           : 58847 packets, 5422376 bytes
Total DS Throughput                     : 443 bits/sec, 0 packets/sec
LB group ID assigned                    : 2147509287
LB group ID in config file              : N/A
LB policy ID                            : 0
LB policy ID in config file             : 0
LB priority                             : 0
Tag                                     :
Required DS Attribute Mask              : 0x0
Forbidden DS Attribute Mask             : 0x0
Required US Attribute Mask              : 0x0
Forbidden US Attribute Mask             : 0x0
```

```
Service Type ID                          :
Service Type ID in config file           :
Ranging Class ID                         : 0x6
Active Classifiers                       : 0 (Max = NO LIMIT)
CM Upstream Filter Group                 : 0
CM Downstream Filter Group               : 0
CPE Upstream Filter Group                : 0
CPE Downstream Filter Group              : 0
DSA/DSX messages                         : permit all
Voice Enabled                            : NO
DS Change Times                          : 0
Boolean Services                         : 62
CM Energy Management Capable             : Y
CM Enable Energy Management              : N
CM Enter Energy Management               : NO
Battery Mode                             : N
Battery Mode Status                      : AC_POWER_MODE
Number of Multicast DSIDs Support        : 32
MDF Capability Mode                      : 2
IGMP/MLD Version                         : IGMPv3
FCType10 Forwarding Support              : Y
IPv6 Support                             : Y
Features Bitmask                         : 0x0
Total Time Online                        : 3d17h   (3d17h    since last counter reset)
CM Initialization Reason                 : NO_PRIM_SF_USCHAN
CM_CTRL   req/rsp                        : 0/0
CM_STATUS                                : 0
DBC       req/rsp/ack                    : 7/7/7
DCC       req/rsp/ack                    : 0/0/0
DSA_US    req/rsp/ack                    : 0/0/0
DSA_DS    req/rsp/ack                    : 0/0/0
DSC_US    req/rsp/ack                    : 0/0/0
DSC_DS    req/rsp/ack                    : 0/0/0
DSD_US    req/rsp                        : 0/0
DSD_DS    req/rsp                        : 0/0
REG       req/rsp/ack                    : 1/1/1
EM        req/rsp                        : 0/0
ODS       req/rsp                        : 0/0
OPT       req/rsp/ack                    : 0/540/180
UCC       req/rsp                        : 0/0
```

Note

In the release Cisco IOS XE Dublin 17.12.1y, on CBR8, the command **show cable modem verbose** has been updated for all SCQAM and OFDMA upstream channels to include upstream RF port base power if configured(applicable to RPHY only) in addition to channel power adjust. Additionally we display the "Configured Received Power" and "Received Power" with reference to both:

1. channel width(dBmV@chw) and
2. 1.6MHz PSD (dBmV@1.6MHz)

The newly added/modified fields in the verbose output are listed below:

1. Upstream Channel Width (MHz)
2. Received Power delta (dBmV)
3. Configured Received Power (dBmV@chw)
4. Received Power (dBmV@chw)
5. Configured Received Power (dBmV@1.6MHz)
6. Received Power (dBmV@1.6MHz)

show cable modem voice

To show the detected voice-enabled modems, use the **show cable modem voice** command.

show cable modem voice [**pending** | **failed**]

Syntax Description

pending	(Optional) Displays cable modems that are being moved to the target channel via Downstream Frequency Override (DFO).
failed	(Optional) Displays cable modems that have already reached the maximum Downstream Frequency Override retry limit without success.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display the detected voice-enabled modems.

Note The **show cable modem voice** command is not supported on the Cisco uBR-MC28U line card on the Cisco uBR7200 series routers.

Examples

```
Router# show cable modem voice
MAC Address    IP Address      Host      MAC          Prim  Num  Primary    DS
                               Interface State        Sid   CPE  Downstream RfId
0013.10bb.22f9 80.17.1.2       C6/0/0/U0 online(pt)   2     0    Mo3/0/0:1  1
0013.10bb.23d1 80.17.1.5       C6/0/1/U1 online(pt)   5     0    C6/0/1     255
```

Related Commands

Command	Description
show cable service-voice downstream-type	Displays the downstream-types that are capable of providing voice services.

show cable modem wideband

To display information for registered and unregistered wideband CMs, use the **show cable modem wideband** command in privileged EXEC mode.

Cisco uBR Series Router
show cable modem wideband [registered-traditional-docsis| channel]
show cable modem { *ip-address mac-address*}**wideband [channel]**
show cable modem [**cable** *slot*/*subslot*/*cable-interface-index* [**upstream** *port* [*logical-channel-index*]]] **wideband** [**channel**]

Cisco cBR Series Router
show cable modem wideband [registered-traditional-docsis| channel]
show cable modem wideband {*forwarding-summary*}
show cable modem { *ip-address mac-address*}**wideband [channel]**
show cable modem [**cable** *slot*/*subslot*/*cable-interface-index* [**upstream** *port*]] **wideband** [**channel**]

ip-address	(Optional) Identifies the IP address of a specific wideband CM to be displayed. If you specify the IP address for a CPE device behind a CM, information for that CM is displayed.
mac-address	(Optional) Identifies the MAC address of a specific wideband CM to be displayed. If you specify the MAC address for a CPE device behind a wideband CM, information for that wideband CM is displayed.
slot	Slot where the line card resides. The valid range is from 5 to 8 for uBR series router, 0 to 3 and 6 to 9 for cBR series router.
subslot	Secondary slot number of the cable interface line card. The valid subslots are 0 or 1 for uBR series router, 0 for cBR series router.
cable-interface-index	DOCSIS line card MAC domain index. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR-8 router—The valid range is from 0 to 15.
upstream *port*	(Optional) Displays information for all CMs using this specific upstream. You can specify this option only when displaying information for a cable interface. The valid range for *port* begins with 0 and ends with a value that depends on the number of upstream ports on the cable interface line card.
logical-channel-index	(Optional) Logical channel index. The valid values are 0 or 1.

forwarding-summary	(Optional) Displays the following details: • FrwdIF—The wideband interface that each modem is using • BG DS Config—Number of downstreams in the wideband interface • Bonded State—Number of downstreams the modem is currently bonded on • CM DS Capab—Number of downstreams the modem is capable of bonding on
registered-traditional-docsis	(Optional) Displays information for wideband CMs that are currently registered as traditional DOCSIS modems.
channel	(Optional) Displays the number of downstream (DS) and upstream (US) channels used by a cable modem.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 universal broadband router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command output no longer shows the downstream (DS) channel ID or the bonding group (BG) ID. A new column was added to display the Receive Channel Configuration (RCC) ID of the RCC assigned to the cable modem.
12.2(33)SCE	This command was modified. The *port* parameter was changed to *cable-interface-index*.
12.2(33)SCF	This command was modified. The channel keyword and *logical-channel-index* argument was added.
12.2(33)SCG	This command output was modified to display direct downstream and upstream channel information on downstream channel bonding (DSCB) and upstream channel bonding (USCB) partial services.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The *logical-channel-index* variable was removed.
IOS-XE 3.18.1SP	This command was modified. The *forwarding-summary* argument was added.

Usage Guidelines

This command displays information for a one or more wideband CMs. Optionally, the CMs for which to display information can be identified IP address, MAC address, or cable interface.

If a wideband-capable CM is not able to register as a wideband CM (for example, if no wideband channel is available), the CM attempts to register as a traditional DOCSIS modem. The **registered-traditional-docsis** keyword limits the set of wideband CMs for which to display information to wideband-capable CMs that are currently registered as DOCSIS 1.X or DOCSIS 2.0 modems.

The following is a sample output of the **show cable modem wideband** *forwarding-summary* command for all cable modems running Cisco IOS-XE Release 3.18.1SP:

```
Router# show cable modem wideband forwarding-summary
MAC Address    IP Address      Primary        FrwdIF         BG DS  Bonded CM DS
                               Downstream                    Config State  Capab
c8fb.26a3.c694 88.22.0.8       In8/0/0:13     Wi8/0/0:1      8      8      8
c8fb.26a3.bc1e 88.22.0.11      In8/0/0:9      Wi8/0/0:1      8      8      8
c8fb.26a3.c160 88.22.0.37      In8/0/0:15     Wi8/0/0:1      8      8      8
c8fb.26a3.c18c 88.22.0.134     In8/0/0:10     Wi8/0/0:1      8      8      8
c8fb.26a3.c6ee 88.22.0.38      In8/0/0:11     Wi8/0/0:1      8      8      8
c8fb.26a3.c25c 88.22.0.41      In8/0/0:14     Wi8/0/0:1      8      8      8
c8fb.26a3.7fd6 88.22.0.15      In8/0/0:12     Wi8/0/0:1      8      8      8
c8fb.26a3.b8e8 88.22.0.29      In8/0/0:8      Wi8/0/0:1      8      8      8
c8fb.26a3.c510 88.22.0.10      In8/0/0:10     Wi8/0/0:1      8      8      8
c8fb.26a3.c524 88.22.0.40      In8/0/0:13     Wi8/0/0:1      8      8      8
c8fb.26a3.c1ac 88.22.0.43      In8/0/0:9      Wi8/0/0:1      8      8      8
c8fb.26a3.e158 88.22.0.27      In8/0/0:8      Wi8/0/0:1      8      8      8
c8fb.26a3.c452 88.22.0.7       In8/0/0:11     Wi8/0/0:1      8      8      8
c8fb.26a3.c722 88.22.0.12      In8/0/0:15     Wi8/0/0:1      8      8      8
c8fb.26a3.c68a 88.22.0.30      In8/0/0:14     Wi8/0/0:1      8      8      8
c8fb.26a3.c528 88.22.0.45      In8/0/0:14     Wi8/0/0:1      8      8      8
c8fb.26a3.c6ec 88.22.0.95      In8/0/1:10     Wi8/0/1:1      8      8      8
c8fb.26a3.c566 88.22.0.107     In8/0/1:11     Wi8/0/1:1      8      8      8
c8fb.26a3.c718 88.22.0.86      In8/0/1:10     Wi8/0/1:1      8      8      8
c8fb.26a3.c68e 88.22.0.99      In8/0/1:15     Wi8/0/1:1      8      8      8
c8fb.26a3.6da6 88.22.0.108     In8/0/1:12     Wi8/0/1:1      8      8      8
c8fb.26a3.c5d2 88.22.0.110     In8/0/1:8      Wi8/0/1:1      8      8      8
c8fb.26a3.c6f0 88.22.0.182     In8/0/1:11     Wi8/0/1:1      8      8      8
c8fb.26a3.e182 88.22.0.111     In8/0/1:15     Wi8/0/1:1      8      8      8
c8fb.26a3.c5e6 88.22.0.93      In8/0/1:14     Wi8/0/1:1      8      8      8
c8fb.26a3.c418 88.22.0.181     In8/0/1:9      Wi8/0/1:1      8      8      8
c8fb.26a3.c568 88.22.0.113     In8/0/1:13     Wi8/0/1:1      8      8      8
c8fb.26a3.c674 88.22.0.117     In8/0/1:14     Wi8/0/1:1      8      8      8
c8fb.26a3.c680 88.22.0.91      In8/0/1:13     Wi8/0/1:1      8      8      8
c8fb.26a3.c65e 88.22.0.88      In8/0/1:9      Wi8/0/1:1      8      8      8
```

Examples

The following is a sample output for the default form of the **show cable modem wideband** command on a Cisco uBR10012 router running a Cisco IOS Release prior to Cisco IOS Release 12.2(33)SCB:

```
Router# show cable modem wideband
MAC Address    IP Address      I/F       MAC          Prim BG DSID MD-DS-SG
                               State        Sid   ID
0014.bfbe.3cc0 1.11.0.1        C5/0/1/U0 w-online(pt)  3    24     24   N/A
0016.92f0.90d6 1.11.0.4        C5/0/1/U0 w-online(pt)  5    24     272  1
0014.bfbe.3cb8 1.11.0.2        C6/0/1/U0 w-online(pt)  3    36     36   N/A
0016.92f0.90d8 1.11.0.3        C6/0/1/U0 w-online(pt)  5    36     274  1
```

Example of the show cable modem wideband Command in Cisco IOS Release 12.2(33)SCB

The following is a sample output for the default form of the **show cable modem wideband** command on a Cisco uBR10012 router running Cisco IOS Release 12.2(33)SCB:

```
Router# show cable modem wideband
MAC Address    IP Address I/F        MAC           Prim   RCC  MD-DS-SG
                                     State          Sid    ID
0014.bfbe.4694 30.2.0.3   C8/0/0/U0  w-online(pt)    3      1     1
0018.6852.84aa 30.2.0.5   C8/0/0/U0  w-online(pt)    4      2     1
```

Note The RCC ID refers to the output of the **show cable mac-domain rcc command.**

Examples of the show cable modem wideband channel Command in Cisco IOS Release 12.2(33)SCF

The following is a sample output of the **show cable modem widebandchannel** command for all cable modems running Cisco IOS Release 12.2(33)SCF:

```
Router# show cable modem wideband channel
MAC Address    IP Address      I/F           MAC           DSxUS Primary
                                             State               WB
0018.6852.7b76 80.62.0.5       C6/1/0/U0     w-online      2x1   Wi6/1/0:1
0019.474a.c182 80.62.0.2       C6/1/0/U0     w-online      2x1   Wi6/1/0:1
```

The following is a sample output of the **show cable modem widebandchannel** command for a specific cable modem identified by its IP address:

```
Router# show cable modem 80.62.0.5 wideband channel
MAC Address    IP Address      I/F           MAC           DSxUS Primary
                                             State               WB
0018.6852.7b76 80.62.0.5       C6/1/0/U0     w-online      2x1   Wi6/1/0:1
```

The following is a sample output of the **show cable modem widebandchannel** command for a specific cable modem identified by its MAC address:

```
Router# show cable modem 0018.6852.7b76 wideband channel
MAC Address    IP Address      I/F           MAC           DSxUS Primary
                                             State               WB
0018.6852.7b76 80.62.0.5       C6/1/0/U0     w-online      2x1   Wi6/1/0:1
```

The following is a sample output of the **show cable modem widebandchannel** command for a specific cable interface:

```
Router# show cable modem Cable 6/1/0  wideband channel
MAC Address    IP Address      I/F           MAC           DSxUS Primary
                                             State               WB
0018.6852.7b76 80.62.0.5       C6/1/0/U0     w-online      2x1   Wi6/1/0:1
0019.474a.c182 80.62.0.2       C6/1/0/U0     w-online      2x1   Wi6/1/0:1
```

Table below describes the significant fields shown in the display:

Table 147: show cable modem wideband Field Descriptions

Field	Description
MAC Address	MAC address for the CM.
IP Address	IP address that the DHCP server has assigned to the CM.
I/F	Cable interface providing the upstream for this CM.
MAC State	Current state of the MAC layer.
Prim SID	Primary SID assigned to this CM.

Field	Description
Bonding group ID	Identifier of the primary wideband channel.
DSID	Downstream Service Identifier.
DSxUS	Number of DS and US channels used by the CM.
Primary WB	Primary wideband channel for the CM.
MD-DS-SG	MAC Domain Downstream Service Group, the downstream channels of a single MAC domain that reach the cable modem.

Following is a sample output of the **show cable modem wideband** command in Cisco IOS Release 12.2(33)SCG:

```
Router# show cable modem cable 7/0/0 wideband channel
MAC Address    IP Address      I/F           MAC            DSxUS Primary
                                             State                WB
001a.c30c.7f04 40.4.58.4       C7/0/0/U3     w-online(pt)   3x1   Wi7/0/0:0
54d4.6ffb.2f6b 40.4.58.16      C7/0/0/p      w-online(pt)   3x3   Wi7/0/0:0
54d4.6ffb.30fd 40.4.58.14      C7/0/0/p      w-online(pt)   3x3   Wi7/0/0:0
4458.2945.2ade 40.4.58.18      C7/0/0/p      w-online(pt)   3x3   Wi7/0/0:0
001e.6bfc.d1ea 40.4.58.26      C7/0/0/p      w-online       3x3   Wi7/0/0:0
001a.c30c.7dbc 40.4.58.7       C7/0/0/U2     w-online(pt)   3x1   Wi7/0/0:0
001a.c30c.7efc 40.4.58.6       C7/0/0/U2     w-online(pt)   3x1   Wi7/0/0:0
001a.c30c.7e1e 40.4.58.8       C7/0/0/U2     w-online(pt)   3x1   Wi7/0/0:0
54d4.6ffb.2e1b 40.4.58.23      C7/0/0/p      w-online(pt)   3x3   Wi7/0/0:0
4458.2945.2a78 40.4.58.21      C7/0/0/p      w-online(pt)   3x3   Wi7/0/0:0
4458.2945.4604 40.4.58.19      C7/0/0/p      w-online(pt)   3x3   Wi7/0/0:0
```

Note Some modems on CMTS have an exclamation point showing next to their MD-DS-SG, and denotes an FN configuration change on the CMTS. The configuration change might have triggered the MD-DS-SG changes. Every time there is a change in frequency, the SG-ID will be increased by 1. For modems which would use the old SG-ID, they will stay online, but will be marked by an exclamation mark (!).

```
0090.ea1c.8442 172.19.254.80   C7/0/2/UB     w-online(pt)      3     5     !2 / 2
fc91.14b3.03b0 172.20.211.137  C7/0/2/UB     w-online(pt)      20    7     !2 / 2
0090.ea1c.80aa 172.18.254.71   C7/0/2/UB     w-online(pt)      32    4     !2 / 5
48f7.c072.164e 172.20.211.90   C7/0/2/UB     w-online(pt)      35    7     !2 / 2
48f7.c07e.880c 172.22.11.165   C7/0/2/UB     w-online(pt)      52    7     !2 / 5
001d.d4bd.8c01 172.20.211.24   C7/0/2/UB     w-online(pt)      65    5     !2 / 2
48f7.c07e.700c 172.20.211.100  C7/0/2/UB     w-online(pt)      67    7     !2 / 2
acb3.131a.faa7 172.20.171.40   C7/0/2/UB     w-online(pt)      72    6     !2 / 5
48f7.c070.028e 172.20.211.85   C7/0/2/UB     w-online(pt)      73    7     !2 / 2
2073.55c7.b4db 172.20.211.50   C7/0/2/UB     w-online(pt)      108   5     !2 / 2
```

Table below shows the possible values for the MAC State field for a wideband CM modem that registers as a traditional DOCSIS modem:

Table 148: Descriptions for the MAC State Field (for Traditional DOCSIS Modems)

MAC State Value [18]	Description
Registration and Provisioning Status Conditions	
init(r1)	The CM sent initial ranging.
init(r2)	The CM is ranging. The CMTS received initial ranging from the CM and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed. **Note** If a CM appears to be stuck in this state, it could be that the CM is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the CM to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the **cable load-balance** commands.
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a CM appears to be stuck in this state, the CM has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
init(o)	The CM has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the CM remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
resetting	The CM is being reset and will shortly restart the registration process.
Non-error Status Conditions	
cc(r1)	The CM had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The CM has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.

MAC State Value [18]	Description
cc(r2)	This state should normally follow cc(r1) and indicates that the CM has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	The CM is considered offline (disconnected or powered down).
online	The CM has registered and is enabled to pass data on the network.
online(d)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the CM using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.
online(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	The CM registered, BPI is enabled and KEK is assigned.
online(pt)	The CM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.
Note If an exclamation point (!) appears in front of one of the online states, it indicates that the **cable dynamic-secret** command has been used with either the **mark** or **reject** option, and that the cable modem has failed the dynamic secret authentication check	
expire(pk)	The CM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.

MAC State Value [18]	Description
expire(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	The CM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.
expire(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	
reject(m)	The CM attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the **cable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so.
reject(c)	The CM attempted to register, but registration was refused due to a a number of possible errors: • The CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • The CM has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The CM attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and CMTS.)
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.

MAC State Value [18]	Description
reject(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
reject(ts)	The CM attempted to register, but registration failed because the TFTP server timestamp in the CM registration request did not match the timestamp maintained by the CMTS. This might indicate that the CM attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.
reject(ip)	The CM attempted to register, but registration failed because the IP address in the CM request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
reject(na)	The CM attempted to register, but registration failed because the CM did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.

[18] The CM MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtsCmStatusValue object in the CISCO-DOCS-EXT-MIB.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Table below shows the possible values for the MAC state field for a wideband-capable CM that registers as a wideband modem:

Table 149: Additional MAC States for a Wideband Cable Modem

MAC State Value	Description
Non-error Status Conditions	
w-online	The WCM has registered and is enabled to pass data on the network.

MAC State Value	Description
w-online(d)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the WCMTS can continue to communicate with the WCM using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the WCM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
w-online(pkd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the w-online(d) and w-online(pk) states.
w-online(pt)	The WCM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the WCM, the network disabled status takes precedence, and the MAC status field shows w-online(d) instead of w-online(pt) even when BPI encryption is enabled and operational.
w-online(ptd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the w-online(d) and w-online(pt) states.
w-online(pk)	The WCM registered, BPI is enabled and KEK is assigned.
w-expire(pk)	The WCM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the WCM could successfully renew a new KEK value.
w-expire(pkd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the w-online(d) and w-expire(pk) states.
w-expire(pt)	The WCM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value.

MAC State Value	Description
w-expire(ptd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the WCM could successfully renew a new KEK value. **Note** This state is equivalent to the w-online(d) and w-expire(pt) states.
Error Status Conditions	
w-reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
w-reject(pkd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the w-online(d) and w-reject(pk) states.
w-reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
w-reject(ptd)	The WCM registered, but network access for CPE devices using this WCM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the w-online(d) and w-reject(pt) states.



Note For the complete list of the cable modem status, see Table 100: Descriptions for the MAC State Field , on page 1892.

Related Commands

Command	Description
show cable modem vendor	Associates the name of a vendor with its Organizational Unique Identifier (OUI).
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem summary	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem classifiers	Displays information about the classifiers for a particular CM.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show cable modem errors	Displays error statistics for one or more CMs.

Command	Description
show cable modem flap	Displays flap list statistics for one or more cable modems.
show cable modem maintenance	Displays station maintenance (SM) error statistics for one or more cable modems.
show cable modem remote-query	Displays information collected by the remote-query feature.
show cable modulation-profile	Displays modulation profile group information.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.
show interface cable sid	Displays cable interface information.

show cable modem wideband phy

To display the physical information of registered and unregistered wideband CMs on the Cisco CMTS router, use the **show cable modem wideband phy** command in privileged EXEC mode.

show cable modem wideband phy

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output for the default form of the **show cable modem wideband phy** command:

```
Router# show cable modem wideband phy
MAC Address    IP Address      I/F           MAC          Chan   Frq    SNR    Pwr
                                             State        Desc   (MHZ)  (db)   (dBmV)
001a.c30c.7f04 40.4.58.4       C7/0/0/U3     w-online(pt) dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                            us3    13  36.12   0.00
54d4.6ffb.2f6b 40.4.58.16      C7/0/0/p      w-online(pt) dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                            us0    31  36.12   45.00
                                                            us1    37  -----   44.00
                                                            us2    20  36.12   44.50
                                                            us3    13  36.12   44.00
54d4.6ffb.30fd 40.4.58.14      C7/0/0/p      w-online(pt) dsPri   561  -----   0.00
                                                          dsSec   555    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                            us0    31  36.12   44.75
                                                            us1    37  -----   44.00
                                                            us2    20  36.12   44.00
                                                            us3    13  36.12   44.75
4458.2945.2ade 40.4.58.18      C7/0/0/p      w-online(pt) dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                            us0    31  36.12   23.50
                                                            us1    37  -----   23.50
                                                            us2    20  36.12   23.50
                                                            us3    13  36.12   23.50
001e.6bfc.d1ea 40.4.58.26      C7/0/0/p      w-online     dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                            us0    31  36.12   46.25
                                                            us1    37  -----   46.25
                                                            us2    20  36.12   46.25
```

```
                                                          us3    13  36.12   46.25
54d4.6ffb.2e21 40.4.58.5      C7/0/0/p      w-online(pt)  dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us0     31  36.12   45.50
                                                          us1     37  -----   45.00
                                                          us2     20  36.12   45.00
                                                          us3     13  36.12   45.00
001a.c30c.7dbc 40.4.58.7      C7/0/0/U2     w-online(pt)  dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us2     20  36.12   0.00
001a.c30c.7efc 40.4.58.6      C7/0/0/U2     w-online(pt)  dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us2     20  36.12   0.00
001a.c30c.7e1e 40.4.58.8      C7/0/0/U2     w-online(pt)  dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us2     20  36.12   0.00
54d4.6ffb.2e1b 40.4.58.23     C7/0/0/p      w-online(pt)  dsPri   561  -----   0.00
                                                          dsSec   555    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us0     31  36.12   45.00
                                                          us1     37  -----   44.25
                                                          us2     20  36.12   44.25
                                                          us3     13  36.12   44.50
4458.2945.2a78 40.4.58.21     C7/0/0/p      w-online(pt)  dsPri   561  -----   0.00
                                                          dsSec   555    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us0     31  36.12   34.75
                                                          us1     37  -----   33.00
                                                          us2     20  36.12   33.00
                                                          us3     13  36.12   33.75
4458.2945.4604 40.4.58.19     C7/0/0/p      w-online(pt)  dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us0     31  36.12   23.75
                                                          us1     37  -----   23.75
                                                          us2     20  36.12   24.00
                                                          us3     13  36.12   24.00
001e.6bfb.0662 40.4.58.11     C8/0/0/UB     w-online(pt)  dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us0     15  36.12   27.50
                                                          us1     25  36.12   27.00
                                                          us2     35  27.70   29.00
                                                          us3     45  27.70   38.25
001e.6bfb.01aa ---            C8/0/0/UB     w-online(pt)  dsPri   573  -----   0.00
                                                          dsSec   555    N/A   N/A
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us0     15  36.12   26.75
                                                          us1     25  36.12   26.75
                                                          us2     35  27.48   28.25
                                                          us3     45  27.32   38.00
54d4.6ffb.2e66 ---            C8/0/0/p      w-online(pt)  dsPri   555  -----   0.00
                                                          dsSec   561    N/A   N/A
                                                          dsSec   567    N/A   N/A
                                                          us0     15  36.12   26.25
                                                          us1     25  36.12   28.75
                                                          us2     35  28.26   27.00
                                                          us3     45  28.26   38.00
```

Table below describes the significant fields shown in the display:

Table 150: show cable modem wideband phy Field Descriptions

Field	Description
MAC Address	MAC address of the CM.
IP Address	IP address that the DHCP server has assigned to the CM.
I/F	Cable interface providing the upstream to the CM.
MAC State	Current state of the MAC layer.
Chan Desc	Descriptive name of the channel.
Frq State (MHZ)	Frequency value.
SNR (db)	Upstream signal-to-noise ratio (SNR) for a particular CM.
Pwr (dBmV)	Power value.

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.
show cable modem summary	Displays voice call information for a particular CM, identified either by its IP address or MAC address.
show cable modem wideband	Displays information of registered and unregistered wideband CMs.
show interface cable modem	Displays information about the CMs connected to a particular cable interface.

show cable modem wideband primary-channel

To display primary-channel information for a wideband channel, use the **show cable modem wideband primary-channel** command in privileged EXEC mode.

show cable modem {**ip-address** | **mac-address**} **wideband primary-channel**

Syntax Description

ip-address	Identifies the IP address of a specific cable modem to be displayed. If you specify the IP address for a CPE device behind a cable modem, information for that cable modem is displayed.
mac-address	Identifies the MAC address of a specific cable modem to be displayed. You can also specify the MAC address for a CPE device behind a cable modem, and information for that cable modem will be displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays primary-channel information for a wideband channel that is associated with a specific MAC address or IP address of a cable modem or CPE device being the cable modem.

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered cable modems.
show cable modem primary-channel summary total	Displays information for the wideband and narrowband cable modems and location of the primary downstream channel.

show cable modem wideband rcs-status

To display details of events for each RF channel in the cable modem's receive channel configuration (RCC), use the **show cable modem wideband rcs-status** command in privileged EXEC mode.

Cisco uBR Series Router

show cable modem {**mac-address** | **ip-address** | **cable** *slot/subslot/port*} **wideband rcs-status**

Cisco cBR Series Router
show cable modem {**mac-address** | **ip-address** | **cable** *slot/subslot/mac-domain*} **wideband rcs-status [verbose]**

Syntax Description

mac-address	(Optional) Specifies the MAC address of a wideband CM to be displayed.
ip-address	(Optional) Specifies the IP address of a wideband CM to be displayed.
cable *slot/subslot/port*	(Optional) Identifies a cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid values are 5 to 8. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Specifies the port number. Valid values are 0 to 4 (depending on the cable interface).
cable *slot/subslot/mac-domain*	(Optional) Identifies a cable interface on the Cisco cBR-8 router. The following are the valid values: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid values are 0 to 9. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslots is 0. • *mac-domain* —Specifies the mac-domain. The valid values are 0 to 15.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **verbose** keyword was added.
IOS-XE 3.18.0SP	The command was modified on the Cisco cBR Series Converged Broadband Routers to display the DS OFDM profile ID events when **verbose** keyword was used.

Release	Modification
IOS-XE 16.6.1	The command was modified on the Cisco cBR Series Converged Broadband Routers to display the statistics of the OFDM specific CM-STATUS events when verbose keyword was used.

The following is a sample output of the **show cable modem wideband rcs-status** command:

```
Router# show cable modem 0010.18de.813f wideband rcs-status
CM              DS-CTRL  RF   CH ID  STATUS        TYPE      PRIM-CHAN
--------------  -------  ---  -----  ------------  --------  ---------

0010.18de.813f  6/0/4    0    1      UP            SC-QAM    YES
                         1    2      UP            SC-QAM    NO
                         2    3      UP            SC-QAM    NO
                         3    4      UP            SC-QAM    NO
                         4    5      UP            SC-QAM    NO
                         5    6      UP            SC-QAM    NO
                         6    7      UP            SC-QAM    NO
                         7    8      UP            SC-QAM    NO
                         8    9      UP            SC-QAM    NO
                         9    10     UP            SC-QAM    NO
                         10   11     UP            SC-QAM    NO
                         11   12     UP            SC-QAM    NO
                         12   13     UP            SC-QAM    NO
                         13   14     UP            SC-QAM    NO
                         14   15     UP            SC-QAM    NO
                         15   16     UP            SC-QAM    NO
                         16   17     UP            SC-QAM    NO
                         17   18     UP            SC-QAM    NO
                         18   19     UP            SC-QAM    NO
                         19   20     UP            SC-QAM    NO
                         20   21     UP            SC-QAM    NO
                         21   22     UP            SC-QAM    NO
                         22   23     UP            SC-QAM    NO
                         23   24     UP            SC-QAM    NO
                         158  159    UP            OFDM      NO
```

The following is a sample output of the **show cable modem wideband rcs-status verbose** command on Cisco cBR Series Converged Broadband Routers:

```
cbr8-14#show cable modem 0010.18de.813f wideband rcs-status verbose
RF  : 6/0/4 158
  Status                   : UP
  FEC/QAM Failure          : 0
  Dup FEC/QAM Failure      : 0
  FEC/QAM Recovery         : 0
  Dup FEC/QAM Recovery     : 0
  MDD Failure              : 0
  Dup MDD Failure          : 0
  MDD Recovery             : 0
  Dup MDD Recovery         : 0
  Flaps                    : 0
  Flap Duration            : 00:00
OFDM Profile Id : 2
  Status                   : UP
  FEC Lock Failure         : 1         Mar 31 16:03:37
  DUP FEC Lock Failure     : 0
  FEC Lock Recovery        : 1         Mar 31 16:04:01
  DUP FEC Lock Recovery    : 0
 OFDM Profile Id : 8
```

```
  Status                  : DOWN
  FEC Lock Failure        : 1         Mar 31 16:04:50
  DUP FEC Lock Failure    : 0
  FEC Lock Recovery       : 0
  DUP FEC Lock Recovery   : 0
```

Example of show cable modem wideband rcs-status verbose command in Cisco IOS-XE Release 16.6.1

The following is a sample output of the **show cable modem wideband rcs-status verbose** command on Cisco cBR Series Converged Broadband Routers:

```
cbr8-14#show cable modem 4800.33ea.7072 wideband rcs-status verbose
CM  : 4800.33ea.7072
RF  : 3/0/0 0
  Status                  : UP
  FEC/QAM Failure         : 0
  Dup FEC/QAM Failure     : 0
  FEC/QAM Recovery        : 0
  Dup FEC/QAM Recovery    : 0
  MDD Failure             : 0
  Dup MDD Failure         : 0
  MDD Recovery            : 0
  Dup MDD Recovery        : 0
  Flaps                   : 0
  Flap Duration           : 00:00
RF  : 3/0/0 1
  Status                  : UP
  FEC/QAM Failure         : 0
  Dup FEC/QAM Failure     : 0
  FEC/QAM Recovery        : 0
  Dup FEC/QAM Recovery    : 0
  MDD Failure             : 0
  Dup MDD Failure         : 0
  MDD Recovery            : 0
  Dup MDD Recovery        : 0
  Flaps                   : 0
  Flap Duration           : 00:00
RF  : 3/0/0 159
  Status                  : UP
  FEC/QAM Failure         : 0
  Dup FEC/QAM Failure     : 0
  FEC/QAM Recovery        : 0
  Dup FEC/QAM Recovery    : 0
  MDD Failure             : 0
  Dup MDD Failure         : 0
  MDD Recovery            : 0
  Dup MDD Recovery        : 0
  NCP PROF Failure        : 2         May 8  15:14:24
  Dup NCP PROF Failure    : 0
  NCP PROF Recovery       : 1         May 8  15:15:18
  Dup NCP PROF Recovery   : 0
  PLC Lock Failure        : 1         May 8  15:14:47
  Dup PLC Lock Failure    : 0
  PLC Lock Recovery       : 1         May 8  15:15:46
  Dup PLC Lock Recovery   : 0
  Flaps                   : 0
  Flap Duration           : 00:00
  OFDM Profile Id : 2
  Status                  : UP
  Profile Failure         : 1         May 8  15:16:18
  DUP Profile Failure     : 0
```

```
Profile Recovery         : 1         May 8  15:16:44
DUP Profile Recovery     : 0
```

*Table 151: Field Description for **show cable modem wideband rcs-status** command:*

Field	Description
CM	Cable Modem
DS-CTRL	Downstream Integrated Controller
STATUS	RF channel DS resiliency status
RF CH ID	RF channel Docsis Channel ID
TYPE	RF channel OAM type
PRIM-CHAN	If it is a primary channel

*Table 152: Field Description for **show cable modem wideband rcs-status verbose** command on the Cisco cBR Series Converged Broadband Routers:*

Field	Description
CM	Cable Modem
RF	RF Channel
Status	RF channel DS resiliency status
FEC/QAM Failure	Loss of FEC lock or QAM count
Dup FEC/QAM Failure	Duplicate Loss of FEC lock or QAM count
FEC/QAM Recovery	FEC lock or QAM recovery count
Dup FEC/QAM Recovery	Duplicate FEC lock or QAM recovery count
MDD Failure	Secondary channel MDD timeout count
Dup MDD Failure	Duplicate Secondary channel MDD timeout count
MDD Recovery	Secondary channel MDD recovery count
Dup MDD Recovery	Duplicate Secondary channel MDD recovery count
Flaps	RF channel flap count
Flap Duration	RF channel flap duration
NCP PROF Failure	Loss of FEC lock on NCP count
Dup NCP PROF Failure	Duplicate loss of FEC lock on NCP count
NCP PROF Recovery	FEC recovery on NCP profile count

Field	Description
Dup NCP PROF Recovery	Duplicate FEC recovery on NCP profile count
PLC Lock Failure	Loss of FEC lock on PLC channel count
Dup PLC Lock Failure	Duplicate loss of FEC lock on PLC count
PLC Lock Recovery	FEC recovery on PLC channel count
Dup PLC Lock Recovery	Duplicate FEC recovery on PLC channel count
OFDM Profile Id	OFDM profile ID
Status	OFDM profile status
Profile Failure	Loss of FEC lock on OFDM profile count
DUP Profile Failure	Duplicate Loss of FEC lock on OFDM profile count
Profile Recovery	FEC recovery on OFDM profile count
DUP Profile Recovery	Duplicate FEC recovery on OFDM profile count

Related Commands

Command	Description
show cable modem summary wb-rf	Displays the number of RFs that are down on a cable interface.

show cable modulation-profile

To display modulation profile group information for a Cisco CMTS, use the **show cable modulation-profile** command in privileged EXEC mode.

Cisco uBR Series Router

show cable modulation-profile [*profile* [**verbose**]] [*iuc-code*]
show cable modulation-profile cable {*slot* /*port* | *slot* /*subslot*/*port* } [**upstream** *port*]

Cisco cBR Series Router

show cable modulation-profile [*profile* [**verbose**]] [*iuc-code*]
show cable modulation-profile Upstream-Cable *slot* /*card*/*port* **us-channel** *us-channel-id*
show cable modulation-profile ofdma

Syntax Description

profile	(Optional) Profile number. Valid values start with 1.
verbose	(Optional) Displays detailed information for an individual profile.
iuc-code	(Optional) Internal usage code (IUC). Valid options are: **a-long**—Advanced Phy Long Grant Burst (IUC 10)**a-short**—Advanced Phy Short Grant Burst (IUC 9)**a-ugs**—Advanced Phy Unsolicited Grant Burst (IUC 11)**initial**—Initial Ranging Burst (IUC 3) **long**—Long Grant Burst (IUC 6) **reqdata**—Request/Data Burst (IUC 2) [19]**request**—Request Burst (IUC 1) **short**—Short Grant Burst (IUC 5) **station—**Station Ranging Burst (IUC 4)
cable *slot* /*port*	For uBR series router, identifies a cable interface and downstream port on the Cisco uBR7100 series and Cisco uBR7200 series routers. On the Cisco uBR7100 series router, the only valid value is **1/0**. On the Cisco uBR7200 series router, *slot* can range from 3 to 6, and *port* can be 0 or 1, depending on the cable interface.
cable *slot* /*subslot* /*port*	For uBR series router, identifies a cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* = 5 to 8 • *subslot* = 0 or 1 • *port* = 0 to 4 (depending on the cable interface)
upstream *port*	(Optional) For uBR series router, displays information for a particular upstream on the selected cable interface. The *port* value starts with 0 and continues up, depending on the type of cable interface card.

cable *slot* /*card*/*port*	For cBR series router, identifies a cable interface on the Cisco cBR-8 router. The following are the valid values: • *slot* = 0 to 9 • *card* = 0 • *port* = 0 to 15 (depending on the cable interface)
us-channel *us-channel-id*	(Optional) For cBR series router, displays information for a particular upstream on the selected cable interface. The *us-channel-id* value is from 0 to 12, depending on the type of cable interface card.
ofdma	Displays the OFDMA modulation profile details.

[19] The Cisco CMTS recognizes the reqdata burst type but does not use it.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3 XA	This command was first introduced.
12.(0)5T1, 12.0(6)SC, 12.1(2)EC	This command was supported, replacing the **show cable burst-profile** command.
12.1(3a)EC	This **reqdata** type was added as a placeholder for scripts that might reference it, but the DOCSIS MAC scheduler on the Cisco CMTS does not use this type of burst.
12.2(15)CX	Support was added for the Cisco uBR-MC28U/X cable interface line card, including support for DOCSIS 2.0 A-TDMA and mixed modulation profiles. This includes adding additional information to the command's display, as well as adding the **a-long**, **a-short**, **a-ugs**, and **verbose** options.
12.2(15)CX1	Added the ability to display the modulation profiles being used by a particular cable interface and upstream.
12.2(15)BC2	This command displays all default modulation profiles 1, 21, 41, 101, 121, 201, 221, and 241), even when the cable interface card that is associated with those profiles is not installed. Previous releases displayed only the default modulation profiles that were in use.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value range for the *slot* /*card* /*port* variables are changed.
Cisco IOS XE Everest 16.6.1	This command was modified. The **ofdma** keyword was added to display the OFDMA modulation profile details.

Usage Guidelines

The **show cable modulation-profile** command displays modulation profile group information. A modulation profile is a collection of burst profiles that are sent out in a Upstream Channel Descriptor (UCD) message to configure a modem's transmit parameters for an upstream message burst type.

Table below shows the IUC codes for each burst type:

Table 153: Internal Usage Code Types

IUC	Type	IUC	Type
IUC 1	Request Burst (**req**)	IUC 7	Not used
IUC 2	Request/Data Burst (**reqdata**)[20]	IUC 8	Not used
IUC 3	Initial Ranging Burst (**initial**)	IUC 9	Advanced Phy Short Grant Burst (**a-short**)
IUC 4	Station Ranging Burst (**station**)	IUC 10	Advanaced Phy Long Grant Burst (**a-long**)
IUC 5	Short Grant Burst (**short**)	IUC 11	Advanaced Phy Unsolicited Grant Burst (**a-ugs**)
IUC 6	Long Grant Burst (**long**)	IUC 12	Not used

[20] The Cisco CMTS recognizes the reqdata burst type but does not use it.

Modulation Profile Ranges

The ranges for modulation profiles depends on the cable interface being used and the type of modulation profile being created. Table below lists the valid ranges according to cable interface and modulation type:

Table 154: Allowable Ranges for Modulation Profiles

Cable Interface	DOCSIS 1.X (TDMA)	Mixed DOCSIS 1.X/2.0	DOCSIS 2.0 (A-TDMA)
Cisco uBR7100 series	1 to 10[21], default=1	N/A	N/A
Cisco uBR-MC16C	1 to 10, default=1	N/A	N/A
Cisco uBR-MC16S	1 to 10, default=1	N/A	N/A
Cisco uBR-MC28C	1 to 10, default=1	N/A	N/A
Cisco uBR10-MC5X20S, Cisco uBR10-MC5X20U, Cisco uBR10-MC5X20H	21 to 30, default=21	121 to 130, default=121	221 to 230, default=221
Cisco uBR-MC16U/X, Cisco uBR-MC28U/X	41 to 50, default=41	141 to 150, default=141	241 to 250, default=241

[21] Only 8 modulation profiles are supported in Cisco IOS software releases before 12.2(15)BC1, so in these releases the valid range is 1 to 8.

Note Default modulation profiles are created for each type of card and operation mode. You cannot delete the default modulation profiles (1, 21, 41, 101, 121, 201, 221, and 241). In Cisco IOS Release 12.2(15)BC2 and later, all default modulation profiles are displayed, even when that particular cable interface is not installed. In previous versions, only the default modulation profiles that were in use were displayed.

Examples

The following example shows a sample output of the show cable modulation-profile ofdma command in Cisco IOS XE Everest 16.6.1 release:

```
Router# show cable modulation-profile ofdma

Mod  Subc     IUC type    Act   Preamble   Bit       Pilot
     Spacing              subc  Symbols    Loading   Pattern
421  25KHz    3 (IR)      64       4
              4 (FR)      192      1
              13 (data)                    16-QAM    8

423  25KHz    3 (IR)      64       4
              4 (FR)      128      1
              6 (data)                     1024-QAM  8
              10 (data)                    512-QAM   8
              11 (data)                    256-QAM   8
              12 (data)                    128-QAM   9
              13 (data)                    64-QAM    9

461  50KHz    3 (IR)      32       4
              4 (FR)      192      1
              13 (data)                    16-QAM    1

466 50KHz     3 (IR)      64       4
              4 (FR)      128      1
              13 (data)                    1024-QAM  2
```

The following example shows a sample output of the show cable modulation-profile ofdma command in Cisco IOS XE Everest 16.6.1 release to show a list of upstream state us channels for a specific OFDMA profile:

```
Router# show cable modulation-profile ofdma 421
Mod   Subc    IUC type  Act    Preamble  Bit      Pilot
      Spacing           subc   Symbols   Loading  Pattern
421   25KHz    3  (IR)   64     4
               4  (FR)   192    1
               13 (data)                  1024-QAM 8

**** OFDMA Profile Assigned Channels ****
Prof Channel
421 1/0/1:/12
```

The following is sample output from the **show cable modulation-profile** command in Cisco IOS Release 12.2(11)BC3 and earlier releases:

```
CMTS01# show cable modulation-profile

Mo IUC     Type  Preamb Diff FEC     FEC   Scrambl Max  Guard Last Scrambl Preamb
                 length enco T       CW    seed    B    time  CW           offset
                              bytes  size          size size  short
1  request qpsk   64     no   0x0    0x10  0x152   1    8     no     yes     56
1  initial qpsk   128    no   0x5    0x22  0x152   0    48    no     yes     0
1  station qpsk   128    no   0x5    0x22  0x152   0    48    no     yes     0
1  short   qpsk   72     no   0x5    0x4B  0x152   0    8     no     yes     48
```

The following is sample output from the **show cable modulation-profile** command in Cisco IOS Release 12.2(15)CX and later releases:

```
Router# show cable modulation-profile

Mod IUC     Type  Pre Diff FEC  FEC  Scrmb Max Guard Last Scrmb Pre   Pre   RS
                  len enco T    k    seed  B   time  CW         offst Type
                           BYTE BYTE       siz size  short
1   request qpsk  64  no   0x0  0x10 0x152 0   8     no   yes   184   qpsk  na
```

```
1   initial qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   128   qpsk  na
1   station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   128   qpsk  na
1   short   qpsk  72  no   0x4  0x4C 0x152 12  8     yes  yes   176   qpsk  na
1   long    qpsk  80  no   0x9  0xEC 0x152 0   8     yes  yes   168   qpsk  na
41  request qpsk  68  no   0x0  0x10 0x152 0   8     no   yes   0     qpsk  na
41  initial qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk  na
41  station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk  na
41  short   qpsk  80  no   0x4  0x4C 0x152 12  8     yes  yes   0     qpsk  na
41  long    qpsk  80  no   0x8  0xEC 0x152 0   8     yes  yes   0     qpsk  na
45  request qpsk  68  no   0x0  0x10 0x152 0   8     no   yes   0     qpsk  na
45  initial qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk  na
45  station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk  na
45  short   16qam 160 no   0x6  0x4C 0x152 7   8     yes  yes   0     16qam na
45  long    16qam 160 no   0x8  0xE7 0x152 0   8     yes  yes   0     16qam na
141 request qpsk  68  no   0x0  0x10 0x152 0   8     no   yes   0     qpsk  na
141 initial qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk  na
141 station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk  na
141 short   16qam 160 no   0x6  0x4C 0x152 7   8     yes  yes   0     16qam na
141 long    16qam 160 no   0x8  0xE7 0x152 0   8     yes  yes   0     16qam na
141 a-short 32qam 160 no   0x9  0x4C 0x152 6   8     yes  yes   0     qpsk1 no
141 a-long  64qam 196 no   0xC  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
241 request qpsk  68  no   0x0  0x10 0x152 0   8     no   yes   0     qpsk0 no
241 initial qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk0 no
241 station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk0 no
241 a-short 32qam 160 no   0x9  0x4C 0x152 6   8     yes  yes   0     qpsk1 no
241 a-long  64qam 196 no   0xC  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
241 a-ugs   16qam 80  no   0x3  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
242 request qpsk  68  no   0x0  0x10 0x152 0   8     no   yes   0     qpsk0 no
242 initial qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk0 no
242 station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk0 no
242 a-short qpsk  80  no   0x4  0x4C 0x152 12  8     yes  yes   0     qpsk0 no
242 a-long  qpsk  68  no   0x8  0xEC 0x152 0   8     yes  yes   0     qpsk0 no
242 a-ugs   qpsk  80  no   0x0  0xEC 0x152 0   8     yes  yes   0     qpsk0 no
243 request 64qam 132 no   0x4  0x10 0x152 0   8     no   yes   0     qpsk1 no
243 initial 64qam 128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk1 no
243 station 64qam 128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk1 no
243 a-short 64qam 160 no   0x9  0x4C 0x152 5   8     yes  yes   0     qpsk1 no
243 a-long  64qam 196 no   0xC  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
243 a-ugs   64qam 100 no   0x7  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
244 request 64qam 132 no   0x4  0x10 0x152 0   8     no   yes   0     qpsk1 no
244 initial 64qam 128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk1 no
244 station 64qam 128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk1 no
244 a-short 64qam 160 no   0x9  0x4C 0x152 5   8     yes  yes   0     qpsk1 no
244 a-long  64qam 196 no   0xC  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
244 a-ugs   64qam 32  no   0xA  0xC8 0x152 255 32    yes  yes   0     qpsk1 yes
245 initial qpsk  32  no   0xA  0xC8 0x152 32  32    no   yes   0     qpsk1 yes
245 station qpsk  32  no   0xA  0xC8 0x152 32  32    yes  yes   0     qpsk1 yes
245 a-short 64qam 64  no   0xA  0xC8 0x152 32  32    yes  yes   0     qpsk1 yes
245 a-long  64qam 32  no   0xA  0xC8 0x152 252 32    yes  yes   0     qpsk1 yes
245 a-ugs   64qam 32  no   0xA  0xC8 0x152 32  32    yes  yes   0     qpsk1 yes
Router#
```

The following shows sample output from the **show cable modulation-profile** command for a mixed mode modulation profile (TDMA/A-TDMA) on the Cisco uBR10-MC5X20S cable interface line card:

```
Router# show cable modulation-profile 121

Mod IUC     Type  Pre Diff FEC  FEC  Scrmb Max Guard Last Scrmb Pre   Pre   RS
                  len enco T    k    seed  B   time  CW         offst Type
                            BYTE BYTE       siz size  short
121 request qpsk  32  no   0x0  0x10 0x152 0   20    no   yes   0     qpsk  na
121 initial qpsk  64  no   0x5  0x22 0x152 0   48    no   yes   64    qpsk  na
```

```
121 station qpsk  64  no   0x5  0x22 0x152 0   48    no   yes   64    qpsk  na
121 short   qpsk  64  no   0x5  0x4B 0x152 6   20    yes  yes   64    qpsk  na
121 long    qpsk  64  no   0x8  0xDC 0x152 0   20    yes  yes   64    qpsk  na
121 a-short 64qam 128 no   0x5  0x63 0x152 10  20    yes  yes   192   qpsk0 no
121 a-long  64qam 128 no   0xF  0xC8 0x152 0   20    yes  yes   192   qpsk0 no
Router#
```

The following shows sample output from the **show cable modulation-profile** command for two DOCSIS 2.0 modulation profiles (A-TDMA) on the Cisco uBR10-MC5X20S cable interface line card:

```
Router# show cable modulation-profile 221

Mod IUC     Type  Pre Diff FEC  FEC  Scrmb Max Guard Last Scrmb Pre   Pre   RS
                  len enco T    k    seed  B   time  CW         offst Type
                      BYTE BYTE       siz size  short
221 request qpsk  64  no   0x0  0x10 0x152 0   8     no   yes   184   qpsk0 na
221 initial qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk0 na
221 station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk0 na
221 short   qpsk  72  no   0x5  0x4B 0x152 6   8     yes  yes   176   qpsk0 na
221 long    qpsk  80  no   0x8  0xDC 0x152 0   8     yes  yes   168   qpsk0 na
221 a-short 64qam 128 no   0x5  0x63 0x152 10  20    yes  yes   192   qpsk0 no
221 a-long  64qam 128 no   0xF  0xC8 0x152 0   20    yes  yes   192   qpsk0 no
Router# show cable modulation-profile 241

Mod IUC     Type  Pre Diff FEC  FEC  Scrmb Max Guard Last Scrmb Pre   Pre   RS
                  len enco T    k    seed  B   time  CW         offst Type
                      BYTE BYTE       siz size  short
241 request qpsk  68  no   0x0  0x10 0x152 0   8     no   yes   0     qpsk0 no
241 initial qpsk  2   no   0x0  0x10 0x0   0   0     no   no    0     qpsk1 no
241 station qpsk  128 no   0x5  0x22 0x152 0   48    no   yes   0     qpsk0 no
241 a-short 32qam 160 no   0x9  0x4C 0x152 6   8     yes  yes   0     qpsk1 no
241 a-long  64qam 132 no   0xC  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
241 a-ugs   16qam 80  no   0x3  0xE7 0x152 0   8     yes  yes   0     qpsk1 no
Router#
```

The following shows sample output for the **upstream** option, which displays the modulation profile currently being used by a particular upstream:

```
Router# show cable modulation-profile cable 4/1 upstream 1

Mod  IUC     Type  Pre Diff FEC  FEC  Scrmb  Max Guard Last Scrmb Pre   Pre   RS
                  len enco T    k    seed   B   time  CW         offst Type
                      BYTE BYTE       siz size  short
41   request qpsk  64  no   0x0  0x10 0x152  0   8     no   yes   396  qpsk  na
41   initial qpsk  128 no   0x5  0x22 0x152  0   48    no   yes   6    qpsk  na
41   station qpsk  128 no   0x5  0x22 0x152  0   48    no   yes   6    qpsk  na
41   short   qpsk  88  no   0x5  0x4C 0x152  35  42    yes  yes   396  qpsk  na
41   long    qpsk  76  no   0x6  0xE8 0x152  135 143   yes  yes   396  qpsk  na
Router#
```

The following example shows typical detailed output for an individual modulation profile that is displayed when using the **verbose** option. Each IUC is described in detail.

```
Router# show cable modulation-profile 1 verbose

Modulation Profile Number:      1
Burst:                          tdma
IUC:                            request (IUC 1)
Modulation:                     qpsk
Preamble length:                64
Differential Encoding:          off
```

```
FEC parity T bytes:             0x0
FEC codeword length K bytes:    0x10
Scrambler seed:                 0x152
Max short burst size B bytes:   0
Guard time size in symbols:     8
Shortened last codeword:        no
Scrambler:                      enabled
Preamble offset:                184
Preamble type:                  qpsk0
RS interleaver on:              na
RS interleaver depth:           0
RS interleaver block size:      0
Modulation Profile Number:      1
Burst:                          tdma
IUC:                            initial maintenance (IUC 3)
Modulation:                     qpsk
Preamble length:                128
Differential Encoding:          off
FEC parity T bytes:             0x5
FEC codeword length K bytes:    0x22
Scrambler seed:                 0x152
Max short burst size B bytes:   0
Guard time size in symbols:     48
Shortened last codeword:        no
Scrambler:                      enabled
Preamble offset:                0
Preamble type:                  qpsk0
RS interleaver on:              na
RS interleaver depth:           0
RS interleaver block size:      0
Modulation Profile Number:      1
Burst:                          tdma
IUC:                            station maintenance (IUC 4)
Modulation:                     qpsk
Preamble length:                128
Differential Encoding:          off
FEC parity T bytes:             0x5
FEC codeword length K bytes:    0x22
Scrambler seed:                 0x152
Max short burst size B bytes:   0
Guard time size in symbols:     48
Shortened last codeword:        no
Scrambler:                      enabled
Preamble offset:                0
Preamble type:                  qpsk0
RS interleaver on:              na
RS interleaver depth:           0
RS interleaver block size:      0
Modulation Profile Number:      1
Burst:                          tdma
IUC:                            short grant (IUC 5)
Modulation:                     qpsk
Preamble length:                72
Differential Encoding:          off
FEC parity T bytes:             0x5
FEC codeword length K bytes:    0x4B
Scrambler seed:                 0x152
Max short burst size B bytes:   6
Guard time size in symbols:     8
Shortened last codeword:        yes
Scrambler:                      enabled
Preamble offset:                176
Preamble type:                  qpsk0
RS interleaver on:              na
```

```
RS interleaver depth:           0
RS interleaver block size:      0
Modulation Profile Number:      1
Burst:                          tdma
IUC:                            long grant (IUC 6)
Modulation:                     qpsk
Preamble length:                80
Differential Encoding:          off
FEC parity T bytes:             0x8
FEC codeword length K bytes:    0xDC
Scrambler seed:                 0x152
Max short burst size B bytes:   0
Guard time size in symbols:     8
Shortened last codeword:        yes
Scrambler:                      enabled
Preamble offset:                168
Preamble type:                  qpsk0
RS interleaver on:              na
RS interleaver depth:           0
RS interleaver block size:      0
Router#
```

Table below describes the significant fields displayed by the show cable modulation-profile command.

Table 155: show cable modulation-profile field descriptions

Field	Description
Mo	Modulation profile group number. A modulation profile group is the set of burst profiles that defines upstream transmit characteristics for the various types of upstream transmission classes.
IUC	Interval usage code. Each upstream transmit burst belongs to a class that is given a number called the interval usage code (IUC). Bandwidth maps messages (MAP) by IUC codes used to allocate upstream time slots. The following types are currently defined: • Request—Bandwidth request slot • Request Data—Bandwidth request and short data burst slot • Initial Maintenance—Initial link registration contention slot • Station Maintenance—Link keepalive slot • Short Data Grant—Short data burst slot • Long Data Grant—Long data burst slot
Type	Modulation type.
Preamb length	Preamble length.
Diff enco	Differential encoding enabled (yes) or not enabled (no).
FEC T bytes	Number of bytes that can be corrected for each forward error correction (FEC) code word.
FEC CW size	Size, in bytes, of the FEC code word.
Scrambl seed	Scrambler seed value in hex format.
Max B size	Maximum burst size.
Guard time size	Time between successive bursts measured in symbols.

Field	Description
Last CW short	Handling of FEC for shortened last code word.
Scrambl	Scrambler enabled (yes) or not enabled (no).
Preamb offset	(DOCSIS 1.0 and DOCSIS 1.1 modulation profiles) The bits to be used for the preamble value.
Pre offst	(DOCSIS 2.0 modulation profiles) The bits to be used for the preamble value.
Pre Type	(DOCSIS 2.0 modulation profiles) The A-TDMA preamble type (qpsk0 or qpsk1).
RS	(DOCSIS 2.0 modulation profiles) The A-TDMA RS encoding type.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable upstream modulation-profile	Configures a spectrum group to use a specified frequency.
show cable hop	Displays CM configuration settings.
show interface cable sid	Displays cable interface information.

show cable multicast authorization

To display the list of defined multicast authorization profiles and all CMs associated with corresponding profiles, use the **show cable multicast authorization** command in privileged EXEC mode.

show cable multicast authorization profile-group {*profile-group-number* | **all**} **profile-list** {*profile-number* | **all**}

Syntax Description

profile-group	Displays the profile group.
profile-group-number	Displays the profile number.
all	Displays all profile groups.
profile-list	Displays the profile list.
profile-number	Displays the profile number.
all	Displays all profiles.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCC	The command output was modified to display profile description for the specified profile.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display all the profile groups, profile descriptions, and CMs associated with the profiles.

Examples

The following command shows all the profile groups and rules associated with it:

```
Router# show cable multicast authorization profile-group all
Profile-Group Index: 1
   CMs using this group: 2
   ProfileId   CMs        Profile
   -------------------------------
     0         2         prof1
     1         2         prof2
     2         2         prof3
 Session-Rule List:
   Group / Source                                      Prio  Action
   ------------------------------------------------------------------
   grp: FF15::1/64                                     1     permit
   src: 0::0/0
   grp: FF15::1/64                                     1     permit
```

```
   src: 1234::1/64
   grp: 224.1.1.1/16                                  1     permit
   src: 0.0.0.0/0
   grp: FF16::1/64                                    1     permit
   src: 0::0/0
   grp: 224.1.1.1/16                                  1     permit
   src: 10.1.1.1/16
   ---------------------------------------------------------------
```

The following command shows a particular profile group and rules associated with it:

```
Router# show cable multicast authorization profile-group 1
Profile-Group Index: 1
   CMs using this group: 2
   ProfileId   CMs        Profile
   ------------------------------
     0         2         prof1
     1         2         prof2
     2         2         prof3
 Session-Rule List:
   Group / Source                                     Prio  Action
   ---------------------------------------------------------------
   grp: FF15::1/64                                    1     permit
   src: 0::0/0
   grp: FF15::1/64                                    1     permit
   src: 1234::1/64
   grp: 224.1.1.1/16                                  1     permit
   src: 0.0.0.0/0
   grp: FF16::1/64                                    1     permit
   src: 0::0/0
   grp: 224.1.1.1/16                                  1     permit
   src: 10.1.1.1/16
   ---------------------------------------------------------------
```

The following command shows all the profiles and their profile descriptions, and the session rules for each profile.

```
Router# show cable multicast authorization profile-list all
CMTS Authorization Profile List
-------------------------------
Profile-Index: 0    Name: prof1
   Number of CMs: 2
   Id         Group / Source                                  Prio  Action
   ------------------------------------------------------------------------
   1          grp: FF15::1/64                                 1     permit
              src: 0::0/0
   2          grp: FF15::1/64                                 1     permit
              src: 1234::1/64
   3          grp: 224.1.1.1/16                               1     permit
              src: 0.0.0.0/0
   4          grp: FF16::1/64                                 1     permit
              src: 0::0/0
   5          grp: 224.1.1.1/16                               1     permit
              src: 10.1.1.1/16
   ------------------------------------------------------------------------
Profile-Index: 1    Name: prof2
   Number of CMs: 2
   Id         Group / Source                                  Prio  Action
   ------------------------------------------------------------------------
   ------------------------------------------------------------------------
Profile-Index: 2    Name: prof3
   Number of CMs: 2
   Id         Group / Source                                  Prio  Action
```

```
   ------------------------------------------------------------------------
   ------------------------------------------------------------------------
```

The following command shows a particular profile and its description.

```
Router# show cable multicast authorization profile-list 3
CMTS Authorization Profile List
-------------------------------
Profile-Index: 3    Name: gold
   Number of CMs: 0
   Profile Description: gold profile for higher bandwidth
   Id         Group / Source                                  Prio  Action
   ------------------------------------------------------------------------
   ------------------------------------------------------------------------
```

Table below describes the significant fields shown in the display.

Table 156: show cable multicast authorization Field Descriptions

Field	Description
Profile-Group Index	Displays the profile group index.
Name	Displays the name of the profile group.
Profile Description	Displays the description given to the profile.
ProfileId	Displays the QoS profile being used.
CMs	Displays the CMs belonging to the profile.
Profile	Displays the profile being used for multicast.
Session-Rule List	Displays the list of session rules being used for the multicast.
Source (src)	Displays the source IP address.
Group (grp)	Displays the group IP address.
Priority	Displays the rule priority value.
Action	Displays the action taken for multicast.

Related Commands

Command	Description
cable multicast auth enable default-action	Configures cable multicast authorization profile and sets the maximum sessions limit.
cable multicast auth profile-name	Configures cable multicast authorization profile.
profile description	Configures profile descriptions for each profile in the selected cable multicast authorization profile.
show cable multicast db	Displays the contents of multicast explicit tracking database.
show cable multicast dsid	Displays the entire DSID database content.

Command	Description
show cable multicast qos	Displays the configuration information for MQoS, (Group-Config, Group-QoS-Config, Group-Encryption-Config).

show cable multicast db

To display the contents of the multicast explicit tracking database, use the **show cable multicast db** command in privileged EXEC mode.

{**show cable multicast db** [**bundle** *bundle-interface* [*ipv4-addressipv6-address* | **summary**] | *cm-mac* [*host-mac-add* | **hosts** | **proxy**] | **summary** | **client pcmm**] | [**detail**]}

Syntax Description

bundle bundle-interface	(Optional) Displays the bundle interface. For example, Bundle 10.
ipv4-address	(Optional) IPv4 address.
ipv6-address	(Optional) IPv6 address of the group that should be matched using the format X:X:X:X:X.
cm-mac	(Optional) MAC address of the cable modem.
host-mac-add	(Optional) Host MAC address.
hosts	(Optional) Displays host details.
proxy	(Optional) Displays proxy details.
summary	(Optional) Displays the bundle interface summary or the multicast explicit tracking database summary.
client	(Optional) Displays entries by the client type.
pcmm	(Optional) Displays all PacketCable multimedia (PCMM) client entries.
detail	(Optional) Displays additional information related to the multicast explicit tracking database.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCE	This command was modified. The following two keywords were added to this command: • **client** • **pcmm**
12.2(33)SCF	This command was modified. A new keyword, **detail, was added to provide** additional information related to the multicast explicit tracking database.

Release	Modification
IOS-XE 3.15.0S	This command was integrated into Cisco IOS-XE Release 3.15.0S. Support for the Cisco cBR Series Converged Broadband Routers was added.

Usage Guidelines

Starting with Cisco IOS Release 12.2(33)SCF:

- There is an Explicit Tracking Database (ETDB) entry for each static multicast configuration.
- The total number of replications supported on each chassis is restricted to a maximum of 5000 replications.
- The total number of replications corresponding to static multicast is restricted to a maximum of 1500 replications.
- The **show cable multicast db detail** command is not applicable for ETDB entries created by the static TLV.

Examples

The following is a sample output from the **show cable multicast db** command:

```
Router# show cable multicast db
Interface : Bundle1
Session (S,G) : (*,230.1.1.1)
Fwd Intfc  Sub Intfc  Host Intfc  CM Mac          Hosts
w1/0/0:0                          aaaa.bbbb.cccc      2
w1/0/0:0                          aaaa.bbbb.cccc      2
Session (S,G) : (255.255.255.255,255.255.255.255)
Fwd Intfc  Sub Intfc  Host Intfc  CM Mac          Hosts
w1/0/0:0                          aabb.bbcc.ccdd      3
Interface : Bundle2
Session (S,G) : (*,230.1.1.1)
Fwd Intfc  Sub Intfc  Host Intfc  CM Mac          Hosts
w1/0/0:0                          aaaa.bbbb.cccc      2
w1/0/0:0                          aaaa.bbbb.cccc      2
Session (S,G) : (255.255.255.255,255.255.255.255)
Fwd Intfc  Sub Intfc  Host Intfc  CM Mac          Hosts
w1/0/0:0                          aabb.bbcc.ccdd      3
```

The following is a sample output from the **show cable multicast db summary** command:

```
Router# show cable multicast db summary
Interface  Session Count  CM Count
Bundle1           10         5
Bundle2               23        11
```

The following is a sample output from the **show cable multicast db bundle** *bundle-interface* command:

```
Router# show cable multicast db bundle 1
Interface : Bundle1
Session (S,G) : (*,230.1.2.3)
Fwd Intfc  Sub Intfc            Host Intfc   CM Mac           Hosts
Wi1/1/0:0  Bundle1              Ca5/0/0      ff01.0001.0000       1
Interface : Bundle1
Session (S,G) : (20.1.1.1,232.1.1.1)
Fwd Intfc  Sub Intfc            Host Intfc   CM Mac           Hosts
Wi1/1/0:0  Bundle1              Ca5/0/0      ff01.0001.0000       1
```

The following is a sample output from the **show cable multicast db bundle** *bundle-interface summary* command:

```
Router# show cable multicast db bundle 1 summary
Interface  Session Count  CM Count
Bundle1           10      5
```

The following is a sample output from the **show cable multicast db bundle** *bundle-interface ipv4-address* command:

```
Router# show cable multicast db bundle 1
225.0.0.1
Session (S,G) : (*,225.0.0.1)
Fwd Intfc  Sub Intfc            Host Intfc   CM Mac           Hosts
Wi5/1:0    Bundle1              Ca5/1        001e.6bfb.29a6       1
```

The following is a sample output from the **show cable multicast db bundle** *bundle-interface ipv6-address* command:

```
Router# show cable multicast db bundle1
ff15::1
Session (S,G) : (*,FF15::1)
Fwd Intfc  Sub Intfc            Host Intfc   CM Mac           Hosts
In5/1:0    Bundle1              Ca5/1        001e.6bfb.29a6       1
```

The following is a sample output from the **show cable multicast db** *cm-mac* command:

```
Router# show cable multicast db 000f.66f9.aa73
Session (S,G) : (*,230.1.1.1)
Fwd Intfc  Sub Intfc  Host Intfc  Hosts  Proxy  Static
w1/0/0:0                            2      Y       N
Session (S,G) : (*,230.1.1.1)
Fwd Intfc  Sub Intfc  Host Intfc  Hosts  Proxy  Static
w1/0/0:0
```

The following is a sample output from the **show cable multicast db** *cm-mac host-mac-add* command:

```
Router# show cable multicast db aaaa.bbbb.cccc 000f.66f9.aa73
Bundle Interface : Bundle1
CM mac           :
Host mac         : aaaa.bbbb.cccc
Session (S,G)    : (*,230.1.1.1)
Fwd Interface    :
Sub Interface    :
Host Interface   :
IGMP/MLD Ver     :
TimeStamp Delta  :
Bundle Interface : Bundle1
CM mac           :
Host mac         : aaaa.bbbb.cccc
Session  (S,G)   : (*,230.1.1.1)
Fwd Interface    :
Sub Interface    :
Host Interface   :
IGMP/MLD Ver     :
TimeStamp Delta  :
```

The following is a sample output from the **show cable multicast db** *cm-mac hosts* command:

```
Router# show cable multicast db aaaa.bbbb.cccc hosts
Session (S,G) : (*,230.1.1.1)
Fwd Intfc  Sub Intfc  Host Intfc  Host Mac        Proxy
w1/0/0:0                          aaaa.bbbb.cccc      Y
Session (S,G) : (255.255.255.255,255.255.255.255)
Fwd Intfc  Sub Intfc  Host Intfc  Host Mac         Proxy
w1/0/0:0                          aabb.bbcc.ccdd       N
```

The following is a sample output from the **show cable multicast db** *cm-mac proxy* command:

```
Router# show cable multicast db aaaa.bbbb.cccc proxy
Bundle Interface : Bundle1
CM mac           :
Host mac         : aaaa.bbbb.cccc
Session  (S,G)   : (*,230.1.1.1)
Fwd Interface    :
Sub Interface    :
Host Interface   :
IGMP/MLD Ver     :
TimeStamp Delta  :
Bundle Interface : Bundle1
CM mac           :
Host mac         : aaaa.bbbb.cccc
Session (S,G)    : (*,230.1.1.1)
Fwd Interface    :
Sub Interface    :
Host Interface   :
IGMP/MLD Ver     :
TimeStamp Delta  :
```

The following is a sample output from the **show cable multicast db command** that displays all the available PCMM client entries on a Cisco CMTS router:

```
Router# show cable multicast db client pcmm
Interface : Bundle1
Session (S,G) : (*,229.2.2.12)
Fwd Intf     Bundle Intf  Host Intf    CM MAC         CPE IP           Gate-ID SFID
Wi1/1/0:0    Bundle1      Ca5/0/0      0018.6852.8056 60.1.1.202       134 4
```

The following is a sample output from the **show cable multicast db** command with the **detail** keyword **in Cisco IOS Release 12.2(33)SCF**:

```
Router# show cable multicast db detail
Interface  Fwd Intfc   group            source
Bundle1    Wi7/0/0:0   230.1.2.4        N/A
ETDB received IGMP   ETDB processed IGMP
Nov 25 08:42:36.643   Nov 25 08:42:36.643
Sid      gc_id    Stat Index   DSID       Stat Index Allocated
DEFAULT  N/A      61330        0xCF25C    Nov 25 08:42:36.643
8201     1        61331        0xCF25C    Nov 25 08:42:36.643
Interface  Fwd Intfc   group            source
Bundle1    Wi7/0/0:0   230.1.2.3        N/A
ETDB received IGMP   ETDB processed IGMP
Nov 25 08:42:22.339   Nov 25 08:42:22.339
Sid      gc_id    Stat Index   DSID       Stat Index Allocated
DEFAULT  N/A      61328        0xCF25B    Nov 25 08:42:22.339
8201     1        61329        0xCF25B    Nov 25 08:42:22.339
```

The following is a sample output from the **show cable multicast db** command with the **detail** keyword that provides multicast explicit tracking database information for a particular bundle interface in Cisco IOS Release 12.2(33)SCF :

```
Router# show cable multicast db bundle 1 detail
Interface  Fwd Intfc   group            source
Bundle1    Wi7/0/0:0   230.1.2.4        N/A
ETDB received IGMP   ETDB processed IGMP
Nov 25 08:42:36.643   Nov 25 08:42:36.643
Sid      gc_id    Stat Index   DSID       Stat Index Allocated
DEFAULT  N/A      61330        0xCF25C    Nov 25 08:42:36.643
8201     1        61331        0xCF25C    Nov 25 08:42:36.643
Interface  Fwd Intfc   group            source
Bundle1    Wi7/0/0:0   230.1.2.3        N/A
ETDB received IGMP   ETDB processed IGMP
Nov 25 08:42:22.339   Nov 25 08:42:22.339
Sid      gc_id    Stat Index   DSID       Stat Index Allocated
DEFAULT  N/A      61328        0xCF25B    Nov 25 08:42:22.339
8201     1        61329        0xCF25B    Nov 25 08:42:22.339
```

The following is a sample output from the **show cable multicast db** command with the **detail** keyword that provides multicast explicit tracking database information for a particular bundle interface based on its host MAC address in Cisco IOS Release 12.2(33)SCF :

```
Router# show cable multicast db bundle 1 230.1.2.4 detail
Interface  Fwd Intfc   group            source
Bundle1    Wi7/0/0:0   230.1.2.4        N/A
ETDB received IGMP   ETDB processed IGMP
Nov 25 08:42:36.643   Nov 25 08:42:36.643
Sid      gc_id    Stat Index   DSID       Stat Index Allocated
DEFAULT  N/A      61330        0xCF25C    Nov 25 08:42:36.643
8201     1        61331        0xCF25C    Nov 25 08:42:36.643
```

The following is a sample output from the **show cable multicast db** command with the **detail** keyword that provides multicast explicit tracking database information based on its cable modem MAC address n Cisco IOS Release 12.2(33)SCF:

```
Router# show cable multicast db 0019.474a.d516 detail
Interface  Fwd Intfc   group            source
Bundle1    Wi7/0/0:0   230.1.2.3        N/A
ETDB received IGMP   ETDB processed IGMP
Nov 25 08:42:22.339   Nov 25 08:42:22.339
Sid      gc_id    Stat Index   DSID       Stat Index Allocated
DEFAULT  N/A      61328        0xCF25B    Nov 25 08:42:22.339
8201     1        61329        0xCF25B    Nov 25 08:42:22.339
Interface  Fwd Intfc   group            source
Bundle1    Wi7/0/0:0   230.1.2.4        N/A
ETDB received IGMP   ETDB processed IGMP
Nov 25 08:42:36.643   Nov 25 08:42:36.643
Sid      gc_id    Stat Index   DSID       Stat Index Allocated
DEFAULT  N/A      61330        0xCF25C    Nov 25 08:42:36.643
8201     1        61331        0xCF25C    Nov 25 08:42:36.643
```

Table below describes the significant fields shown in the show cable multicast db command display.

Table 157: show cable multicast db Field Descriptions

Field	Description
Bundle Interface	Bundle interface number.

Field	Description
CM Mac	MAC address of the CM.
Host Mac	Host MAC address.
Fwd Intfc	Forwarding interface name.
Sub Intfc	Sub-interface name.
Host Intfc	Host interface name.
IGMP/MLD Ver	IPv4 or IPv6 multicast group signaling protocols. IPv4: IGMPv1/v2/v3 IPv6: MLDv1/v2
TimeStamp Delta	Timestamp of the session.
Hosts	Hosts behind the CM.
CPE IP	IP address of the CPE.
Gate-ID	Unique number identifying the local PCMM multicast gate.
SFID	Service flow ID (SFID) for the downstream associated with this PCMM multicast gate.



Note For cBR Series Broadband Converged Routers, multicast ipv6 support will be supported in later releases.

Related Commands

Command	Description
show cable multicast authorization	Displays the list of defined multicast authorization profiles and all cable modems associated with the corresponding profiles.
show cable multicast dsid	Displays the entire multicast downstream service identifier (DSID) database content.
show cable multicast qos	Displays the configuration information of the MQoS (Group-Config, Group-QoS-Config, Group-Encryption-Config).
show packetcable gate multimedia	Displays the information about the total number of PCMM multicast gates.

show cable multicast debug

To display information about debug counters, use the **show cable multicast** debug command in privileged EXEC mode.

show cable multicast debug [**etdb** [*multicast-group-addressmac-address*]]

Syntax Description

etdb	(Optional) Displays information about multicast explicit tracking database debug counters.
multicast-group-address	(Optional) IP address of the multicast group.
mac-address	(Optional) MAC address of the cable modem.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.

Usage Guidelines

The show cable multicast debug command provides information only about the explicit tracking database **counter in Cisco IOS Release 12.2(33)SCE and later. This means that the command output does not include other debug counters such as multicast a**uthorization and multicast quality of service (QoS).

If you want to verify multicast group specific or MAC specific debug counters, you must turn on debugging of multicast counters using the debug cable multicast counter start command before using the **show cable multicast debug** command.

Note The command output will be the same if you run the **show cable multicast debug** command with or without the keyword etdb **in Cisco IOS Release 12.2(33)SCE, because this command does not support any other debug counters in Cisco IOS Release 12.2(33)SCE.**

Examples

The following is a sample output of the **show cable multicast debug** command that displays information about multicast explicit tracking database debug counters on the Cisco uBR10012 router:

```
Router# show cable multicast debug
ETDB
counter                    value
et_ses_update              3
et_ses_delete              0
et_cm_delete               0
et_post_host_add           1
et_post_cm_add             1
et_post_ses_intfc_update   3
et_post_ses_intfc_delete   0
```

```
et_post_cm_delete          0
et_post_host_delete        0
```

The following is a sample output of the **show cable multicast debug** command that displays information about multicast explicit tracking database debug counters based on a particular multicast group:

```
Router# show cable multicast debug etdb 230.1.1.1
ETDB  GROUP:230.1.1.1
counter                    value
et_ses_update              3
et_ses_delete              0
et_post_host_add           1
et_post_cm_add             1
et_post_ses_intfc_update   3
et_post_ses_intfc_delete   0
et_post_cm_delete          0
et_post_host_delete        0
```

The following is a sample output of the **show cable multicast debug** command that displays information about multicast explicit tracking database debug counters based on a particular cable modem:

```
Router# show cable multicast debug etdb 001a.c3ff.d41a
ETDB  CM:001a.c3ff.d41a
counter                    value
et_ses_update              2
et_ses_delete              0
et_cm_delete               0
et_post_host_add           0
et_post_cm_add             0
et_post_ses_intfc_update   2
et_post_cm_delete          0
et_post_host_delete        0
```

Table below describes the major fields shown in the **show depi** command display:

Table 158: show cable multicast debug Field Descriptions

Field	Description
ETDB	Multicast explicit tracking database
counter	Debug counters for the multicast operation.
value	Debug counter values.
ETDB GROUP	Identifies a particular multicast group for explicit tracking database debug counters.
ETDB CM	Identifies a particular cable modem for explicit tracking database debug counters.

Related Commands

Command	Description
debug cable multicast counter clear	Resets debugging of multicast counters.
debug cable multicast counter start	The Cisco CMTS router starts collecting multicast debug counters based on a particular multicast group or a cable modem.

Command	Description
debug cable multicast counter stop	The Cisco CMTS router stops collecting multicast debug counters.

show cable multicast dsid

To display the entire Downstream Service Identifier (DSID) database content, use the **show cable multicast dsid** command in privileged EXEC mode.

Cisco uBR7246VXR and Cisco uBR7225VXR Routers
show cable multicast dsid [*dsidip-address* | [**source-ip**] | **integrated-cable** *slot* / *port* **:** *integrated-channel* {**dynamic** | **static**} | **wideband-cable***slot* / *port* **:** *wideband-channel* {**dynamic** } *ipv6-address*]

Cisco uBR10012 Router
show cable multicast dsid [*dsidip-address* | [**source-ip**] | **integrated-cable** *slot* / *sub-slot* / *port* **:** *integrated-channel* {**dynamic** | **static**} | **wideband-cable***slot* / *bay* / *port* **:** *wideband-channel* {**dynamic** | **static**} *ipv6-address*]

Cisco cBR Series Router
show cable multicast dsid [*dsidip-address* | [**source-ip**] | **integrated-cable** *slot* / *sub-slot* / *port* **:** *integrated-channel* {**dynamic** | **static**} | **wideband-cable***slot* / *bay* / *port* **:** *wideband-channel* **dynamic** *ipv6-address*]

Syntax Description

dsid	Specifies the Downstream Service Identifier.
ip-address	Specifies the IP address of the group.
integrated-cable *slot* / *sub-slot* / *port* **:** *integrated-channel*	Identifies the cable interface on the router for which information should be displayed, where: • *slot*—0 to 8 for uBR series router, 0 to 9 for cBR series router • *sub-slot*—0 or 1 for uBR series router, 0 for cBR series router • *port*—0 to 4 for uBR series router, 0 to 7 for cBR series router • *integrated-channel* —0 to 3 for uBR series router, 0 to 157 for cBR series router
wideband-cable *slot* / *sub-slot* / *port* **:** *wideband-channel*	Identifies the wideband interface on the router for which information should be displayed, where: • *slot*—0 to 8 for uBR series router, 0 to 9 for cBR series router • *sub-slot*—0 or 1 for uBR series router, 0 for cBR series router • *port*—0 to 4 for uBR series router, 0 to 7 for cBR series router • *wideband-channel*—0 to 5 for uBR series router, 0 to 63 for cBR series router
ipv6-address	Specifies the IPv6 address of the group that should be matched using the format X:X:X:X::X.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCC	This command was modified to display all the SIP/SPA indexes assigned for a multicast session.
12.2(33)SCD	This command was modified. Support for Cisco uBR7246VXR and Cisco uBR7225VXR routers were added. Two new keywords, dynamic and static, were added to this command.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **dynamic** keyword in the **wideband-cable** was removed.

Usage Guidelines

Use this command to display the DSID database content and SIP/SPA indexes assigned for a multicast session.

Examples

The following example shows sample output for the **show cable multicast dsid** command:

```
Router# show cable multicast dsid

Multicast Group    : 230.1.2.3

         Source    : *

         IDB       : Bu2         Interface: Mo1/1/0:0   Dsid: 0x1F078

         StatIndex : 2           SAID: DEFAULT

Multicast Group    : 230.1.2.3

         Source    : *

         IDB       : Bu2         Interface: Mo1/1/0:0   Dsid: 0x1F078

         StatIndex : 3           SAID: 8196

Multicast Group    : 230.1.2.3

         Source    : *

         IDB       : Bu2         Interface: Mo1/1/0:0   Dsid: 0x1F078

         StatIndex : 4           SAID: 8197
```

The following example shows a sample output for the **show cable multicast dsid** *ip-address* [*source-ip*] command:

```
Router#  show cable multicast dsid 225.0.0.1


Multicast Group    : 225.0.0.1

         Source    : *

         IDB       : Bu1               Interface: Wi5/0:0     Dsid: 0x5F078

         StatIndex : 7                 SAID     : DEFAULT
```

```
Multicast Group    : 225.0.0.1
         Source    : *
         IDB       : Bu1               Interface: Wi5/0:0     Dsid: 0x5F078
         StatIndex : 8                 SAID     : 8195        GC  : 1
```

The following example shows a sample output for the **show cable multicast dsid wideband-Cable** [**dynamic** | **static**] command for uBR series router:

```
Router# show cable multicast dsid wideband-Cable 5/0:0 dynamic
Multicast Group    : 225.0.0.1
         Source    : *
         IDB       : Bu1               Interface: Wi5/0:0     Dsid: 0x5F078
         StatIndex : 7                 SAID     : DEFAULT
Multicast Group    : 225.0.0.1
         Source    : *
         IDB       : Bu1               Interface: Wi5/0:0     Dsid: 0x5F078
         StatIndex : 8                 SAID     : 8195        GC  : 1
Multicast Group    : 225.0.0.2
         Source    : *
         IDB       : Bu1               Interface: Wi5/0:0     Dsid: 0x5F079
         StatIndex : 9                 SAID     : DEFAULT
Multicast Group    : 225.0.0.2
         Source    : *
         IDB       : Bu1               Interface: Wi5/0:0     Dsid: 0x5F079
         StatIndex : 10                SAID     : 8196        GC  : 1
```

The following example shows a sample output for the **show cable multicast dsid wideband-Cable dynamic** command for cBR series router:

```
Router# show cable multicast dsid wideband-Cable 6/0/0:0 dynamic
show cable multicast dsid wideband-Cable 6/0/0:0 dynamic
Load for five secs: 3%/0%; one minute: 3%; five minutes: 5%
Time source is NTP, 15:19:37.706 CST Fri Apr 24 2015
Multicast Group    : 225.1.1.33
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCE6
```

```
         StatIndex : 245693            SAID     : DEFAULT
Multicast Group    : 225.1.1.33
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCE6
         StatIndex : 245694            SAID     : 9061          GC  : 1
Multicast Group    : 225.1.1.32
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCDE
         StatIndex : 245678            SAID     : DEFAULT
Multicast Group    : 225.1.1.32
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCDE
         StatIndex : 245679            SAID     : 9054          GC  : 1
Multicast Group    : 225.1.1.17
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCE5
         StatIndex : 245691            SAID     : DEFAULT
Multicast Group    : 225.1.1.17
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCE5
         StatIndex : 245692            SAID     : 9060          GC  : 1
Multicast Group    : 225.0.0.1
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCD6
         StatIndex : 245665            SAID     : DEFAULT
Multicast Group    : 225.0.0.1
         Source    : *
         IDB       : Bu10              Interface: Wi6/0/0:0     Dsid: 0x9BCD6
```

The following example shows a sample output for the **show cable multicast dsid integrated-Cable static** command:

```
Router# show cable multicast dsid integrated-Cable 5/0:0 static
```

```
Dsid   Stat Index   Type

0x5F000  65384      IGMPv1/v2

0x5F001  65385      IGMPv3

0x5F002  65386      MLDv1

0x5F003  65387      MLDv2

0x5F004  65388      PreReg
```

Table below describes the significant fields shown in the display.

Table 159: show cable multicast dsid Field Descriptions

Field	Description
Multicast Group	Displays the multicast group.
Source	Displays the source IP address.
IDB	Interface description block number.
Interface	Displays the interface name.
Dsid	The Downstream Service Identifier.
StatIndex	The Blaze indexes assigned for a multicast session.
SAID	Security Association Identifier (SAID).

Related Commands

Command	Description
show cable multicast authorization	Displays the list of defined multicast authorization profiles and all CMs associated with corresponding profiles.
show cable multicast db	Displays the contents of multicast explicit tracking database.
show cable multicast qos	Displays the configuration information for MQoS, (Group-Config, Group-QoS-Config, Group-Encryption-Config).

show cable multicast qos

To display the configuration information for multicast quality of service (MQoS), use the **show cable multicast qos** command in privileged EXEC mode.

show cable multicast qos {**group-config** [*group-config-index*] | **group-encryption** [*group-encryption-index*] | **group-qos** [*group-qos-index*]}

Syntax Description

group-config	Displays multicast group configuration information.
group-config-index	(Optional) Index for the multicast group. The valid range is from 1 to 2048.
group-encryption	Displays multicast group encryption information.
group-encryption-index	(Optional) Index for the multicast group encryption.
group-qos	Displays multicast group QoS information.
group-qos-index	(Optional) Index for the multicast group QoS.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCC	The command output was modified to display the application ID for default multicast group QoS configuration.
12.2(33)SCE	The command output was modified to list the PCMM application for multimedia multicast configuration.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

Example of the **show cable multicast qos** Command Output for Multicast Group Configuration

The following example shows a sample output of the command that displays multicast group configuration information: :

```
Router# show cable multicast qos group-config
Default Multicast Group-Qos Application ID 65535
Multiast Group Config 1 : Priority 1
Group QOS - 1
Group Encryption - 1
Application ID 65534
Session Range - Group Prefix 230.0.0.0 Mask 255.0.0.0 Source Prefix 0.0.0.0 Mask 0.0.0.0
```

Example of the **show cable multicast qos** Command Output for Multicast Group Encryption

The following example shows a sample output of the **show cable multicast qos** command that displays multicast group encryption information:

```
Router# show cable multicast qos group-encryption
Multicast Group Encryption 1 : Algorithm 56bit-des
Multicast Group Encryption 2 : Algorithm 128bit-aes
```

Example of the show cable multicast qos Command Output for Multicast Group QoS

The following example shows a sample output of the **show cable multicast qos command that displays multicast group QoS information in Cisco IOS Release 12.2(33)SCC**:

```
Router# show cable multicast qos group-qos
Group QOS Index  Service Class  Control         Igmp Limit         Override
DEFAULT      MQOS_DEFAULT     Aggregate NO-LIMIT 1 MQOS Aggregate NO-LIMIT
```

The following example shows a sample output of the **show cable multicast qos command that displays multicast group QoS information including the** application (the App field) for multimedia multicast configuration **in Cisco IOS Release 12.2(33)SCE**:

```
Router# show cable multicast qos group-qos
Group QOS Index    Service Class    Control    Igmp Limit    Override  App
 DEFAULT           mcast_default     Aggregate  NO-LIMIT
 1                 SDV_SD            Single      ---          No        CLI
 512               SDV_HD            Single      ---          No        PCMM
```

Table below describes the significant fields shown in the display.

Table 160: show cable multicast qos Field Descriptions

Field	Description
Group	Identifies the multicast group.
QOS	Identifies the QoS profile that is being enforced.
Index	Index number of the QoS group.
Service Class	Identifies the service class being used for the multicast.
Control	Identifies the type of control.
Igmp Limit	Displays the Internet Group Management Protocol (IGMP) session limit for aggregate service flows.
Override	Displays the additional IGMP session admitted and forwarded as best effort traffic.
App	Displays the application used for multimedia multicast.

Related Commands

Command	Description
show cable multicast authorization (for uBR series router)	Displays the list of defined multicast authorization profiles and all CMs associated with corresponding profiles.
show cable multicast db	Displays the contents of multicast explicit tracking database.
show cable multicast dsid	Displays the entire Downstream Service Identifier (DSID) database content.

show cable multicast ses-cache

To display the current multicast replication sessions cache information, use the **show cable multicast ses-cache** command in interface configuration and global configuration mode.

show cable multicast ses-cache interface integrated-cable *slot*/*subslot*/*port*:*rf-channel* [**summary** | **verbose**]
show cable multicast ses-cache interface modular-cable *slot*/ {*subslotbay*}/*port*:*interface-number* [**summary** | **verbose**]
show cable multicast ses-cache interface wideband-cable *slot*/ {*subslotbay*}/*port*:*wideband-channel* [**summary** | **verbose**]
show cable multicast ses-cable global [**summary**]

Syntax Description

interface integrated-cable*slot/subslot/port:rf-channel*	Displays the multicast replication sessions cache information for a integrated-cable interface. • *slot* —Slot where a line card resides. • *subslot* —(Cisco uBR10012 only) Secondary slot number of a line card. • *port*—Downstream port number. • *rf:channel* —RF channel number.
interface integrated-cable*slot/{subslot* | *bay}/port:interface-number*	Displays the multicast replication sessions cache information for a wideband-cable interface. • *slot*—Slot where a SPA interface processor (SIP) or a line card resides. • *subslot*—Secondary slot for a shared port adapter (SPA) or a line card. • *bay*—Bay in a SIP where a SPA is located. • *port*—Downstream port number. • *interface-number*—Modular cable interface number
interface wideband-cable *slot/{subslot* | *bay}/port:wideband-channel*	Displays the multicast replication sessions cache information for a wideband-cable interface. • *slot*—Slot where a SPA interface processor (SIP) or a line card resides. • *subslot*—Secondary slot for a shared port adapter (SPA) or a line card. • *bay*—Bay in a SIP where a SPA is located. • *port*—Downstream port number. • *wideband-channel*—Wideband channel number.
global	Displays the multicast replication sessions cache information at a global level.
summary	Provides summarized information of the multicast replication sessions cache.

verbose	Provides detailed information of the multicast replication session cache.

Command Modes

Global configuration (config)

Interface configuration (config-if)

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable multicast ses-cache interface** and the **show cable multicast ses-cache global** command displays the session cache information when multicast replication session cache is configured on the Cisco uBR10012 router. The **show cable multicast ses-cable global** command displays the cache information for all interfaces at the chassis level. The **show cable multicast ses-cache interface** displays the session cache information for a particular interface.

Table below displays the valid values for an integrated-cable interface.

Table 161: Integrated Cable Interface Density Information

CMTS Router	Line Card	Slot	Subslot	Port	RF Channel Number
Cisco uBR10012	Cisco uBR-MC3GX60V	5 to 8	0 or 1	0 to 4	0 to 3
	Cisco UBR-MC20X20V				
	Cisco uBR10-MC5X20				
Cisco uBR7225VXR	All	1 or 2	—	0 or 1	—
Cisco uBR7246VXR	All	3 to 6	—	0 or 1	—

Table below displays the valid values for a modular cable interface.

Table 162: Modular Cable Interface Density Information

Line Card	Slot	Subslot	Bay	Port	Interface Number
Cisco uBR-MC3GX60V	5 to 8	0 or 1	—	0 to 2	0 to 23
Cisco UBR-MC20X20V			—	0 to 5	
Cisco Wideband SPA	—	0 or 1[22]	0 to 3	0	
Cisco Wideband SIP / Cisco SIP-600	1 or 3	—	—	—	

[22] Applicable to SPAs when the SIP is in Slot1 or Slot 3. The subslot is not specified from Cisco IOS Release 12.2(33)SCB onwards.

Table below displays the valid values for a wideband-cable interface.

Table 163: Wideband Interface Density Information

CMTS Router	Line Card	Slot	Subslot	Bay	Port	Wideband Channel
Cisco uBR10012	Cisco uBR-MC3GX60V	5 to 8	0 or 1	—	0 to 4	0 to 31
	Cisco UBR-MC20X20V			—		0 to 5
	Cisco uBR10-MC5X20			—		—
	Cisco Wideband SPA	—	0 or 1[23]	0 to 3	0	—
	Cisco Wideband SIP / Cisco SIP-600	1 or 3	—	—	—	—
Cisco uBR7225VXR	All	1 to 2	—	—	0 or 1	0 to 5
Cisco uBR7246VXR	All	3 to 6	—	—		

[23] Applicable to SPAs when the SIP is in Slot1 or Slot 3. The subslot is not specified from Cisco IOS Release 12.2(33)SCB onwards.

Examples

The following example displays the multicast replication session cache information at the global level:

```
Router#
show cable multicast ses-cache global

Fwd Intfc          Sub Intfc              Session (S,G)
Wi7/1/0:0          Bundle1                (30.30.30.30,227.0.0.20)
                   Bundle1                (30.30.30.30,227.0.0.22)
Wi7/1/0:1          Bundle1                (30.30.30.30,226.0.0.20)
                   Bundle1                (30.30.30.30,226.0.0.22)
                   Bundle1                (30.30.30.30,226.0.0.23)
                   Bundle1                (30.30.30.30,226.0.0.21)
Mo6/0/1:0          Bundle1                (*, 230.0.8.138)
In8/1/0:1          Bundle1                (*, 226.0.0.18)
```

The following example displays the multicast replication session cache at the wideband-cable interface:

```
Router# show cable multicast ses-cache interface wi7/1/0:1
Fwd Intfc           Sub Intfc              Session (S,G)
Wi7/1/0:1          Bundle1                (30.30.30.30,226.0.0.20)
                   Bundle1                (30.30.30.30,226.0.0.22)
                   Bundle1                (30.30.30.30,226.0.0.23)
                   Bundle1                (30.30.30.30,226.0.0.21)
```

Table below describes the significant fields shown in the display.

Table 164: show cable multicast ses-cache Field Descriptions

Field	Description
Fwd Intc	Layer 2 forwarding interface such as interface cable, integrated-cable and wideband-cable interface.
Sub Intfc	Sub interface.
Session (S,G)	Secondary multicast group.

The following example shows a summarized view of the multicast replication session cache information at the chassis level:

```
Router# show cable multicast ses-cache global summary
Global Cache Config: 20
---------------------------------------------------------------------
Fwd             Cache      Cache     Cache      Cache
Intfc           Config     Used      Missed     Hitted
Wi7/1/0:1        10          4          4          12
Mo6/0/1:0        12          3          3          15
In8/1/0:1        100         1          1           0
---------------------------------------------------------------------
Total
```

The following example is a summary of the multicast replication session cache at the wideband interface:

```
Router# show cable multicast ses-cache interface wi7/1/0:1 summary
Global Cache Config: 20
-------------------------------------------------
Fwd             Cache       Cache    Cache      Cache
Intfc             Config      Used     Missed    Hitted
Wi7/1/0:1    10              4          4              12
```

Table below describes the significant fields shown in the display.

Table 165: show cable multicast ses-cache summary Field Descriptions

Field	Description
Fwd Intfc	Layer 2 forwarding interface.
Cache Config	Multicast session cache value.
Cache Used	No. of sessions used from cache.
Cache Missed	No. of IGMP join sessions that were missed.
Cache Hitted	No. of times the IGMP join session was matched with the reused cache sessions.

The following example displays verbose information of the multicast replication session cache at the wideband interface:

```
Router# show cable multicast ses-cache wi8/0/0:0 verbose
Multicast Group    : 232.10.0.8
         Source    : 100.0.0.2
```

```
         Act GCRs  : 1
         Interface : Bu255                State: A      GI: Bu255       RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                           10   8858    24      0     1      0
Multicast Group    : 232.10.0.16
         Source    : 100.0.0.2
         Act GCRs  : 1
         Interface : Bu255                State: A      GI: Bu255       RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                           10   8859    25      0     1      0
Total session cache num: 2
```

Table below describes the significant fields shown in the display.

Table 166: show cable multicast ses-cache verbose Field Descriptions

Field	Description
Multicast Group	IP address of the multicast group
Source	IP address of the source.
Act GCRs	Active group classifier rules on the multicast QoS.
Interface	Forwarding interface.
GCR	Group classifier rules.

Related Commands

Command	Description
cable multicast ses-cache	Enables multicast replication session on the forwarding interface on the Cisco uBR10012 router.
clear cable multicast ses-cache	Clears the multicast replication session cache on the interfaces on the Cisco uBR10012 router.

show cable multicast statistics

To display the multicast statistics details, use the **show cable multicast statistics** command in privileged EXEC mode.

show cable multicast statistics {*index* | **failure** | **pool** [*pool-id*] [**verbose**]}

Syntax Description

index	Statistics index value of the configured multicast. The valid range is from 61320 to 64815.
failure	Displays the multicast statistics failure information.
pool	Displays the multicast statistics pool information.
pool-id	Multicast statistics pool ID. The valid range is from 0 to 15.
verbose	Displays the detailed multicast statistics pool information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
12.2(33)SCI	This command was modified. The output of the command with the **pool** keyword was modified to display the downstream service identifier (DSID) allocation information.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **Pool_Start** and **Pool_End** columns in the output were removed.

Usage Guidelines

The **show cable multicast statistics failure** command displays information about admission control failure, PXF (uBR series router) or DP (cBR series router) queue failure, IGMP report drop, and DBC failure counters.

Examples

The following is a sample output from the **show cable multicast statistics failure** command in uBR series router:

```
Router# show cable multicast statistics failure

counter                   value
Admission Control Failure  0
PXF Queue Failure          0
IGMP Report Drop           0
DBC Failure                0

Driver IGMP Dropped:
 Fragmented                0
 Record Size Incorrect     0
 IP Sanity Error           0
 IGMP Sanity Error         0
 IGMP CRC Error            0
```

The following is a sample output from the **show cable multicast statistics failure** command in cBR series router:

```
Router# show cable multicast statistics failure

counter                    value
Admission Control Failure  0
DP Queue Failure          0
IGMP Report Drop           0
DBC Failure                0

Driver IGMP Dropped:
 Fragmented                0
 Record Size Incorrect     0
 IP Sanity Error           0
 IGMP Sanity Error         0
 IGMP CRC Error            0
```

The following is a sample output from the **show cable multicast statistics pool** command in uBR series router:

```
Router# show cable multicast statistics pool

Pool   Total   Allocated   Pool_Start   Pool_End
9      3496    24          24           0
```

The following is a sample output from the **show cable multicast statistics pool** command in cBR series router:

```
Router# show cable multicast statistics pool

Pool   Total   Allocated
9      3496    24
```

The following is a sample output from the **show cable multicast statistics pool** command for the pool ID 9 in uBR series router:

```
Router# show cable multicast statistics pool 9

Pool   Total   Allocated   Pool_Start   Pool_End
9      3496    24          24           0

Stat Index List:
        61320 61321 61322 61323 61324 61325 61326 61327 61328 61329 61330 61331
        61332 61333 61334 61335 61336 61337 61338 61339 61340 61341 61342 61343
```

The following is a sample output from the **show cable multicast statistics pool** command for the pool ID 9 in cBR series router:

```
Router# show cable multicast statistics pool 9

Pool   Total   Allocated
6      18256   1136

Stat Index List:
243888 243890 243892 243894 243895 243896 243898 243899 243900 243902 243904 243906
243907 243908 243910 243911 243912 243914 243916 243918 243919 243920 243922 243923
```

The table below describes the significant fields shown in the display:

Table 167: show cable multicast statistics pool Field Descriptions

Field	Description
Pool	Multicast statistics pool ID.
Total	Total number of statistics index.
Allocated	Number of allocated statistics index.
Pool_Start	For uBR series router, pointer to the position of the first available statistics index.
Pool_End	For uBR series router, pointer to the position of the last available statistics index.
Stat Index List	List of the allocated statistics index in the pool.

The following is a sample output from the **show cable mulitcast statistics** command with and index value of 61328:

```
Router# show cable multicast statistics 61328

Stat Index Pool id: 9

Multicast Group   : 232.1.1.1
         Source   : N/A
         Interface: Mo5/1/0:8   StatIndex : 61328
         SAID     : 8203             SFID : 59      NB/WB index :  15/0
```

The following is a sample output from the **show cable multicast statistics pool verbose** command:

```
Router# show cable multicast statistics pool verbose

Stat Index Pool id: 9

Multicast Group   : 232.1.1.1
         Source   : N/A
         Interface: Mo5/1/0:0   StatIndex : 61320
         SAID     : 8195             SFID : 51      NB/WB index :  15/0
Multicast Group   : 232.1.1.1
         Source   : N/A
         Interface: Mo5/1/0:1   StatIndex : 61321
         SAID     : 8196             SFID : 52      NB/WB index :  15/0
Multicast Group   : 232.1.1.1
         Source   : N/A
         Interface: Mo5/1/0:2   StatIndex : 61322
         SAID     : 8197             SFID : 53      NB/WB index :  15/0
Multicast Group   : 232.1.1.1
         Source   : N/A
         Interface: Mo5/1/0:3   StatIndex : 61323
         SAID     : 8198             SFID : 54      NB/WB index :  15/0
Multicast Group   : 232.1.1.1
         Source   : N/A
         Interface: Mo5/1/0:4   StatIndex : 61324
         SAID     : 8199             SFID : 55      NB/WB index :  15/0
!
```

The table below describes the significant fields shown in the display:

Table 168: show cable multicast statistics and show cable multicast statistics pool verbose Field Descriptions

Field	Description
Stat Index Pool id	Statistics index pool ID.
Multicast Group	Multicast group address.
Source	Multicast source address.
Interface	Interface number.
StatIndex	Statistics index value.
SAID	Security association identifier (SAID).
SFID	Service flow identifier (SFID).
NB/WB index	Narrowband and wideband index numbers.

The following is a sample output from the **show cable multicast statistics pool** command in Cisco IOS Release 12.2(33)SCI:

```
Router# show cable multicast statistics pool

Min Static Index: 59424, Max: 62079
Pool   Total   Allocated
15     2656    1


DSID Table:
Min DSID: 62160, Max DSID: 65535.
Pool   Total   Allocated
0      3376    0
1      3376    0
2      3376    0
3      3376    0
4      3376    0
5      3376    0
6      3376    0
7      3376    0
8      3376    0
9      3376    0
10     3376    0
11     3376    0
12     3376    0
13     3376    0
14     3376    0
15     3376    1
```

The table below describes the significant fields shown in the display:

Table 169: show cable multicast statistics pool Field Descriptions

Field	Description
Pool	Multicast statistics pool ID.
Total	Total number of statistics index.

Field	Description
Allocated	Number of the allocated statistics index.
Min DSID	Minimum value of the DSID.
Max DSID	Maximum value of the DSID.

Related Commands

Command	Description
show cable multicast db	Displays the contents of the multicast explicit tracking database.
clear cable multicast statistics counter	Clears all multicast statistics counters.

show cable noise

To display cable noise statistics on a Cisco CMTS, use the **show cable noise** command in EXEC mode.

show cable {*slot* /*port* | *slot* /*subslot* /*port* } **noise**

Syntax Description

slot /*port*	Identifies the cable interface and downstream port on the Cisco uBR7100 series and Cisco uBR7200 series routers. On the Cisco uBR7100 series router, the only valid value is **1/0**. On the Cisco uBR7200 series router, *slot* can range from 3 to 6, and *port* can be 0 or 1, depending on the cable interface.
slot /*subslot* /*port*	Identifies the cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* = 5 to 8 • *subslot* = 0 or 1 • *port* = 0 to 4 (depending on the cable interface)

Command Modes

EXEC

Command History

Release	Modification
12.0(4)XI	This command was introduced.
12.1(3a)EC1	This command was removed from the 12.1 EC release.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is not supported on Cisco IOS Release 12.1(3a)EC1 or later releases.

Examples

The following example shows how to display CM noise statistics:

```
Router# show cable 6/0 noise
```

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show cable modem	Displays CM configuration settings.

show cable ofdm-chan-profiles

To verify the OFDM channel profile configuration, use the **show cable ofdm-chan-profile** command in privileged EXEC mode.

show cable ofdm-chan-profile {*id* | **channels** | **configuration**}

Syntax Description

id	Display an individual OFDM channel profile's configuration and assigned channels.
channels	Display the assigned channels for all configured OFDM channel profiles.
configuration	Display the configuration for all OFDM channel profiles.

Command Modes

Privileged EXEC

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.1SP	This command was modified on the Cisco cBR Series Converged Broadband Routers. **guardband override** was added in the command output.

Examples

The following example displays an individual OFDM channel profile's configuration and assigned channels:

```
Router# show cable ofdm-chan-profile 21
 **** OFDM Channel Profile Configuration ****

Prof  Cycl  Roll  Guardband  FFT  Intr   Pilot  Modulation (D-Default, P-Profile)

ID    Prfx  Off   Override   KHz  Depth  Scale  Cntrl   NCP     Data Profiles (count = 0)
                                                             1       2       3       4
      5
21    1024  128   2400000    50   16     48     D:1024  D:16    NA      NA      NA      NA
      NA

**** OFDM Channel Profile Assigned Channels ****

Prof  Admin  Controller:channels
ID
21    Up     6/0/4:158
```

The following example displays the configuration for all OFDM channel profiles:

```
Router# show cable ofdm-chan-profile configuration

**** OFDM Channel Profile Configuration ****

Prof  Cycl  Roll  Guardband  FFT  Intr   Pilot  Modulation (D-Default, P-Profile)

ID    Prfx  Off   Override   KHz  Depth  Scale  Cntrl   NCP     Data Profiles
```

```
              (Limited to 20)
                                                                                  1       2       3       4
      5
0     1024  128   NA          50   16     48     D:256   D:16    D:1024  NA      NA      NA
      NA
1     1024  128   NA          50   16     48     D:256   D:16    D:2048  D:1024  NA      NA
      NA
2     1024  128   NA          50   16     48     D:256   D:16    D:4096  D:2048  D:1024  NA
      NA
3     1024  128   NA          50   16     48     D:256   D:16    P:0     D:4096  D:2048
D:1024  NA
4     1024  128   NA          50   16     48     D:256   D:16    D:512   P:0     D:4096
D:2048  D:1024
5     1024  128   NA          25   16     48     D:256   D:16    D:1024  NA      NA      NA
      NA
6     1024  128   NA          25   16     48     D:256   D:16    D:2048  D:1024  NA      NA
      NA
7     1024  128   NA          25   16     48     D:256   D:16    D:4096  D:2048  D:1024  NA
      NA
8     1024  128   NA          25   16     48     D:256   D:16    P:1     D:4096  D:2048
D:1024  NA
9     1024  128   NA          25   16     48     D:256   D:16    D:512   P:1     D:4096
D:2048  D:1024
20    1024  128   NA          50   16     48     D:1024  D:16    NA      NA      NA      NA
      NA
21    1024  128   1000000     50   16     48     D:1024  D:16    NA      NA      NA      NA
      NA
```

The following example displays the assigned channels for all configured OFDM channel profiles:

```
Router# show cable ofdm-modulation-profile channels

**** OFDM Channel Profile Assigned Channels ****

Prof  Admin  Controller:channels
ID
20    Up     3/0/4:158-159,161-162  7/0/0:158,161-162      7/0/1:159              7/0/2:160

             7/0/4:162              7/0/5:158              7/0/6:159              7/0/7:160

      Down   7/0/3:161
35    Down   7/0/0:160
255   Up     3/0/4:160              3/0/5:158-160,162      3/0/6:159-161          3/0/7:158

             7/0/0:159               7/0/7:159
      Down   3/0/5:161              3/0/6:158              3/0/7:161-162          7/0/5:162

             7/0/6:160               7/0/7:158
```

Related Commands

Command	Description
cable downstream ofdm-chan-profile	Define the OFDM channel profile on the OFDM channel.

show cable ofdm-modulation-profiles

To verify the OFDM modulation profile configuration, use the **show cable ofdm-modulation-profile** command in privileged EXEC mode.

show cable ofdm-modulation-profile {*id* | **channel-profiles** | **configuration**}

Syntax Description

id	Display an individual OFDM modulation profile's configuration and channel profiles that include this modulation profile.
channel-profiles	Display the OFDM channel profiles that include this modulation profile.
configuration	Display the configuration for all OFDM modulation profiles.

Command Modes

Privileged EXEC

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example displays an individual OFDM modulation profile's configuration and channel profiles that include this specific modulation profile:

```
Router# show cable ofdm-modulation-profile 8

**** OFDM Modulation Profile Configuration ****

Description: Mixed-mod ex14

Prof  FFT  Width     Start-freq Modulations
ID    KHz  Hz        Hz
9     50   96000000  627000000  1024 default
                                512  freq-abs  659050000
                                     width      12000000
                                2048 freq-abs  627000000
                                     width       6000000

Profile Subcarrier Modulations
  Modulation: Start-freq-abs[start-sc] - End-freq-abs[end-sc] Width-freq[num-sc]
  1024: 572600000[   0] -  626950000[1087]    54400000[1088]
  2048: 627000000[1088] -  632950000[1207]     6000000[ 120]
  1024: 633000000[1208] -  659000000[1728]    26050000[ 521]
  512 : 659050000[1729] -  671000000[1968]    12000000[ 240]
  1024: 671050000[1969] -  722950000[3007]    51950000[1039]
  1024: 723000000[3008] -  777350000[4095]    54400000[1088]

**** OFDM Modulation Profile Assigned Channel Profiles ****

Prof  Channel
ID    Profiles
9     25, 100-102, 255
```

The following example displays the configuration for all OFDM modulation profiles:

```
Router# show cable ofdm-modulation-profile configuration

**** OFDM Modulation Profile Configuration ****

Prof  FFT  Width     Start-freq Modulations              Description
ID    KHz  Hz        Hz                                  (Limited to 20)
8     50   192000000 NA         2048 default
                                 512  freq-off   48000000
                                      width      24000000
9     50   96000000  627000000  1024 default             Mixed-mod ex14
                                 512  freq-abs  659050000
                                      width      12000000
                                 2048 freq-abs  627000000
                                      width       6000000
```

The following example displays the OFDM channel profiles that include this specific modulation profile:

```
Router# show cable ofdm-modulation-profile channel-profiles

**** OFDM Modulation Profile Assigned Channel Profiles ****

Prof  Channel
ID    Profiles
8     20, 22
9     25, 100-102, 255
```

Related Commands

Command	Description
cable downstream ofdm-modulation-profile	Define the OFDM modulation profile on the OFDM channel.

show cable privacy

To display Baseline Privacy Interface Plus (BPI+) certificate information and the security or privacy information for the Cisco CMTS router, use the **show cable privacy** command in privileged EXEC mode.

Cisco uBR Series Router

show cable privacy {**eae-exclude** | **hotlist cm** | **manufacturer-cert-list** | **root-cert-list**}

Cisco cBR Series Router

show cable privacy {**eae-exclude** | **hotlist** {**cm** | **host**} | **manufacturer-cert-list** | **root-cert-list**}

Syntax Description

eae-exclude	Displays the early authentication and encryption (EAE) details.
hotlist cm	Displays a list of cable modems detected as clones.
host	Block a CPE.
manufacturer-cert-list	Displays the BPI manufacturer certificate verification list.
root-cert-list	Displays the BPI root certificate verification list.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced in a different form and its functions moved to the show interface cable privacy command.
12.2(4)BC1	This command was introduced in its current form.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	This command was modified. The eae-exclude keyword was added.
12.2(33)SCE	This command was modified. The hotlist keyword was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **host** keyword was added.

Usage Guidelines

The **show cable privacy** command is available only in IOS images that support BPI and BPI+ encryption.

Examples

The following is a sample output of the show cable privacy command with the **eae-exclude** keyword that lists the cable modems excluded from the early authentication and encryption process:

```
Router#
 show cable privacy eae-exclude

EAE Exclusion List:
```

```
  MAC: 1111.1111.1111 Mask: ffff.ffff.ffff
  MAC: 2222.2222.2222 Mask: ffff.ffff.ffff
```

The following is a sample output of the show cable privacy command with the **hotlist** keyword that lists the permanent and temporary hotlist entries:

```
Router#
 show cable privacy hotlist
 cm
MAC Address            Last Ranged           Type             Interface
0025.2eaf.6f16         Dec 13 21:03:56       Permanent        C8/1/0
0025.2eaf.6f26         Dec 13 21:03:56       Temporary        C5/1/0
```

Table below describes the significant fields shown in the **show cable privacy command** display:

Table 170: show cable privacy Command Field Description

Field	Description
MAC Address	MAC address of the cable modem that is on the hotlist.
Last Ranged On	Displays the time stamp when the cable modem last attempted registration on that interface. This value helps gauge the frequency with which the MAC address is attempting to be cloned, and manage the hotlist accordingly.
Type	• Permanent—The cable modem entry can be configured as a permanent clone from the CLI by executing the **cable privacy hotlist cable modem** command. A cable modem marked as a permanent clone can only be removed from the hotlist by executing the **no** form of the **cable privacy hotlist cable modem** command. • Temporary—The Cisco CMTS detects a duplicate cable modem MAC address. This duplicate MAC address is flagged as a clone and is prevented from coming online for 180 seconds.

Related Commands

Command	Description
cable privacy add-certificate (for uBR series router)	Configures certificates for BPI+ encryption.
cable privacy	Enables and configures BPI+ encryption on a cable interface.
show cable modem	Displays cable modem configuration settings.
show interface cable privacy	Displays baseline privacy information.

show cable profile

To display configuration of profile in service group based configuration, use the **show cableprofile** command in the Privileged EXEC mode.

show cable profile [**downstream** | **mac-domain** | **service-group** | **wideband**] *profile-name*

Syntax Description

downstream	Shows OPS downstream profile.
mac-domain	Shows OPS mac-domain profile.
service-group	Shows OPS service-group profile.
wideband	Shows OPS wideband profile.
profile name	Name of the desired profile.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 3.17.0S	This command was introduced.

Usage Guidelines

This command is used to display the configuration of profile in service group.

```
Router#show cable profile downstream
Load for five secs: 2%/1%; one minute: 2%; five minutes: 2%
Time source is NTP, 14:15:33.701 CST Tue Oct 27 2015
cable profile downstream DS
cable rf-bandwidth-percent 10

Router#show cable profil mac-domain
Load for five secs: 1%/0%; one minute: 2%; five minutes: 2%
Time source is NTP, 14:34:14.121 CST Tue Oct 27 2015
cable profile mac-domain MD
 cable privacy mandatory

Router#show cable profile service-group
Load for five secs: 1%/0%; one minute: 2%; five minutes: 2%
Time source is NTP, 14:37:28.081 CST Tue Oct 27 2015
cable profile service-group test
 cable bundle 1
 mac-domain 0 profile MD
  downstream sg-channel 0-3 profile DS
  upstream 0 sg-channel 0
  upstream 1 sg-channel 1
  upstream 2 sg-channel 2
  upstream 3 sg-channel 3
  us-bonding-group 1
   upstream 0
   upstream 1
   upstream 2
   upstream 3
```

```
 wideband-interface 0 profile WB
  downstream sg-channel 0-3 rf-bandwidth-percent 10

Router#show cable profile wideband
Load for five secs: 3%/0%; one minute: 2%; five minutes: 2%
Time source is NTP, 14:37:49.195 CST Tue Oct 27 2015
cable profile wideband-interface WB
```

show cable qam-profile

To display information about the QAM profile, use the **show cable qam-profile** command in privileged EXEC mode.

show cable qam-profile *qam-profile-id*

Syntax Description

qam-profile-id	Specifies a qam-profile ID. Valid values range from 0 to 31.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable qam-profile** command to display information about a qam-profile. If you specify the *qam-profile-id*, the command displays the QAM profile with the specified ID.

Examples

The following is a sample output of the **show cable qam-profile** command:

```
Router# show cable qam-profile
QAM Profile ID 0: default-annex-b-64-qam
        annex: B
        modulation: 64
        interleaver-depth: I32-J4
        symbol rate: 5057 kilo-symbol/second
        spectrum-inversion: off

QAM Profile ID 1: default-annex-b-256-qam
        annex: B
        modulation: 256
        interleaver-depth: I32-J4
        symbol rate: 5361 kilo-symbol/second
        spectrum-inversion: off

QAM Profile ID 2: default-annex-a-64-qam
        annex: A
        modulation: 64
        interleaver-depth: I12-J17
        symbol rate: 6952 kilo-symbol/second
        spectrum-inversion: off

QAM Profile ID 3: default-annex-a-256-qam
        annex: A
```

The following is a sample output of the **show cable qam-profile** *qam-profile-id* command:

```
Router# show cable qam-profile 1
QAM Profile ID 1: default-annex-b-256-qam
        annex: B
        modulation: 256
```

```
interleaver-depth: I32-J4
symbol rate: 5361 kilo-symbol/second
spectrum-inversion: off
```

This table describes the fields shown in the **show cable qam-profile** command display.

Table 171: show cable qam-profile Field Descriptions

Field	Description
annex	Displays the annex (MPEG framing format) configured in the QAM profile.
modulation	Displays the QAM modulation format configured in the QAM profile.
interleaver-depth	Displays the interleaver-depth configured in the QAM profile.
symbol rate	Displays the symbol rate configured in the QAM profile.
spectrum-inversion	Displays the spectrum-inversion status configured in the QAM profile.

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.

show cable qos enforce-rule

To display the quality of service (QoS) enforce-rules that are currently defined, use the **show cable qos enforce-rule** command in privileged EXEC mode.

show cable qos enforce-rule [*name*] [**verbose**]

Syntax Description

name	(Optional) Specifies the name of a particular enforce-rule to be displayed.
verbose	(Optional) Displays detailed information about the QoS enforce-rule options that are currently defined.

Command Default

All enforce-rules are displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.
12.3(9a)BC	This command was integrated into Cisco IOS Release 12.3(9a)BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.3(23)BC2	The following new output fields were added for the **verbose** form of the command: Penalty End-time, Weekend First Peak Time, Weekend First Duration, Weekend First Average-rate, Weekend Second Peak Time, Weekend Second Duration, Weekend Second Average rate, Weekend Offpeak Duration, Weekend Offpeak Average-rate, and Weekend Auto-enforce.
12.2(33)SCB	The new output fields for the **verbose** form of the command were integrated into Cisco IOS Release 12.2(33)SCB.
12.3(23)SCD2	The following new output fields were added for the **verbose** form of the command: Monitoring after RelTime, Penalty-Period for week-days, Penalty-Period for week-ends. The following output fields were modified for the verbose form of the command: Penalty End-time, First Peak Time, Second Peak Time, Weekend First Peak Time, Weekend Second Peak Time. The output field Penalty End-time was renamed as Default Penalty Duration.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows typical output for the default version of the **show cable qos enforce-rule** command:

```
Router# show cable qos enforce-rule
```

```
           Name               Dur   Dir byte-cnt Auto rate  penalty Reg Enf Ena Persist
                             (min)      (kbytes) enf  (min) (min)   QoS QoS
 residential                  10    us  5        act  1     10080   5   10  Yes Yes
 ef-q11d                      30    ds  150      act  1     20      11  99  Yes Yes
 ef-q11u                      30    us  60       act  1     20      11  99  Yes Yes
 ef-q21                       720   us  60       act  1     10      21  81  Yes Yes
 ef-q21d                      300   ds  150      act  1     10      21  81  Yes Yes
 ef-q22                       720   us  60       act  1     10      22  82  Yes Yes
 ef-q22d                      300   ds  150      act  1     10      22  82  Yes No
 ef-q23                       720   us  60       act  1     10      23  83  Yes Yes
 ef-q23d                      300   ds  150      act  1     10      23  83  Yes Yes
 ef-q24                       720   us  60       act  1     10      24  84  Yes Yes
 ef-q24d                      300   ds  150      act  1     10      24  84  Yes Yes
 ef-q25                       720   us  60       act  1     10      25  85  Yes Yes
 ef-q25d                      300   ds  150      act  1     10      25  85  Yes Yes
 ef-q26                       720   us  60       act  1     10      26  86  Yes Yes
 ef-q26d                      300   ds  150      act  1     10      26  86  Yes Yes
 ef-q27                       720   us  60       act  1     10      27  87  Yes Yes
 ef-q27d                      300   ds  150      act  1     10      27  87  Yes Yes
 ef-q28                       720   us  60       act  1     10      28  88  Yes Yes
 ef-q28d                      300   ds  150      act  1     10      28  88  Yes No
 ef-q5d                       300   ds  150      act  1     10      5   99  Yes Yes
 ef-q5u                       720   us  600      act  1     10      5   99  Yes Yes
```

The following example shows sample output from the **show cable qos enforce-rule** command for a particular enforce-rule named “residential”:

```
Router# show cable qos enforce-rule residential
           Name               Dur   Dir byte-cnt Auto rate  penalty Reg Enf Ena Persist
                             (min)      (kbytes) enf  (min) (min)   QoS QoS
 residential                  10    us  5        act  1     10080   5   10  Yes Yes
```

Table below describes the significant fields displayed by the **show cable qos enforce-rule** command.

Table 172: show cable qos enforce-rule Field Descriptions

Field	Description
Name	Name of the enforce-rule.
Dur (min)	The monitoring duration period, in minutes.
Dir	Direction in which the byte-count is applied: • DS—Downstream direction • US—Upstream direction
byte-cnt (kbytes)	Maximum number of bytes, in kilobytes, that subscribers using this enforce-rule can transmit during the monitoring-duration window before being considered to be overconsuming.
Auto enf	Displays whether the enforce-rule QoS profile is automatically activated when a subscriber exceeds their allowed bandwidth.
rate (min)	Size of the sample-rate interval, in minutes.
penalty (min)	Size of the penalty period, in minutes.
Reg QoS	Profile ID for the registered QoS profile or the name of the service class.

Field	Description
Enf QoS	Profile ID for the enforced QoS profile or the name of the service class.
Ena	Displays whether this enforce-rule is currently enabled and active.
Persist	Displays whether this enforce-rule keeps the enforced QoS profile in force across cable modem reboots: • Yes—Enforced QoS profiles remain in effect across cable modem reboots. • No—Enforced QoS profiles do not remain in effect when a cable modem reboots. See the **no-persistence** option for the **qos-profile enforced** command.

The following example shows the sample output from the **show cable qos enforce-rule verbose** form of the command with the new output fields beginning in Cisco IOS Release 12.3(23)BC2:

```
Name                          : test
Version                       : docsis10
Monitoring Type               : peak-offpeak
Registered                    : 255
Enforced                      : 4
Monitoring Duration           : 120 (in minutes)
Sample-rate                   : 10 (in minutes)
Average-rate                  : 1 kbits/sec
Direction                     : upstream
Penalty Time                  : 10080 (in minutes)
Penalty End-time              : 23 (time of day in hrs)
Rule Enabled                  : Yes
Persistence                   : Yes
Week-end                      : Yes
First Peak Time               : 6
Duration                      : 180 (in minutes)
First Average-rate            : 2 kbits/sec
Second Peak Time              : 18
Duration                      : 240 (in minutes)
Second Averate-rate           : 3 kbits/sec
Offpeak Duration              : 120 (in minutes)
Offpeak Average-rate          : 1 kbits/sec
Auto-enforce                  : active
Weekend First Peak Time       : 8
Weekend First Duration        : 120 (in minutes)
Weekend First Average-rate    : 2 kbits/sec
Weekend Second Peak Time      : 18
Weekend Second Duration       : 180 (in minutes)
Weekend Second Average-rate   : 5 kbits/sec
Weekend Offpeak Duration      : 240 (in minutes)
Weekend Offpeak Average-rate  : 4 kbits/sec
Weekend Auto-enforce          : active
```

The following example shows the sample output from the **show cable qos enforce-rule verbose** form of the command with the new output fields in Cisco IOS Release 12.3(33)SCD2:

```
Router# show cable qos enforce-rule test verbose
Name                          : test
Version                       : docsis11
Monitoring Type               : peak-offpeak
Registered                    : REG-DS
Enforced                      : ENF-DS
Monitoring Duration           : 70 (in minutes)
Sample-rate                   : 10 (in minutes)
```

```
Average-rate                 : 3 kbits/sec
Direction                    : downstream
Auto Enforce                 : Yes
Current Penalty Duration     : 10 (in minutes)
Default Penalty Duration     : 10 (in minutes)
Penalty End-time             : 23:0 (time of day)
Rule Enabled                 : Yes
Persistence                  : Yes
Weekend                      : No
Penalty Off                  : No
Monitor Weekend              : Yes
Monitoring after RelTime     : Off
First Peak Time              : 10:0
Duration                     : 60 (in minutes)
First Average-rate           : 1 kbits/sec
Second Peak Time             : 19:0
Duration                     : 65 (in minutes)
Second Average-rate          : 2 kbits/sec
Offpeak Duration             : 70 (in minutes)
Offpeak Average-rate         : 3 kbits/sec
Auto Enforce                 : Yes
Sample Rate                  : 10
Penalty-Period for week-days : 0
Weekend First Peak Time      : 11:0
Weekend Duration             : 75 (in minutes)
Weekend First Average-rate   : 4 kbits/sec
Weekend Second Peak Time     : 20:0
Weekend Duration             : 80 (in minutes)
Weekend Second Average-rate  : 5 kbits/sec
Weekend Offpeak Duration     : 85 (in minutes)
Weekend Offpeak Average-rate : 6 kbits/sec
Weekend Auto Enforce         : Yes
Weekend Sample Rate          : 12
Penalty-Period for week-ends : 0
```

Related Commands

Command	Description
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS router.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers that violate their registered QoS profiles.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles. This command is applicable for only DOCSIS 1.0 cable modems.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule. This command is applicable for only DOCSIS 1.0 cable modems.
service-class (enforce-rule)	Specifies a service class (enforced or registered) that should be used for the cable modem monitoring in an enforce-rule. This command is applicable for DOCSIS 1.1 or later cable modems.

Command	Description
show cable subscriber-usage	Displays subscribers who are violating their registered QoS profiles.

show cable qos permission

To display the status of permissions for changing quality-of-service (QoS) tables on a Cisco CMTS, use the **show cable qos permission** command in privileged EXEC mode.

show cable qos permission

Syntax Description

This command has no keywords or arguments.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1 T	This command was introduced.
12.1(4)CX	This command was deprecated for DOCSIS 1.1 use, because DOCSIS 1.1 replaces the QoS profile model with a service flow model. The **show interface cable qos paramset** command is used for DOCSIS 1.1 operation.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example displays the output of the **show cable qos permission** command:

```
CMTS01# show cable qos permission

Create by mgmt  Update by mgmt  Create by modems
no              no              yes
```

Table below describes the fields displayed by the **show cable qos permission** command.

Table 173: show cable qos permission Command Field Descriptions

Field	Description
Create by mgmt	Indicates permission setting for creation of QoS table entries by the Simple Network Management Protocol (SNMP).
Update by mgmt	Indicates permission setting for creation of QoS table entries by modem registration requests.
Create by modems	Indicates permission setting for dynamic updating of QoS table entries by the SNMP.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable qos permission	Specifies permission for updating the cable router QoS table.
cable qos profile	Configures a QoS profiles.
cable service-flow inactivity-timeout	Sets the amount of time a dynamic service-flow can be present in the system without any activity.
show controllers cable	Displays cable router QoS profiles.
show interface cable qos paramset	Displays the DOCSIS 1.1 QoS parameter sets.

show cable qos profile

To display quality-of-service (QoS) profiles for a Cisco CMTS, use the **show cable qos profile** command in privileged EXEC mode.

show cable qos profile *profile-index* [**verbose**]

Syntax Description

profile-index	Displays cable QoS table. Valid range is 1 to 255.
verbose	Displays detailed information about the QoS profiles.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3NA	This command was introduced.
12.0(3)T	The command was included in the mainline release.
12.0(7)XR	The verbose option was added.
12.1(1)T	The IP precedence rate enabling bits were added to the display.
12.1(4)CX	This command was deprecated for DOCSIS 1.1 use, because DOCSIS 1.1 replaces the QoS profile model with a service flow model. The **show interface cable qos paramset** command is used for DOCSIS 1.1 operation.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to display the existing QoS profiles on the CMTS:

```
Router# show cable qos profile

ID  Prio Max       Guarantee Max        Max   TOS  TOS   Create  B     IP prec.
         upstream  upstream  downstream tx    mask value by      priv  rate
         bandwidth bandwidth bandwidth  burst                     enab  enab
1   0    0         0         0          0     0x0  0x0   cmts(r) no    no
2   0    64000     0         1000000    0     0x0  0x0   cmts(r) no    no
3   7    31200     31200     0          0     0x0  0x0   cmts    yes   no
4   7    87200     87200     0          0     0x0  0x0   cmts    yes   no
5   2    256000    0         128000     1503  0x0  0x0   cm      no    no
```

Profiles 1 and 2 are always created by the CMTS at initial startup. The CMTS dynamically creates profiles 3 and 4, as shown above, to support Voice over IP (VoIP) codecs G.711 and G.729 when a CM configures phone lines and uses dynamic service requests to request VoIP service. The remaining profiles, such as profile 5 above, are typically created by a CM when it comes online.

Profile 3 creates a grant-size of 31.22 KiloBytes per second for G.729 service, and profile 4 creates a grant-size of 87.2 KiloBytes per second for G.711 service. Both profiles use a default grant-interval of 20 milliseconds. For more information on these profiles, see the TAC technical note at the following URL: http://www.cisco.com/warp/public/109/uBR7200_QoSMAC.html

The following example displays detailed output for profile 1:

```
Router# show cable qos profile 1 verbose

Profile Index                          1
Name                                   Default
Upstream Traffic Priority              0
Upstream Maximum Rate (bps)            0
Upstream Guaranteed Rate (bps)         0
Unsolicited Grant Size (bytes)         0
Unsolicited Grant Interval (usecs)     0
Upstream Maximum Transmit Burst (bytes) 0
IP Type of Service Overwrite Mask      0x0
IP Type of Service Overwrite Value     0x0
Downstream Maximum Rate (bps)          0
Created By                             cmts(r)
Baseline Privacy Enabled               no
```

Table below describes the fields displayed by the **show cable qos profile** command.

Table 174: show cable qos profile Command Field Descriptions

Field	Description
ID	Profile number.
Prio	Priority level.
Max upstream bandwidth	Maximum upstream bandwidth.
Guarantee upstream bandwidth	Guaranteed minimum upstream bandwidth.
Max downstream bandwidth	Maximum downstream bandwidth.
Max tx burst	Maximum transmit burst size in bytes.
Tos mask	Hex value of the mask bits.
Tos value	Hex value of the mask byte.
Create by	Identity of who created the profile: • cmts = Created by the CMTS with read-write properties. The profile can be modified but not deleted. • cmts(r) = Created by the CMTS with read-only properties. The profile cannot be modified or deleted. • cm = Created by the CM DOCSIS configuration file. • mgmt = Created by an operator using CLI commands.
B priv enab	Describes whether Baseline Privacy Interface (BPI) encryption is enabled (yes) or disabled (no) for this QoS profile.
IP prec. rate enab	Describes whether IP precedence rate limiting enabling is enabled (yes) or disabled (no) for this QoS profile. When a profile is created by a CM, this value is set by the Type Length Value (TLV) 11 fields in the DOCSIS configuration file, unless overwritten using the **cable qos profile** command.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable qos permission	Specifies permission for updating the cable router QoS table.
cable qos profile	Configures a QoS profiles.
cable service-flow inactivity-timeout	Sets the amount of time a dynamic service-flow can be present in the system without any activity.
show cable modem qos	Displays quality of service (QoS) and service flow information for a particular CM.
show cable noise	Displays the status of permissions for changing QoS tables.
show interface cable qos paramset	Displays the DOCSIS 1.1 QoS parameter sets.

show cable rate-adapt

To display the global and local upstream utilization optimization configuration parameters, use the **show cable rate-adapt** command in privileged EXEC mode.

show cable rate-adapt

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the current global rate-adapt settings that govern all cable modem and the local rate-adapt settings that relate to a specific cable modem upstream.

Examples

The following example shows a typical display of the **show cable rate-adapt** command:

```
Router# show cable rate-adapt
Global:Enabled Local-Only:Enabled global:maps 500 priority 6, rate 12 bcs 10 fcms On
```

Note The output “maps 500” relates to duration. It indicates that the service flow is optimized for 500 MAPs.

Table below describes the fields shown in the **show cable rate-adapt** display.

Table 175: show cable rate-adapt Field Descriptions

Field	Description
Global	Indicates if upstream utilization optimization is enabled globally on all cable modems.
Local	Indicates if upstream utilization optimization is enabled locally on a specific upstream flow.
priority	Indicates the specified priority setting.
rate	Indicates the specified minimum max-rate.
bcs	Indicates the number of broadcast contention minislots (BCS).
fcms	Indicates if forced broadcast contention minislot (fcms) is turned on or off.

Field	Description
duration	Indicates the duration of a rate-adapt flow.

Related Commands

Command	Description
cable upstream rate-adapt (global)	Enables upstream utilization optimization globally on all cable modem upstream flows.
cable upstream rate-adapt (interface)	Enables upstream utilization optimization locally.

show cable rate-limit-ccf

To display information about rate limiting criteria for upstream bonded service flows on the Cisco uBR10-MC5X20H cable interface line card, use the **showcable rate-limit-ccf** command in privileged EXEC mode.

show cable rate-limit-ccf [*start-index count* | **clear**]

Syntax Description

start-index	(Optional) Starting index for the log entries. The valid range is from 0 to 2000. The default value is 0.
count	(Optional) Total number of log entries to be displayed. The valid range is from 0 to 2000.
clear	(Optional) Clears information about rate limiting.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable rate-limit-ccf** command that displays information about rate limiting criteria for upstream bonded service flows on a Cisco uBR10-MC5X20H cable interface line card:

```
Router# show cable rate-limit-ccf
rate_limiting config: aggr_throughput: 215000000 aggr_burst: 240000
cpu_threshold: 50 cpu_burst: 10
5X20H rate limit: cpu-throttle 0 ccf-bw-drop 0 others 0
5X20H rate limit ccf info count: 0
```

Table below describes the fields shown in the **show cable rate-limit-ccf command display.**

Table 176: show cable rate-limit-ccf Field Descriptions

Field	Description
aggr_throughput	Aggregate throughput value.
aggr_burst	Aggregate burst rate value.
cpu_threshold	CPU threshold for Continuous Concatenation and Fragmentation (CCF) in percentage.
cpu_burst	CPU burst for CCF in percentage

Field	Description
cpu-throttle	Total number of bandwidth requests that stopped due to CPU throttle.
ccf-bw-drop	Total number of bandwidth requests that stopped due to CCF resource constraint.
5X20H rate limit ccf info count	Total number of log entries.

Related Commands

Command	Description
cable upstream rate-limit-ccf	Configures rate limiting criteria for upstream bonded service flows on a Cisco uBR10-MC5X20H cable interface line card.

show cable rcp-id

To view available Receive Channel Profile (RCP) on the cmts which includes well-known RCP defined in CableLab DOCSIS MULPI specification, use **show cable rcp-id** command in privileged EXEC mode.

show cable rcp-id

Syntax Description

rcp id	Specifies a unique RCP ID in hexadecimal.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR8 Series Converged Broadband Routers.

Usage Guidelines

The **show cable rcp-id** is used along with RCP-ID to view the RCP definition.

The following example shows a typical display for the **show cable rcp-id** command:

```
Router#show cable rcp-id  00 10 18 80 61
RCP ID  : 00 10 18 80 61
  Name  :
  Center Frequency Spacing      : 0
  Max number of Channels        : 0
  Primary Capable Channel       : 1
  Number of Modules             : 1
   Module[1]:
     Number of Adjacent Channels: 1
     Minimum Center Frequency-Hz: 111000001
     Maximum Center Frequency-Hz: 111000000
```

Related Commands

Command	Description
cable rcp-id	Specifies the receive channel profile ID.
show cable rcps	Displays all the available Receive Channel Profiles (RCP) on the CMTS.

show cable rcps

To view all the available Receive Channel Profiles (RCP) on the CMTS, use the **show cable rcps** command in privilged EXEC mode.

show cable rcps

Syntax Description

This command has no arguments.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable rcps** allows users to view all the available RCP's in CMTS.

Examples

The following example shows a typical display for the **show cable rcps** command for all cable interfaces:

```
Router# show cable rcps
RCP-ID  : 00 10 00 10 04
  Name  : CLAB-8M-004
  Center Frequency Spacing     : 8
  Number of Channels           : 4
  Primary Capable Channels     : 1
  Number of Modules            : 1
    Module [1]:
        Number-of-adjacent-channels : 8
        Minimum-center-frequency    : 112000000
        Maximum-center-frequency    : 858000000
        Connected Module            :  64
```

Related Commands

Command	Description
cable rcp-id	Specifies the receive channel profile ID.
show cable rcp-id	Displays all available Receive Channel Profile (RCP) on the cmts which includes well-known RCP defined in CableLab DOCSIS MULPI specification.

show cable redundancy

To display the DDC redundancy partners and their relative states, and additional information about DDC states on the Cisco CMTS, use the **show cable redundancy** command in privileged EXEC mode.

show cable redundancy {**hashfilter** | **class** | **calls**}

Syntax Description

hashfilter	Displays the hash filter(s) being used in the scheme.
class	Displays the displays the number of cable modems in each DDC class of the same scheme.
calls	Displays the number of active and E911 calls currently being supported on the relative DDC nodes.

Command Default

This command has no default behaviors or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Release 12.3(9a)BC	This command was introduced on the Cisco uBR7246 universal broadband router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example of the **show cable redundancy hashfilter** command illustrates the same DDC Redundancy scheme (two Cisco uBR7246VXR routers). This command displays the configured hash filter parameters. You can either list all hash filters (as shown) or list one hash filter, if specified with the optional *hash_id* value at the end of the command.

```
Router# show cable redundancy hashfilter
HashFilter 1
HashType        MacMask
default         ffff.ffff.ffff
MacAddr         OUI             Node
0000.39cc.b270                  1
0000.39cc.ba70                  2
0000.39cc.c070                  2
HashFilter 2
HashType        MacMask
default         0000.00ff.ffff
MacAddr  OUI  Node
 00.00.39 1
 00.08.0D 1
 00.0C.E5 1
```

The following example of the**show cable redundancy class** command displays the number of cable modems in each DDC class of the same scheme (two Cisco uBR7246VXR routers).

```
Router# show cable redundancy class
Number of modems in each DDC class:
Interface Class0 Class1 Class2 Class3 Class4
```

```
Cable3/0  32  0 0 0 0
Cable3/1  32 0 0 0 0
Cable4/0 32 0 0 0 0
Cable4/1 0 0 0 0 0
Cable5/0 31 0 0 0 0
Cable5/1 32 0 0 0 0
Cable6/0 0 0 0 0 0
Cable6/1 0 0 0 0 0
```

The following example of the **show cable redundancy calls** command displays the number of active 911 (E911) calls, voice calls, and the number of cable modems with service flows for each subinterface. If the subinterface is configured on a bundle, the number of calls is the total for all the members in the bundle.

```
Router# show cable redundancy calls
SubInterface  911Calls   VoiceCalls  ModemCount  ServiceFlow
Cable3/0.1    0          0           159         159
Cable3/0.2    0          0           0           0
```

Related Commands

Command	Description
cable redundancy hashfilter	Sets the MAC address and DDC node mappings of the DDC redundancy scheme.
cable redundancy myid	Sets the total number of Cisco DDC nodes (routers) in the DDC Redundancy scheme and sets the ID of the current DDC node.
cable redundancy node	Configures the DDC node with active or standby state.
cable redundancy node frequency	Sets the downstream frequencies for each node participating in the scheme other than the current DDC node (router).
cable redundancy target	Sets the target DDC node (router) to use in a DDC switchover event.
cable redundancy threshold	Sets the active voice call threshold on the current DDC node (router).

show cable resil-rf-status

To display the logical up and down state of a channel number, or the logical state of all RF channels, use the **show cable resil-rf-status** command in privileged EXEC mode.

show cable resil-rf-status [**integrated-cable** *slot /card/port wb-rf-channel-number* | **down** | **uncfg** | **up**]

Syntax Description

integrated-cable	(Optional) Specifies the integrated cable interface.
slot	(Optional) The slot where a SIP resides. Valid values are from 0 to 3 and 6 to 9.
card	(Optional) The bay in a SIP where a SPA is located. Valid values is 0.
port	(Optional) Specifies the interface number on the SPA. Valid values are from 0 to 15.
wb-rf-channel-number	(Optional) Specifies the channel number for the RF channel. Valid values are from 0 to 162.
down	(Optional) Display the RF in "DOWN" status.
uncfg	(Optional) Display the RF in "UNCFG" status.
up	(Optional) Display the RF in "UP" status.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **show cable rf-status** command.

Examples

The following is a sample output of the **show cable resil-rf-status** command used to display the logical state of all RF channels on a integrated cable interface:

```
Router# show cable rf-status
          Logical  Suspend  Suspend  Flap    Flap
RF        Status   Status   Fails    Counts  Time
--------  -------  -------  -------  ------  ----
3/0/0 0   UP       N/A      0        0
      1   UP       N/A      0        0
      2   UP       N/A      0        0
      3   UP       N/A      0        0
      4   UP       N/A      0        0
      5   UP       N/A      0        0
      6   UP       N/A      0        0
      7   UP       N/A      0        0
      8   UP       N/A      0        0
      9   UP       N/A      0        0
```

```
10  UP       N/A      0        0
11  UP       N/A      0        0
12  UP       N/A      0        0
13  UP       N/A      0        0
14  UP       N/A      0        0
15  UP       N/A      0        0
16  UP       N/A      0        0
17  UP       N/A      0        0
18  UP       N/A      0        0
19  UP       N/A      0        0
20  UP       N/A      0        0
```

Table below describes the significant fields shown in the display.

Table 177: show cable resil-rf-status Field Descriptions

Field	Description
RF	Indicates the RF channel ID.
Suspend Status	Indicates if the channel is currently suspended
Suspend Fails	Indicates the number of times that the CMTS attempted to suspend a channel without success.
Logical Status	Indicates the logical up and down state of all RF channels.
Flap Counts	Indicates the number of times the RF channel has dropped and recovered.
Flap Time	Indicates the duration in seconds for each flap count.

The following is a sample output of the **show cable resil-rf-status** command used to display the logical up and down state of a particular channel number on a integrated cable interface:

```
Router# show cable resil-rf-status integrated-cable 3/0/3:111
          Logical  Suspend  Suspend  Flap    Flap
RF        Status   Status   Fails    Counts  Time
--------  -------  -------  -------  ------  ----
3/0/3 111 UP       N/A      0        0
```

Related Commands

Command	Description
show interface resil-rf-status	Displays the logical up and down state for each of the configured RF channels for a wideband interface.

show cable resiliency

To display all information about the resiliency bonding groups and their assigned status on the Cisco CMTS router, use the **show cable resiliency** command in privileged EXEC mode.

show cable resiliency

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows a sample output of the **show cable resiliency** command:

```
Router# show cable resiliency
              BG   Resil BG                                  RF
Resil BG I/F  ID   State          Count Time              Ctrl  Num
------------- ---- -------------- ----- --------------- ----------
Wi1/2/0:10    10   Free
Wi1/2/0:20    20   Free
Wi7/0/0:1     1    Assigned       3     Nov 3  09:55:49 0     0
                                                               1
                                                               2
Wi7/0/0:2     2    Assigned       3     Nov 3  09:57:09 0     0
                                                               1
                                                               3
```

Table below describes the significant fields shown in the display.

Table 178: show cable resiliency Field Descriptions

Field	Description
Resil BG I/F	Bonding group interface assigned to resiliency mode.
BG ID	Bonding group ID.
Resil BG State	Status of the resiliency bonding group—free or assigned.
Count	Number of times this bonding group has been assigned.
Time	Day and time the bonding group was last assigned.
RF Ctrl	Primary RF channel.
RF Num	RF index number of the assigned RF channel.

Related Commands

Command	Description
cable resiliency ds-bonding	Enables the Downstream Resiliency Bonding Group feature on the Cisco CMTS router.
cable ds-resiliency	Reserves a resiliency bonding group for a line card on the Cisco CMTS router.
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.

show cable resiliency counts

You can use the **show cable resiliency counts** command in privileged EXEC mode to display the number of RBGs created per downstream port.

show cable resiliency counts

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1x	This command is introduced for the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable resiliency counts** command to monitor RBG creation counts per DS port and quickly identify where most RBGs are created. You can use this information to further identify which DS channels and cable modems have the most impairments.

Examples

The following example shows a sample output of the **show cable resiliency counts** command:

```
Router# show cable resiliency counts
Load for five secs: 3%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 10:30:03.791 EDT Mon Nov 30 2023

RBG Creation Count Per Port:
DS-CTRL          Total
                 RBG Count
-------          ---------
1/0/0            1
1/0/1            2
```

Related Commands

Command	Description
cable resiliency exclude	Use this command to exclude cable modems from Downstream Resiliency operations.

show cable resiliency exclude

You can use the **show cable resiliency exclude** command in privileged EXEC mode to display a list of cable modems excluded from Downstream Resiliency operations.

show cable resiliency exclude

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1x	This command is introduced for the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows a sample output of the **show cable resiliency exclude** command:

```
router# show cable resiliency exclude
Load for five secs: 14%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 21:59:51.293 EDT Sun Nov 30 2023

MAC Address        I/F       State         Primary WB
34bd.fa0f.4784     C8/0/1    w-online(pt)  Wi8/0/1:4
34bd.fa0f.3726     C8/0/1    w-online(pt)  Wi8/0/1:4
34bd.fa0f.5690     C8/0/0    w-online(pt)  Wi8/0/0:3
34bd.fa0f.8899     C8/0/0    w-online(pt)  Wi8/0/0:5
```

Related Commands

Command	Description
cable resiliency exclude	Use this command to exclude cable modems from Downstream Resiliency operations.

show cable resiliency throttled-cm

You can use the **show cable resiliency throttled-cm** command in privileged EXEC mode to display RGB throttle information.

show cable resiliency throttled-cm { **list** | **stats** }

Syntax Description

list	Displays all the CMs that are moved to NB due to RBG throttle.
stats	Displays the RBG Throttle statistics information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced for the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows a sample output of the **show cable resiliency throttled-cm stats** command:

```
Router# show cable resiliency throttled-cm stats
RBG Throttle:            Enabled
RBG Throttle Auto Mode:  Enabled

RBG Throttle Auto Mode State:  STEADY
RBG Throttle Auto Mode Settling State Duration:  2 (minutes)
RBG Throttle Auto Mode NB to RBG Rate:  2 (per 30 seconds)

Metric:             Configured Threshold:    Current Value:
RBG Creation Rate        010                        0
CPU Usage                095%                       3
CM Online Rate           025                        0
```

Examples

The following example shows a sample output of the **show cable resiliency throttled-cm list** command:

```
Router# show cable resiliency throttled-cm list
Number of Throttled CMs: 3

MAC Address Timestamp
-------------- ---------
c8fb.26a3.cd54 Jul 28 23:25:58
c8fb.26a3.961a Jul 28 23:26:06
c8fb.26a3.aa82 Jul 28 23:26:11
```

Related Commands

Command	Description
cable resiliency rbg-throttle	Use this command to reduce SUP CPU usage during CM Mass Registration Events.

show cable rf-adapt

To display the downgrade and upgrade candidate modems, use the **show cable rf-adapt** command in user EXEC or privileged EXEC mode.

show cable rf-adapt [**cable** {*slot* / *cable-interface-index* | *slot* / *subslot* / *cable-interface-index* } [**upgrade-candidates** | **downgrade-candidates** | **upstream** *upstream-channel-id* [**upgrade-candidates** | **downgrade-candidates**]] | **upgrade-candidates** | **downgrade-candidates**]

Syntax Description

cable	Displays information about the cable modems in a specific cable interface.
slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
upgrade-candidates	Displays information about the upgrade candidate cable modems.
downgrade-candidates	Displays information about the downgrade candidate cable modems.
upstream *upstream-channel-id*	(Optional) Displays candidates on a particular upstream channel. The valid range for *upstream-channel-id* is from 0 to 3.

Command Modes

User EXEC (>) or

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable rf-adapt downgrade-candidates** command:

```
Router# show cable rf-adapt downgrade-candidates
MAC Address      IP Address      Source       Destination
                                 Upstream     Upstream
0019.474a.d4cc   10.10.1.9       C8/0/1/U3.0  C8/0/1/U3.1
0019.474a.d554   10.10.1.73      C8/0/14/U0.0 C8/0/14/U0.1
0019.474a.d542   10.10.1.79      C8/0/0/U0.0  C8/0/0/U0.1
0019.474a.d508   10.10.1.11      C8/0/8/U0.0  C8/0/8/U0.1
0025.2e2d.7400   10.10.1.66      C8/0/0/U1.0  C8/0/0/U1.1
0022.cea4.f404   10.10.1.53      C8/0/2/U2.0  C8/0/2/U2.1
```

The following is a sample output of the **show cable rf-adapt upgrade-candidates** command:

```
Router# show cable rf-adapt upgrade-candidates
MAC Address      IP Address      Source       Destination
                                 Upstream     Upstream
0019.474a.d554   10.10.1.73      C8/0/14/U0.1 C8/0/14/U0.0
0019.474a.d542   10.10.1.79      C8/0/0/U0.1  C8/0/0/U0.0
0025.2e2d.7400   10.10.1.66      C8/0/0/U1.1  C8/0/0/U1.0
```

The following is a sample output of the **show cable rf-adapt cable upstream downgrade-candidates** command:

```
Router# show cable rf-adapt cable 7/0/0 upstream 0 downgrade-candidates
MAC Address      IP Address      Source       Destination
                                 Upstream     Upstream
0019.474a.d4cc   10.10.1.9       C7/0/0/U3.0  C7/0/0/U3.1
```

The following is a sample output of the **show cable rf-adapt cable upstream upgrade-candidates** command:

```
Router# show cable rf-adapt cable 7/0/0 upstream 0 upgrade-candidates
MAC Address      IP Address      Source       Destination
                                 Upstream     Upstream
0019.474a.d554   10.10.1.73      C7/0/0/U0.1  C7/0/0/U0.0
```

The following is a sample output of the **show cable rf-adapt cable downgrade-candidates** command:

```
Router# show cable rf-adapt cable 7/0/0 downgrade-candidates
 MAC Address IP Address Source Destination
 Upstream Upstream
  0019.474a.d4cc 10.10.1.9 C7/0/0/U3.0 C7/0/0/U3.1
```

The following is a sample output of the **show cable rf-adapt cable upgrade-candidates** command:

```
Router# show cable rf-adapt cable 7/0/0 upgrade-candidates
MAC Address      IP Address      Source       Destination
                                 Upstream     Upstream
0019.474a.d554   10.10.1.73      C7/0/0/U0.1  C7/0/0/U0.0
```

Table below describes the significant fields shown in the display.

Related Commands

Command	Description
cable rf-adapt timer	Configures timers for RF adaptation.
cable upstream rf-adapt	Enables RF adaptation on the physical upstream channel.

Command	Description
cable upstream rf-adapt (logical channel)	Specifies the primary upstream logical channel and the secondary upstream logical channel.
cable upstream threshold rf-adapt	Configures the upstream RF adaptation threshold value, which prevents excessive relocation of modems from the primary upstream channel to the secondary upstream channel.
show cable modem	Displays information about the registered and unregistered cable modems.

show cable rf-status

To display the logical up and down state of a channel number, or the logical state of all RF channels, use the **show cable rf-status** command in privileged EXEC mode.

show cable rf-status [**modular-cable** *slot* /**bay**/*port*:*nb-channel-number*]

Syntax Description

modular-cable	(Optional) Specifies the modular cable interface.
slot	(Optional) The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
bay	(Optional) The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	(Optional) Specifies the interface number on the SPA.
nb-channel-number	(Optional) Specifies the channel number for the RF channel.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **show cable resil-rf-status** command on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable rf-status** command used to display the logical state of all RF channels on a modular cable interface:

```
Router# show cable rf-status
          Logical  Flap    Flap
RF        Status   Counts  Time
--------  -------  ------  ----
1/0/0 0   UP       0
      1   UP       0
      2   UP       0
      3   UP       0
      5   UP       0
      6   UP       0
      7   UP       0
      8   UP       0
      9   UP       0
      10  UP       0
      11  UP       0
      12  UP       0
      13  UP       0
      14  UP       0
```

```
15  UP        0
16  UP        0
17  UP        0
18  UP        0
19  UP        0
20  UP        0
21  UP        0
22  UP        0
23  UP        0
```

Table below describes the significant fields shown in the display.

Table 179: show cable rf-status Field Descriptions

Field	Description
RF	Indicates the RF channel ID.
Logical Status	Indicates the logical up and down state of all RF channels.
Flap Counts	Indicates the number of times the RF channel has dropped and recovered.
Flap Time	Indicates the duration in seconds for each flap count.

The following is a sample output of the **show cable rf-status** command used to display the logical up and down state of a particular channel number on a modular cable interface:

```
Router# show cable rf-status modular-cable 1/0/0:1
Load for five secs: 6%/0%; one minute: 3%; five minutes: 2%
Time source is NTP, .14:47:27.751 EDT Thu Aug 7 2008

          Logical  Flap    Flap
RF        Status   Counts  Time
--------  -------  ------  ----
1/0/0 1   UP       0
```

Related Commands

Command	Description
show interface rf-status	Displays the logical up and down state for each of the configured RF channels for a wideband interface.

show cable rpd

To display the active Cisco Remote PHY Devices (RPD), use the **show cable rpd** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd { **slot** *slot* | [*ip-address mac-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | { *slot* / *subslot* / *port* } } [**verbose**]

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.
verbose *port*	Displays detailed information of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Fuji 16.7.1	This command was updated to support IPv6 on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to verify the active RPDs with the principal and auxiliary roles.

The following example shows the sample output for the **show cable rpd** command:

```
Router#show cable rpd
MAC Address     IP Address       I/F       State        Role HA  Auth Name

0000.5e00.5301  192.0.2.21       Te1/1/0   online       Pri  Act N/A  shelf-node8

0000.5e00.5302  192.0.2.106      Te1/1/1   online       Pri  Act N/A  shelf-node9

0000.5e00.5303  192.0.2.104      Te1/1/2   online       Pri  Act N/A  shelf-node10

0000.5e00.5304  192.0.2.100      Te7/1/0   online       Pri  Act N/A  node0
```

```
0000.5e00.5304  192.0.2.100      Te7/1/1   online       Aux  Act N/A  node0

0000.5e00.5305  192.0.2.103      Te7/1/1   online       Pri  Act N/A  node2

0000.5e00.5306  192.0.2.104      Te7/1/1   online       Pri  Act N/A  node1

0000.5e00.5307  192.0.2.105      Te7/1/2   online       Pri  Act N/A  node3

0000.5e00.5308  192.0.2.102      Te7/1/2   online       Pri  Act N/A  node4

0000.5e00.5309  192.0.2.128      Te7/1/4   online       Pri  Act N/A  shelf-node5

0000.5e00.530a  192.0.2.101      Te7/1/5   online       Pri  Act N/A  shelf-node6

0000.5e00.530b  192.0.2.100      Te7/1/6   online       Pri  Act N/A  shelf-node7

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following table contains information on the RPD states.

State	Description
online	RPD is online.
!online	RPD has lost PTP phase lock. Restore phase lock to avoid RPD losing service.
^online	RPD uses the default password. If you continue to use the default password, RPD services are disabled from RPD 7.7 and later.

The following example shows the sample output for the **show cable rpd** *MAC adderss* **tengigabitethernet** command:

```
Router#show cable rpd 0000.5e00.5301 te7/1/0

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.10       Te7/1/0   online       Pri  Act node
```

The following example shows the sample output for the **show cable rpd** *IP adderss* **tengigabitethernet** command:

```
Router#show cable rpd 192.0.2.10 te7/1/0

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.10       Te7/1/0   online       Pri  Act node
```

The following example shows the sample output for the **show cable rpd id** *id* **tengigabitethernet** command:

```
Router#show cable rpd id 0000.5e00.5301 te7/1/0

MAC Address     IP Address       I/F       State        Role HA  Name
```

```
0000.5e00.5301  192.0.2.10       Te7/1/0   online       Pri  Act node
```

The following example shows the sample output for the **show cable rpd name** *name* **tengigabitethernet** command:

```
Router#show cable rpd name node te7/1/0

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.10       Te7/1/0   online       Pri  Act node
```

The following example shows the sample output for the **show cable rpd slot** *slot* command:

```
Router#show cable rpd slot 7
MAC Address     IP Address       I/F       State        Role HA  Auth Name

0000.5e00.5301  192.0.2.100       Te7/1/0   online       Pri  Act N/A  node0

0000.5e00.5301  192.0.2.100       Te7/1/1   online       Aux  Act N/A  node0

0000.5e00.5302  192.0.2.105       Te7/1/1   online       Pri  Act N/A  node2

0000.5e00.5303  192.0.2.102       Te7/1/1   online       Pri  Act N/A  node1

0000.5e00.5304  192.0.2.100       Te7/1/2   online       Pri  Act N/A  node3

0000.5e00.5305  192.0.2.122       Te7/1/2   online       Pri  Act N/A  node4

0000.5e00.5306  192.0.2.128       Te7/1/4   online       Pri  Act N/A  shelf-node5

0000.5e00.5307  192.0.2.101       Te7/1/5   online       Pri  Act N/A  shelf-node6

0000.5e00.5308  192.0.2.200       Te7/1/6   online       Pri  Act N/A  shelf-node7

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd tengigabitethernet verbose** command for a specific RPD:

```
Router#show cable rpd name node te1/1/0 verbose

RPD ID                                  : 0000.5e00.5301
Vendor Name                             : Cisco
Vendor Id                               : NA
Model Number                            : NB
Device Mac Address                      : 0000.5e00.5301
Current Sw Version                      : Linux version 4.1.8-rt8
(gitlab-runner@cabu-openrpd-minhang) (gcc version 4.8.3 (OpenWrt/Linaro GCC 4.8-2014.04
r48749) ) #1 SMP Fri Feb 10 02:55:15 CST 2017
Boot Rom Version                        : ND
Device Description                      : RPD
Device Alias                            : RPD
Serial Number                           : NE
Us Burst Receiver Vendor Id             : NF
Us Burst Receiver Model Number          : R_Dummy
```

```
Us Burst Receiver Driver Version          : R_Dummy
Us Burst Receiver Serial Number           : R_Dummy
Rpd Rcp Protocol Version                  : R_Dummy
Rpd Rcp Schema Version                    : R_Dummy
Hw Revision                               : NL
offline_timestamp                         :
auth_timestamp                            : Mar 8  10:56:52
online_timestamp                          : Mar 8  10:57:08
```

show cable rpd 55d1-us cpp-cache

To display information stored in the software cache (IOS) for 55-1 OOB, use the **show cable rpd 55d1-us cpp-cache** command in privileged EXEC mode.

show cable rpd 55d1-us cpp-cache

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.3.1x	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows a sample output of the command **show cable rpd 55d1-us cpp-cache**:

```
Router#show cable rpd 55d1-us cpp-cache
Session ID rpd_index  rfport     chn_id     demodId    chan_index msg_chn_id msg_Flag
HA_Mode
0x40300003 3          0          0          32         18         18         TRUE
Active
0x40300003 3          1          0          32         21         18         FALSE
Active
0x60300003 3          0          0          32         536870930  536870930  TRUE
Standby
0x60300003 3          0          2          130        536870932  536870932  TRUE
Standby
0x60300003 3          1          0          32         536870933  536870930  FALSE
Standby
0x60300003 3          1          2          130        536870935  536870932  FALSE
Standby
```

show cable rpd alloc-chan-resources

To display the allocation status for both upstream and downstream channel resources of the Cisco Remote PHY Device (RPD), use the **show cable rpd alloc-chan-resources** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] **alloc-chan-resources**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the allocation status for channel resources of the RPD.

The following example shows the sample output for the **showcable rpdalloc-chan-resources** command for a specific RPD:

```
Router#show cable rpd name node alloc-chan-resources
RPD ID                                  : 0004.9f00.0907
Downstream RF Port Index                : 0
Allocated DS OFDM Channels              : 0
Allocated DS SCQAM Channels             : 0
Allocated DS OOB55D1 Channels           : 0
Allocated DS NDF Channels               : 0
Downstream RF Port Index                : 1
Allocated DS OFDM Channels              : 0
Allocated DS SCQAM Channels             : 0
Allocated DS OOB55D1 Channels           : 0
Allocated DS NDF Channels               : 0
Upstream RF Port Index                  : 0
Allocated US OFDMA Channels             : 0
Allocated US SCQAM Channels             : 0
Allocated US OOB55D1 Channels           : 0
Allocated US NDR Channels               : 0
Upstream RF Port Index                  : 1
Allocated US OFDMA Channels             : 0
Allocated US SCQAM Channels             : 0
Allocated US OOB55D1 Channels           : 0
Allocated US NDR Channels               : 0
```

show cable rpd auxiliary

To display the Cisco Remote PHY Device (RPD) with the auxiliary role, use the **show cable rpd auxiliary** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd auxiliary

show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] **auxiliary**

Syntax Description

ip-address	(Optional) IP address of the RPD with the auxiliary role.
mac-adderss	(Optional) MAC address of the RPD with the auxiliary role.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD with the auxiliary role.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the RPDs that are in the auxiliary role.

The following example shows the sample output for the **show cable rpd auxiliary** command:

```
Router#show cable rpd auxiliary

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.11       Te7/1/1   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/2   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/7   online       Aux  Act node
```

The following example shows the sample output for the **show cable rpd** *ip-address* **auxiliary** command:

```
Router#show cable rpd 192.0.2.11 auxiliary

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.11       Te7/1/1   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/2   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/7   online       Aux  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd** *MAC address* **auxiliary** command:

```
Router#show cable rpd 0000.5e00.5301 auxiliary

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.11       Te7/1/1   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/2   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/7   online       Aux  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd id** *id* **auxiliary** command:

```
Router#show cable rpd id 0000.5e00.5301 auxiliary

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.11       Te7/1/1   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/2   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/7   online       Aux  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd name** *name* **auxiliary** command:

```
Router#show cable rpd name node auxiliary

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.11       Te7/1/1   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/2   online       Aux  Act node
0000.5e00.5301  192.0.2.11       Te7/1/7   online       Aux  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd capability

To display the capability information of Cisco Remote-PHY device (RPD), use the **show cable rpd capability** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] **capability**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to monitor buffer depth of RPD towards various types of upstream and downstream channels.

The following example shows the sample output for the **showcable rpdcapability** command for a specific RPD:

```
Router#show cable rpd name node capability

RPD ID                                  : 0004.9f00.0907
Bi-direction RF Ports                   : 2
Downstream RF Ports                     : 1
Upstream RF Ports                       : 1
10 Gigabit Ethernet Ports               : 2
1 Gigabit Ethernet Ports                : 1
Downstream SC-QAM Channels Per Port     : 158
Downstream OFDM Channels Per Port       : 1
Upstream SC-QAM Channels Per Port       : 12
Upstream OFDMA Channels  Per Port       : 2
Downstream SCTE-55-1 Channels Per Port  : 1
Upstream SCTE-55-1 Channels Per Port    : 3
Downstream SCTE-55-2 Channels Per Port  : 1
Upstream SCTE-55-2 Channels Per Port    : 1
DS NDF Channels Per Port                : 1
US NDF Channels Per Port                : 1
UDP Encapsulation On L2TPv3             : Not Support
DS Distinct PSP Flows                   : 8
US Distinct PSP Flows                   : 4
Asynchronous MPEG Video Channels Per Port : 160
```

```
Flow Tags support capability              : Support
Frequency Tilt support capability         : Support
Range of tilt setting                     : 0
Number of CW Tone Generators              : 4
Lowest CW Tone Frequency                  : 48000000
Highest CW Tone Frequency                 : 999000000
Maximum Power of CW Tone Generators       : 340
QAM as Pilot setting                      : 1
Buffer depth monitor alert support        : 0
Buffer depth configuration support        : 0
Rpd ucd processing time                   : 0
Rpd ucd change null grant time            : 0
Multi section timing mer reporting support: 0
```

show cable rpd config

To display the Cisco Remote PHY Device (RPD) downstream configuration information for CCAP-Core side (local) and RPD side (remote), use the **show cable rpd config** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd {[*ip-address mac-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | {*slot* / *subslot* / *port* }}**config downstream** { **local** **remote** }

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the RPD downstream configuration information for CCAP-Core side (local) and RPD side (remote).

The following example shows the sample output for the **show cable rpd config** command:

```
Router#show cable rpd 0004.9f33.0731 Te9/1/6 config downstream local

Load for five secs: 8%/3%; one minute: 9%; five minutes: 9%
Time source is NTP, 17:06:02.859 CST Mon Mar 27 2017
Controller Downstream 9/0/31
max-carrier 158
base-channel-power 21
rf-chan 72
  type DOCSIS
  docsis-channel-id 73
  frequency 531000000
  rf-output NORMAL
  power-adjust 0
  annex B
```

```
modulation 256
interleaver-depth I_32_J_4
spectrum-inversion off
symbol-rate 5361
```

show cable rpd core-ident

You can use the **show cable rpd core-ident** command in privileged EXEC mode to display RPD CCAP Core Identification information.

Cisco cBR Series Converged Broadband Router

show cable rpd { **slot** *slot* | [*mac-address ip-address*] | **id** *id* | **name** *name* | **tengigabitethernet** { *slot* | *subslot* | *port* } } **core-ident**

Syntax Description

slot *slot*	(Optional) The slot number of the Digitial Position Independent Card (DPIC) that connects to the RPD.
ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitEthernet *slot*	(Optional) The slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.
tengigabitEthernet *subslot*	(Optional) The secondary slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD. The secondary slot number is always 1.
tengigabitEthernet *port*	(Optional) The port number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced on theCisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show cable rpd core-ident** command to display to display RPD CCAP Core identification information.

The following example shows the sample output for the **show cable badb.ad13.2be0 core-ident** command:

```
Router#show cable rpd badb.ad13.2be0 core-ident
RPD ID                                  : badb.ad13.2be0
Core Index                              : 0
Core ID                                 : 005f.8692.dd31
Core IP Address Type                    : Ipv4
```

```
Core IP Address                          : 10.1.0.1
Is Principal Core                        : Yes
CoreName                                 : CCAPCORE
VendorId                                 : 9
CoreMode                                 : Active
InitialConfigurationComplete             : True
MoveToOperational                        : True
CoreFunction                             : 3
ResourceSetIndex                         : 2
AuxCoreGcpConnectionStatus               : Connected
AuxCoreRpdState                          : Unknown
BackupGcpConfig                          : Connection
rpdGcpConnectionStatus                   : Connected
rpdGcpBackupCoreStatus                   : InService

RPD ID                                   : badb.ad13.2be0
Core Index                               : 1
Core ID                                  : 005f.8692.dcc0
Core IP Address Type                     : Ipv4
Core IP Address                          : 10.10.0.1
Is Principal Core                        : No
CoreName                                 : CCAPCORE
VendorId                                 : 9
CoreMode                                 : Backup
InitialConfigurationComplete             : True
MoveToOperational                        : True
CoreFunction                             : 3
ResourceSetIndex                         : 2
AuxCoreGcpConnectionStatus               : Connected
AuxCoreRpdState                          : OutOfService
BackupGcpConfig                          : Connection
rpdGcpConnectionStatus                   : Connected
rpdGcpBackupCoreStatus                   : StandingBy
```

Related Commands

Command	Description
show cable rpd	Displays general information and status of RPD when the RPD is in the initialization state (L2TP).

show cable rpd depi

To display Downstream External PHY Interface (DEPI) session and tunnel information of the Cisco Remote-PHY device (RPD), use the **show cable rpd depi** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd {**slot** *slot* | [*mac-addressip-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | {*slot* */subslot/port* }}**depi**

Syntax Description

slot *slot*	(Optional) The slot number of the Digitial Position Independent Card (DPIC) that connects to the RPD.
ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitEthernet *slot*	(Optional) The slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.
tengigabitEthernet *subslot*	(Optional) The secondary slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD. The secondary slot number is always 1.
tengigabitEthernet *port*	(Optional) The port number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use the **show cable rpd depi** command to display the complete DEPI session and L2TP status information associated to the RPD.

Use the **show cable rpd slot** *slot* **depi** command to display the DEPI session and L2TP status information associated to a specific slot of the RPD.

Use the **show cable rpd** *ip-address* **depi** command to display the DEPI session and L2TP status information associated to the RPD with a specific IP address.

Use the **show cable rpd** *mac-address* **depi** command to display the DEPI session and L2TP status information associated to the RPD with a specific MAC address.

Use the **show cable rpd id** *identifier* **depi** command to display the DEPI session and L2TP status information associated to the RPD with a specific identifier.

Use the **show cable rpd name** *name* **depi** command to display the DEPI session and L2TP status information associated to the RPD with a specific name.

Use the **show cable rpd tengigabitEthernet** *slot/subslot/port* **depi** command to display the DEPI session and L2TP status information associated to the RPD on a specific Ten Gigabit Ethernet interface of the RPD.

The following example shows the sample output for the **show cable rpd depi** command for a specific RPD:

```
Router#show cable rpd depi

DEPI Tunnel and Session Information Total tunnels 1 sessions 26
LocTunID   RemTunID   Remote Device  State  Remote Address  Sessn L2TP Class
                                                           Count
338514820  671581873  0004.9f00.0901 est    120.100.1.20    26    rphy-l2tp-gl...

LocID      RemID      Pseudowire      State  Last Chg Uniq ID    Type Mode RemSt
0x41040008 0x00000B02 US1/0/0:2(R)    est    00:34:57 21          P    PSP  UP
0x41010000 0x00000600 US1/0/0:0(D)    est    00:34:57 11          P    PSP  UP
0x00002006 0x00000405 DS1/0/0:5       est    00:34:57 6           P    PSP  UP
0x00002004 0x00000403 DS1/0/0:3       est    00:34:57 4           P    PSP  UP
0x4100000C 0x00000D03 US1/0/0:3(M)    est    00:34:57 23          P    PSP  UP
0x00002002 0x00000401 DS1/0/0:1       est    00:34:57 2           P    PSP  UP
0x00002007 0x00000406 DS1/0/0:6       est    00:34:57 7           P    PSP  UP
0x00002008 0x00000407 DS1/0/0:7       est    00:34:57 8           P    PSP  UP
0x4101000C 0x00000603 US1/0/0:3(D)    est    00:34:57 24          P    PSP  UP
0x41000004 0x00000D01 US1/0/0:1(M)    est    00:34:57 15          P    PSP  UP
0x00002001 0x00000400 DS1/0/0:0       est    00:34:57 1           P    PSP  UP
0x41080008 0x00000F02 US1/0/0:2(S)    est    00:34:57 22          P    PSP  UP
0x41010004 0x00000601 US1/0/0:1(D)    est    00:34:57 16          P    PSP  UP
0x41020000 0x00000800 US1/0/0:0(B)    est    00:34:57 12          P    PSP  UP
0x00002009 0x00000408 DS1/0/0:8       est    00:34:57 9           P    PSP  UP
0x41010008 0x00000602 US1/0/0:2(D)    est    00:34:57 20          P    PSP  UP
0x41000008 0x00000D02 US1/0/0:2(M)    est    00:34:57 19          P    PSP  UP
0x4108000C 0x00000F03 US1/0/0:3(S)    est    00:34:57 26          P    PSP  UP
0x00002003 0x00000402 DS1/0/0:2       est    00:34:57 3           P    PSP  UP
0x41080000 0x00000F00 US1/0/0:0(S)    est    00:34:57 14          P    PSP  UP
0x41040004 0x00000B01 US1/0/0:1(R)    est    00:34:57 17          P    PSP  UP
0x41080004 0x00000F01 US1/0/0:1(S)    est    00:34:57 18          P    PSP  UP
0x41000000 0x00000D00 US1/0/0:0(M)    est    00:34:56 10          P    PSP  UP
0x00002005 0x00000404 DS1/0/0:4       est    00:34:56 5           P    PSP  UP
0x4104000C 0x00000B03 US1/0/0:3(R)    est    00:34:56 25          P    PSP  UP
0x41040000 0x00000B00 US1/0/0:0(R)    est    00:34:56 13          P    PSP  UP
```

The following example shows the sample output for the **show cable rpdslot depi** command for a specific RPD:

```
Router#show cable rpd slot 7 depi
 Load for five secs: 5%/1%; one minute: 6%; five minutes: 6%
No time source, *12:40:16.725 CST Mon Mar 20 2017

DEPI Tunnel and Session Information Total tunnels 2 sessions 58
LocTunID   RemTunID   Remote Device  State  Remote Address  Sessn L2TP Class
                                                           Count
813114830  35521958   000c.2923.9991 est    120.105.4.6     29    rphy-l2tp-gl...
```

```
LocID      RemID      Pseudowire      State  Last Chg Uniq ID    Type Mode RemSt
0x0000A012 0x8000A013 DS7/0/0:17      est    02:22:09 134         P    PSP  UP
0x0000A00D 0x8000A00E DS7/0/0:12      est    02:22:09 129         P    PSP  UP
0x0000A002 0x8000A003 DS7/0/0:1       est    02:22:09 118         P    PSP  UP
0x0000A00C 0x8000A00D DS7/0/0:11      est    02:22:09 128         P    PSP  UP
0x0000A013 0x8000A014 DS7/0/0:18      est    02:22:09 135         P    PSP  UP
0x45010004 0x00000601 US7/0/1:1(D)    est    02:22:09 143         P    PSP  UP
0x0000A010 0x8000A011 DS7/0/0:15      est    02:22:09 132         P    PSP  UP
0x45020004 0x00000800 US7/0/1:0(B)    est    02:22:09 139         P    PSP  UP
0x0000A00F 0x8000A010 DS7/0/0:14      est    02:22:09 131         P    PSP  UP
0x0000A00B 0x8000A00C DS7/0/0:10      est    02:22:08 127         P    PSP  UP
0x45080004 0x00000F01 US7/0/1:1(S)    est    02:22:08 145         P    PSP  UP
0x45010000 0x00000600 US7/0/1:0(D)    est    02:22:08 138         P    PSP  UP
0x45000000 0x00000D00 US7/0/1:0(M)    est    02:22:08 137         P    PSP  UP
0x0000A00E 0x8000A00F DS7/0/0:13      est    02:22:08 130         P    PSP  UP
0x0000A00A 0x8000A00B DS7/0/0:9       est    02:22:08 126         P    PSP  UP
0x45040000 0x00000B00 US7/0/1:0(R)    est    02:22:08 140         P    PSP  UP
0x0000A007 0x8000A008 DS7/0/0:6       est    02:22:08 123         P    PSP  UP
0x0000A011 0x8000A012 DS7/0/0:16      est    02:22:08 133         P    PSP  UP
0x0000A014 0x8000A015 DS7/0/0:19      est    02:22:08 136         P    PSP  UP
0x0000A004 0x8000A005 DS7/0/0:3       est    02:22:08 120         P    PSP  UP
0x0000A008 0x8000A009 DS7/0/0:7       est    02:22:08 124         P    PSP  UP
0x45080000 0x00000F00 US7/0/1:0(S)    est    02:22:08 141         P    PSP  UP
0x0000A006 0x8000A007 DS7/0/0:5       est    02:22:08 122         P    PSP  UP
0x0000A005 0x8000A006 DS7/0/0:4       est    02:22:08 121         P    PSP  UP
0x0000A009 0x8000A00A DS7/0/0:8       est    02:22:08 125         P    PSP  UP
0x45040004 0x00000B01 US7/0/1:1(R)    est    02:22:08 144         P    PSP  UP
0x45000004 0x00000D01 US7/0/1:1(M)    est    02:22:08 142         P    PSP  UP
0x0000A003 0x8000A004 DS7/0/0:2       est    02:22:08 119         P    PSP  UP
0x0000A001 0x8000A002 DS7/0/0:0       est    02:22:08 117         P    PSP  UP
LocTunID   RemTunID   Remote Device  State  Remote Address  Sessn L2TP Class
                                                            Count
3388764998 1054297851 0004.9f03.0214 est    120.105.4.7     29    rphy-l2tp-gl...

LocID      RemID      Pseudowire      State  Last Chg Uniq ID    Type Mode RemSt
0x45010008 0x00000600 US7/0/0:0(D)    est    02:22:09 167         P    PSP  UP
0x45000008 0x00000D00 US7/0/0:0(M)    est    02:22:09 166         P    PSP  UP
0x4501000C 0x00000601 US7/0/0:1(D)    est    02:22:09 172         P    PSP  UP
0x4500000C 0x00000D01 US7/0/0:1(M)    est    02:22:09 171         P    PSP  UP
0x45020000 0x00000800 US7/0/0:0(B)    est    02:22:09 168         P    PSP  UP
0x0001A00F 0x8000A010 DS7/0/0:14      est    02:22:09 160         P    PSP  UP
0x45040008 0x00000B00 US7/0/0:0(R)    est    02:22:09 169         P    PSP  UP
0x0001A009 0x8000A00A DS7/0/0:8       est    02:22:09 154         P    PSP  UP
0x0001A012 0x8000A013 DS7/0/0:17      est    02:22:08 163         P    PSP  UP
0x0001A013 0x8000A014 DS7/0/0:18      est    02:22:08 164         P    PSP  UP
0x0001A00C 0x8000A00D DS7/0/0:11      est    02:22:08 157         P    PSP  UP
0x0001A014 0x8000A015 DS7/0/0:19      est    02:22:08 165         P    PSP  UP
0x0001A010 0x8000A011 DS7/0/0:15      est    02:22:08 161         P    PSP  UP
0x0001A004 0x8000A005 DS7/0/0:3       est    02:22:08 149         P    PSP  UP
0x0001A002 0x8000A003 DS7/0/0:1       est    02:22:08 147         P    PSP  UP
0x0001A00D 0x8000A00E DS7/0/0:12      est    02:22:08 158         P    PSP  UP
0x0001A005 0x8000A006 DS7/0/0:4       est    02:22:08 150         P    PSP  UP
0x4504000C 0x00000B01 US7/0/0:1(R)    est    02:22:08 173         P    PSP  UP
0x0001A00E 0x8000A00F DS7/0/0:13      est    02:22:08 159         P    PSP  UP
0x0001A008 0x8000A009 DS7/0/0:7       est    02:22:08 153         P    PSP  UP
0x4508000C 0x00000F01 US7/0/0:1(S)    est    02:22:08 174         P    PSP  UP
0x0001A006 0x8000A007 DS7/0/0:5       est    02:22:08 151         P    PSP  UP
0x0001A00B 0x8000A00C DS7/0/0:10      est    02:22:08 156         P    PSP  UP
0x0001A00A 0x8000A00B DS7/0/0:9       est    02:22:08 155         P    PSP  UP
0x0001A007 0x8000A008 DS7/0/0:6       est    02:22:08 152         P    PSP  UP
0x0001A011 0x8000A012 DS7/0/0:16      est    02:22:08 162         P    PSP  UP
0x0001A001 0x8000A002 DS7/0/0:0       est    02:22:08 146         P    PSP  UP
0x45080008 0x00000F00 US7/0/0:0(S)    est    02:22:08 170         P    PSP  UP
```

```
0x0001A003 0x8000A004 DS7/0/0:2       est    02:22:08 148        P    PSP  UP
```

The following example shows the sample output for the **show cable rpd te depi** command for a specific RPD:

```
Router#show cable rpd te7/1/0 depi
 Load for five secs: 8%/1%; one minute: 6%; five minutes: 6%
No time source, *12:40:30.447 CST Mon Mar 20 2017

DEPI Tunnel and Session Information Total tunnels 2 sessions 58
LocTunID   RemTunID   Remote Device  State  Remote Address  Sessn L2TP Class
                                                          Count
813114830  35521958   000c.2923.9991 est    120.105.4.6     29    rphy-l2tp-gl...

LocID      RemID      Pseudowire      State  Last Chg Uniq ID    Type Mode RemSt
0x0000A012 0x8000A013 DS7/0/0:17      est    02:22:22 134        P    PSP  UP
0x0000A00D 0x8000A00E DS7/0/0:12      est    02:22:22 129        P    PSP  UP
0x0000A002 0x8000A003 DS7/0/0:1       est    02:22:22 118        P    PSP  UP
0x0000A00C 0x8000A00D DS7/0/0:11      est    02:22:22 128        P    PSP  UP
0x0000A013 0x8000A014 DS7/0/0:18      est    02:22:22 135        P    PSP  UP
0x45010004 0x00000601 US7/0/1:1(D)    est    02:22:22 143        P    PSP  UP
0x0000A010 0x8000A011 DS7/0/0:15      est    02:22:22 132        P    PSP  UP
0x45020004 0x00000800 US7/0/1:0(B)    est    02:22:22 139        P    PSP  UP
0x0000A00F 0x8000A010 DS7/0/0:14      est    02:22:22 131        P    PSP  UP
0x0000A00B 0x8000A00C DS7/0/0:10      est    02:22:22 127        P    PSP  UP
0x45080004 0x00000F01 US7/0/1:1(S)    est    02:22:22 145        P    PSP  UP
0x45010000 0x00000600 US7/0/1:0(D)    est    02:22:22 138        P    PSP  UP
0x45000000 0x00000D00 US7/0/1:0(M)    est    02:22:22 137        P    PSP  UP
0x0000A00E 0x8000A00F DS7/0/0:13      est    02:22:22 130        P    PSP  UP
0x0000A00A 0x8000A00B DS7/0/0:9       est    02:22:22 126        P    PSP  UP
0x45040000 0x00000B00 US7/0/1:0(R)    est    02:22:22 140        P    PSP  UP
0x0000A007 0x8000A008 DS7/0/0:6       est    02:22:22 123        P    PSP  UP
0x0000A011 0x8000A012 DS7/0/0:16      est    02:22:22 133        P    PSP  UP
0x0000A014 0x8000A015 DS7/0/0:19      est    02:22:22 136        P    PSP  UP
0x0000A004 0x8000A005 DS7/0/0:3       est    02:22:22 120        P    PSP  UP
0x0000A008 0x8000A009 DS7/0/0:7       est    02:22:22 124        P    PSP  UP
0x45080000 0x00000F00 US7/0/1:0(S)    est    02:22:22 141        P    PSP  UP
0x0000A006 0x8000A007 DS7/0/0:5       est    02:22:22 122        P    PSP  UP
0x0000A005 0x8000A006 DS7/0/0:4       est    02:22:22 121        P    PSP  UP
0x0000A009 0x8000A00A DS7/0/0:8       est    02:22:22 125        P    PSP  UP
0x45040004 0x00000B01 US7/0/1:1(R)    est    02:22:22 144        P    PSP  UP
0x45000004 0x00000D01 US7/0/1:1(M)    est    02:22:22 142        P    PSP  UP
0x0000A003 0x8000A004 DS7/0/0:2       est    02:22:22 119        P    PSP  UP
0x0000A001 0x8000A002 DS7/0/0:0       est    02:22:22 117        P    PSP  UP
LocTunID   RemTunID   Remote Device  State  Remote Address  Sessn L2TP Class
                                                          Count
3388764998 1054297851 0004.9f03.0214 est    120.105.4.7     29    rphy-l2tp-gl...

LocID      RemID      Pseudowire      State  Last Chg Uniq ID    Type Mode RemSt
0x45010008 0x00000600 US7/0/0:0(D)    est    02:22:22 167        P    PSP  UP
0x45000008 0x00000D00 US7/0/0:0(M)    est    02:22:22 166        P    PSP  UP
0x4501000C 0x00000601 US7/0/0:1(D)    est    02:22:22 172        P    PSP  UP
0x4500000C 0x00000D01 US7/0/0:1(M)    est    02:22:22 171        P    PSP  UP
0x45020000 0x00000800 US7/0/0:0(B)    est    02:22:22 168        P    PSP  UP
0x0001A00F 0x8000A010 DS7/0/0:14      est    02:22:22 160        P    PSP  UP
0x45040008 0x00000B00 US7/0/0:0(R)    est    02:22:22 169        P    PSP  UP
0x0001A009 0x8000A00A DS7/0/0:8       est    02:22:22 154        P    PSP  UP
0x0001A012 0x8000A013 DS7/0/0:17      est    02:22:22 163        P    PSP  UP
0x0001A013 0x8000A014 DS7/0/0:18      est    02:22:22 164        P    PSP  UP
0x0001A00C 0x8000A00D DS7/0/0:11      est    02:22:22 157        P    PSP  UP
0x0001A014 0x8000A015 DS7/0/0:19      est    02:22:22 165        P    PSP  UP
```

```
0x0001A010 0x8000A011 DS7/0/0:15      est    02:22:22 161        P    PSP  UP
0x0001A004 0x8000A005 DS7/0/0:3       est    02:22:22 149        P    PSP  UP
0x0001A002 0x8000A003 DS7/0/0:1       est    02:22:22 147        P    PSP  UP
0x0001A00D 0x8000A00E DS7/0/0:12      est    02:22:22 158        P    PSP  UP
0x0001A005 0x8000A006 DS7/0/0:4       est    02:22:22 150        P    PSP  UP
0x4504000C 0x00000B01 US7/0/0:1(R)    est    02:22:22 173        P    PSP  UP
0x0001A00E 0x8000A00F DS7/0/0:13      est    02:22:22 159        P    PSP  UP
0x0001A008 0x8000A009 DS7/0/0:7       est    02:22:22 153        P    PSP  UP
0x4508000C 0x00000F01 US7/0/0:1(S)    est    02:22:22 174        P    PSP  UP
0x0001A006 0x8000A007 DS7/0/0:5       est    02:22:22 151        P    PSP  UP
0x0001A00B 0x8000A00C DS7/0/0:10      est    02:22:22 156        P    PSP  UP
0x0001A00A 0x8000A00B DS7/0/0:9       est    02:22:22 155        P    PSP  UP
0x0001A007 0x8000A008 DS7/0/0:6       est    02:22:22 152        P    PSP  UP
0x0001A011 0x8000A012 DS7/0/0:16      est    02:22:22 162        P    PSP  UP
0x0001A001 0x8000A002 DS7/0/0:0       est    02:22:22 146        P    PSP  UP
0x45080008 0x00000F00 US7/0/0:0(S)    est    02:22:22 170        P    PSP  UP
0x0001A003 0x8000A004 DS7/0/0:2       est    02:22:22 148        P    PSP  UP
```

Related Commands

Command	Description
show cable rpd	Displays general information and status of RPD when the RPD is in the initialization state (L2TP).
show cable rpd depi session	Displays DEPI session information of RPD.

show cable rpd depi session

To display Downstream External PHY Interface (DEPI) session information of the Cisco Remote-PHY device (RPD), use the **show cable rpd depi session** command in privileged EXEC mode.

show cable rpd {**slot** *slot* | [*mac-addressip-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | {*slot* */subslot/port* }}**depi**[**session** | [*session-id* | **configured** | **endpoints** | **name** *session-name* | **tsid** *tsid*]]

Syntax Description

slot *slot*	(Optional) The slot number of the Digitial Position Independent Card (DPIC) that connects to the RPD.
mac-adderss	(Optional) MAC address of the RPD.
ip-address	(Optional) IP address of the RPD.
id *identifier*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitEthernet *slot*	(Optional) The slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.
tengigabitEthernet *subslot*	(Optional) The secondary slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD. The secondary slot number is always 1.
tengigabitEthernet *port*	(Optional) The port number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.
session*session-id*	(Optional) The DEPI session ID of the RPD. The value ranges from 1 to 4,294,967,295.
session configured	(Optional) Displays all the DEPI sessions configured and their state. The states are IDLE and ACTIVE..
session endpoints	(Optional) The DEPI session endpoints including tunnel ID.
session name *session-name*	(Optional) The DEPI session name of the RPD.
session tsid *tsid*	(Optional) The information for DEPI sessions identified by Transport Stream Identifier (TSID).

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use the **show cable rpd depi session** command to display the complete DEPI session information associated to the RPD.

Use the **show cable rpd depi session** *session-id* command to display a DEPI session information with a specific session identifier.

Use the **show cable rpd depi session configured** command to display all the DEPI sessions configured and their states.

Use the **show cable rpd depi session endpoints** command to display the DEPI session endpoints including tunnel ID.

Use the **show cable rpd depi session name** *session-name* command to display a DEPI session information with a specific session name.

Use the **show cable rpd depi session tsid** *tsid* command to display the information for DEPI sessions identified by a specifc TSID.

Use the **show cable rpd slot** *slot* **depi session** command to display the DEPI session information associated to a specific slot of the RPD.

Use the **show cable rpd tengigabitEthernet** *slot/subslot/port* **depi session** command to display the DEPI session information associated to the RPD on a specific Ten Gigabit Ethernet interface of the RPD.

Use the **show cable rpd** *mac-address* **depi session** *session-id* command to display a specific DEPI session information associated to the RPD with a specific MAC address.

Use the **show cable rpd** *ip-address* **depi session configured** command to display a specific DEPI session configured associated to the RPD with a specific IP address.

Use the **show cable rpd id** *identifier* **depi session endpoints** command to display the DEPI session endpoint information associated to the RPD with a specific identifier.

Use the **show cable rpd name** *name* **depi session name** *name* command to display the DEPI session information associated to the RPD with a specific name.

Use the **show cable rpd** *mac-address* **depi session tsid** *tsid* command to display the information for DEPI sessions identified by a specifc TSID.

Use the **show cable rpd** *mac-address* **tengigabitEthernet** *slot/subslot/port* **depi session** command to display the DEPI session information associated to the RPD with a specific MAC address on a specific Ten Gigabit Ethernet interface of the RPD.

The following example shows the sample output for the **show cable rpd depi session** command for particular RPD:

```
Router#show cable rpd te7/1/0 depi session

Load for five secs: 6%/1%; one minute: 6%; five minutes: 6%
No time source, *12:41:02.578 CST Mon Mar 20 2017

LocID      RemID      Pseudowire      State  Last Chg Uniq ID    Type Mode RemSt
0x0000A012 0x8000A013 DS7/0/0:17      est    02:22:55 134         P    PSP  UP
0x0000A00D 0x8000A00E DS7/0/0:12      est    02:22:55 129         P    PSP  UP
0x0000A002 0x8000A003 DS7/0/0:1       est    02:22:55 118         P    PSP  UP
0x0000A00C 0x8000A00D DS7/0/0:11      est    02:22:55 128         P    PSP  UP
0x0000A013 0x8000A014 DS7/0/0:18      est    02:22:54 135         P    PSP  UP
0x45010004 0x00000601 US7/0/1:1(D)    est    02:22:54 143         P    PSP  UP
0x0000A010 0x8000A011 DS7/0/0:15      est    02:22:54 132         P    PSP  UP
0x45020004 0x00000800 US7/0/1:0(B)    est    02:22:54 139         P    PSP  UP
```

```
0x0000A00F 0x8000A010 DS7/0/0:14      est    02:22:54 131        P    PSP  UP
0x0000A00B 0x8000A00C DS7/0/0:10      est    02:22:54 127        P    PSP  UP
0x45080004 0x00000F01 US7/0/1:1(S)    est    02:22:54 145        P    PSP  UP
0x45010000 0x00000600 US7/0/1:0(D)    est    02:22:54 138        P    PSP  UP
0x45000000 0x00000D00 US7/0/1:0(M)    est    02:22:54 137        P    PSP  UP
0x0000A00E 0x8000A00F DS7/0/0:13      est    02:22:54 130        P    PSP  UP
0x0000A00A 0x8000A00B DS7/0/0:9       est    02:22:54 126        P    PSP  UP
0x45040000 0x00000B00 US7/0/1:0(R)    est    02:22:54 140        P    PSP  UP
0x0000A007 0x8000A008 DS7/0/0:6       est    02:22:54 123        P    PSP  UP
0x0000A011 0x8000A012 DS7/0/0:16      est    02:22:54 133        P    PSP  UP
0x0000A014 0x8000A015 DS7/0/0:19      est    02:22:54 136        P    PSP  UP
0x0000A004 0x8000A005 DS7/0/0:3       est    02:22:54 120        P    PSP  UP
0x0000A008 0x8000A009 DS7/0/0:7       est    02:22:54 124        P    PSP  UP
0x45080000 0x00000F00 US7/0/1:0(S)    est    02:22:54 141        P    PSP  UP
0x0000A006 0x8000A007 DS7/0/0:5       est    02:22:54 122        P    PSP  UP
0x0000A005 0x8000A006 DS7/0/0:4       est    02:22:54 121        P    PSP  UP
0x0000A009 0x8000A00A DS7/0/0:8       est    02:22:54 125        P    PSP  UP
0x45040004 0x00000B01 US7/0/1:1(R)    est    02:22:54 144        P    PSP  UP
0x45000004 0x00000D01 US7/0/1:1(M)    est    02:22:54 142        P    PSP  UP
0x0000A003 0x8000A004 DS7/0/0:2       est    02:22:54 119        P    PSP  UP
0x0000A001 0x8000A002 DS7/0/0:0       est    02:22:54 117        P    PSP  UP
0x45010008 0x00000600 US7/0/0:0(D)    est    02:22:55 167        P    PSP  UP
0x45000008 0x00000D00 US7/0/0:0(M)    est    02:22:55 166        P    PSP  UP
0x4501000C 0x00000601 US7/0/0:1(D)    est    02:22:54 172        P    PSP  UP
0x4500000C 0x00000D01 US7/0/0:1(M)    est    02:22:54 171        P    PSP  UP
0x45020000 0x00000800 US7/0/0:0(B)    est    02:22:54 168        P    PSP  UP
0x0001A00F 0x8000A010 DS7/0/0:14      est    02:22:54 160        P    PSP  UP
0x45040008 0x00000B00 US7/0/0:0(R)    est    02:22:54 169        P    PSP  UP
0x0001A009 0x8000A00A DS7/0/0:8       est    02:22:54 154        P    PSP  UP
0x0001A012 0x8000A013 DS7/0/0:17      est    02:22:54 163        P    PSP  UP
0x0001A013 0x8000A014 DS7/0/0:18      est    02:22:54 164        P    PSP  UP
0x0001A00C 0x8000A00D DS7/0/0:11      est    02:22:54 157        P    PSP  UP
0x0001A014 0x8000A015 DS7/0/0:19      est    02:22:54 165        P    PSP  UP
0x0001A010 0x8000A011 DS7/0/0:15      est    02:22:54 161        P    PSP  UP
0x0001A004 0x8000A005 DS7/0/0:3       est    02:22:54 149        P    PSP  UP
0x0001A002 0x8000A003 DS7/0/0:1       est    02:22:54 147        P    PSP  UP
0x0001A00D 0x8000A00E DS7/0/0:12      est    02:22:54 158        P    PSP  UP
0x0001A005 0x8000A006 DS7/0/0:4       est    02:22:54 150        P    PSP  UP
0x4504000C 0x00000B01 US7/0/0:1(R)    est    02:22:54 173        P    PSP  UP
0x0001A00E 0x8000A00F DS7/0/0:13      est    02:22:54 159        P    PSP  UP
0x0001A008 0x8000A009 DS7/0/0:7       est    02:22:54 153        P    PSP  UP
0x4508000C 0x00000F01 US7/0/0:1(S)    est    02:22:54 174        P    PSP  UP
0x0001A006 0x8000A007 DS7/0/0:5       est    02:22:54 151        P    PSP  UP
0x0001A00B 0x8000A00C DS7/0/0:10      est    02:22:54 156        P    PSP  UP
0x0001A00A 0x8000A00B DS7/0/0:9       est    02:22:54 155        P    PSP  UP
0x0001A007 0x8000A008 DS7/0/0:6       est    02:22:54 152        P    PSP  UP
0x0001A011 0x8000A012 DS7/0/0:16      est    02:22:54 162        P    PSP  UP
0x0001A001 0x8000A002 DS7/0/0:0       est    02:22:54 146        P    PSP  UP
0x45080008 0x00000F00 US7/0/0:0(S)    est    02:22:54 170        P    PSP  UP
0x0001A003 0x8000A004 DS7/0/0:2       est    02:22:54 148        P    PSP  UP
```

The following example shows the sample output for the **show cable rpd depi session endpoints** command for a specific RPD:

```
Router#show cable rpd depi session endpoints
Load for five secs: 4%/1%; one minute: 4%; five minutes: 4%
Time source is NTP, 14:50:21.553 CST Wed Mar 22 2017

DEPI Tunnel              RF Channel          EQAM RF-Port    Tsid       State  Type
0004.9f00.0413:57        Mod3:40961:57          -            40961      est    P
0004.9f00.0413:57        Mod3:40962:57          -            40962      est    P
```

```
0004.9f00.0413:57       Mod3:40963:57         -           40963      est    P
0004.9f00.0413:57       Mod3:40964:57         -           40964      est    P
0004.9f00.0413:57       Mod3:40965:57         -           40965      est    P
0004.9f00.0413:57       Mod3:40966:57         -           40966      est    P
0004.9f00.0413:57       Mod3:40967:57         -           40967      est    P
0004.9f00.0413:57       Mod3:40968:57         -           40968      est    P
0004.9f00.0413:57       Mod3:1073777665:57    -           1073777665 est    P
0004.9f00.0413:57       Mod3:1073777666:57    -           1073777666 est    P
0004.9f00.0413:57       Mod3:1073777667:57    -           1073777667 est    P
0004.9f00.0413:57       Mod3:1073777668:57    -           1073777668 est    P
0004.9f00.0413:57       Mod3:1073777669:57    -           1073777669 est    P
0004.9f00.0413:57       Mod3:1073777670:57    -           1073777670 est    P
0004.9f00.0413:57       Mod3:1073777671:57    -           1073777671 est    P
0004.9f00.0413:57       Mod3:1073777673:57    -           1073777673 est    P
0004.9f00.0413:57       Mod3:1073777674:57    -           1073777674 est    P
0004.9f00.0413:57       Mod3:1073777675:57    -           1073777675 est    P
0004.9f00.0413:57       Mod3:1073777676:57    -           1073777676 est    P
0004.9f00.0413:57       Mod3:1073777678:57    -           1073777678 est    P
0004.9f00.0413:57       Mod3:1073777679:57    -           1073777679 est    P
0004.9f00.0413:57       Mod3:1073777680:57    -           1073777680 est    P
0004.9f00.0413:57       Mod3:1073777681:57    -           1073777681 est    P
0004.9f00.0413:57       Mod3:1073777683:57    -           1073777683 est    P
0004.9f00.0413:57       Mod3:1073777684:57    -           1073777684 est    P
0004.9f00.0413:64       Mod3:48921:64         -           48921      est    P
0004.9f00.0413:64       Mod3:48922:64         -           48922      est    P
0004.9f00.0413:64       Mod3:48923:64         -           48923      est    P
0004.9f00.0413:64       Mod3:48924:64         -           48924      est    P
0004.9f00.0413:64       Mod3:48925:64         -           48925      est    P
0004.9f00.0413:64       Mod3:48926:64         -           48926      est    P
0004.9f00.0413:64       Mod3:48927:64         -           48927      est    P
0004.9f00.0413:64       Mod3:48928:64         -           48928      est    P
0004.9f00.0413:58       Mod3:43785:58         -           43785      est    P
0004.9f00.0413:58       Mod3:43786:58         -           43786      est    P
0004.9f00.0413:58       Mod3:43787:58         -           43787      est    P
0004.9f00.0413:58       Mod3:43788:58         -           43788      est    P
0004.9f00.0413:58       Mod3:43789:58         -           43789      est    P
0004.9f00.0413:58       Mod3:43790:58         -           43790      est    P
0004.9f00.0413:58       Mod3:43791:58         -           43791      est    P
0004.9f00.0413:58       Mod3:43792:58         -           43792      est    P
0004.9f00.0413:59       Mod3:44049:59         -           44049      est    P
0004.9f00.0413:59       Mod3:44050:59         -           44050      est    P
0004.9f00.0413:59       Mod3:44051:59         -           44051      est    P
0004.9f00.0413:59       Mod3:44052:59         -           44052      est    P
0004.9f00.0413:59       Mod3:44053:59         -           44053      est    P
0004.9f00.0413:59       Mod3:44054:59         -           44054      est    P
0004.9f00.0413:59       Mod3:44055:59         -           44055      est    P
0004.9f00.0413:59       Mod3:44056:59         -           44056      est    P
```

Related Commands

Command	Description
show cable rpd	Displays general information and status of RPD when the RPD is in the initialization state (L2TP).
show cable rpd depi tunnel	Displays DEPI tunnel information of RPD.

show cable rpd depi tunnel

To display Downstream External PHY Interface (DEPI) tunnel information of the Cisco Remote-PHY device (RPD), use the **show cable rpd depi tunnel** command in privileged EXEC mode.

show cable rpd {**slot** *slot* | [*mac-addressip-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | {*slot* /*subslot*/*port* }}**depitunnel***tunnel-id***ver**

Syntax Description

slot *slot*	(Optional) The slot number of the Digitial Position Independent Card (DPIC) that connects to the RPD.
mac-adderss	(Optional) MAC address of the RPD.
ip-address	(Optional) IP address of the RPD.
id *identifier*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitEthernet *slot*	(Optional) The slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.
tengigabitEthernet *subslot*	(Optional) The secondary slot number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD. The secondary slot number is always 1.
tengigabitEthernet *port*	(Optional) The port number of the DPIC in the Ten Gigabit Ethernet interface that connects to the RPD.
tunnel *tunnel-id***ver**	(Optional) Local tunnel identifier. The value ranges from 1 to 4,294,967,295.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to view the detailed information of DEPI tunnel with Layer 2 Tunnel Protocol (L2TP) status of the RPD.

Use the **show cable rpd depi tunnel** command to display the DEPI tunnel with Layer 2 Tunnel Protocol (L2TP) status of the RPD.

Use the **show cable rpd slot** *slot* **depi tunnel** command to display the DEPI tunnel information associated to a specific slot of the RPD.

Use the **show cable rpd tengigabitEthernet** *slot*/*subslot*/*port* **depi tunnel** command to display the DEPI tunnel information associated to the RPD on a specific Ten Gigabit Ethernet interface of the RPD.

Use the **show cable rpd** *mac-address* **depi tunnel** command to display a specific DEPI tunnel information associated to the RPD with a specific MAC address.

Use the **show cable rpd** *ip-address* **depi tunnel** command to display a specific DEPI tunnel associated to the RPD with a specific IP address.

Use the **show cable rpd id***identifier* **depi tunnel** command to display the DEPI tunnel information associated to the RPD with a specific identifier.

Use the **show cable rpd name** *name* **depi tunnel name** *name* command to display the DEPI tunnel information associated to the RPD with a specific name.

Use the **show cable rpd** *mac-address* **tengigabitEthernet** *slot/subslot/port* **depi tunnel** command to display the DEPI tunnel information associated to the RPD with a specific MAC address on a specific Ten Gigabit Ethernet interface of the RPD.

The following example shows the sample output for the **show cable rpd depi tunnel** command for particular RPD:

```
Router#show cable rpd 0004.9f03.0214 te7/1/0 depi tunnel

Load for five secs: 7%/2%; one minute: 6%; five minutes: 6%
No time source, *12:41:44.228 CST Mon Mar 20 2017

LocTunID   RemTunID   Remote Device  State  Remote Address  Sessn L2TP Class
                                                           Count
3388764998 1054297851 0004.9f03.0214 est    120.105.4.7     29    rphy-l2tp-gl...

TST78-NH04#show cable rpd 0004.9f03.0214 te7/1/0 depi ses
TST78-NH04#show cable rpd 0004.9f03.0214 te7/1/0 depi session
Load for five secs: 6%/2%; one minute: 6%; five minutes: 6%
No time source, *12:41:47.668 CST Mon Mar 20 2017

LocID      RemID      Pseudowire      State  Last Chg Uniq ID    Type Mode RemSt
0x45010008 0x00000600 US7/0/0:0(D)    est    02:23:40 167        P    PSP  UP
0x45000008 0x00000D00 US7/0/0:0(M)    est    02:23:40 166        P    PSP  UP
0x4501000C 0x00000601 US7/0/0:1(D)    est    02:23:40 172        P    PSP  UP
0x4500000C 0x00000D01 US7/0/0:1(M)    est    02:23:40 171        P    PSP  UP
0x45020000 0x00000800 US7/0/0:0(B)    est    02:23:40 168        P    PSP  UP
0x0001A00F 0x8000A010 DS7/0/0:14      est    02:23:40 160        P    PSP  UP
0x45040008 0x00000B00 US7/0/0:0(R)    est    02:23:39 169        P    PSP  UP
0x0001A009 0x8000A00A DS7/0/0:8       est    02:23:39 154        P    PSP  UP
0x0001A012 0x8000A013 DS7/0/0:17      est    02:23:39 163        P    PSP  UP
0x0001A013 0x8000A014 DS7/0/0:18      est    02:23:39 164        P    PSP  UP
0x0001A00C 0x8000A00D DS7/0/0:11      est    02:23:39 157        P    PSP  UP
0x0001A014 0x8000A015 DS7/0/0:19      est    02:23:39 165        P    PSP  UP
0x0001A010 0x8000A011 DS7/0/0:15      est    02:23:39 161        P    PSP  UP
0x0001A004 0x8000A005 DS7/0/0:3       est    02:23:39 149        P    PSP  UP
0x0001A002 0x8000A003 DS7/0/0:1       est    02:23:39 147        P    PSP  UP
0x0001A00D 0x8000A00E DS7/0/0:12      est    02:23:39 158        P    PSP  UP
0x0001A005 0x8000A006 DS7/0/0:4       est    02:23:39 150        P    PSP  UP
0x4504000C 0x00000B01 US7/0/0:1(R)    est    02:23:39 173        P    PSP  UP
0x0001A00E 0x8000A00F DS7/0/0:13      est    02:23:39 159        P    PSP  UP
0x0001A008 0x8000A009 DS7/0/0:7       est    02:23:39 153        P    PSP  UP
0x4508000C 0x00000F01 US7/0/0:1(S)    est    02:23:39 174        P    PSP  UP
0x0001A006 0x8000A007 DS7/0/0:5       est    02:23:39 151        P    PSP  UP
0x0001A00B 0x8000A00C DS7/0/0:10      est    02:23:39 156        P    PSP  UP
0x0001A00A 0x8000A00B DS7/0/0:9       est    02:23:39 155        P    PSP  UP
0x0001A007 0x8000A008 DS7/0/0:6       est    02:23:39 152        P    PSP  UP
0x0001A011 0x8000A012 DS7/0/0:16      est    02:23:39 162        P    PSP  UP
0x0001A001 0x8000A002 DS7/0/0:0       est    02:23:39 146        P    PSP  UP
```

```
0x45080008 0x00000F00 US7/0/0:0(S)    est    02:23:39 170        P    PSP  UP
0x0001A003 0x8000A004 DS7/0/0:2       est    02:23:39 148        P    PSP  UP
```

Related Commands

Command	Description
show cable rpd	Displays general information and status of RPD when the RPD is in the initialization state (L2TP).
show cable rpd depi session	Displays DEPI session information of RPD.

show cable rpd event

To display event logging information and messages of the Cisco Remote PHY Devices (RPD), use the **show cable rpd event** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*]**event**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify error event information of the RPD.

The following example shows the sample output for the **showcable rpdevent** command for RPDs:

```
Router#show cable rpd event

RPD            EventId  Level Count      LastTime       Message
0004.9f00.0401 66070205 Error 37         Nov21 22:43:41 Loss of Clock Sync
0004.9f00.0401 66070206 Notic 1          Nov21 22:43:42 Clock Sync Reestablished
0004.9f30.0255 66070201 Criti 36         Nov21 14:13:59 Connection lost - Principal CCAP
Core CCAP-IP=30.85.33.1
0004.9f30.0255 66070202 Error 7          Nov21 14:44:44 Principal Core Not Found
0004.9f30.0255 66070204 Error 712        Nov21 14:44:36 GCP Connection Failure
CCAP-IP=30.85.33.1
0004.9f30.0255 66070205 Error 2210       Nov21 14:46:55 Loss of Clock Sync
0004.9f30.0255 66070214 Notic 22         Nov21 14:30:09 Ethernet Link Up vbh0
```

show cable rpd gcp-session

To display the GCP session information for the Cisco Remote-PHY device (RPD), use the **show cable rpd tengigabitethernetgcp-session** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd {**slot** *slot* | [*ip-address mac-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | {*slot /subslot/port* }}**gcp-session**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the GCP session details with the packet and message statistical information of the RPD.

The following example shows the sample output for the **show cable rpd tengigabitethernetgcp-session** command for a specific RPD:

```
Router#show cable rpd name node te1/1/0 gcp-session

GCP Session ID : 10
Core Address   : 120.100.1.1:8190
RPD Address    : 120.100.1.20:60656
Next Hop MAC   : 0004.9F00.0901
Session State  : Active

Packet Statistics:
========================
Rx         : 5038
Tx         : 5034
Rx Dropped : 0
```

```
Tx Dropped : 0

Message Statistics:
=======================
Rx         : 5948
Tx         : 5954
Rx Dropped : 7
Tx Dropped : 0
Rx Illegal : 0
Tx Illegal : 0
```

Related Commands

Command	Description
show cable rpd	Displays general information and status of the RPD, when the RPD is in the initialization state (GCP).
show cable rpd gcp-state	Displays GCP state information of the RPD.

show cable rpd gcp-state

To display the Generic Control Plane (GCP) state information of Cisco Remote-PHY device (RPD), use the **show cable rpd tengigabitethernetgcp-state** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd {**slot** *slot* | [*mac-addressip-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | {*slot* */subslot/port* }}**gcp-state**

Syntax Description

mac-adderss	(Optional) MAC address of the RPD.
ip-address	(Optional) IP address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

To display the Generic Control Plane (GCP) state information of the RPD.

The following example shows the sample output for the **show cable rpd tengigabitethernetgcp-state** command for a specific RPD:

```
Router#show cable rpd 0004.9f03.0280 Te3/1/0 gcp-state

MAC Address     IP Address       I/F       State        Role HA  Name
0004.9f03.0280  120.101.19.9     Te3/1/0   ready        Pri  Act 2

A06#show cable rpd 0004.9f03.0280 Te3/1/0 gcp-state
MAC Address     IP Address       I/F       State        Role HA  Name
0004.9f03.0280  120.101.19.9     Te3/1/0   ready        Pri  Act 2
```

Related Commands

Command	Description
show cable rpd	Displays general information and status of the RPD, when the RPD is in the initialization state (GCP).
show cable rpd gcp-session	Displays GCP session information of the RPD.

show cable rpd gcp-transaction

To display the complete history and the current Generic Control Plane (GCP) transaction information for the Cisco Remote-PHY device (RPD), use the **show cable rpd tengigabitethernetgcp-transaction** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd {**slot** *slot* | [*ip-address mac-address* | **id** *id* | **name** *name*] | **tengigabitethernet** | {*slot* */subslot/port* }}**gcp-transaction**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the GCP transaction information of the RPD.

Use the **show cable rpd tengigabitethernetgcp-transaction verbose** command to view the detailed GCP message information for the RPD) in privileged EXEC mode.

The following example shows the sample output for the **show cable rpd tengigabitethernetgcp-transaction** command for a specific RPD:

```
Router#show cable rpd 120.102.6.7 te9/1/1 gcp-transaction
 Load for five secs: 3%/1%; one minute: 4%; five minutes: 4%
No time source, *10:22:57.158 CST Thu Mar 16 2017

RPD ID           I/F        TRANS ID   GCP MSG TYPE             RCP MSG TYPE   TIMESTAMP
---------------- ---------- ---------- ------------------------ --------------
-------------------------
0004.9f31.1007   Te9/1/1    7452       GCP_MSG_ID_EDS_RSP       TYPE_REX       2017-03-16
10:22:54.440
0004.9f31.1007   Te9/1/1    7452       GCP_MSG_ID_EDS           TYPE_REX       2017-03-16
```

```
10:22:54.415
0004.9f31.1007   Te9/1/1    7451       GCP_MSG_ID_EDS_RSP       TYPE_REX       2017-03-16
10:22:54.240
0004.9f31.1007   Te9/1/1    7451       GCP_MSG_ID_EDS           TYPE_REX       2017-03-16
10:22:54.215
0004.9f31.1007   Te9/1/1    7450       GCP_MSG_ID_EDS_RSP       TYPE_REX       2017-03-16
10:22:54.040
0004.9f31.1007   Te9/1/1    7450       GCP_MSG_ID_EDS           TYPE_REX       2017-03-16
10:22:54.015
0004.9f31.1007   Te9/1/1    7449       GCP_MSG_ID_EDS_RSP       TYPE_REX       2017-03-16
10:22:53.836
0004.9f31.1007   Te9/1/1    7449       GCP_MSG_ID_EDS           TYPE_REX       2017-03-16
10:22:53.815
0004.9f31.1007   Te9/1/1    7448       GCP_MSG_ID_EDS_RSP       TYPE_REX       2017-03-16
10:22:50.236
0004.9f31.1007   Te9/1/1    7448       GCP_MSG_ID_EDS           TYPE_REX       2017-03-16
10:22:50.215
0004.9f31.1007   Te9/1/1    7447       GCP_MSG_ID_EDS_RSP       TYPE_REX       2017-03-16
10:22:50.038
0004.9f31.1007   Te9/1/1    7447       GCP_MSG_ID_EDS           TYPE_REX       2017-03-16
10:22:50.015
0004.9f31.1007   Te9/1/1    7446       GCP_MSG_ID_EDS_RSP       TYPE_REX       2017-03-16
10:22:49.839
0004.9f31.1007   Te9/1/1    7446       GCP_MSG_ID_EDS           TYPE_REX       2017-03-16
10:22:49.815
```

The following example shows the sample output for the **show cable rpd tengigabitethernetgcp-transaction verbose** command for a specific RPD:

```
Router#show cable rpd 120.102.6.7 te9/1/1 gcp-transaction verbose

Load for five secs: 3%/1%; one minute: 3%; five minutes: 3%
No time source, *10:24:52.791 CST Thu Mar 16 2017

DETAILED TRANSACTION FOR RPD(0004.9f31.1007)
------------------------------------------------
RPD ID                        : 0004.9f31.1007
I/F                           : Te9/1/1
TRANS ID                      : 7616
GCP MSG TYPE                  : GCP_MSG_ID_EDS_RSP
RCP MSG TYPE                  : TYPE_REX
TIMESTAMP                     : 2017-03-16 10:24:51.238
MODE                          : 0
PORT                          : 0
CHANNEL                       : 0
VENDOR ID                     : 4491
VENDOR INDEX                  : 1
TLV                           :
{ T = TYPE_REX, L = 65, V =
    { T = TYPE_SEQUENCE, L = 62, V =
        { T = TYPE_SEQUENCENUMBER, L = 2, V = 7616 }
        { T = TYPE_OPERATION, L = 1, V = 5 }
        { T = TYPE_RESPONSECODE, L = 1, V = 0 }
        { T = TYPE_RFCHANNEL, L = 46, V =
            { T = TYPE_RFCHANNELSELECTOR, L = 12, V =
                { T = TYPE_RFPORTINDEX, L = 1, V = 0 }
                { T = TYPE_RFCHANNELTYPE, L = 1, V = 5 }
                { T = TYPE_RFCHANNELINDEX, L = 1, V = 3 }
            }
            { T = TYPE_FFT_TRIGGER, L = 28, V =
                { T = TYPE_SID, L = 2, V = 8191 }
```

```
                    { T = TYPE_FREQ, L = 4, V = 31400 }
                    { T = TYPE_IUC, L = 1, V = 4 }
                    { T = TYPE_SIZE, L = 4, V = 4 }
                    { T = TYPE_MODE, L = 2, V = 6 }
                }
            }
        }
    }
```

show cable rpd group

To display Cisco Remote-PHY devices (RPD) of all groups, use the **show cable rpd group** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd group *group id*
clear cable rpd group *group id* {**reset** | **delete**}
show cable rpd group { **eeprom-fanio** | **eeprom-psio** | **eeprom-psu** }

Syntax Description

group id	Specify the ID of the group to display RPDs of that group.
reset	Reset RPDs of a specific group.
delete	Delete RPDs of a specific group.
eeprom-fanio	Shows shelf group fanio eeprom info.
eeprom-psio	Shows shelf group psio eeprom info.
eeprom-psu	Shows shelf group psu eeprom info.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Fuji 16.8.1	Options to show eeprom info for shelf group fanio, psio, and psu were added.

The following example shows the sample output for the **show cable rpd group** command to display specific RPDs:

```
Router# show cable rpd group 0004.9f30.a078

MAC Address     IP Address       I/F     State        Group Id          Slot   M Name

0100.5e0a.0a02  192.0.2.1      Te6/1/1   online       0004.9f30.a078    0      Y
h01-shelf-rpd1
0100.5e0a.0a04  192.0.2.24     Te6/1/1   online       0004.9f30.a078    1      N
h01-shelf-rpd2
```

The following example shows the sample output for the **show cable rpd group eeprom-fanio** command:

```
Router# show cable rpd group eeprom-fanio
```

```
---------- Group Id 0053.bff4.4b6e -----------
Eeprom format version: 04
Compatiblity Byte: FF
Controller Type - Type: 40
Controller Type - High Byte: 0D
Controller Type - Low Byte: 7F
Hardware Version - Type: 41
Hardware Version - High Byte: 02
Hardware Version - Low Byte: 00
PCA Part Number - Type: 82
PCA Part Number - Values: 73-18623-2
PCA Revision - Type: 42
PCA Revision - Values: 42 30
TAN Part Number - Type: C0
TAN Part Number - Length: 46
TAN Part Number: 800-104482-2
TAN Revision Number - Type: 8D
TAN Revision Number: 42 30 00 00
Product Number (PID) - Type: CB
Product Number (PID) - Length: 92
Product Number (PID): RPHY_SHELF_3X6
Version ID (VID) - Type: 89
Version ID (VID): V02
CLEI Code - Type: C6
CLEI Code - Length: 8A
CLEI Code: CAMME00BRB
Deviation Number - Type: 88
Deviation Number: 00 00 00 00
PCB Fab Version - Type: 02
PCB Fab Version: 02
PCA Serial Number - Type: C1
PCA Serial Number - Length: 8B
PCA Serial Number: CAT2222E1JJ
RMA Test History - Type: 03
RMA Test History: 00
RMA Number - Type: 81
RMA Number: 00 00 00 00
RMA History - Type: 04
RMA History: 00
Manufacturing Test Data - Type: C4
Manufacturing Test Data - Length: 08
Manufacturing Test Data: 00 00 00 00 00 00 00 00
Field Diagnostic Data - Type: C5
Field Diagnostic Data - Length: 08
Field Diagnostic Data: 00 00 00 00 00 00 00 00
Asset ID - Type: CC
Asset ID - Length: A0
Asset ID: 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
 20 20 20 20 20
Licensing Transaction ID - Type: 8B
Licensing Transaction ID: 00 00 00 00
```

The following example shows the sample output for the **show cable rpd group eeprom-psio** command:

```
Router# show cable rpd group eeprom-psio
---------- Group Id 0053.bff4.4b6e -----------
Eeprom format version: 04
Compatiblity Byte: FF
Controller Type - Type: 40
Controller Type - High Byte: 0D
Controller Type - Low Byte: 7F
```

```
Hardware Version - Type: 41
Hardware Version - High Byte: 01
Hardware Version - Low Byte: 00
PCA Part Number - Type: 82
PCA Part Number - Values: 73-18592-1
PCA Revision - Type: 42
PCA Revision - Values: 46 30
TAN Part Number - Type: C0
TAN Part Number - Length: 46
TAN Part Number: 800-104482-2
TAN Revision Number - Type: 8D
TAN Revision Number: 42 30 00 00
Product Number (PID) - Type: CB
Product Number (PID) - Length: 92
Product Number (PID): RPHY_SHELF_3X6
Version ID (VID) - Type: 89
Version ID (VID): V02
CLEI Code - Type: C6
CLEI Code - Length: 8A
CLEI Code: CAMME00BRB
Deviation Number - Type: 88
Deviation Number: 00 00 00 00
PCB Fab Version - Type: 02
PCB Fab Version: 01
PCA Serial Number - Type: C1
PCA Serial Number - Length: 8B
PCA Serial Number: CAT2222E0UX
RMA Test History - Type: 03
RMA Test History: 00
RMA Number - Type: 81
RMA Number: 00 00 00 00
RMA History - Type: 04
RMA History: 00
Manufacturing Test Data - Type: C4
Manufacturing Test Data - Length: 08
Manufacturing Test Data: 00 00 00 00 00 00 00 00
Field Diagnostic Data - Type: C5
Field Diagnostic Data - Length: 08
Field Diagnostic Data: 00 00 00 00 00 00 00 00
Asset ID - Type: CC
Asset ID - Length: A0
Asset ID: 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
 20 20 20 20 20
Licensing Transaction ID - Type: 8B
Licensing Transaction ID: 00 00 00 00
System MAC Address - Type: C3
System MAC Address - Length: 06
System MAC Address: 00:53:bf:f4:4b:6e
System MAC Address Block Size - Type: 43
System MAC Address Block Size: 00 01 C2 8B
Chassis Serial Number - Type Field: C2
Chassis Serial Number - Length Field: 8B
Chassis Serial Number: CAT2223E15D
```

The following example shows the sample output for the **show cable rpd group eeprom-psu** command:

```
Router# show cable rpd group eeprom-psu
---------- Group Id 0053.bff4.4b6e -----------
PSU0:   PRESENT
Block Signature: 0xABAB
Block Version: 2
```

```
Block Length: 124
Block Checksum: 3734
Seeprom Size: 4096
Block Count: 2
Fru Major Type: 0x4501
Fru Minor Type: 0x0014
OEM String: Cisco
Product Number (PID): RPHYSHLF_AC=
Serial Number: POG2201BT6K
Part Number: 341-100760-01
Part Version: A0
MFG Deviation: 0
HW Rev Major: 0x0001
HW Rev Minor: 0x0000
Power Consumption: 750
RMA_Failure Code: 0,0,0,0
Block Signature: 0x4601
Block Version: 1
Block Length: 22
Block Checksum: 932
CLEI Code: CAP1AAEAAA
Version ID (VID): V01

PSU1:   PRESENT
Block Signature: 0xABAB
Block Version: 2
Block Length: 124
Block Checksum: 3750
Seeprom Size: 4096
Block Count: 2
Fru Major Type: 0x4501
Fru Minor Type: 0x0014
OEM String: Cisco
Product Number (PID): RPHYSHLF_AC=
Serial Number: POG2201BTAP
Part Number: 341-100760-01
Part Version: A0
MFG Deviation: 0
HW Rev Major: 0x0001
HW Rev Minor: 0x0000
Power Consumption: 750
RMA_Failure Code: 0,0,0,0
Block Signature: 0x4601
Block Version: 1
Block Length: 22
Block Checksum: 932
CLEI Code: CAP1AAEAAA
Version ID (VID): V01
```

show cable rpd host-resources

To display the brief CPU process and memory information of the Cisco Remote PHY Devices (RPD), use the **show cable rpd host-resources** command in privileged EXEC mode.

show cable rpd [*ip-address mac-address* | **id** *identifier* | **name** *name*]**host-resources**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *identifier*	(Optional) Unique string to identify the RPD. Specifies the MAC address of the RPD.
name	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the CPU process and memory information of the RPD.

The following sample output shows the **show cable rpd host-resources** command for a specific RPD:

```
Router#show cable rpd name node host-resources
RPD ID                  : 0004.9f00.0901
MemorySize              : 898112KB
CPU Load                : 73%

Storages:
  Index    Type             Size(KB)   Used(KB)  AllocUnits  AllocFailures
  1        Ram              898112     682116       1024         0
  2        FixedDisk        128804     87288        1024         0
  3        VirtualMemory    131072     20728        1024         0

Processes:
  Pid      CPU    Memory(KB)  Status       Type
  3550      0%    41416       runnable     Application
  3553      0%    40692       runnable     Application
  2924      0%    39776       runnable     Application
```

The following sample output shows the **showcable rpd***RPD ID***host-resources** command:

```
router#show cable rpd 0004.9f00.0901 host-resources
Load for five secs: 3%/0%; one minute: 5%; five minutes: 5%
No time source, *02:29:47.704 UTC Thu Jun 13 2019
```

```
RPD ID                  : 0004.9f00.0901

Storages:
 Index    Type      AllocUnits   AllocFailures  Size        Used        Descr
 1        4         1024         0              128804      90272       /
 2        3         1024         0              131072      5192        /tmp
 3        3         1024         0              512         0           /dev
 4        9         1024         0              5160576     1604416     /bootfla
 5        5         1024         0              2064208     148044      /rpd
 6        5         1024         0              266727      53519       /obfl
 7        3         1024         0              65536       0           /tmp/ssd
 8        3         1024         0              65536       1920        /tmp/tra

Processes:
 Index     Type                Status         CPU         Memory      Name
 1         Application         runnable       0           1868        procd
 2         Operating System    runnable       0           0           kthreadd
 ...
 ...
 4233      Application         runnable       0           1600        dropbear
 6021      Application         runnable       0           2496        udhcpc
 6076      Application         runnable       0           2536        rsyslogd
 9054      Operating System    runnable       0           0           kworker/
 13252     Operating System    runnable       0           0           kworker/

router#show redundancy linecard all
Load for five secs: 4%/0%; one minute: 5%; five minutes: 5%
No time source, *02:29:09.997 UTC Thu Jun 13 2019

              LC     My         Peer       Peer     Peer
Slot Subslot  Group  State      State      Slot     Subslot  Role     Mode
-------------------------------------------------------------------------------
 1   -        0      Stdby Hot  Active     0        -        Standby  Primary
 0   -        0      Active     Stdby Hot  1        -        Active   Secondary
```

show cable rpd lcce-chan-reach

To display the connectivity constrains and channel supported information of the Cisco Remote PHY Device (RPD), use the **show cable rpd lcce-chan-reach** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] **lcce-chan-reach**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the Ethernet port and RF port details with the channel type of RPD.

The following example shows the sample output for the **showcable rpdlcce-chan-reach** command for a specific RPD:

```
Router#show cable rpd 0004.9f00.0907 lcce-chan-reach

RPD ID          EthPort     ChnlType    RFPort  FirstChnl   LastChnl
0004.9f00.0907  1           DsScQam     1       1           1
```

show cable rpd identification

To display the identification parameters of the Cisco Remote-PHY device (RPD), use the **show cable rpd identification** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*]**identification**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the vendor details with model number and software version of a specific RPD.

The following example shows the sample output for the **showcable rpdidentification** command for a specific RPD:

```
Router#show cable rpd name node identification

RPD ID                                  : 0004.9f00.0907
Vendor Name                             : Cisco
Vendor Id                               : AB
Model Number                            : 123456
Device Mac Address                      : 0004.9F00.0907
Current Sw Version                      : Prototype
Boot Rom Version                        :
Device Description                      : TestingPrototypeWithHardcodedValues
Device Alias                            : TP
Serial Number                           : 123456
Us Burst Receiver Vendor Id             :
Us Burst Receiver Model Number          :
Us Burst Receiver Driver Version        :
Us Burst Receiver Serial Number         :
Rpd Rcp Protocol Version                : 1.0
Rpd Rcp Schema Version                  : 1.0.0
Hw Revision                             :
```

show cable rpd info

To display specific information of the Cisco Remote PHY Device (RPD), use the **show cable rpd info** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd info

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The output of the command is updated to display the RPD name.
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify specific information of the RPD.

The following example shows the sample output for the **showcable rpdinfo** command for a specific RPD:

```
Router#show cable rpd info
Load for five secs: 4%/0%; one minute: 5%; five minutes: 5%
No time source, *07:08:04.508 EDT Fri Sep 13 2024

RPD ID                : 246c.84f4.1a60
RPD Name              : RPD_dev2
SysUpTime             : 2h51m
NumCrashFilesAvail    : 0
PrincipalCoreStatus   : 7

RPD ID                : 9088.556b.a454
RPD Name              : RPD_dev1
SysUpTime             : 2h51m
NumCrashFilesAvail    : 0
PrincipalCoreStatus   : 7
```

show cable rpd ipv6

To display IPv6 information of the Cisco Remote PHY Devices (RPD), use the **show cable ipv6** command in privileged EXEC mode.

show cable rpd ipv6

Command Modes

Privileged EXEC (#)

Related Commands

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The output of the command is updated to display the RPD name.

The following example shows the RPD IPV6 Status:

```
Router#show cable rpd ipv6
Load for five secs: 4%/0%; one minute: 5%; five minutes: 5%
No time source, *07:08:04.510 EDT Fri Sep 13 2024

MAC Address     Name                          I/F       State        Role HA  Auth IP
Address
246c.84f4.1a60  RPD_dev2                      Te8/1/0   online       Pri  Act N/A
2002::6621:6519
9088.556b.a40c  RPD_dev3                      Te8/1/0   offline      Pri  Act N/A
2002::6621:65CE
9088.556b.a454  RPD_dev1                      Te8/1/0   online       Pri  Act N/A
2002::6621:656A

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd lcha-cores

To display the Cisco Remote PHY Device (RPD) Line Card High Availability (LCHA) active and standby cores, use the **show cable rpd lcha-cores** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*]**lcha-cores** [*active standbysummary*]

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
active	(Optional) Displays RPD LCHA active cores.
standby	(Optional) Displays RPD LCHA standby cores.
summary	(Optional) Displays RPD LCHA cores summary.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the RPD LCHA cores.

The following example shows the sample output for the **showcable rpd lcha-cores** command:

```
Router#show cable rpd lcha-cores

MAC Address     IP Address    I/F       State        Role HA  Auth Name
0000.5e00.5396  192.0.2.21    Te1/1/0   online       Pri  Act N/A  shelf-node8
0000.5e00.53c0  192.0.2.106   Te1/1/1   online       Pri  Act N/A  shelf-node9
0000.5e00.5320  192.0.2.104   Te1/1/2   online       Pri  Act N/A  shelf-node10
0000.5e00.5361  192.0.2.100   Te7/1/0   online       Pri  Act N/A  node0
0000.5e00.5361  192.0.2.100   Te0/1/0   offline      NA   Sby N/A  node0
0000.5e00.5361  192.0.2.100   Te0/1/1   offline      NA   Sby N/A  node0
0000.5e00.5361  192.0.2.100   Te7/1/1   online       Aux  Act N/A  node0
0000.5e00.538e  192.0.2.130   Te7/1/1   online       Pri  Act N/A  node2
0000.5e00.538e  192.0.2.130   Te0/1/1   offline      NA   Sby N/A  node2
0000.5e00.5302  192.0.2.102   Te7/1/1   online       Pri  Act N/A  node1
0000.5e00.5302  192.0.2.102   Te0/1/1   offline      NA   Sby N/A  node1
0000.5e00.53c4  192.0.2.110   Te7/1/2   online       Pri  Act N/A  node3
0000.5e00.53c4  192.0.2.110   Te0/1/2   offline      NA   Sby N/A  node3
```

```
0000.5e00.53cc  192.0.2.102   Te7/1/2   online       Pri  Act N/A  node4
0000.5e00.53cc  192.0.2.102   Te0/1/2   offline      NA   Sby N/A  node4
0000.5e00.53ee  192.0.2.128   Te7/1/4   online       Pri  Act N/A  shelf-node5
0000.5e00.53ee  192.0.2.128   Te0/1/4   offline      NA   Sby N/A  shelf-node5
0000.5e00.530d  192.0.2.101   Te7/1/5   online       Pri  Act N/A  shelf-node6
0000.5e00.530d  192.0.2.101   Te0/1/5   offline      NA   Sby N/A  shelf-node6
0000.5e00.5330  192.0.2.120   Te7/1/6   online       Pri  Act N/A  shelf-node7
0000.5e00.5330  192.0.2.120   Te0/1/6   offline      NA   Sby N/A  shelf-node7

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd location

To display the location information of the Cisco Remote PHY Device (RPD), use the **show cable rpd location** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] **location**

Syntax Description

ip-address	(Optional) Location information displayed for the RPD with the specified IP address.
MAC adderss	(Optional) Location information displayed for the RPD with the specified MAC address.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the location information of the remote physical device.

The following example shows the sample output for the **showcable rpdlocation** command for a specific RPD:

```
Router#show cable rpd 0004.9f00.0907 location

RPD ID                          : 0004.9f00.0907
Location Description            : NM
Latitude                        : NN
Longitude                       : NO
```

show cable rpd md-association

To display MAC Domain (MD) association details of the Cisco Remote PHY Devices (RPD), use the **show cable rpd md-association** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd {**slot** *slot* | **tengigabitethernet** | {*slot /subslot/port* }}**md-association**

Syntax Description

slot	(Optional) The slot number of the Digitial Position Independent Card (DPIC) that connects to the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The output of the command is updated to display the RPD Alias (RPD Name) and the associated fiber node IDs information.
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify MD association of the RPD.

The following example shows the sample output for the **showcable rpd md-association** command:

```
Router#show cable rpd md-association
Load for five secs: 4%/0%; one minute: 5%; five minutes: 5%
No time source, *07:11:09.911 EDT Fri Sep 13 2024

RPD ID: 246c.84f4.1a60
RPD Name: RPD_dev2

RPD Principal Core Te8/1/0:
  DS 0 controller: 8/0/1  (profile 1, DOCSIS)
  DS 1 controller: NA
  US 0 controller: 8/0/2  (profile 1, DOCSIS)
  US 1 controller: 8/0/3  (profile 1, DOCSIS)
  US 2 controller: NA
  US 3 controller: NA
  Mac Domain: Ca8/0/1
  Fiber node: 3, 4

RPD ID: 9088.556b.a40c
RPD Name: RPD_dev3
```

```
RPD Principal Core Te8/1/0:
  DS 0 controller: NA
  DS 1 controller: 8/0/2  (profile 1, DOCSIS)
  US 0 controller: NA
  US 1 controller: NA
  US 2 controller: 8/0/4  (profile 1, DOCSIS)
  US 3 controller: 8/0/5  (profile 1, DOCSIS)
  Mac Domain: Ca8/0/2
  Fiber node: 5, 6

RPD ID: 9088.556b.a454
RPD Name: RPD_dev1

RPD Principal Core Te8/1/0:
  DS 0 controller: 8/0/0  (profile 1, DOCSIS)
  DS 1 controller: NA
  US 0 controller: NA
  US 1 controller: 8/0/1  (profile 1, DOCSIS)
  US 2 controller: NA
  US 3 controller: NA
  Mac Domain: Ca8/0/0
  Fiber node: 2
```

show cable rpd name

To display the Cisco Remote PHY Device (RPD) name, use the **show cable rpd name** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd {**slot** *slot* | **tengigabitethernet** | {*slot /subslot/port* }}**name**

Syntax Description

slot	(Optional) The slot number of the Digitial Position Independent Card (DPIC) that connects to the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the complete detailed information of RPDs.

The following example shows the sample output for the **showcable rpd name** command:

```
Router#show cable rpd name

MAC Address     Name
0000.5e00.5379  node_2_0
0000.5e00.5337  node_3_0
0000.5e00.5343  node_0_6
0000.5e00.5373  node_0_5
0000.5e00.5301  node_0_8
0000.5e00.5307  node_0_7
0000.5e00.5327  node_0_1
0000.5e00.5387  node_0_2
0000.5e00.5393  node_0_0
0000.5e00.5337  node_0_3
```

The following example shows the sample output for the **showcable rpd tengigabitethernet name** command:

```
Router#show cable rpd te1/1/0 name
```

```
MAC Address    Name
0000.5e00.5361 node0
```

The following example shows the sample output for the **showcable rpd slot name** command:

```
Router#show cable rpd slot 1 name

MAC Address    Name
0000.5e00.5396 shelf-node8
0000.5e00.53c0 shelf-node9
0000.5e00.5320 shelf-node10
```

The following example shows the sample output for the **showcable rpd tengigabitethernet name** command:

```
Router#show cable rpd tengigabitethernet 7/1/0 name

MAC Address    Name
0004.9f31.0161 node0
```

show cable rpd online

To display the Cisco Remote PHY Device (RPD) in the online state, use the **show cable rpd online** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd {**slot** *slot* | **tengigabitethernet** | {*slot /subslot/port* }}**online**

Syntax Description

slot *slot*	Slot number of the RPD line card to which the RPDs are connected.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the RPDs that are in the online state.

The following example shows the sample output for the **show cable rpd online** command:

```
Router#show cable rpd online

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.10       Te7/1/0   online       Pri  Act node
0000.5e00.5301  192.0.2.10       Te7/1/1   online       Aux  Act node
0000.5e00.5301  192.0.2.10       Te7/1/2   online       Aux  Act node
0000.5e00.5301  192.0.2.10       Te7/1/7   online       Aux  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd slot** *slot* **online** command:

```
Router#show cable rpd slot 7 online

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.10       Te7/1/0   online       Pri  Act node
0000.5e00.5301  192.0.2.10       Te7/1/1   online       Aux  Act node
0000.5e00.5301  192.0.2.10       Te7/1/2   online       Aux  Act node
0000.5e00.5301  192.0.2.10       Te7/1/7   online       Aux  Act node
```

```
! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd tengigabitethernet online** command:

```
Router#show cable rpd tenGigabitEthernet 7/1/0 online

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5301  192.0.2.10       Te7/1/7   online       Aux  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd offline

To display the Cisco Remote PHY Device (RPD) in the offline state, use the **show cable rpd offline** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd {**slot** *slot* | **tengigabitethernet** | {*slot /subslot/port* }}**offline**

Syntax Description

slot *slot*	Slot number of the RPD line card to which the RPDs are connected.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the RPDs that are in the offline state.

The following example shows the sample output for the **show cable rpd offline** command:

```
Router#show cable rpd offline

MAC Address     I/F      State        Previous State  Offline Time     Role HA
0000.5e00.5320  Te1/1/0  offline      !online         Mar 01 09:58:42  Pri  Act
0000.5e00.5301  Te1/1/0  offline      !online         Mar 01 09:58:42  Pri  Act

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd slot** *slot* **offline** command:

```
Router#show cable rpd slot 1 offline

MAC Address     I/F      State        Previous State  Offline Time     Role HA
0000.5e00.5355  Te1/1/0  offline      !online         Mar 01 09:58:42  Pri  Act
0000.5e00.5301  Te1/1/0  offline      !online         Mar 01 09:58:42  Pri  Act

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd tengigabitethernet offline** command:

```
Router#show cable rpd te 1/1/0 offline

MAC Address     I/F      State        Previous State  Offline Time     Role HA
0000.5e00.5355  Te1/1/0  offline      !online         Mar 01 09:58:42  Pri  Act

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd pilot-tone

To display the pilot tone configuration of a specific Cisco Remote PHY Device (RPD), use the **show cable rpd pilot-tone** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd {[*mac-addressip-address* | **id** *identifier* | **name** *name*]}**pilot-tone**

Syntax Description

mac-adderss	(Optional) MAC address of the RPD.
ip-address	(Optional) IP address of the RPD.
id *identifier*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the pilot tones and alignment carriers information, and the leakage detection signal of a specific RPD.

Use the **show cable rpd capability** command to show the pilot tone capability of the RPD.

The following example shows the sample output for the **show cable rpdpilot-tone** command:

```
Router#show cable rpd 0004.9f00.0719 pilot-tone
Load for five secs: 8%/1%; one minute: 9%; five minutes: 9%
No time source, *06:03:44.969 CST Wed Mar 29 2017

Downstream 0 pilot tone profile 1:
  SC-QAM as tone list:
   rf-chan-id     freq         pwr_adj mute
   35             267000000    0.0     N
   37             270000000    10.0    N
  Dedicated tone list:
   dedicated-tone freq         freq_frac pwr_adj mute
   0              400000000    0         12.0    N
   1              401000000    0         10.0    N
   2              287000000    0         10.0    N
   3              289000000    0         -10.0   N
```

The following example shows the sample output for the **show cable rpdcapability** command:

```
Router#show cable rpd  7.5.5.13 capability
```

```
Number of CW Tone Generators              : 4
Lowest CW Tone Frequency                  : 48000000
Highest CW Tone Frequency                 : 999000000
Maximum Power of CW Tone Generators       : 340
QAM as Pilot setting                      : 1
```

Related Commands

Command	Description
show cable rpd capability	Displays the pilot tone capability of a specific RPD.

show cable rpd principal

To display the Cisco Remote PHY Device (RPD) with the principal role, use the **show cable rpd principal** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd principal

show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] **principal**

Syntax Description

ip-address	(Optional) IP address of the RPD with the principal role.
mac-adderss	(Optional) MAC address of the RPD with the principal role.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD with the principal role.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the RPDs that are in the principal role.

The following example shows the sample output for the **show cable rpd principal** command:

```
Router#show cable rpd principal

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.53c0  192.0.2.16       Te7/1/0   online       Pri  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd** *ip-address* **principal** command:

```
Router#show cable rpd 93.7.10.11 principal

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.53c0  192.0.2.16       Te7/1/0   online       Pri  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd** *MAC address* **principal** command:

```
Router#show cable rpd 0004.9f00.0413 principal

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.53c0  192.0.2.16       Te7/1/0   online       Pri  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd id** *id* **principal** command:

```
Router#show cable rpd id 0004.9f00.0413 principal

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.53c0  192.0.2.16       Te7/1/0   online       Pri  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

The following example shows the sample output for the **show cable rpd name** *name* **principal** command:

```
Router#show cable rpd name node principal

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.53c0  192.0.2.16       Te7/1/0   online       Pri  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd sbfd-session

To display the seamless BFD (SBFD) session information of the Cisco Remote PHY Device (RPD), use the **show cable rpd sbfd-session** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd sbfd-session[*session-id* | **summary**]

Syntax Description

session-id	(Optional) SBFD session identifier of the RPD.
summary	(Optional) Complete SBFD session information of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the SBFD session information of the RPD.

The following example shows the sample output for the **show cable rpdsbfd-session** command:

```
Router#show cable rpd sbfd-session
```

show cable rpd spectrum-capture-capabilities

You can use the **show cable rpd spectrum-capture-capabilities** command in privileged EXEC mode, to display the spectrum capture capability of the Remote PHY Device (RPD).

Cisco cBR Series Converged Broadband Router

show cable rpd spectrum-capture-capabilities

show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] **spectrum-capture-capabilities**

Syntax Description

ip-address	(Optional) IP address of the RPD with the principal role.
mac-adderss	(Optional) MAC address of the RPD with the principal role.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD with the principal role.
spectrum-capture-capabilities *slot*	Display the spectrum capture capability of the Remote PHY Device (RPD).

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Bengaluru 17.6.1z	This command is introduced for the Cisco cBR Series Converged Broadband Routers

Usage Guidelines

Use this command to display the spectrum capture capability of the Remote PHY Device (RPD).

The following example shows the sample output for the **show cable rpd 0018.4802.71a8 spectrum-capture-capabilities** command:

```
Router# show cable rpd 0018.4802.71a8 spectrum-capture-capabilities
Load for five secs: 6%1%: one minute: 7%; five minutes: 7%
Time source is NTP, 10:24:56.527 CST Mon Jul 22 2022
-------------------------------------------------
RPD ID                          : 0018.48fe.e643
NumSacs                         : 4
SacIndex                        : 0

SacDescription                  : Wideband spectrum analysis circuit, upstream RF ports 0 &
 0
MaxCaptureSpan                  : 409600000 Hz
MinimumCaptureFrequency         : 0 Hz
MaximumCaptureFrequency         : 409600000 Hz
SupportedTriggerModes           : |freeRunning|miniSlotCount|sid|burstIuc|timestamp|
SupportedOutputFormats          : |timeIQ|fftPower|fftIQ|fftAmplitude|
```

```
SupportedWindowFormats         :
|rectangular|hann|blackmanHarris|hamming|flatTop|gaussian|chebyshev|
SupportsAveraging              : Support
SupportedAggregationMethods    : None
SupportsSpectrumQualification  : Not Support
MaxNumBins                     : 4096
MinNumBins                     : 256
MinRepeatPeriod                : 100000 ms
SupportedTrigChanTypes         : |OFDMA|
PwType                         : |PNM PW|
LowestCapturePort              : 0
HighestCapturePort             : 0
SupportsScanningCapture        : Not Support
MinScanningRepeatPeriod        : 0 ms

--------------------------------------------------
```

show cable rpd slot

To display the active Cisco Remote PHY Devices (RPD) configured under a specific slot, use the **show cable rpd slot** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd slot *slot*

Syntax Description

slot	Slot number of the RPD line card to which the RPDs are connected

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the active RPDs configured for a specific slot.

The following example shows the sample output for the **show cable rpd slot** *slot* command:

```
Router#show cable rpd slot 7

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.53c0  192.0.2.16       Te7/1/0   online       Pri  Act node
0000.5e00.53c0  192.0.2.16       Te7/1/1   online       Aux  Act node
0000.5e00.53c0  192.0.2.16       Te7/1/2   online       Aux  Act node
0000.5e00.53c0  192.0.2.16       Te7/1/7   online       Aux  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd summary

To display the Cisco Remote PHY Device (RPD) information on all or specified Ten Gigabit Ethernet intfaces, use the **show cable rpd summary** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd {**slot** *slot* | **tengigabitethernet** | {*slot /subslot/port* }}**summary**

Syntax Description

slot	(Optional) The slot number of the Digitial Position Independent Card (DPIC) that connects to the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the complete detailed information of RPDs.

The following example shows the sample output for the **showcable rpd summary** command:

```
Router#show cable rpd summary

I/F      Total    offline init(auth) init(gcp) init(clock) init(l2tp) online
Te0/1/6  1        0       0          0         0          0          1
Te1/1/5  8        0       0          0         0          0          8
Te1/1/7  8        0       0          0         0          0          8
Te3/1/0  8        0       0          0         0          0          8
Te6/1/0  7        0       0          0         0          0          7
Te7/1/2  16       0       0          0         0          0          16
Te7/1/5  16       0       0          0         0          0          16
Te7/1/7  15       0       0          0         0          0          15

Total    79       0       0          0         0          0          79
```

show cable rpd tengigabitethernet

To display the active Cisco Remote PHY Device (RPD) on a specified Ten Gigabit Ethernet interface, use the **show cable rpd tengigabitethernet** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd tengigabitethernet*slot*/*subslot*/*port*

Syntax Description

slot	Ten Gigabit Ethernet line card slot number of the RPD.
subslot	Ten Gigabit Ethernet line card secondary slot number of the RPD.
port	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the active RPDs configured on a specific Ten Gigabit Ethernet interface.

The following example shows the sample output for the **showcable rpd tengigabitethernet** command:

```
Router#show cable rpd te7/1/0

MAC Address     IP Address       I/F       State        Role HA  Name
0000.5e00.5396  192.0.2.21       Te7/1/0   online       Pri  Act node

! = PTP clock out of phaselock occurred, ^ = Default password in use
```

show cable rpd topology

To display topology information of the Cisco Remote PHY Devices (RPD), use the **show cable rpd topology** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*]**topology**

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify topology information of the RPD.

The following example shows the sample output for the **showcable rpdtopology** command for a specific RPD:

```
Router#show cable rpd name node topology
RPD-ID              Local Addr      Peer Addr       VRF        Link Role  Link Type  Status

0004.9f00.0907      120.100.2.16    120.100.2.20               Primary    Link-ha    Active
```

show cable rpd us-phy channel

To display the physical channels of the Cisco Remote PHY Device (RPD), use the **show cable rpd us-phy channel** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd {[*mac-addressip-address* | **id** *identifier* | **name** *name*] | **tengigabitethernet** | {*slot* /*subslot*/*port* }}**us-phy channel***physical-channel-number*

Syntax Description

mac-adderss	(Optional) MAC address of the RPD.
ip-address	(Optional) IP address of the RPD.
id *identifier*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.
us-phy channel*physical-channel-number*	US PHY physical channel number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Before using the **show cable rpd us-phy channel** command, you need to know the following information:

- The upstream controller configured for the RPD.
- The card level receiver number (CARD-RCVR) of the physical channel associated with the upstream controller of the RPD. Use the **show cable urm** *slot*/*subslot* command to check CARD-RCVR.

Use the CARD-RCVR to display the physical channels of the RPD using the **show cable rpd us-phy channel** command.

The following example shows the sample output for the **show cable rpdus-phy channel** command:

```
Router#show cable rpd 0004.9f00.0731 Te9/1/0 us-phy channel 0

Channel Counters for physical channel 0/0, status valid(1)
+-------+----------+-------+----------+-------+-------+----------+----------+----------+-----+
```

```
|IUC    |  Grants  |Collide|  No      |Phy    |No     |   Good   | Corrected|Uncorrectd|
SNR |
|       |          |       |  Energy  |Errors |Preambl|   FEC    | FEC      |FEC       |
   |
+-------+----------+-------+----------+-------+-------+----------+----------+----------+-----+
|1-Req  |9714572   |0      |9714314   |0      |0      |0         |0         |0         |0
. 0|
|2-ReqD |0         |0      |0         |0      |0      |0         |0         |0         |0
. 0|
|3-Init |5796      |0      |5759      |0      |0      |35        |0         |2
|39.59|
|4-Maint|1376      |0      |929       |0      |0      |447       |0         |0
|38.51|
|5-Short|0         |0      |0         |0      |0      |0         |0         |0         |0
. 0|
|6-Long |0         |0      |0         |0      |0      |0         |0         |0         |0
. 0|
|9-AShrt|102       |0      |0         |0      |0      |102       |0         |0
|32.78|
|10-ALng|735       |0      |85        |0      |0      |1037      |3         |0
|33.97|
|11-AUGS|0         |0      |0         |0      |0      |0         |0         |0         |0
. 0|
+-------+----------+-------+----------+-------+-------+----------+----------+----------+-----+

Physical Channel 0/0 Counters:
DOCSIS 2.0 REQ Count:      166       DOCSIS 3.0 REQ Count:     1451
REQ Overflow Count  :        0       Delete Packet Count :        0
High Byte Count :        0       Low Byte Count  :   685824
```

Related Commands

Command	Description
show cable urm *slot*/*subslot*	Displays the mapping of MAC domain upstream channel/upstream-cable controller us channel/the US PHY receiver in the Cisco cBR series router. .

show cable rpd verbose

To display a detailed information about the Cisco Remote-PHY device (RPD), use the **show cable rpd verbose** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable rpd [*ip-address mac-address* | **id** *id* | **name** *name*] [{**tengigabitethernet** *slot*/*subslot*/*port*}] [**verbose**]

Syntax Description

ip-address	(Optional) IP address of the RPD.
mac-adderss	(Optional) MAC address of the RPD.
id *id*	(Optional) An unique string to identify the RPD. Specifies the MAC address of the RPD.
name *name*	(Optional) Name of the RPD.
tengigabitethernet *slot*	Ten Gigabit Ethernet line card slot number of the RPD.
tengigabitethernet *subslot*	Ten Gigabit Ethernet line card secondary slot number of the RPD.
tengigabitethernet *port*	Ten Gigabit Ethernet line card port number of the RPD.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the detailed information f the RPD.

The following example shows the sample output for the **showcable rpdtengigabitethernetverbose** command for a specific RPD:

```
Router#show cable rpd name node te1/1/0 verbose

RPD ID                                  : 0004.9f00.0901
Vendor Name                             : Cisco
Vendor Id                               : NA
Model Number                            : NB
Device Mac Address                      : 0004.9F00.0901
Current Sw Version                      : Linux version 4.1.8-rt8
(gitlab-runner@cabu-openrpd-minhang) (gcc version 4.8.3 (OpenWrt/Linaro GCC 4.8-2014.04
r48749) ) #1 SMP Fri Feb 10 02:55:15 CST 2017
Boot Rom Version                        : ND
Device Description                      : RPD
Device Alias                            : RPD
Serial Number                           : NE
```

```
Us Burst Receiver Vendor Id                : NF
Us Burst Receiver Model Number             : R_Dummy
Us Burst Receiver Driver Version           : R_Dummy
Us Burst Receiver Serial Number            : R_Dummy
Rpd Rcp Protocol Version                   : R_Dummy
Rpd Rcp Schema Version                     : R_Dummy
Hw Revision                                : NL
offline_timestamp                          :
auth_timestamp                             : Mar 8  10:56:52
online_timestamp                           : Mar 8  10:57:08
```

show cable rpd version

To display verion of the Cisco Remote PHY Devices (RPD), use the **show cable rpd version** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd version

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The output of the command is updated to display the RPD name.

Usage Guidelines

Use this command to verify MD association of the RPD.

The following example shows the sample output for the **show cable rpd version** command:

```
Router#show cable rpd version
Load for five secs: 4%/0%; one minute: 5%; five minutes: 5%
No time source, *07:08:04.516 EDT Fri Sep 13 2024

RPD ID                          : 246c.84f4.1a60
RPD Name                        : RPD_dev2
SN                              : FCH2718700L
CurrentSwVersion                : v10.9_20240904170626
Boot Rom Version                : Primary: U-Boot 2016.01 (Aug 20 2020 - 06:18:01 +0800)
v27 Rel *;Golden: U-Boot 2016.01 (Apr 12 2017 - 09:13:28 +0800) v22 Rel;
Device DescriptionBoot          : RPD

RPD ID                          : 9088.556b.a40c
RPD Name                        : RPD_dev3
SN                              : FCH27197EAS
CurrentSwVersion                : v10.9_20240904170626
Boot Rom Version                : Primary: U-Boot 2016.01 (Aug 20 2020 - 06:18:01 +0800)
v27 Rel *;Golden: U-Boot 2016.01 (Apr 12 2017 - 09:13:28 +0800) v22 Rel;
Device DescriptionBoot          : RPD

RPD ID                          : 9088.556b.a454
RPD Name                        : RPD_dev1
SN                              : FCH27197E7S
CurrentSwVersion                : v10.9_20240904170626
Boot Rom Version                : Primary: U-Boot 2016.01 (Aug 20 2020 - 06:18:01 +0800)
v27 Rel *;Golden: U-Boot 2016.01 (Apr 12 2017 - 09:13:28 +0800) v22 Rel;
Device DescriptionBoot          : RPD
```

show cable rpd sw-version

To display verion of the Cisco Remote PHY Devices (RPD), use the **show cable rpd sw-version** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

show cable rpd sw-version

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.15.1w	The output of the command is updated to display the RPD name.

Usage Guidelines

Use this command to verify MD association of the RPD.

The following example shows the sample output for the **show cable rpd version** command:

```
Router#show cable rpd sw-version
Load for five secs: 4%/0%; one minute: 5%; five minutes: 5%
No time source, *07:08:04.515 EDT Fri Sep 13 2024

RPD ID          Name                            SwVersion
246c.84f4.1a60  RPD_dev2                        v10.9_20240904170626
9088.556b.a40c  RPD_dev3                        v10.9_20240904170626
9088.556b.a454  RPD_dev1                        v10.9_20240904170626
```

show cable rsvp flow-db

To display contents of the Resource ReSerVation Protocol (RSVP) to DOCSIS service-flow mapping database, use the show cable rsvp flow-db command in user EXEC mode.

show cable rsvp flow-db [*mac-addr*]

Syntax Description

mac-addr	(Optional) The MAC address of the specific cable modem in hexadecimal format.

Command Default

None

Command Modes

User EXEC mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable rsvp flow-db** command displays contents of the RSVP to DOCSIS service-flow mapping database.

Examples

The following example shows the sample output for the **show cable rsvp flow-db** command.

```
Router# show cable rsvp flow-db
CM Count   : 1
Flow Count : 1
Mac Address    Src IP          Src   Dest IP         Dest  Pr Sfid  Dir Handle
                               Port                  Port  ot           (Hex)
0019.474a.c5f6 200.0.0.1       1000  40.1.1.62       1000  6  11    DS  7000406
```

Table below describes the significant fields shown in the display.

Table 180: cable rsvp flow-db Field Descriptions

Field	Description
Mac Address	The MAC address of the specific cable modem.
Src IP	RSVP path source IP address.
Src Port	RSVP path source port number.
Dest IP	Destination IP address.
Dest port	Destination port number.
Proto	IP protocol type. Here 17 is the UDP's IP protocol number.
SFid	Service flow ID.

Field	Description
Dir	Direction of the DOCSIS service flow. Here DS indicates downstream flow.

Related Commands

Command	Description
cable rsvp default-scn	Specifies the default service class for the RSVP.

show cable service-class

To display the parameters for cable service class, use the **show cable service class** command in privileged EXEC mode.

show cable service-class [*sclass-index*] [**verbose**]

Syntax Description

sclass-index	Identifies the index for a service class that has already been defined (1 to 255).
verbose	Displays all of the defined attributes for the service class.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(4)CX	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC. The command output was modified to display the traffic peak rate value for a specific service flow.
12.2(33)SCG	The command output was modified to display the scheduling type as "N/A" for all downstream service flows.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can display a summary of either one service class or all service classes. You can also display a complete listing of each service class and of all the defined service classes.

Note Starting with Cisco IOS Release 12.2(33)SCG, the output of the **show cable service class** command displays the scheduling type of all downstream service flows (DS-SF) as "N/A" to indicate that the DS-SFs do not have any scheduling type.

Examples

The following sample output shows the standard and verbose formats of the **show cable service class** command:

```
Router# show cable service-class

Index Name             Dir   Sched  Prio MaxSusRate  MaxBurst    MinRsvRate
1     UP_UGS           US/DS UGS    0    0           1522        0
2     UP_UGSAD         US/DS UGS_AD 0    0           1522        0
3     UP_RTPS          US/DS RTPS   0    128000      2000        64000
4     UP_BE            US/DS BE     5    128000      2000        0
5     DOWN_BE          US/DS BE     5    1000000     3000        0
Router# show cable service-class 1
```

```
Index Name             Dir   Sched  Prio MaxSusRate  MaxBurst    MinRsvRate
1     UP_UGS           US/DS UGS    0    0           1522        0
Router# show cable service-class 1 verbose

Index:                                  1
Name:                                   UP_UGS
Direction:                              Upstream/Downstream
Traffic Priority:                       0
Maximum Sustained Rate:                 0 bits/sec
Max Burst:                              1522 bytes
Minimum Reserved Rate:                  0 bits/sec
Minimum Packet Size                     100 bytes
Admitted QoS Timeout                    30 seconds
Active QoS Timeout                      30 seconds
Scheduling Type:                        Unsolicited Grant Service
Request/Transmission Policy:            0x1FF
Unsolicited Grant Size:                 100 bytes
Nominal Grant Interval:                 20000 usecs
Tolerated Grant Jitter:                 4000 usecs
Grants per Interval:                    1
IP ToS Overwrite [AND-mask,OR-mask]:    0xE0,0xA0
Max Latency:                            0 usecs
Parameter Presence Bitfield:            {0xE08, 0xBCC000}
Router# show cable service-class verbose

Index:                                  1
Name:                                   UP_UGS
Direction:                              Upstream/Downstream
Traffic Priority:                       0
Maximum Sustained Rate:                 0 bits/sec
Max Burst:                              1522 bytes
Minimum Reserved Rate:                  0 bits/sec
Minimum Packet Size                     100 bytes
Peak Rate                               0 bits/sec
Admitted QoS Timeout                    30 seconds
Active QoS Timeout                      30 seconds
Scheduling Type:                        Unsolicited Grant Service
Request/Transmission Policy:            0x1FF
Unsolicited Grant Size:                 100 bytes
Nominal Grant Interval:                 20000 usecs
Tolerated Grant Jitter:                 4000 usecs
Grants per Interval:                    1
IP ToS Overwrite [AND-mask,OR-mask]:    0xE0,0xA0
Max Latency:                            0 usecs
Parameter Presence Bitfield:            {0xE08, 0xBCC000}
Index:                                  2
Name:                                   UP_UGSAD
Direction:                              Upstream/Downstream
Traffic Priority:                       0
Maximum Sustained Rate:                 0 bits/sec
Max Burst:                              1522 bytes
Minimum Reserved Rate:                  0 bits/sec
Minimum Packet Size                     100 bytes
Peak Rate                               0 bits/sec
Admitted QoS Timeout                    30 seconds
Active QoS Timeout                      30 seconds
Scheduling Type:                        Unsolicited Grant Service(AD)
Request/Transmission Policy:            0x1FF
Nominal Polling Interval:               10000 usecs
Tolerated Poll Jitter:                  4000 usecs
Unsolicited Grant Size:                 100 bytes
Nominal Grant Interval:                 20000 usecs
Tolerated Grant Jitter:                 4000 usecs
Grants per Interval:                    1
```

```
IP ToS Overwrite [AND-mask,OR-mask]:    0xE0,0xA0
Max Latency:                            0 usecs
Parameter Presence Bitfield:            {0xE08, 0xBFC000}
Index:                                  3
Name:                                   UP_RTPS
Direction:                              Upstream/Downstream
Traffic Priority:                       0
Maximum Sustained Rate:                 128000 bits/sec
Max Burst:                              2000 bytes
Minimum Reserved Rate:                  64000 bits/sec
Minimum Packet Size                     64 bytes
Peak Rate                               0 bits/sec
Admitted QoS Timeout                    30 seconds
Active QoS Timeout                      30 seconds
Maximum Concatenated Burst:             1522 bytes
Scheduling Type:                        Realtime Polling Service
Request/Transmission Policy:            0x1FF
Nominal Polling Interval:               10000 usecs
Tolerated Poll Jitter:                  4000 usecs
IP ToS Overwrite [AND-mask,OR-mask]:    0xE0,0xA0
Max Latency:                            0 usecs
Parameter Presence Bitfield:            {0xDC8, 0x83E000}
Index:                                  4
Name:                                   UP_BE
Direction:                              Upstream/Downstream
Traffic Priority:                       5
Maximum Sustained Rate:                 128000 bits/sec
Max Burst:                              2000 bytes
Minimum Reserved Rate:                  0 bits/sec
Minimum Packet Size                     64 bytes
Peak Rate                               0 bits/sec
Admitted QoS Timeout                    30 seconds
Active QoS Timeout                      30 seconds
Maximum Concatenated Burst:             1522 bytes
Scheduling Type:                        Best Effort
Request/Transmission Policy:            0x0
IP ToS Overwrite [AND-mask,OR-mask]:    0xE0,0x0
Max Latency:                            0 usecs
Parameter Presence Bitfield:            {0xDE8, 0x80E000}
Index:                                  5
Name:                                   DOWN_BE
Direction:                              Upstream/Downstream
Traffic Priority:                       5
Maximum Sustained Rate:                 1000000 bits/sec
Max Burst:                              3000 bytes
Minimum Reserved Rate:                  0 bits/sec
Minimum Packet Size                     64 bytes
Peak Rate                               0 bits/sec
Admitted QoS Timeout                    30 seconds
Active QoS Timeout                      30 seconds
Maximum Concatenated Burst:             0 bytes
Scheduling Type:                        Best Effort
Request/Transmission Policy:            0x0
IP ToS Overwrite [AND-mask,OR-mask]:    0xFF,0x0
Max Latency:                            0 usecs
Parameter Presence Bitfield:            {0xDE8, 0x0}
Router#
```



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable service class	Defines and modifies a service class.
show interface cable qos paramset	Displays the parameters in one or more service templates.

show cable service-voice downstream-type

To display the downstream-types that are capable of providing voice services, use the **show cable service-voice downstream-type** command.

show cable service-voice downstream-type

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display the downstream-types that are capable for providing voice services on each uBR10-MC 5x20 line card.

Examples

The example below shows that both HA-capable-DS and MDC-DS are enabled for downstream types on the uBR10-MC5X20 line card in slot 5, subslot 1 and the line card in slot 6, subslot 0.

```
Router# show cable service-voice downstream-type
Slot 5/1 :    HA-capable-DS               MDC-DS
Slot 6/0 :    HA-capable-DS               MDC-DS
```

show cable service-flow summary

To display system level service flow and downstream classifier summary information per line card basis, use the **show cable service-flow summary** command in privileged EXEC mode..

show cable service-flow summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCJ	This command was introduced.
IOS-XE 3.18.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cable service-flow summary** command displays system level service flow and downstream classifier summary information per line card basis. For uBR10K series routers, system level downstream classifier resource used percentage and downstream service flow system limit are displayed. However, for cBR Series Converged Broadband Routers, the downstream classifier used percentage and system limit are not displayed. This command displays only the unicast service flow summary information and limit and excludes multicast service flows.

For uBR10k series routers:

- Downstream service flow:
  - For a given MC2020, MC3G60, 3GSPA or 6GSPA Line Card, per Line Card limit is about 64k. However, the upper limit per line card is highly dependent on configuration. For example, the downstream service flow limit would differ if two MC3G60 Line Cards share the same 3GSPA. So it is not possible to set a fixed value for Line Card downstream service flow upper limit.
  - For each chassis limit the fixed value is 294865. This is similar to a “RP flow” table resource.



Note Each downstream service flow and downstream classifier consumes one “RP flow” table resource. So actual limit depends on the downstream service flow and classifier configuration.

- Upstream service flow
  - Limited by 8K SID space per mac-domain.



Note If SID Cluster is configured, one upstream service flow might have multiple SIDs and the total upstream service flow limit per mac-domain will be lesser than 8K.

- 64K per line card.
- There is no chassis limit on the CMTS. In order to specify this, the command output displays "Not Applicable".

- Dowstream classifier
  - Each chassis is limited by "RP flow" table resource.
  - The fixed limit is displayed in percentage.
- Upstream classifier
  - The upstream classifier has no limit on CMTS and it is not displayed on the output.

For cBR Series Converged Broadband Routers, the following limitations are applicable:

- Downstream service flow
  - The downstream service flow count is limited by Yoda capability even though hardware limitation per CLC is 128K. Each Yoda has a limitation about 100K+ service flows and the Yoda to CLC mapping decides the CLC limitation. For example, if Yoda 1 is mapped to CLC1 and CLC2, the two CLCs has a shared limitation of 100K service flows. However, if Yoda 1 is mapped only to CLC1, CLC1 alone could reach 100K service flows.
  - 426K per chassis for Quad Yoda. 72K per chassis for one Yoda.
  - The downstream service flow upper limit is not displayed since it is not possible to derive a fixed value.
- Upstream service flow
  - Similar to uBR10K Series Routers, the upstream service flow is limited by 8K SID space per mac-domain.



Note If SID Cluster is configured, one upstream service flow might have multiple SIDs and the total upstream service flow limit per mac-domain will be lesser than 8K.

- No chassis limit on CMTS.

- Downstream classifier
  - No limit on CMTS.
  - There is no "RP flow" table resource for cBR Series Converged Broadband Routers and no used percentage is displayed on the output.
- Upstream classifier

- The upstream classifier has no limit on CMTS and it is not displayed on the output.

Examples

The following example shows the sample output for the **show cable service-flow summary** command on the uBR10K series routers.

```
Router#   show cable service-flow summary
                Upstream Service Flow              Downstream Service Flow
Downstream Classifier
              Active CM   Inactive CM Total       Active CM   Inactive CM Total       Count
CLC5/0         8000         100          8100        12000        100          12100        800

CLC6/0         1000         10           1010        1000         10           1010         500

CLC7/0         10           0            10          10           0            10           5


Total:         9010        110           9120        13010        110          13120        1305
  1%
System Limit: Not Applicable                       294865
```

The following example shows the sample output for the **show cable service-flow summary** command on the cBR series routers.

```
Router# show cable service-flow summary
                  Upstream Service Flow              Downstream Service Flow
Downstream Classifier
              Active CM   Inactive CM Total       Active CM   Inactive CM Total       Count
CLC1           8000         100          8100        12000        100          12100        800
CLC2           1000         10           1010        1000         10           1010         500
CLC3           10           0            10          10           0            10           5

Total:         9010        110           9120       13010         110          13120        1305
```

Table below describes the significant fields shown in the display.

Table 181: show cable service-flow summary Field Descriptions

Field	Description
Upstream Service Flow	Upstream service flow summary information.
Downstream Service Flow	Downstream service flow summary information.
Downstream Classifier	Downstream classifier summary information.
Active CM	The upstream or downstream service flow count for active modems, including online and initiating modems.
Inactive CM	The upstream or downstream service flow count for offline modems.
Total	Total upstream or downstream service flow count.

Field	Description
Count	Downstream classifier count. For uBR10K Series Routers, the downstream classifier resource used percentage is displayed as well. **Note** For cBR Series Converged Broadband Routers, downstream classifier resource used percentage is not displayed since there is no limit for downstream classifier.

Related Commands

Command	Description
show cable service-flow summary detail	Displays service flow and classifier summary information per MAC domain basis.

show cable service-flow summary detail

To display system level service flow and classifier summary information per MAC domain basis, use the **show cable service-flow summary detail** command in privileged EXEC mode.

show cable service-flow summary detail

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCJ	This command was introduced.
IOS-XE 3.18.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows the sample output for the **show cable service-flow summary detail** command on the uBR10K series routers.

```
Router# show cable service-flow summary detail
Interface     Upstream Service Flow              Downstream Service Flow
Downstream Classifier
              Active CM   Inactive CM Total       Active CM   Inactive CM Total       Count
Cable5/0/0    1000        0           1000        1000        0           1000        0
Cable5/0/1    1000        0           1000        1000        0           1000        0
Cable5/0/2    6000        100         6100        10000       100         11000       800
Cable6/0/0    900         10          910         900         10          910         500
Cable6/0/1    100         0           100         100         0           100         0
Cable7/0/0    10          0           10          10          0           10          5
```

The following example shows the sample output for the **show cable service-flow summary detail** command on the cBR series routers.

```
Router# show cable service-flow summary detail
Interface     Upstream Service Flow              Downstream Service Flow
Downstream Classifier
              Active CM   Inactive CM Total       Active CM   Inactive CM Total       Count
Cable1/0/0    1000        0           1000        1000        0           1000        0
Cable1/0/1    1000        0           1000        1000        0           1000        0
Cable1/0/2    6000        100         6100        10000       100         11000       800
Cable2/0/0    900         10          910         900         10          910         500
Cable2/0/1    100         0           100         100         0           100         0
Cable3/0/0    10          0           10          10          0           10          5
```

Table below describes the significant fields shown in the display.

Table 182: show cable service-flow summary detail Field Descriptions

Field	Description
Interface	The cable mac-domain interface.
Upstream Service Flow	Upstream service flow summary information.
Downstream Service Flow	Downstream service flow summary information.
Active CM	The upstream or downstream service flow count for active modems, including online and initiating modems.
Inactive CM	The upstream or downstream service flow count for offline modems.
Total	Total upstream or downstream service flow count.
Count	Total downstream classifiers count.

Related Commands

Command	Description
show cable service-flow summary	Displays system level service flow and downstream classifier summary information per line card basis.

show cable signal-quality

To display information about the signal quality of an upstream port on a cable interface, use the **show cable signal-quality** command in privileged EXEC mode.

Cisco uBR Series Router

show cable signal-quality {**cable** {*slot* /*port* | *slot* /*subslot* /*port*} **upstream** *number* | **cmts** | **mer**}
Cisco cBR Series Router

show cable signal-quality {**cable** *slot* /*card* /*port* **upstream** *number* | **cmts** | **mer**}

Syntax Description

cable	Specifies the cable interface.
slot /*subslot* /*port*	For uBR series router, displays information about all CMs on the specified cable interface line card on a Cisco CMTS router: • *slot* —Chassis slot number of the cable interface line card. Valid slots are from 5 to 8. • *subslot* —Secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Port number. Valid ports are from 0 to 4, depending on the cable interface line card.
slot /*subslot* /*port*	For cBR series router, displays information about all CMs on the specified cable interface line card on a Cisco CMTS router: • *slot* —Chassis slot number of the cable interface line card. Valid slots are 0 to 3 and 6 to 9. • *card* —Secondary slot number of the cable interface line card. Valid subslots is 0. • *port* — Cable interface index. Valid ports are from 0 to 15, depending on the cable interface line card.
upstream *number*	Specifies the upstream channel ID. Valid values are from 0 to 15.
cmts	Displays the carrier-to-noise ratio (CNR) data and expected signal power received per cable interface.
mer	Displays the modulation error rate (MER) data per cable interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value range for the *slot* /*card* /*port* variables are changed.
Cisco 1x2 RPD Software 4.1	The output of this command was updated when virtual combining of upstream channels was introduced in this release on Cisco Remote PHY Devices.

Usage Guidelines

The **show cable signal-quality** command with the **mer** keyword displays the modulation error rate data per cable interface. Note that at least one cable modem (CM) must be online on the cable interface for this command to provide the modulation error rate data. This is identical to the modulation error rate data displayed by the **show controllers** command.

The CNR data is displayed only for the upstream channels that are assigned to a spectrum group. Upstream channels with fixed frequencies do not return any CNR data.

Examples

The following example shows the CNR data received on the upstream ports on the cable interface line card at slot/subslot/port 7/0/3 on a Cisco uBR10012 router:

```
Router# show cable signal-quality cable 7/0/3 cmts
I/F           CNiR            Expected Received
              (dB)            Signal Power (dBmV)
Cable7/0/3/U0 55.0            1.0
Cable7/0/3/U1 44.0            0.0
Cable7/0/3/U2 43.0            -1.0
Cable7/0/3/U3 43.0            2.0
```

The following example shows the MER data received on the cable upstream port 3 on the cable interface line card at slot/subslot/port 5/0/0 on a Cisco uBR10012 router:

```
Router# show cable signal-quality cable 5/0/0 upstream 3 mer
I/F           Received MER    Received MER
              (dB)            Samples
Cable5/0/0/U3 36.0            10
```

The following example shows the signal quality information for all cable interfaces on a Cisco uBR10012 router:

```
Router#show cable signal-quality mer
I/F           Received MER    Received MER
              (dB)            Samples
Cable6/1/0/U0 -----           -----
Cable6/1/0/U1 -----           -----
Cable6/1/0/U2 -----           -----
Cable6/1/0/U3 -----           -----
Cable6/1/1/U0 -----           -----
Cable6/1/1/U1 -----           -----
Cable6/1/1/U2 -----           -----
Cable6/1/1/U3 -----           -----
Cable6/1/2/U0 -----           -----
Cable6/1/2/U1 -----           -----
Cable6/1/2/U2 -----           -----
Cable6/1/2/U3 -----           -----
Cable6/1/3/U0 -----           -----
Cable6/1/3/U1 -----           -----
Cable6/1/3/U2 -----           -----
Cable6/1/3/U3 -----           -----
```

```
Cable6/1/4/U0 -----           -----
Cable6/1/4/U1 -----           -----
Cable6/1/4/U2 -----           -----
Cable6/1/4/U3 -----           -----
Cable7/1/0/U0 23.6            10
Cable7/1/0/U1 -----           -----
Cable7/1/0/U2 -----           -----
Cable7/1/0/U3 -----           -----
Cable7/1/1/U0 -----           -----
Cable7/1/1/U1 -----           -----
Cable7/1/1/U2 -----           -----
Cable7/1/1/U3 -----           -----
Cable7/1/2/U0 -----           -----
Cable7/1/2/U1 -----           -----
Cable7/1/2/U2 -----           -----
Cable7/1/2/U3 -----           -----
Cable7/1/3/U0 -----           -----
Cable7/1/3/U1 -----           -----
Cable7/1/3/U2 -----           -----
Cable7/1/3/U3 -----           -----
Cable7/1/4/U0 -----           -----
Cable7/1/4/U1 -----           -----
Cable7/1/4/U2 -----           -----
Cable7/1/4/U3 -----           -----
Cable8/0/0/U0 36.1            10
Cable8/0/0/U1 -----           -----
```

The following table describes the major fields displayed by the **show cable signal-quality** command.

Table 183: show cable signal-quality Command Field Descriptions

Field	Description
I/F	Cable interface.
CNiR (db)	CNR value.
Expected Received Signal Power (dBmV)	Expected signal power received per upstream port.
Received MER (db)	Received MER signal-to-noise ratio (SNR) value.
Received MER (samples)	Samples used for calculating the SNR per upstream port.

The following example shows the signal quality information of the specified channels supporting virtual combining:

```
show cable signal-quality cmts
I/F           DevID    CNiR           Expected Received
                       (dB)           Signal Power (dBmV)
Cable1/0/0/U0   0      31.0           0.0
Cable1/0/0/U0   1      31.0           0.0
Cable1/0/0/U0   2      31.0           0.0
Cable1/0/0/U1   0      31.0           0.0
Cable1/0/0/U1   1      31.0           0.0
Cable1/0/0/U2          -----          -----
Cable1/0/0/U3          -----          -----
Cable1/0/0/U4   0      31.0           0.0
Cable1/0/0/U5   0      31.0           0.0
```

Related Commands

Command	Description
show cable spectrum-analysis	Displays information about the spectrum measurements of an upstream port on a cable interface on a Cisco uBR10012 router.
show controllers	Displays information about the interface controllers for a cable interface on the Cisco CMTS router.
show cable modem cnr	Displays information about CNR or SNR data for a particular cable modem.
show cable modem	Displays information about the registered and unregistered CMs on a Cisco CMTS router.

show cable snmp cache-status

To display the SNMP cache status, use the **show cable snmp cache-status** command in privileged EXEC mode.

show cable snmp cache-status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Important You must configure the **service internal** command in global configuration mode to display the SNMP cache status.

Example

The following is a sample output of the **show cable snmp cache-status** command:

```
Router# show cable snmp cache-status
Cache engine is ON, age: 5 seconds
```

Table 184: show cable snmp cache-status Field Descriptions

Field	Description
age	The time interval for which the SNMP cache information is stored on the Supervisor.

Related Commands

Command	Description
cable snmp cache active	Configures the SNMP cache status.

show cable spectrum-analysis

To display information about the spectrum measurements of an upstream port on a cable interface line card, use the **show cable spectrum-analysis** command in privileged EXEC mode.

Cisco uBR Series Router

show cable spectrum-analysis *slot* / *subslot* / *port* **upstream** *port*

Cisco cBR Series Router

show cable spectrum-analysis Cable *slot* / *subslot* / *port* **upstream** *port*

Syntax Description

slot /*subslot* /*port*	Displays information about all CMs on the specified cable interface line card on a Cisco CMTS router: • *slot* —Chassis slot number of the cable interface line card. Valid slots are from 5 to 8 for uBR series router, from 0 to 9 for cBR series router. • *subslot* —Secondary slot number of the cable interface line card. Valid subslots are 0 or 1 for uBR series router, 0 for cBR series router. • *port* —Downstream port number. Valid ports are from 0 to 4 for uBR series router, from 0 to 7 for cBR series router, depending on the cable interface line card.
upstream *port*	Specifies the upstream port number.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value range for the *slot* /*subslot* /*port* variables are changed. This command replaces the **show controllers cable upstream spectrum** command.
Cisco 1x2 RPD Software 4.1	The output of this command was updated when virtual combining of upstream channels was introduced in this release on Cisco Remote PHY devices.

Examples

The following example shows the spectrum measurements on upstream port 1 on a Cisco uBR10012 router:

```
Router# show cable spectrum-analysis  c5/0/0 upstream 1
Spectrum Analysis Measurements for Cable5/0/0: Upstream 1
Channel Center Frequency: 17000000 Hz
Frequency Span: 6400000 Hz
Number of Bins: 321
Bin Spacing: 20000 Hz
```

```
Resolution Bandwidth: 34200 Hz
Amplitude Data:
    Bin   1: -60.00 dBmV
    Bin   2: -58.00 dBmV
    Bin   3: -58.00 dBmV
    Bin   4: -58.00 dBmV
    Bin   5: -55.00 dBmV
    Bin   6: -55.00 dBmV
    Bin   7: -58.00 dBmV
    Bin   8: -55.00 dBmV
    Bin   9: -49.00 dBmV
    Bin  10: -49.00 dBmV
    Bin  11: -49.00 dBmV
    Bin  12: -49.00 dBmV
    Bin  13: -49.00 dBmV
    Bin  14: -55.00 dBmV
    Bin  15: -58.00 dBmV
    Bin  16: -45.00 dBmV
    Bin  17: -38.00 dBmV
    Bin  18: -35.00 dBmV
    Bin  19: -33.00 dBmV
    Bin  20: -33.00 dBmV
    Bin  21: -34.00 dBmV
    Bin  22: -37.00 dBmV
    Bin  23: -37.00 dBmV
    Bin  24: -32.00 dBmV
    Bin  25: -28.00 dBmV
    Bin  26: -27.00 dBmV
    Bin  27: -26.00 dBmV
    Bin  28: -27.00 dBmV
    Bin  29: -31.00 dBmV
    Bin  30: -32.00 dBmV
    Bin  31: -29.00 dBmV
    Bin  32: -29.00 dBmV
```

Table below describes the significant fields shown in the display.

Table 185: show cable spectrum-analysis Field Descriptions

Field	Description
Spectrum analysis measurements	Spectrum measurements.
Channel center frequency	Channel center frequency value.
Frequency span	Frequency span.
No of Bins	Total number of bins in the spectrum analysis data.
Bin spacing	Spacing between the center frequency of each bin.
Resolution Bandwidth	Spacing between bins after the spectral window is applied.
Amplitude Data	Spectral amplitudes for the received signal power of a bin.

The following example shows the signal quality information of the specified channels supporting virtual combining in Cisco 1x2 RPD Software 4.1.

```
show cable spectrum-analysis Cable 9/0/7 upstream 0 sid 1 devID 1
```

```
Load for five secs: 5%/1%; one minute: 5%; five minutes: 5%
No time source, *11:16:00.436 CST Sat Feb 24 2018

Spectrum Analysis Measurements for Cable9/0/7: Upstream 0 Sid 1
Device ID: 1
Channel Center Frequency: 10000 kHz
Frequency Span:           3200 kHz
Number of Bins:           129
Bin Spacing:              25.0 kHz
Resolution Bandwidth:     42.750 kHz
Amplitude Data:
    Bin   1: -60.00 dBmV
    Bin   2: -60.00 dBmV
    Bin   3: -60.00 dBmV
    Bin   4: -32.00 dBmV
    Bin   5: -23.00 dBmV
    Bin   6: -22.00 dBmV
```

Related Commands

Command	Description
show cable signal-quality	Displays information about the signal quality of an upstream port on a cable interface line card.
show controllers cable	Displays information about the interface controllers for a cable interface line card on a Cisco CMTS router.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) or signal-to-noise ratio (SNR) for a particular cable modem.

show cable spectrum-group

To display information about spectrum groups on a Cisco CMTS, use the **show cable spectrum-group** command in user EXEC or privileged EXEC mode.

show cable spectrum-group [*groupnum*] [**detail**]

Syntax Description

groupnum	(Optional) Displays information about the specified group number (1–32). If no group number is specified, information for all spectrum groups is displayed.
detail	(Optional) Displays whether the groups are allocated, free, or in-use.

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0(5)SC, 12.0(5)T	The **detail** keyword was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is sample output from the **show cable spectrum-group** command for all upstream spectrum groups:

```
CMTS01# show cable spectrum-group
 Group  Frequency      Upstream     Weekly Scheduled           Power   Shared
 No.    Band           Port         Availability               Level   Spectrum
        (Mhz)                       From Time:    To Time:     (dBmV)

 1       5.000-42.000                                          0       No
 1      17.328 [1.60]  Cable3/0 U0                            0
 1       5.808 [1.60]  Cable3/0 U1                            0
 1       5.808 [1.60]  Cable3/0 U2                            0
 1      15.792 [1.60]  Cable3/0 U3                            0
 1       6.096 [1.60]  Cable3/0 U4                            0
 1       5.808 [1.60]  Cable3/0 U5                            0
 2       5.000-42.000                                          0       No
 2       6.608 [3.20]  Cable6/0 U1                            0
 2       5.808 [1.60]  Cable6/0 U2                            0
 2       5.808 [1.60]  Cable6/0 U3                            0
 2       5.808 [1.60]  Cable6/0 U4                            0
 2       5.808 [1.60]  Cable6/0 U5                            0
 3       5.000-42.000                                          0       No
 3      17.488 [1.60]  Cable5/0 U1                            0
 3       6.160 [1.60]  Cable5/0 U2                            0
 3      36.912 [1.60]  Cable5/0 U3                            0
 3      36.560 [1.60]  Cable5/0 U4                            0
 3      16.240 [1.60]  Cable5/0 U5                            0
 4       6.000- 8.600                                         0       No
 4      16.000-18.000                                         0       No
```

```
 4      17.168 [1.60]  Cable5/0 U0                              0
 5       5.000-42.000                                           0       No
 6       5.000-42.000                                           0       No
 7       5.000-42.000                                           0       No
 8       5.000-42.000                                           0       No
 9       5.000-42.000                                           0       No
 10      5.000-42.000                                           0       No
 11      5.000-42.000                                           0       No
 12     10.000-13.000                                           0       No
CMTS#
```

The following is sample output from the **show cable spectrum-group detail** command:

```
CMTS# show cable spectrum-group detail

Group  Frequency      Upstream     Weekly Scheduled            Power   Shared
No.    Band           Port         Availability                Level   Spectrum
       (Mhz)                       From Time:    To Time:      (dBmV)

1      10.000                                                   1       Yes
1      10.000                                                   2       Yes
1      11.000                                                   3       Yes
1      11.000                                                   4       Yes
1      15.000-20.000                                            0       Yes
  A     8.400-12.600
  A    15.000-20.000
1      11.008 [0.80]  Cable3/0 U2                              4
1      15.808 [1.60]  Cable3/0 U3                              0
1      Unassigned     Cable3/0 U4
1      17.408 [1.60]  Cable3/0 U5                              0
  I    10.600-11.400                                          4
  I    15.000-16.600                                          0
  I    16.600-18.200                                          0
  F     8.400-10.600
  F    11.400-12.600
  F    18.200-20.000
  C    Width  [3.20]
  C    Width  [1.60]
  C    Width  [0.80]
  O    19.000 [1.60]                                          0
  O    10.000 [0.80]                                          2
  O    18.600 [0.80]                                          0
  O    19.400 [0.80]                                          0
  O    10.000 [0.80]                                          1
CMTS#
```

Table below describes the fields shown in the **show cable spectrum-group** displays.

Table 186: show cable spectrum-group Command Field Descriptions

Field	Description
Group No.	Identifies the spectrum group. When using the detail keyword, the following also appear: • A = Signifies that the band is allocated. • F = Signifies that the band is free. • I = Signifies that the band is in-use. • C = Identifies the channel width. • O = Identifies the offered list bands (based on the current channel widths).

Field	Description
Frequency Band (MHz)	Identifies the upper and lower ranges of the frequency for this spectrum group.
Upstream Port	Identifies the upstream port number.
Weekly Scheduled Availability	Identifies the day and time of day when this group is available. If no values appear in the **From** and **To Time** fields, this group is available at all times.
Power Level (dBmV)	Identifies the assigned decibels per millivolt (dBmV) input level.
Shared Spectrum	Indicates if upstreams are physically combined (share the same combiner group). Y or yes values indicate that upstreams that are members of the spectrum group are combined and cannot be assigned overlapping frequency bands. N or no values indicate that upstreams that are members of the spectrum group are not combined and can be assigned overlapping frequency bands.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show cable hop	Displays CM configuration settings.
show cable modulation-profile	Displays modulation profile group information.

show cable subscriber-usage

To display subscribers who are violating their registered quality of service (QoS) profiles, use the show cable subscriber-usage command in privileged EXEC mode.

show cable subscriber-usage [**over-consume**][{**cable** *slot /port* | **cable** *slot /subslot/port* }][**upstream** *port*][**sort-byte-count**][**sort-avg-rate**]

Syntax Description

over-consume	(Optional) Displays only those subscribers who have exceeded their maximum allowed bandwidth.
cable *slot /port*	(Optional) Displays information for all CMs on the specified cable interface and downstream port on a Cisco 7100 series or Cisco 7200 series router, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
cable *slot/subslot/port*	(Optional) Displays information for all CMs on the specified cable interface on a Cisco uBR10012 router, where: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.
upstream *port*	(Optional) Displays information for a particular upstream on the selected cable interface. The *port* value starts with 0 and continues up, depending on the type of cable interface card.
sort-byte-count	(Optional) Sorts the list by the subscriber byte count, with the highest byte counts listed first. The default is to sort the list by Service Flow ID (SFID). (This option is replaced by the **sort-avg-rate** keyword in later releases.)
sort-avg-rate	(Optional) Sorts the list by the subscriber's average rate. The default is to sort the list by Service Flow ID (SFID).

Command Default

All subscribers are shown, with the display sorted by SFID.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced.

Release	Modification
12.3(9a)BC	This command was integrated into Cisco IOS Release 12.3(9a)BC. The **sort-byte-count** keyword option is replaced by the **sort-avg-rate** keyword option.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added. The output field Total-Kbyte Count was modified to Mon-Dur Cons (kbits/sec).
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The show cable subscriber-usage command displays the current usage statistics for all subscribers on the Cisco CMTS router, all subscribers on a particular cable interface, or for only those subscribers that are marked as over-consuming bandwidth.

Effective with Cisco IOS Release 12.3(9a)BC, the **sort-byte-count** keyword option is replaced by the **sort-avg-rate** keyword option.

Examples

The following example shows typical output for the default version of the show cable subscriber-usage command:

```
Router# show cable subscriber-usage
Sfid Mac Address   Enforce-rule Mon-dur Cons  Last-detect    Last-penalty   Pen
                       Name      (kbits/sec)      time           time        Flag
3    0007.0e03.110d efrule-q5   121944817  Jan1  03:44:08  Jan1  03:54:08  Act
4    0007.0e03.110d efrule-q5d  1879076068 Jan1  03:35:05  Jan1  03:45:06  Act
5    0007.0e03.1431 efrule-q5   120052387  Jan1  03:44:18  Jan1  03:54:18  Act
6    0007.0e03.1431 efrule-q5d  1838493626 Jan1  03:34:55  Jan1  03:44:55  Act
7    0007.0e03.1445 efrule-q5   120919427  Jan1  03:44:08  Jan1  03:54:08  Act
8    0007.0e03.1445 efrule-q5d  1865955172 Jan1  03:35:06  Jan1  03:45:06  Act
9    0007.0e03.1225 efrule-q5   120200155  Jan1  03:44:18  Jan1  03:54:18  Act
10   0007.0e03.1225 efrule-q5d  1839681070 Jan1  03:34:55  Jan1  03:44:55   -
11   0007.0e03.0cb1 efrule-q5   122941643  Jan1  03:43:58  Jan1  03:53:58  Act
12   0007.0e03.0cb1 efrule-q5d  1889107176 Jan1  03:35:06  Jan1  03:45:06  Act
13   0007.0e03.1435 efrule-q5   119504795  Jan1  03:44:18  Jan1  03:54:18  Act
14   0007.0e03.1435 efrule-q5d  1835164034 Jan1  03:34:55  Jan1  03:44:55   -
15   0007.0e02.f80d efrule-q5   119250047  Jan1  03:44:18  Jan1  03:54:18  Act
16   0007.0e02.f80d efrule-q5d  1832034114 Jan1  03:34:55  Jan1  03:44:55   -
17   0007.0e03.1469 efrule-q5   117562137  Jan1  03:44:18  Jan1  03:54:18  Act
18   0007.0e03.1469 efrule-q5d  1816957486 Jan1  03:34:55  Jan1  03:44:55   -
19   0007.0e03.11f9 efrule-q5   124265775  Jan1  03:44:18  Jan1  03:54:18  Act
20   0007.0e03.11f9 efrule-q5d  1959957066 Jan1  03:35:46  Jan1  03:45:46  Act
21   0007.0e03.1461 efrule-q5   113314731  Jan1  03:34:55  Jan1  03:44:55   -
22   0007.0e03.1461 efrule-q5d  1827583110 Jan1  03:35:46  Jan1  03:45:46  Act
23   0007.0e03.11d9 efrule-q5   104607787  Jan1  03:34:55  Jan1  03:44:55   -
24   0007.0e03.11d9 efrule-q5d  1675444338 Jan1  03:34:55  Jan1  03:44:55   -
25   0007.0e03.1475 efrule-q5   113751019  Jan1  03:34:55  Jan1  03:44:55   -
26   0007.0e03.1475 efrule-q5d  1841060070 Jan1  03:35:56  Jan1  03:45:56  Act
27   0007.0e03.10d9 efrule-q5   113713981  Jan1  03:34:55  Jan1  03:44:55   -
28   0007.0e03.10d9 efrule-q5d  1840272262 Jan1  03:35:56  Jan1  03:45:56  Act
29   0007.0e03.1065 efrule-q5   113443243  Jan1  03:34:55  Jan1  03:44:55   -
30   0007.0e03.1065 efrule-q5d  1834855264 Jan1  03:35:56  Jan1  03:45:56  Act
31   0007.0e03.1081 efrule-q5   119843737  Jan1  03:44:18  Jan1  03:54:18  Act
32   0007.0e03.1081 efrule-q5d  1852632338 Jan1  03:35:56  Jan1  03:45:56  Act
33   0007.0e03.1179 efrule-q5   118522795  Jan1  03:44:18  Jan1  03:54:18  Act
34   0007.0e03.1179 efrule-q5d  1834693996 Jan1  03:35:56  Jan1  03:45:56  Act
35   0007.0e03.1471 efrule-q5   122182565  Jan1  03:43:58  Jan1  03:53:58  Act
36   0007.0e03.1471 efrule-q5d  1881390866 Jan1  03:34:55  Jan1  03:44:55   -
```

```
37   0007.0e03.1341 efrule-q5   129557931  Jan1  03:43:48  Jan1  03:53:48  Act
38   0007.0e03.1341 efrule-q5d  2016792338 Jan1  03:35:56  Jan1  03:45:56  Act
```

The following example shows typical output for subscribers on a particular cable interface:

```
Router# show cable subscriber-usage c6/0/0

Sfid Mac Address   Enforce-rule Mon-dur Cons  Last-detect    Last-penalty   Pen
                      Name      (kbits/sec)       time            time     Flag
7    0007.0e03.2cad test1       0          Jan1  00:00:00  Jan1  00:00:00   -
9    0007.0e03.2c45 test1       0          Jan1  00:00:00  Jan1  00:00:00   -
```

The following example shows typical output for the **show cable subscriber-usage** command for one upstream on a particular cable interface:

```
Router# show cable subscriber-usage c6/0/1
 upstream 0

Sfid Mac Address   Enforce-rule Mon-dur Cons  Last-detect    Last-penalty   Pen
                      Name      (kbits/sec)       time            time     Flag
5    0007.0e03.2c25 test1       0          Jan1  00:00:00  Jan1  00:00:00   -
```

The following example shows typical output for the **sort-byte-count** option for the **show cable subscriber-usage** command:

```
Router# show cable subscriber-usage
 sort-byte-count

Sfid Mac Address   Enforce-rule Mon-dur Cons  Last-detect    Last-penalty   Pen
                      Name      (kbits/sec)       time          time        Flag
7    0007.0e03.2cad test1       65157114   Feb24 11:36:34  Mar3  11:36:34  Act
9    0007.0e03.2c45 test1       16381014                                   -
5    0007.0e03.2c25 test1       13440960                                   -
```

Table below describes the fields shown by the show cable subscriber-usage command.

Table 187: show cable subscriber-usage Field Descriptions

Field	Description
SFID	Number of the Service Flow ID.
Mac Address	Hardware address (MAC address) of the subscriber's cable modem.
Enforce-rule Name	Name of the enforce-rule being applied to this subscriber.
Total-Kbyte	Total number of kilobytes consumed by the subscriber's cable modem during the last monitoring-duration window. **Note** The total byte count is reset to 0 whenever an enforce-rule's configuration is changed. **Note** Effective with Cisco IOS Release 12.2(33)SCA, the field Total-Kbyte has been modified to Mon-Dur Cons (kbits/sec).

Field	Description
Last-detect time	Last time period, if any, at which it was determined that the cable modem was using more bandwidth than allowed by their QoS profile. This value also shows the time at which the enforced QoS profile was automatically applied, if this option has been enabled.
Last-penalty time	If an enforced QoS profile is currently in effect, this field shows the time period at which the subscriber's current penalty time expires, at which point their original registered QoS profile is restored.
Pen Flag	Identifies whether a penalty enforce-rule has been applied to this cable modem.

Related Commands

Command	Description
activate-rule at-byte-count	Specifies the number of bytes that a subscriber can transmit during the monitoring period on a Cisco CMTS router.
cable qos enforce-rule	Creates an enforce-rule to enforce a particular QoS profile for subscriber traffic management and enters enforce-rule configuration mode.
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
enabled (enforce-rule)	Activates an enforce-rule and begins subscriber traffic management on a Cisco CMTS Router.
penalty-period	Specifies the time period that an enforced QoS profile should be in effect for subscribers who violate their registered QoS profiles.
qos-profile enforced	Specifies a QoS profile that should be enforced when users violate their registered QoS profiles.
qos-profile registered	Specifies the registered QoS profile that should be used for this enforce-rule.
show cable qos enforce-rule	Displays the QoS enforce-rules that are currently defined.

show cable tech-support

To display general information about the router when reporting a problem, use the **show cable tech-support** command in privileged EXEC mode.

show cable tech-support {*slot* /*port* | *slot* /*subslot* /*port* }

Syntax Description

slot /*port*	(Optional) Cisco IOS Release 12.3(9a)BC allows you to display information about one specific cable interface. Identifies the cable interface and downstream port on the Cisco uBR7100 series and Cisco uBR7200 series routers. On the Cisco uBR7100 series router, the only valid value is **1/0**. On the Cisco uBR7200 series router, *slot* can range from 3 to 6, and *port* can be 0 or 1, depending on the cable interface.
slot /*subslot* /*port*	(Optional) Cisco IOS Release 12.3(9a)BC allows you to display information about one specific cable interface. Identifies the cable interface on the router. The following are the valid values: • *slot* = 5 to 8 for uBR series router, 0 to 9 for cBR series router. • *subslot* = 0 or 1 for uBR series router, 0 for cBR series router. • *port* = 0 to 4 for uBR series router, 0 to 7 for cBR series router (depending on the cable interface).

Command Default

None.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.1(1a)T1	This command was modified to include information about the cable clock card.
12.2(15)BC2	This command added several **show pxf** commands to the display on the Cisco uBR10012 router.
12.3(9a)BC	The output of the command was significantly shortened by moving a number of show commands (the ones that display information about individual cable modems) to the show tech-support command. This release also adds support for an option to display information about only one specific cable interface.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value range for the *slot* /*subslot* /*port* variables were changed.

Usage Guidelines

The **show cable tech-support** command displays a large amount of configuration, run-time status, and other information about the cable interfaces on the Cisco CMTS. The output of this command can be provided to technical support representatives when reporting a problem.

Note The **show tech-support** includes most of the information shown in the **show cable tech-support** command. Unless the problem is clearly cable-specific, TAC personnel will typically request the **show tech-support** output to troubleshoot any problems.

The **show cable tech-support** command displays the output of a number of different show commands. The exact output depends on the platform, configuration, and type of protocols being used. The output includes the output from the following commands:

- **show cable modem**
- **show cable flap-list**
- **show cable qos profile**
- **show cable modulation-profile**
- **show cable spectrum-group**
- **show cable hop**
- **show interface cable sid (for each cable interface)**
- **show interface cable sid connectivity (for each cable interface)**
- **show interface cable downstream**
- **show interface cable upstream**
- **show interface cable mac-scheduler**
- **show interface cable modem**

Other commands could be included in the **show cable tech-support** output, depending on the CMTS platform, the Cisco IOS software being used, and the cards that are installed in the chassis.

On the Cisco uBR10012 router, the following commands also appear in Cisco IOS Release 12.2(15)BC2 and later releases:

- **show pxf cpu statistics**
- **show pxf cpu subblocks**
- **show pxf cpu buffer**
- **show pxf dma**
- **show pxf cpu cef memory**
- **show pxf cpu queue**
- **show pxf cpu statistics drop**
- **show cable modem partial-mode**

Tip Depending on the platform and configuration, the output from the **show cable tech-support** command can easily exceed the buffers found in most communications programs. To capture this output so it can be sent to Cisco TAC, use a Telnet program that allows you to capture the output directly to disk.

Examples

The following abbreviated example illustrates the cable modem and interface information for the Cisco uBR10012 router on which Cisco IOS Release 12.3(9a)BC is installed.

```
Router# show cable tech-support
------------------------------------ Slot 8/1 -----------------------------------
------------------ show cable modem Cable8/1/0 ------------------
MAC Address    IP Address      I/F       MAC         Prim RxPwr  Timing  Num BPI
                                         State       Sid  (dB)   Offset  CPE Enb
------------------ show cable modem Cable8/1/0 connectivity ------------------
Prim  1st time    Times  %online     Online time            Offline time
Sid   online      Online          min     avg     max     min     avg     max
------------------ show interface Cable8/1/0 sid ------------------
Sid  Prim  MAC Address    IP Address      Type Age      Admin   Sched  Sfid
                                                       State   Type
------------------ show interface Cable8/1/0 sid counter ------------------
Sid  Req-polls  BW-reqs    Grants     Packets    Frag       Concatpkts
     issued     received   issued     received   complete   received
------------------ show interface Cable8/1/0 sid association ------------------
Sid  Prim Online     IP Address      MAC Address    Interface     VRF Name
------------------ show interface Cable8/1/0 modem 0 ------------------
SID   Priv bits  Type      State       IP address      method    MAC address
------------------ show cable modem Cable8/1/1 ------------------
MAC Address    IP Address      I/F       MAC         Prim RxPwr  Timing  Num BPI
                                         State       Sid  (dB)   Offset  CPE Enb
------------------ show cable modem Cable8/1/1 connectivity ------------------
Prim  1st time    Times  %online     Online time            Offline time
Sid   online      Online          min     avg     max     min     avg     max
------------------ show cable modem Cable8/1/1 partial-mode ------------------
MAC Address    IP Address      I/F       MAC         Prim  RCC  UP-reason/
                                         State       Sid   ID   Failed-tcs
------------------ show interface Cable8/1/1 sid ------------------
Sid  Prim  MAC Address    IP Address      Type Age      Admin   Sched  Sfid
                                                       State   Type
------------------ show interface Cable8/1/1 sid counter ------------------
Sid  Req-polls  BW-reqs    Grants     Packets    Frag       Concatpkts
     issued     received   issued     received   complete   received
------------------ show interface Cable8/1/1 sid association ------------------
Sid  Prim Online     IP Address      MAC Address    Interface     VRF Name
------------------ show interface Cable8/1/1 modem 0 ------------------
SID   Priv bits  Type      State       IP address      method    MAC address
```

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show controllers cable	Displays information about a specific line card's interface controllers.
show interface cable downstream	Displays information about the cable interface.
show running-config	Displays the current run-time configuration.
show startup-config	Displays the configuration that was used to initially configure the CMTS at system startup.
show tech-support	Displays the output from **show** commands that display the router's configuration and run-time status.

Command	Description
show version	Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.

show cable throttle-modem

To display cable modem (CM) throttle information, use the **show cable throttle-modem** command in user EXEC or privileged EXEC mode.

show cable throttle-modem

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

User EXEC (>),

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF3	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable throttle-modem** command when the Cable Modem Registration Throttling feature is disabled:

```
Router# show cable throttle-modem
CPU for five seconds: 4%/0%; one minute: 1%; five minutes: 1%
CM Throttle Status : Config Disabled; Oper Disabled;
CM Throttle Config : Init Rate 32 CM/Sec; Holdoff 45 Sec;
Flush Rate 300 CM/Sec
CM Register Rate : 0 CM/Sec
```

The following is a sample output of the **show cable throttle-modem** command when the Cable Modem Registration Throttling feature is enabled:

```
Router# show cable throttle-modem
CPU for five seconds: 5%/0%; one minute: 1%; five minutes: 1%
CM Throttle Status : Config Enabled; Oper Enabled;
CM Throttle Config : Init Rate 32 CM/Sec; Holdoff 45 Sec;
Flush Rate 300 CM/Sec
CM Register Rate : 0 CM/Sec
CM Throttling Rate : 4 CM/Sec
Num of CM in Queue : 0
```

Table below describes the significant fields shown in the display.

Table 188: show cable throttle-modem Field Descriptions

Field	Description
CPU for five seconds	CPU usage information.

Field	Description
CM Throttle Status	CM throttle operating status. The valid values are: • Config Enabled—Feature is enabled. • Oper Enabled—Feature is functional.
CM Throttle Config	CM throttle configuration parameters.
CM Register Rate	Information about the current cable modem registration success rate.
CM Throttling Rate	Dynamic cable modem throttle rate from the waiting queue, adjusted according to CPU usage, capped by the init-rate value.
Num of CM in Queue	Number of CMs in the queue.

Related Commands

Command	Description
cable throttle-modem	Enables the Cable Modem Registration Throttling feature.

show cable upstream controller-profile

To display the cable upstream controller profile, use the **show cable upstream controllerprofile** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable upstream controller profile *id* {**us-channel** *chan-id1 chan-id2*}

Syntax Description

profile *id*	Profile identifiler.
us-channel *chan-id1 chan-id2*	Channel identifier.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the cable upstream controller profile.

The following example shows the sample output for the **show cable upstream controllerprofile** command:

```
Router#show cable upstream controller-profile 0

Load for five secs: 2%/0%; one minute: 3%; five minutes: 3%
Time source is NTP, 15:14:27.916 CST Fri Feb 24 2017

Upstream controller-profile 0
Description:
Upstream controller-profile 0 is being used by controller Upstream-Cable:
8/0/1,  8/0/0
  Controller Upstream-Cable
    ...
  Upstream-channel 0
    chan-class-id                  : 0x0
    channel-width                  : 1600000 1600000
    docsis-mode                    : atdma
```

show cable upstream service-flow summary

To display the upstream service flow summary information on the Cisco CMTS router, use the **show cable upstream service-flow summary** command in privileged EXEC mode.

show cable upstream service-flow summary

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable upstream service-flow summary** command:

```
Router# show cable upstream service-flow summary
Interface             Static Upstream Service Flow Dynamic Upstream Service Flow Desc
            Total PRI BE   UGS  UGS-AD RTPS N-RTPS BE   UGS  UGS-AD RTPS  N-RTPS
C7/0/0/U0   3     0   0    0    0      3    0      0    0    0      0     0
C7/0/0/U2   21    4   12   0    0      9    0      0    0    0      0     0
C7/0/0/U3   20    5   15   0    0      5    0      0    0    0      0     0
C7/0/0/UB1  24    8   24   0    0      0    0      0    0    0      0     0      UBG1
C7/1/0/U2   4     1   3    0    0      1    0      0    0    0      0     0
C7/1/1/U2   1     1   1    0    0      0    0      0    0    0      0     0
C8/0/0/U0   1     1   1    0    0      0    0      0    0    0      0     0
C8/0/0/U1   1     0   0    0    0      1    0      0    0    0      0     0
C8/0/0/U2   1     0   0    0    0      1    0      0    0    0      0     0
C8/0/0/U3   1     0   0    0    0      1    0      0    0    0      0     0
C8/0/0/UB3  5     2   5    0    0      0    0      0    0    0      0     0
C8/0/0/UB8  4     1   4    0    0      0    0      0    0    0      0     0
Total:      86    23  65   0    0      21   0      0    0    0      0     0
```

Table below describes the significant fields shown in the display.

Table 189: show cable upstream service-flow summary Field Descriptions

Field	Description
Interface	Cable interface.
Total	Total number of upstream service flows.
PRI	Number of primary upstream service flows.
BE	Number of best effort service schedule types.
UGS	Number of unsolicited grant service schedule types.

Field	Description
UGS-AD	Number of unsolicited grant service with activity detection schedule types.
RTPS	Number of real-time polling service schedule types.
N-RTPS	Number of non-real-time polling service schedule types.
Description	Descriptive name for the bonding group.

Related Commands

Command	Description
show interface cable	Displays configuration and status information for the cable interface on the Cisco CMTS router.
show interface cable downstream	Displays information about the downstream cable interface on the Cisco CMTS router.

show cable upstream ofdma mer-fec

To display the per-IUC summary information for every OFDMA channel that is active in the system, you can use the **show cable upstream ofdma mer-fec** command in privileged EXEC mode.

show cable upstream ofdma mer-fec

To clear FEC and MER counts on every OFDMA channel in the system, you can use the **clear cable upstream ofdma mer-fec all**

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Command History

Release	Modification
Cisco IOS XE Gibraltar 16.12.1z	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable upstream ofdma mer-fec** command:

```
Router# show cable upstream ofdma mer-fec
Upstream:IUC           MER(dB)    TotalFecCW    CorrectedFecCW   UncorrFecCW UncorrCW%
MD:upstream
UC1/0/0:U12:IR           0.00     1517          1516             1           0.100
Ca1/0/0:u14
UC1/0/0:U12:FR           0.00     212           212              0           0.0
Ca1/0/0:u14
UC1/0/0:U12:IUC5        39.50     182847169     24808975         4600        0.224
Ca1/0/0:u14
UC1/0/0:U12:IUC6        39.75     12238138      1330784          235         0.204
Ca1/0/0:u14
UC1/0/0:U12:IUC9        39.75     11905027      1870105          101         0.116
Ca1/0/0:u14
UC1/0/0:U12:IUC10        0.00     0             0                0           0.0
Ca1/0/0:u14
UC1/0/0:U12:IUC11        0.00     0             0                0           0.0
Ca1/0/0:u14
UC1/0/0:U12:IUC12        0.00     0             0                0           0.0
Ca1/0/0:u14
UC1/0/0:U12:IUC13       38.25     3308365       471591           16          0.64
Ca1/0/0:u14
UC1/0/0:U13:IR           0.00     431           431              0           0.0
Ca1/0/0:u15
UC1/0/0:U13:FR           0.00     163           163              0           0.0
Ca1/0/0:u15
UC1/0/0:U13:IUC5        40.50     57309324      1071754          827         0.12
Ca1/0/0:u15
```

The following is a sample of the **clear cable upstream ofdma mer-fec all** command:

```
clear cable upstream ofdma mer-fec all
```

```
clear cable upstream ofdma mer-fec upstream-cable <slot>/0/<us-controller> us-channel <12-15>
```

show cable upstream ofdma chan-util

To display the rolling window utilization summary information for every OFDMA channel that is active in the system, you can use the **show cable upstream ofdma chan-util** command in privileged EXEC mode.

show cable upstream ofdma chan-util

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1y	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable upstream ofdma chan-util** command:

```
Router# show cable upstream ofdma chan-util
                SNMP util interval: 360
Upstream Channel %data bytes %dps grants %data grants SNMP   30 sec   MD:upstream
UC1/0/0:U12           0           0            0           0         0          Ca1/0/0:u4
UC1/0/0:U12           0           0            0           0         0          Ca1/0/0:u4
UC1/0/0:U12           0           0            0           0         0          Ca1/0/0:u4
UC1/0/0:U13           0           0            0           0         0          Ca1/0/0:u5
UC1/0/0:U12           0           0            0           0         0          Ca1/0/0:u4
UC1/0/0:U12           0           0            0           0         0          Ca1/0/0:u4
UC1/0/0:U12           0           0            0           0         0          Ca1/0/0:u4
```

show cable urm

To view the mapping of cable MAC domain upstream channel to connector on a Cisco uBR-MC3GX60V cable interface line card in the Cisco uBR series router, or view the mapping of MAC domain upstream channel/upstream-cable controller us channel/the US PHY receiver in the Cisco cBR series router, use the **show cable urm** command in the privileged EXEC mode.

show cable urm [**slot**/**subslot**]

Syntax Description

slot/**subslot**	Identifies the cable interface on the router. • **slot**—Slot where the line card resides. The valid range is from 5 to 8 for uBR series router, 0 to 9 for cBR series router. • **subslot**—Subslot where the line card resides. Available slots are 0 or 1 for uBR series router, 0 for cBR series router.

Command Default

Display information for all the slot/subslot values that has been configured.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output indicating the connector group table information of the cable line card in slot 6/1 of the uBR series router:

```
Router# show cable urm 6/1
===
connector group table
===
card  cnnrs  md:us=>cnnr
6/1    0-3    3:2=> 1 *empty*   *empty*   *empty*   *empty*   *empty*
                *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
       4-7     *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
                *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
       8-11    *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
                *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
      12-15    *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
                *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
      16-19    *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
                *empty*   *empty*   *empty*   *empty*   *empty*   *empty*
```

Table below describes the significant fields shown in the display.

Field	Description
card	The slot/subslot information of the card.

Field	Description
cnnrs	The connector index range of connectors in a connector group. The values for the Cisco uBR-MC3GX60V, Cisco UBR-MC20X20V, and the Cisco uBR10-MC5X20U line cards are 0-19.
md:us=>cnnr	The MAC domain upstream channel to connector mapping information of a physical upstream channel. The entry position corresponding to a physical upstream channel index in a connector group. For uBR-MC3GX60V line card, there are 12 physical upstream channels in each connector group. For the UBR-MC20X20V and uBR10-MC5X20U line cards, there are 2 channels in each group. In the example, C6/1/3:U2 is mapped to connector 1 in the running config by the user using connector command. Internally, CMTS software maps C6/1/3:U2 to physical upstream channel 0 (1st entry) in the 0-3 connector group.

Examples

The following is a sample output indicating the URM mapping table information of the cable line card in slot 9/0 of the cBR series router:

```
Router# show cable urm 9/0
===
Card 9/0
===

===
URM Mapping Table
===

UPSTREAM-CHAN MD-US       CARD- CARD- CHIP CHIP- CHIP-
                          CNNR  RCVR       CNNR  RCVR
UC9/0/0:U0    Ca9/0/0/U0  0     12    1    0     0
UC9/0/0:U1    Ca9/0/0/U1  0     13    1    0     1
UC9/0/0:U2    Ca9/0/0/U2  0     14    1    0     2
UC9/0/0:U3    Ca9/0/0/U3  0     15    1    0     3
UC9/0/0:U4    Ca9/0/0/U4  0     16    1    0     4
UC9/0/0:U5    Ca9/0/0/U5  0     17    1    0     5
UC9/0/1:U0    Ca9/0/1/U0  1     18    1    1     6
UC9/0/1:U1    Ca9/0/1/U1  1     19    1    1     7
UC9/0/1:U2    Ca9/0/1/U2  1     20    1    1     8
UC9/0/1:U3    Ca9/0/1/U3  1     21    1    1     9
UC9/0/1:U4    Ca9/0/1/U4  1     22    1    1     10
UC9/0/1:U5    Ca9/0/1/U5  1     23    1    1     11
UC9/0/2:U0    Ca9/0/2/U0  2     0     0    1     0
UC9/0/2:U1    Ca9/0/2/U1  2     1     0    1     1
UC9/0/2:U2    Ca9/0/2/U2  2     2     0    1     2
UC9/0/2:U3    Ca9/0/2/U3  2     3     0    1     3
UC9/0/2:U4    Ca9/0/2/U4  2     4     0    1     4
UC9/0/2:U5    Ca9/0/2/U5  2     5     0    1     5
UC9/0/3:U0    Ca9/0/3/U0  3     6     0    0     6
UC9/0/3:U1    Ca9/0/3/U1  3     7     0    0     7
UC9/0/3:U2    Ca9/0/3/U2  3     8     0    0     8
UC9/0/3:U3    Ca9/0/3/U3  3     9     0    0     9
UC9/0/3:U4    Ca9/0/3/U4  3     10    0    0     10
UC9/0/3:U5    Ca9/0/3/U5  3     11    0    0     11
UC9/0/4:U0    Ca9/0/4/U0  4     36    3    0     0
UC9/0/4:U1    Ca9/0/4/U1  4     37    3    0     1
UC9/0/4:U2    Ca9/0/4/U2  4     38    3    0     2
UC9/0/4:U3    Ca9/0/4/U3  4     39    3    0     3
UC9/0/4:U4    Ca9/0/4/U4  4     40    3    0     4
UC9/0/4:U5    Ca9/0/4/U5  4     41    3    0     5
```

```
UC9/0/5:U0    Ca9/0/5/U0  5     42    3     1     6
UC9/0/5:U1    Ca9/0/5/U1  5     43    3     1     7
UC9/0/5:U2    Ca9/0/5/U2  5     44    3     1     8
UC9/0/5:U3    Ca9/0/5/U3  5     45    3     1     9
UC9/0/5:U4    Ca9/0/5/U4  5     46    3     1     10
UC9/0/5:U5    Ca9/0/5/U5  5     47    3     1     11
UC9/0/6:U0    Ca9/0/6/U0  6     24    2     1     0
UC9/0/6:U1    Ca9/0/6/U1  6     25    2     1     1
UC9/0/6:U2    Ca9/0/6/U2  6     26    2     1     2
UC9/0/6:U3    Ca9/0/6/U3  6     27    2     1     3
UC9/0/6:U4    Ca9/0/6/U4  6     28    2     1     4
UC9/0/6:U5    Ca9/0/6/U5  6     29    2     1     5
UC9/0/7:U0    Ca9/0/7/U0  7     30    2     0     6
UC9/0/7:U1    Ca9/0/7/U1  7     31    2     0     7
UC9/0/7:U2    Ca9/0/7/U2  7     32    2     0     8
UC9/0/7:U3    Ca9/0/7/U3  7     33    2     0     9
UC9/0/7:U4    Ca9/0/7/U4  7     34    2     0     10
UC9/0/7:U5    Ca9/0/7/U5  7     35    2     0     11
UC9/0/8:U0    Ca9/0/8/U0  8     60    5     0     0
UC9/0/8:U1    Ca9/0/8/U1  8     61    5     0     1
UC9/0/8:U2    Ca9/0/8/U2  8     62    5     0     2
UC9/0/8:U3    Ca9/0/8/U3  8     63    5     0     3
UC9/0/8:U4    Ca9/0/8/U4  8     64    5     0     4
UC9/0/8:U5    Ca9/0/8/U5  8     65    5     0     5
UC9/0/9:U0    Ca9/0/9/U0  9     66    5     1     6
UC9/0/9:U1    Ca9/0/9/U1  9     67    5     1     7
UC9/0/9:U2    Ca9/0/9/U2  9     68    5     1     8
UC9/0/9:U3    Ca9/0/9/U3  9     69    5     1     9
UC9/0/9:U4    Ca9/0/9/U4  9     70    5     1     10
UC9/0/9:U5    Ca9/0/9/U5  9     71    5     1     11
UC9/0/10:U0   Ca9/0/10/U0 10    48    4     1     0
UC9/0/10:U1   Ca9/0/10/U1 10    49    4     1     1
UC9/0/10:U2   Ca9/0/10/U2 10    50    4     1     2
UC9/0/10:U3   Ca9/0/10/U3 10    51    4     1     3
UC9/0/10:U4   Ca9/0/10/U4 10    52    4     1     4
UC9/0/10:U5   Ca9/0/10/U5 10    53    4     1     5
UC9/0/11:U0   Ca9/0/11/U0 11    54    4     0     6
UC9/0/11:U1   Ca9/0/11/U1 11    55    4     0     7
UC9/0/11:U2   Ca9/0/11/U2 11    56    4     0     8
UC9/0/11:U3   Ca9/0/11/U3 11    57    4     0     9
UC9/0/11:U4   Ca9/0/11/U4 11    58    4     0     10
UC9/0/11:U5   Ca9/0/11/U5 11    59    4     0     11
UC9/0/12:U0   Ca9/0/12/U0 12    84    7     0     0
UC9/0/12:U1   Ca9/0/12/U1 12    85    7     0     1
UC9/0/12:U2   Ca9/0/12/U2 12    86    7     0     2
UC9/0/12:U3   Ca9/0/12/U3 12    87    7     0     3
UC9/0/12:U4   Ca9/0/12/U4 12    88    7     0     4
UC9/0/12:U5   Ca9/0/12/U5 12    89    7     0     5
UC9/0/13:U0   Ca9/0/13/U0 13    90    7     1     6
UC9/0/13:U1   Ca9/0/13/U1 13    91    7     1     7
UC9/0/13:U2   Ca9/0/13/U2 13    92    7     1     8
UC9/0/13:U3   Ca9/0/13/U3 13    93    7     1     9
UC9/0/13:U4   Ca9/0/13/U4 13    94    7     1     10
UC9/0/13:U5   Ca9/0/13/U5 13    95    7     1     11
UC9/0/14:U0   Ca9/0/14/U0 14    72    6     1     0
UC9/0/14:U1   Ca9/0/14/U1 14    73    6     1     1
UC9/0/14:U2   Ca9/0/14/U2 14    74    6     1     2
UC9/0/14:U3   Ca9/0/14/U3 14    75    6     1     3
UC9/0/14:U4   Ca9/0/14/U4 14    76    6     1     4
UC9/0/14:U5   Ca9/0/14/U5 14    77    6     1     5
UC9/0/15:U0   Ca9/0/15/U0 15    78    6     0     6
UC9/0/15:U1   Ca9/0/15/U1 15    79    6     0     7
UC9/0/15:U2   Ca9/0/15/U2 15    80    6     0     8
UC9/0/15:U3   Ca9/0/15/U3 15    81    6     0     9
```

```
UC9/0/15:U4   Ca9/0/15/U4 15    82    6    0     10
UC9/0/15:U5   Ca9/0/15/U5 15    83    6    0     11


===
URM Receiver Resource
===
SLOT/   DEV DEV- MD-US       MD-IDX CARD- CARD- DEV-
SUBSLOT     RCVR                    CNNR  RCVR  CNNR
9/0     D0  R0   Ca9/0/2/U0  0x152  2     0     1
9/0     D0  R1   Ca9/0/2/U1  0x152  2     1     1
9/0     D0  R2   Ca9/0/2/U2  0x152  2     2     1
9/0     D0  R3   Ca9/0/2/U3  0x152  2     3     1
9/0     D0  R4   Ca9/0/2/U4  0x152  2     4     1
9/0     D0  R5   Ca9/0/2/U5  0x152  2     5     1
9/0     D0  R6   Ca9/0/3/U0  0x153  3     6     0
9/0     D0  R7   Ca9/0/3/U1  0x153  3     7     0
9/0     D0  R8   Ca9/0/3/U2  0x153  3     8     0
9/0     D0  R9   Ca9/0/3/U3  0x153  3     9     0
9/0     D0  R10  Ca9/0/3/U4  0x153  3     10    0
9/0     D0  R11  Ca9/0/3/U5  0x153  3     11    0
9/0     D1  R0   Ca9/0/0/U0  0x150  0     12    0
9/0     D1  R1   Ca9/0/0/U1  0x150  0     13    0
9/0     D1  R2   Ca9/0/0/U2  0x150  0     14    0
9/0     D1  R3   Ca9/0/0/U3  0x150  0     15    0
9/0     D1  R4   Ca9/0/0/U4  0x150  0     16    0
9/0     D1  R5   Ca9/0/0/U5  0x150  0     17    0
9/0     D1  R6   Ca9/0/1/U0  0x151  1     18    1
9/0     D1  R7   Ca9/0/1/U1  0x151  1     19    1
9/0     D1  R8   Ca9/0/1/U2  0x151  1     20    1
9/0     D1  R9   Ca9/0/1/U3  0x151  1     21    1
9/0     D1  R10  Ca9/0/1/U4  0x151  1     22    1
9/0     D1  R11  Ca9/0/1/U5  0x151  1     23    1
9/0     D2  R0   Ca9/0/6/U0  0x156  6     24    1
9/0     D2  R1   Ca9/0/6/U1  0x156  6     25    1
9/0     D2  R2   Ca9/0/6/U2  0x156  6     26    1
9/0     D2  R3   Ca9/0/6/U3  0x156  6     27    1
9/0     D2  R4   Ca9/0/6/U4  0x156  6     28    1
9/0     D2  R5   Ca9/0/6/U5  0x156  6     29    1
9/0     D2  R6   Ca9/0/7/U0  0x157  7     30    0
9/0     D2  R7   Ca9/0/7/U1  0x157  7     31    0
9/0     D2  R8   Ca9/0/7/U2  0x157  7     32    0
9/0     D2  R9   Ca9/0/7/U3  0x157  7     33    0
9/0     D2  R10  Ca9/0/7/U4  0x157  7     34    0
9/0     D2  R11  Ca9/0/7/U5  0x157  7     35    0
9/0     D3  R0   Ca9/0/4/U0  0x154  4     36    0
9/0     D3  R1   Ca9/0/4/U1  0x154  4     37    0
9/0     D3  R2   Ca9/0/4/U2  0x154  4     38    0
9/0     D3  R3   Ca9/0/4/U3  0x154  4     39    0
9/0     D3  R4   Ca9/0/4/U4  0x154  4     40    0
9/0     D3  R5   Ca9/0/4/U5  0x154  4     41    0
9/0     D3  R6   Ca9/0/5/U0  0x155  5     42    1
9/0     D3  R7   Ca9/0/5/U1  0x155  5     43    1
9/0     D3  R8   Ca9/0/5/U2  0x155  5     44    1
9/0     D3  R9   Ca9/0/5/U3  0x155  5     45    1
9/0     D3  R10  Ca9/0/5/U4  0x155  5     46    1
9/0     D3  R11  Ca9/0/5/U5  0x155  5     47    1
9/0     D4  R0   Ca9/0/10/U0 0x15A  10    48    1
9/0     D4  R1   Ca9/0/10/U1 0x15A  10    49    1
9/0     D4  R2   Ca9/0/10/U2 0x15A  10    50    1
9/0     D4  R3   Ca9/0/10/U3 0x15A  10    51    1
9/0     D4  R4   Ca9/0/10/U4 0x15A  10    52    1
9/0     D4  R5   Ca9/0/10/U5 0x15A  10    53    1
9/0     D4  R6   Ca9/0/11/U0 0x15B  11    54    0
```

```
9/0      D4  R7   Ca9/0/11/U1 0x15B  11    55    0
9/0      D4  R8   Ca9/0/11/U2 0x15B  11    56    0
9/0      D4  R9   Ca9/0/11/U3 0x15B  11    57    0
9/0      D4  R10  Ca9/0/11/U4 0x15B  11    58    0
9/0      D4  R11  Ca9/0/11/U5 0x15B  11    59    0
9/0      D5  R0   Ca9/0/8/U0  0x158  8     60    0
9/0      D5  R1   Ca9/0/8/U1  0x158  8     61    0
9/0      D5  R2   Ca9/0/8/U2  0x158  8     62    0
9/0      D5  R3   Ca9/0/8/U3  0x158  8     63    0
9/0      D5  R4   Ca9/0/8/U4  0x158  8     64    0
9/0      D5  R5   Ca9/0/8/U5  0x158  8     65    0
9/0      D5  R6   Ca9/0/9/U0  0x159  9     66    1
9/0      D5  R7   Ca9/0/9/U1  0x159  9     67    1
9/0      D5  R8   Ca9/0/9/U2  0x159  9     68    1
9/0      D5  R9   Ca9/0/9/U3  0x159  9     69    1
9/0      D5  R10  Ca9/0/9/U4  0x159  9     70    1
9/0      D5  R11  Ca9/0/9/U5  0x159  9     71    1
9/0      D6  R0   Ca9/0/14/U0 0x15E  14    72    1
9/0      D6  R1   Ca9/0/14/U1 0x15E  14    73    1
9/0      D6  R2   Ca9/0/14/U2 0x15E  14    74    1
9/0      D6  R3   Ca9/0/14/U3 0x15E  14    75    1
9/0      D6  R4   Ca9/0/14/U4 0x15E  14    76    1
9/0      D6  R5   Ca9/0/14/U5 0x15E  14    77    1
9/0      D6  R6   Ca9/0/15/U0 0x15F  15    78    0
9/0      D6  R7   Ca9/0/15/U1 0x15F  15    79    0
9/0      D6  R8   Ca9/0/15/U2 0x15F  15    80    0
9/0      D6  R9   Ca9/0/15/U3 0x15F  15    81    0
9/0      D6  R10  Ca9/0/15/U4 0x15F  15    82    0
9/0      D6  R11  Ca9/0/15/U5 0x15F  15    83    0
9/0      D7  R0   Ca9/0/12/U0 0x15C  12    84    0
9/0      D7  R1   Ca9/0/12/U1 0x15C  12    85    0
9/0      D7  R2   Ca9/0/12/U2 0x15C  12    86    0
9/0      D7  R3   Ca9/0/12/U3 0x15C  12    87    0
9/0      D7  R4   Ca9/0/12/U4 0x15C  12    88    0
9/0      D7  R5   Ca9/0/12/U5 0x15C  12    89    0
9/0      D7  R6   Ca9/0/13/U0 0x15D  13    90    1
9/0      D7  R7   Ca9/0/13/U1 0x15D  13    91    1
9/0      D7  R8   Ca9/0/13/U2 0x15D  13    92    1
9/0      D7  R9   Ca9/0/13/U3 0x15D  13    93    1
9/0      D7  R10  Ca9/0/13/U4 0x15D  13    94    1
9/0      D7  R11  Ca9/0/13/U5 0x15D  13    95    1
```

Table below describes the significant fields shown in the display.

Field	Description
UPSTREAM-CHAN	The upstream channel under upstream-cable controller.
MD-US	The upstream channel under mac domain interface.
CARD-CNNR	The card level connector number.
CARD-RCVR	The card level receiver number.
CHIP	The US PHY chip number.
CHIP-CNNR	The chip level connector number.
CHIP-RCVR	The chip level receiver number.
SLOT/SUBSLOT	The slot and subslot number for this card.

Field	Description
DEV	The US PHY device number.
DEV-RCVR	The US PHY device receiver.
MD-US	The upstream channel under MAC domain.
MD-IDX	The internal MAC domain index.
CARD-CNNR	The card level connector number.
CARD-RCVR	The card level receiver number.
DEV-CNNR	The device level connector number.

Related Commands

Command	Description
show running-config interface cable	Shows the MD:US connector mapping configured by users.

show cable us-sg

To display the upstream service groups configured on all cable interfaces of a Cisco CMTS router, use the **show cable us-sg** command in privileged EXEC mode.

show cable us-sg

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following is a sample output of the **show cable us-sg** command.

```
Router# show cable us-sg

Cable MD 5/0/0
  US-SG-ID  : 1         US-Chan : U0,1,2,3,4,5
  Primary-DS: 1/0/0:0   US-SG-ID: 1
    MDD US-List   : U0,1,2,3,4,5
    MDD Ambiguity : U0,1,2,3,4,5
Cable MD 6/0/0
  US-SG-ID  : 1         US-Chan : U0,1,2,3
  Primary-DS: 1/0/0:4   US-SG-ID: 1
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
Cable MD 7/0/0
  US-SG-ID  : 1         US-Chan : U0,1,2,3
  Primary-DS: 7/0/0:0   US-SG-ID: 1
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
  Primary-DS: 7/0/0:1   US-SG-ID: 1
    MDD US-List   : U0,1,2,3
    MDD Ambiguity : U0,1,2,3
```

Table below shows the significant fields shown in the display:

Table 190: show interface cable service-flow Field Descriptions

Field	Description
US-SG-ID	Upstream service group ID.
US-Chan	Upstream channels on the cable interface line card.
Primary-DS	Primary downstream interafce.
MDD US-List	MAC management message: MDD TLV type 7 content, upstream active channel list.

Field	Description
MDD Ambiguity	MAC management message: MDD TLV type 8 content, upstream ambiguity resolution channel list.

Related Commands

Command	Description
show cable mac-domain upstream-service-group	Displays runtime statistics of the upstream service group on a cable interface line card.

show cable video announce-event-profile

To display the configuration of the GQI announce event profile and a list of LEDs that use the profile, use the **show cable video announce-event-profile** command in privileged EXEC mode.

show cable video announce-event-profile [**name** *name* | **id** *id*]

Syntax Description

name *name*	Displays the information for the GQI announce-event-profile of this name if it exists.
id *id*	Displays the information for the GQI announce-event-profile of this ID if it exists.

Command Default

None.

Command Modes

Privileged EXEC (#).

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following sample output shows the GQI announce event profile and the list of LEDs:

```
Router# show cable video announce-event-profile id 3
ID:3                        Name: profile-2
  ACK timeout: 240 seconds
  Number of Event Filters: 10
    2104 4400 4401 5200 5401 5404 5405 5406 5502 5602

  Number of Logical-edge-device: 2
    ID    Name
    ----------------------------------------------------------------
    2     led2
    3     led3
```

Related Commands

Command	Description
announce-event-profile	Configures the GQI announce event profile.
event-profile	Applies the GQI announce event profile to a specific LED.

show cable video encryption

To display the cable video encryption, use the **show cable video encryption** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show cable video encryption

Syntax Description

—

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.5.1	This command was introduced.

Usage Guidelines

Use this command to verify the active RPDs with the principal and auxilliary roles.

The following example shows the sample output for the **show cable videoencryption** command:

```
Router#show cable video encryption
```

show cable video encryption dvb

To display the digital video broadcasting encryption information, use the **show cable video encryption dvb** command in privileged EXEC mode.

show cable video encryption dvb {**ca-interface brief** | **ecmg** { **all** | **id** *id* | { **brief** | **connection** | **desc-rule** | **overrule** } | **name** *name* | { **brief** | **connection** | **desc-rule** | **overrule** } | **mode** | { **broadcast** | **tier-based** | **vod** } } **eis** { **all** | **id** *id* | **name** *name* } **summary** }
show cable video encryption dvb tier-based { **config** | **ecms** }

Syntax Description

ca-interface brief	Displays the CA interface details.
ecmg all	Displays the information of all the ECMG connections.
id *id*	Specifies the ECMG ID.
name *name*	Specifies the ECMG name.
brief	Displays the brief summary of ECMG.
connection	Displays the details of all the connections of this ECMG.
desc-rule	Displays the details of all the descriptor rules of this ECMG.
overrule	Displays the details of all the overrule settings of this ECMG.
mode {**broadcast** | **tier-based** | **vod**}	Displays the details of ECM application mode.
eis all	Displays the information of all the EIS connections.
id *id*	Specifies the EIS connection ID.
name *name*	Specifies the EIS connection name.
summary	Displays the information of scrambler general settings.
tier-based config	Displays the detail information of tier-based scrambling configuration.
tier-based ecms	Displays Entitlement Control Messages information and debug information for tier-based scrambling.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Release	Modification
Cisco IOS XE Amsterdam 17.3.1x	This command was modified by changing the **show cable video encryption dvb tier-based** form of the command to have two options: **config** and **ecms**

Usage Guidelines

This command displays the digital video broadcasting encryption information.

Examples

The following sample outputs show the ECMG connection information:

```
Router# show cable video encryption dvb ecmg id 1 connection
------------------------------------------------------------------------------------------------------------
ECMG ECMG           ECMG     CA Sys CA Subsys PID    Lower Upper Streams/ Open Streams/
Auto Chan Slot ECMG        ECMG
ID   Name           Type     ID     ID        Source limit limit ECMG     ECMG          ID
             Connections Application
------------------------------------------------------------------------------------------------------------
1    polaris_ecmg01 standard 0x4748 0x0       sid    0     0     1        1
Enabled   RP   1           Tier-Based

ECMG Connections for ECMG ID = 1

-----------------------------------------------------------
Conn Conn     IP          Port    Channel  Conn    Open
-ID  Priority Address     Number  ID       Status  Streams
-----------------------------------------------------------
1    1        1.200.1.81  8888    1        Open    1

Router# show cable video encryption dvb ecmg id 7 connection
------------------------------------------------------------------------------------------------------------
ECMG ECMG           ECMG     CA Sys CA Subsys PID    Lower Upper Streams/ Open Streams/
Auto Chan Slot ECMG        ECMG
ID   Name           Type     ID     ID        Source limit limit ECMG     ECMG          ID
             Connections Application
------------------------------------------------------------------------------------------------------------
7    ecmg-7         standard 0x950  0x1234    sid    0     0     1680     1680
Enabled   7    1           VOD

ECMG Connections for ECMG ID = 1

-----------------------------------------------------------
Conn Conn     IP          Port    Channel  Conn    Open
-ID  Priority Address     Number  ID       Status  Streams
-----------------------------------------------------------
1    1        1.200.1.81  8888    1        Open    1
```

The following sample output shows the CA interface details:

```
Router# show cable video encryption dvb ca-interface brief
CA Interface configuration

------------------------------
Linecard    IP Address    VRF
------------------------------
7           1.24.10.8     N/A

ECMG Route configuration

-----------------------------------------------------
IP Address    NetMast         Interface
```

```
-------------------------------------------------
1.200.1.0     255.255.255.0   TenGigabitEthernet4/1/2
```

The following sample output shows the EIS connection information:

```
Router# show cable video encryption dvb eis id 1
-------------------------------------------------------------------------------------
EIS  EIS   Peer         Management  TCP   CP        CP        Overwrite  Connection
ID   Name  IP           IP          Port  Overrule  Duration  SCG        Status
-------------------------------------------------------------------------------------
1    eis1  1.200.1.172  1.24.2.10   6000  DISABLED  0         DISABLED   Connected
```

The following is sample output from the **show cable video encryption dvb tier-based ecms** command.

```
Router#show cable video encryption dvb tier-based ecms
Aggregator CP:                          12
Number of Ca system:                    1
CAS Logical id:                         1 2
No Of <CWs,ECM> Cached :                3 9(1),10(1),11(1),
Current Pending Request/Response:       NULL
No Of Prefetch CW :                     1
No Of EcmGrps :                         1
Total SCG(s) :                          1
CP Extention :                          Not in CP Extention

Slot      scg_id    cas_id  ReqCP
8         67108872  1       0-- /11(11)[3{(9,9),(10,10),(11,11),} ]
```

Related Commands

Command	Description
dvb	Enters the DVB scrambling configuration mode.

show cable video encryption linecard

To display the encryption configuration information of the line card, use the **show cable video encryption linecard** command in privileged EXEC mode.

show cable video encryption linecard {*slot*/*bay* | **all**}

Syntax Description

slot/*bay*	Displays the encryption configuration information of the line card with this slot and bay number. • *slot*—The line card slot number. The valid range is from 0 to 9. • *bay*—The line card bay number. The valid value is 0.
all	Displays encryption support for all line cards.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Everest 16.5.1	Support for powerKEY and PME encryption on the Cisco Remote-PHY device (RPD).

Usage Guidelines

This command displays the encryption configuration information of the line card.

Note The Cisco Remote-PHY device (RPD) supports powerKEY and PME encryption.

Examples

The following sample output shows the encryption configuration information:

```
Router# show cable video encryption linecard 7/0
Line card: 7/0
CA System Scrambler
====================================
PME dvs-042
```

Related Commands

Command	Description
linecard	Defines the encryption type for a line card.
encrypt	Encrypts the virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.

Command	Description
show cable video encryption pme	Displays the privacy mode encryption information.
show cable video session logical-edge-device	Displays the session information for the logical edge device.

show cable video encryption pme

To display the Privacy Mode Encryption (PME) information, use the **show cable video encryption pme** command in privileged EXEC mode.

show cable video encryption pme {**linecard** *slot* / *bay* **session** {*stream-id* | **all** | **summary**} | **status** | **version**}

Syntax Description

linecard *slot* / *bay*	Displays the privacy mode encryption line card information with this slot and bay number. • *slot*—The line card slot number. The valid range is from 0 to 9. • *bay*—The line card bay number. The valid value is 0.
session	Displays the session information. • *stream-id* —Displays the privacy mode encryption session information with this stream ID. The valid range is from 1 to 65535. • **all** —Displays the statistics for all the privacy mode encryption sessions. • **summary** —Displays the summary for all the privacy mode encryption sessions.
status	Displays the privacy mode encryption status.
version	Displays the version of the privacy mode encryption module.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Everest 16.5.1	The Cisco Remote-PHY device (RPD) supports powerKEY and PME encryption.

Usage Guidelines

This command displays the PME information.

Note

Examples

The following sample output shows the privacy mode encryption line card information:

```
Router# show cable video encryption pme linecard 7/0 session 32
Stream 32, session 7681 is active
Stream number = 32 Session number = 7681
ECM requests = 8 ECM replies = 2
```

```
ECM ID = 32 CryptoPeriod num = 2
CP duration = 0 Nominal duration = 40000
CA transfer mode = 1 Stream status = No
Error Blob details

Router# show cable video encryption pme linecard 7/0 session summary
Currently active streams:
Active = 4
ECM req/resp mismatch = 4
ECM req, all streams = 32
ECM resp, all streams = 8
Since last reset:
Sessions created = 4
Sessions deleted = 0
ECMs received =2
ECMs discarded = 0
```

The following sample output shows the privacy mode encryption status information:

```
Router# show cable video encryption pme status
PME Connection Status:
VODS-ID : 111
CEM IP : 1.200.1.163
CEM Port : 5000
Local Mgmt IP : 1.24.2.6
Local Port : 50394
CEM Connection State : Connected
Count of ECMs recd : 2
```

Related Commands

Command	Description
linecard	Defines the encryption type for a line card.
encrypt	Encrypts the virtual carrier group.
pme cem	Configures the parameters for the Cisco Edge QAM Manager server.
pme mgmt-ip	Configures the privacy mode encryption management IP to establish CEM connection.
pme vodsid	Configures the VODSID of Cisco Edge QAM Manager server.
show cable video encryption linecard	Displays the encryption configuration information of the line card.

show cable video gqi connections

To display the GQI protocol connection information of the logical edge device with the Session Resource Manager, use the **show cable video gqi connections** command in privileged EXEC mode.

show cable video gqi connections

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the GQI connection information of the logical edge device with the Session Resource Manager.

Examples

The following sample output shows the GQI connection information of the logical edge device with the Session Resource Manager:

```
Router# show cable video gqi connections
LED  Management   Server     Connection    Version  Event    Reset      Encryption
ID   IP           IP         Status                 Pending  Indication Discovery
-------------------------------------------------------------------------------
1    1.23.2.10    1.200.3.75 Not Connected 0        0        Not Sent   Not Sent
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
mgmt-ip	Defines the local management IP address for a logical edge device.
mac-address	Defines the MAC address for a logical edge device.
vcg	Specifies the virtual carrier group assigned to the logical edge device.
virtual-edge-input-ip	Defines a virtual edge input.
show cable video logical-edge-device	Displays the logical edge device information.
show diag all eeprom detail | include MAC	Displays the chassis MAC address information.

show cable video jitter

To display the session jitter information, use the **show cable video jitter** command in privileged EXEC mode.

show cable video jitter

Command Default

None.

Command Modes

Privileged EXEC (#)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following sample outputs show the session jitter information:

```
Router# show cable video jitter
Session jitter:
  VOD: 200
  SDV: 200
  broadcast: 200
  gaming: 5
  table-based: 100
```

Related Commands

Command	Description
jitter	Sets session jitter.

show cable video integrated-cable

To display the integrated cable information, use the **show cable video integrated-cable** command in privileged EXEC mode.

show cable video integrated-cable *slot/bay/port* [**rf-channel** *rf-channel*]

Syntax Description

slot/bay/port	• *slot*—Specifies the slot number. The valid range is from 0 to 9. • *bay*—Specifies the bay number. The valid value is 0. • *port*—Specifies the port number. The valid range is from 0 to 7.
rf-channel *channel number*	Displays the RF channel information with this channel number. The valid range is from 0 to 157.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the integrated cable information.

Examples

The following sample output shows the virtual carrier group information:

```
Router# show cable video integrated-cable 8/0/0
Integrated TSID ONID Output Physical    Admin Operational Virtual-Carrier-Group
Service-Distribution-Group Logical-Edge-Device Encryption Total
Cable                Port   QAM ID      State State       Name                    Name
                Name                Capable    Sessions
-------------------------------------------------------------------------------------------------
8/0/0:20    1   0    1      unavailable OFF   DOWN        pme_tbv                 pme_tbv
                 pme_tbv             pme        2
8/0/0:21    2   0    2      unavailable OFF   DOWN        pme_tbv                 pme_tbv
                 pme_tbv             pme        2
8/0/0:22    3   0    3      unavailable OFF   DOWN        pme_tbv                 pme_tbv
                 pme_tbv             pme        2
8/0/0:23    4   0    4      unavailable OFF   DOWN        pme_tbv                 pme_tbv
                 pme_tbv             pme        0
8/0/0:24    5   0    5      unavailable OFF   DOWN        pme_tbv                 pme_tbv
                 pme_tbv             pme        0
```

Related Commands

Command	Description
vcg	Specifies the virtual carrier group assigned to the logical edge device
logical-edge-device	Define a logical edge device.

Command	Description
protocol	Specifies the protocol used in the logical edge device.
virtual-edge-input-ip	Configures a virtual edge input.
show cable video logical-edge-device	Displays the logical edge device information.

show cable video logical-edge-device

To display the logical edge device information, use the **show cable video logical-edge-device** command in privileged EXEC mode.

show cable video logical-edge-device {**all** | **id** *id* [**reserve-pid-range**] | **name** *name* [**reserve-pid-range**]}

Syntax Description

all	Displays all logical edge devices.
id *id*	Displays the information of the logical edge device with this ID.
name *name*	Displays the information of the logical edge device with this name.
reserve-pid-range	Displays the reserved PID range.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the logical edge device information.

Examples

The following sample output shows the logical edge device information:

```
Router# show cable video logical-edge-device id 1
Logical Edge Device: led
Id: 1
Protocol: GQI
Service State: Active
Discovery State: Disable
Management IP: 1.33.2.10
MAC Address: c414.3c17.6000
Number of Servers: 2
  Server 1: 1.200.1.193
  Server 2: 1.200.1.183
Reset Interval: 5
Keepalive Interval: 5
Retry Count:3
Number of Virtual Carrier Groups: 2
Number of Share Virtual Edge Input: 1
Number of Physical Qams: 94
Number of Sessions: 240
No Reserve PID Range

Virtual Edge Input:
Input Port    VEI          Slot/Bay Bundle Gatewayy
ID            IP                    ID     IP
-----------------------------------------------
1             174.102.1.1  7/0      -      - --
```

```
Virtual Carrier Group:
ID Name  Total Total       Service-Distribution-Group Service-Distribution-Groupup
         VEI   RF-channel  Name                       ID
------------------------------------------------------------------------------

1  vcg   0     28          sdg                        1
2  vcg-2 0     19          sdg                        1

Integrated Physical Admin Operational TSID ONID Output VCG SDG Encryption
Cable      QAM ID   State State                 Port   ID  ID  Capable
------------------------------------------------------------------------

7/0/0:1    1        ON    UP          29   1000 30     2   1   powerkey
7/0/0:2    2        ON    UP          30   1000 30     2   1   powerkey
7/0/0:3    3        ON    UP          31   1000 30     2   1   powerkey
7/0/0:4    4        ON    UP          32   1000 30     2   1   powerkey
7/0/0:5    5        ON    UP          33   1000 30     2   1   powerkey
7/0/0:6    6        ON    UP          34   1000 30     2   1   powerkey
7/0/0:7    7        ON    UP          35   1000 30     2   1   powerkey
7/0/0:8    8        ON    UP          36   1000 30     2   1   powerkey
7/0/0:9    9        ON    UP          37   1000 30     2   1   powerkey
```

Related Commands

Command	Description
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
encrypt	Encrypts the virtual carrier group.
service-type	Specifies the service type of the virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
virtual-carrier-group	Defines a virtual carrier group.

show cable video low-latency linecard

To display the linecard low latency information, use the **show cable video low-latency linecard** command in privileged EXEC mode.

show cable video low-latency linecard {*slot/bay* | **all**}

Syntax Description

slot/bay	Displays the low latency information for a specific linecard.
all	Displays the low latency information for all the linecards.

Command Default

None.

Command Modes

Privileged EXEC (#)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following sample outputs show the linecard low latency information:

```
Router# show cable video low-latency linecard 1/0
Line Card: 1
   Virtual-Carrier-Group: vcg1
   Service-Distribution-Group: sdg1
   Logical-Edge-Device: led1
   Number of RF-Channels: 8
   RF-Channel Range   TSID Range   Output Port Number Range
   ------------------------------------------------------
   0-7                  100-107              100-107
```

Related Commands

Command	Description
low-latency	Sets low latency VCG.

show cable video output-port

To display the output port information, use the **show cable video output-port** command in privileged EXEC mode.

show cable video output-port *port*

Syntax Description

port	Displays the output port information with this port number.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the output port information.

Examples

The following sample output shows the output port information:

```
Router# show cable video output-port 10

Integrated TSID  ONID  Output Physical  Admin  Operational  Virtual-Carrier-Group
Cable                  Port   QAM ID    State  State        Name
-------------------------------------------------------------------------------
7/0/0:1    18    1000   10      1         ON     UP          vcg-rep
7/0/0:2    19    1000   10      2         ON     UP          vcg-rep
7/0/0:3    20    1000   10      3         ON     UP          vcg-rep

Service-Distribution-Group  Logical-Edge-Device  Encryption Total
Name                        Name                 Capable    Sessions
-------------------------------------------------------------------
vod                         led-vei              powerkey    2
vod                         led-vei              powerkey    2
vod                         led-vei              powerkey    2
```

Related Commands

Command	Description
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
encrypt	Encrypts the virtual carrier group.
service-type	Specifies the service type of the virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
virtual-carrier-group	Defines a virtual carrier group.

show cable video scg

To display the scrambling control group information, use the **show cable video scg** command in privileged EXEC mode.

show cable video scg {**all** | **id** *id* | **logical-edge-device** {**id** *id* | **name** *name*} | **summary** | **tsid** *number* **onid** *number*}

Syntax Description

all	Displays all the scrambling control groups.
id *id*	Displays the information of the scrambling control group with this ID. The valid range is from 0 to 1008730111.
logical-edge-device	Displays the information of the scrambling control groups on the logical edge device. • **id** *id* —Displays the information of the scrambling control groups on the logical edge device with this ID. The valid range is from 0 to 32. • **name** *name* —Displays the information of the scrambling control groups on the logical edge device with this name.
summary	Displays the number of scrambling control groups and encrypted carriers.
tsid *number* **onid** *number*	Displays the list of scrambling control groups on a transport stream identifier. *tsid*—The valid range is from 0 to 65535. *onid*—The valid range is from 0 to 65535.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the scrambling control group information.

Examples

The following sample output shows the scrambling control group information:

```
Router# show cable video scg logical-edge-device id 1
LED 1 has 8137 SCGs on 128 carriers
SCG ID     Session ID   LED   TSID   ONID
-----------------------------------------
68157683   1048819      1     1      100
68157684   1048820      1     1      100

Router# show cable video scg id 68157684
SCGid: 68157684
```

```
Status: SUCCESS
TSID: 1
ONID: 100
Nominal CP: 550

Router# show cable video scg logical-edge-device id 68157684 | inc session 1048820
SCG ID     Session ID   LED   TSID   ONID
-----------------------------------------
68157684   1048820      1     1      100
```

Related Commands

Command	Description
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
service-distribution-group	Defines a service distribution group.
onid	Override the default ONID.
rf-port integrated-cable	Specifies the RF ports in a service distribution group.
show cable video logical-edge-device	Displays the logical edge device information.

show cable video service-distribution-group

To verify the service distribution group (SDG) configuration, use the **show cable video service-distribution-group** command in the privileged EXEC (#) mode.

show cable video service-distribution-group [**all** | **id** *id*]

Syntax Description

all	Displays the information for all SDGs.
id *id*	Displays the information for the SDG with this ID.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to verify the SDG configuration.

The following sample output shows the SDG information:

```
router#show cable video service-distribution-group all
Number of Service Distribution Groups: 1
ID Name Virtual-Carrier-Group Logical-Edge-Device RF-Port  ONID   PSI Interval
                 Name                 Name
-------------------------------------------------------------------------------------------------------
1  vod         vod                  LEDnew        7/0/0     0       100
1  vod         vod                  LEDnew        7/0/1     0       100
1  vod         vod                  LEDnew        7/0/2     0       100
1  vod         vod                  LEDnew        7/0/3     0       100
1  vod         vod                  LEDnew        7/0/4     0       100
1  vod         vod                  LEDnew        7/0/5     0       100
1  vod         vod                  LEDnew        7/0/6     0       100
1  vod         vod                  LEDnew        7/0/7     0       100
```

Related Commands

Command	Description
service-distribution-group	Defines a service distribution group.
rf-port integrated-cable	Defines the physical slot/bay/port to be used in a video service.
psi-interval	Override the default PSI value.
onid	Override the default ONID.

show cable video session all

To display the video session information for the entire chassis, use the **show cable video session all** command in privileged EXEC mode.

show cable video session all

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 16.8.1	The input program number and the remux information was added to the command output.
Cisco IOS XE Gibraltar 16.10.1c	Added two columns—Encrypt Type and Encrypt Status in the command output. The Encrypt Type column displays the sessions that are encrypted at source as Pre-encrypted and Encrypt Status displays Encrypted.
Cisco IOS XE Amsterdam 17.3.1x	Added the option **dvb-ecm** to the command.
Cisco IOS XE Bengaluru 17.6.x	Added the Virtual Carrier Group ID column in the command output. The VCG ID helps in better debugging.

The following is an example of how to view the session information:

```
Router#show cable video session all
LED Session    Output Streaming   Sess Session Source                  UDP   VCG   Input
 Output  Input      Output  Input    Output   Encrypt  Encrypt    Low PMV   Session
Id  Id         Port   Type        Type Ucast Dest IP/Mcast IP (S,G)    Port  ID    Program
 Program State      State   Bitrate  Bitrate  Type     Status     Lat NUM   Name
-------------------------------------------------------------------------------------------------------------
1   269484032  2      Remap       SSM  175.6.1.12,232.2.1.1            0      1     -
  2      ACTIVE-PSI  ON     1132005  1104565  CLEAR      -         N   -
0x0000000000000080002
1   269484033  3      Remap       SSM  175.6.1.12,232.2.1.1            0      1     -
  3      ACTIVE-PSI  ON     1132005  1058619  CLEAR      -         N   -
0x0000000000000080003
1   269484034  4      Remap       SSM  175.6.1.12,232.2.1.1            0      1     -
  4      ACTIVE-PSI  ON     1132005  1010691  CLEAR      -         N   -
0x0000000000000080004
1   269484035  5      Remap       SSM  175.6.1.12,232.2.1.1            0      1     -
  5      ACTIVE-PSI  ON     1132005  940739   CLEAR      -         N   -
0x0000000000000080005
6   274726912  24     Remap       SSM  175.10.1.2,235.0.1.1            0      6     -
```

```
  2      ACTIVE-PSI  ON     29539426 1217132  CLEAR      -          N   -     mcast.6.182

Total Sessions= 5
Router#
```

show cable video session logical-edge-device

To display the session information for a specific logical edge device, use the **show cable video session logical-edge-device** command in privileged EXEC mode.

show cable video session logical-edge-device { **id** *number* | **name** *led-name* } [{ **session-id** *id* | **session-name** *name* } | { **dvb-ecm** }] [{ **downstream-cable** | **integrated-cable** | **downstream-video** } *slot* | **linecard** *slot/bay* | **summary** | **debug**]

Syntax Description

number	Specifies the logical edge device identifier.
session-id *id*	Specifies the session identifier for the logical edge device.
session-name *name*	Specifies the session identifier for the logical edge device.
summary	Specifies remux processing type.
debug	Displays debug information.
dvb-ecm	Displays the current Entitlement Control Messages packet identifiers for the specified session.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 16.8.1	The input program number and the remux information was added to the command output.
Cisco IOS XE Gibraltar 16.10.1c	Added two columns—Encrypt Type and Encrypt Status in the command output. The Encrypt Type column displays the sessions that are encrypted at source as Pre-encrypted and Encrypt Status displays Encrypted.
Cisco IOS XE Amsterdam 17.3.1x	Added the option **dvb-ecm** to the command.
Cisco IOS XE Bengaluru 17.6.x	Added the Virtual Carrier Group ID column in the command output. The VCG ID helps in better debugging.

The following is an example of how to verify or view the logical edge device session information:

```
Router#show cable video session logical-edge-device id 2
Total Sessions = 3

Session    Output Frequency  Streaming   Sess Session Source                  UDP   VCG
Input   Output  Input      Output  Input    Output   Encrypt        Encrypt        Low PMV
   Session
Id         Port   Hz         Type        Type Ucast Dest IP/Mcast IP (S,G)    Port  ID
Program Program State      State   Bitrate  Bitrate  Type           Status         Lat NUM
   Name
-------------------------------------------------------------------------------------------------------------
270532608  68     519000000  Data-Piping SSM  2.11.101.1,232.101.10.10        0     1
-       -       ACTIVE     ON      117094   117108   CLEAR          -              N   -
   data.2.68
270532609  68     519000000  Remux       SSM  176.51.1.2,238.11.1.106         0     1
1       4       ACTIVE-PSI ON      2473571  2474970  Pre-encrypted  Encrypted      N   -
   remux.2.68
270532610  68     519000000  Remux       SSM  175.10.6.2,236.0.1.2            0     1
1       2       ACTIVE-PSI ON      35876155 691111   CLEAR          -              N   -
   remuxc.2.68



video-LWR-S-A1#$show cable video session logical-edge-device id 2 session-id 270532608
Session Name        : mpts1.2.199
Session Id          : 270532608
Creation Time       : Fri Oct 12 22:07:03 2018

Output Port         : 41
TSID                : 41
Override TSID       : not specified
ONID                : 2
Number of Sources   : 1
  Source IP         : 176.51.1.2
  Group IP          : 238.11.1.106
  UDP Port          : 0
Config Bitrate      : not specified
Jitter              : 100 ms
Processing Type     : Passthru
Stream Rate         : CBR
Program Number      : -
Idle Timeout        : 2000 msec
Init Timeout        : 2000 msec
Off Timeout         : 60 sec
Encryption Type     : Pre-encrypted
Encryption Status   : Encrypted

Input Session Stats:
====================
  State: ACTIVE-PSI, Uptime: 0 days 02:50:59
  IP Packets: In 2569416, RTP 0, Drop 0
  TP Packets: In 16910560, PCR 262629, PSI 292104, Null 1075352
              Unreference 102351, Discontinuity 0
  Errors: Sync loss 0, CC error 0, PCR Jump 4,
          Underflow 2, Overflow 0, Block 0
  Bitrate: Measured 2463450 bps, PCR 2637379 bps

Output Session Stats:
=====================
  State: ON, Uptime: 0 days 02:50:59
  TP Packets: In 17056642, PCR 262628, PSI 292102,
              Drop 0, Forward 16764540, Insert 0
```

```
  Errors: Info Overrun 0, Info Error 0, Block 0, Overdue 0,
          Invalid Rate 0, Underflow 0, Overflow 0
  Bitrate: Measured 2439152 bps

PAT Info:
=========
  Version 18, TSID 1, len 16, section 0/0
  Program 1: PMT 16

Input PMT Info:
===============
  Program 1, Version 1, PCR 17, Info len 0
  PID 17: Type 2, Info len 9, (CA SYS-ID 3584, PID 1, Private data: 010101)
  PID 18: Type 4, Info len 15, (lang eng), (CA SYS-ID 3584, PID 1, Private data: 010102)
  PID 19: Type 4, Info len 15, (lang spa), (CA SYS-ID 3584, PID 1, Private data: 010103)
  PID 20: Type 4, Info len 15, (lang fre), (CA SYS-ID 3584, PID 1, Private data: 010104)

Output PMT Info:
================
  Program 1, Version 1, PCR 17, Info len 0
  PID 17: Type 2, Info len 9, (CA SYS-ID 3584, PID 1, Private data: 010101)
  PID 18: Type 4, Info len 15, (lang eng), (CA SYS-ID 3584, PID 1, Private data: 010102)
  PID 19: Type 4, Info len 15, (lang spa), (CA SYS-ID 3584, PID 1, Private data: 010103)
  PID 20: Type 4, Info len 15, (lang fre), (CA SYS-ID 3584, PID 1, Private data: 010104)

Router#show cable video session logical-edge-device id 2 session-id 2097152
Session Name : SESS_PME2.1.7.338
Session Id: : 2097152
Creation Time: : Fri Jun 24 16:30:45 2016
Output Port : 142
TSID : 142
ONID : 0
Number of Sources : 1
Source IP : 175.2.5.6
Group IP : 232.5.6.7
UDP Port : 0
Config Bitrate : not specified
Jitter : 100 ms
Processing Type : Remap
Stream Rate : VBR
Program Number : 1
Idle Timeout : 2000 msec
Init Timeout : 2000 msec
Off Timeout : 60 sec
Encryption Type : CLEAR
Encryption Status : -
Input Session Stats:
====================
State: OFF, Uptime: 0 days 00:26:35
IP Packets: In 0, RTP 0, Drop 0
TP Packets: In 0, PCR 0, PSI 0, Null 0
Unreference 0, Discontinuity 0
Errors: Sync loss 0, CC error 0, PCR Jump 0,
Underflow 0, Overflow 0, Block 0
Bitrate: Measured 0 bps, PCR 0 bps
Output Session Stats:
=====================
State: ON, Uptime: 0 days 00:26:35
TP Packets: In 0, PCR 0, PSI 0,
Drop 0, Forward 0, Insert 0
Errors: Info Overrun 0, Info Error 0, Block 0, Overdue 0,
Invalid Rate 0, Underflow 0, Overflow 0
Bitrate: Measured 0 bps
```

The following is an example of how to see the remux sessions along with input and output program numbers:

```
Router# show cable video session log id 1
Total Sessions = 4
Session    Output    Frequency    Streaming   Session Session Source                  UDP
  VCG  Input    Output   Input       Output  Input    Output   Encrypt  Encrypt  LOW  PMV
 SESSION
Id         Port      Hz           Type        Type    Ucast Dest IP/Mcast IP (S,G)    Port
  ID   Program  Program  State       State   Bitrate  Bitrate  Type     Status   LAT  NUM
 NAME
-------------------------------------------------------------------------------------------------------
2097152    142       567000000    Remux       SSM     175.2.5.6,232.5.6.7             0
  1    1        100      ACTIVE-PSI  ON      78099327 17115419  CLEAR   -        N    -
 SESS_PME2.1.7.338
2097153    163       567000000    Remux       SSM     175.6.1.13,232.2.1.6            0
  1    2        200      ACTIVE-PSI  ON      78099327 17115419  CLEAR   -        N    -
 SESS_PME3.1.7.497
2097154    184       567000000    Remux       SSM     175.2.6.7,232.5.6.15            0
  1    3        300      ACTIVE-PSI  ON      78099327 17115419  CLEAR   -        N    -
 SESS_PME4.1.7.656
2097155    230       567000000    Remux       SSM     175.7.2.2,232.2.6.7             0
  1    4        400      ACTIVE-PSI  ON      78099327 17115419  CLEAR   -        N    -
 SESS_PME6.1.7.978
```

The following is an example of how to see the remux processing type:

```
Router# show cable video session log id 1 summary
Video Session Summary For Video

Active      : 6    Init      : 0      Idle       : 0
Off         : 6    Blocked   : 0      PSI-Ready  : 6
UDP         : 0    ASM       : 0      SSM        : 12
Remap       : 0    Data      : 0      Passthru   : 0
Remux       : 12   Pending   : 0      Encrypted  : 0
Low Latency : 0

Total Sessions: 12
Total Input Bitrate: 467067498 BPS
Total Output Bitrate: 99841084 BPS
```

The following is an example of how the debugging information is displayed:

```
Router# show cable video sess log id 1 debug
Total Sessions = 1472

Session  Output Streaming   Session Output  Input              PCR
      Output                                Invalid
Id       Port   Type        Type    Program Sync-Loss  CC Err  Jump  UnderFlow Overflow
Block  Info Ovrn Info Err  Block   Overdue   Rate     UnderFlow Overflow
-------------------------------------------------------------------------------------------------
1048576   1     Passthru    SSM     -       0          0       0     0         0        0
     0         0         0       0         0        0         0
1048577   1     Remap       SSM     1817    0          0       0     0         0        0
     0         0         0       0         0        0         0
1048578   1     Remap       SSM     1145    1          33      0     0         0        0
     0         0         0       0         0        0         0
1048579   1     Remap       SSM     1686    0          0       0     0         0        0
     0         0         0       0         0        0         0
```

The following is sample output from the **show cable video session logical-edge-device id** *id* **session-id** *id* **dvb-ecm** command.

```
Router#sshow cable video session logical-edge-device id 1 session-id 1048591 dvb-ecm
ECM TP address 800000010a568f00
Number of TPs: 1
Insertion period: 4500
TP 0:
47 40 4f 10 00 81 00 4f 00 19 00 02 00 00 00 12
00 02 00 03 00 14 00 0a 00 04 02 fd ec eb 0b e1
1d 09 00 14 00 0a 00 03 a9 14 75 32 66 e8 4c 9a
00 0d 00 04 12 34 12 34 8f fd 00 04 00 00 00 03
8f fe 00 13 31 39 3a 34 35 3a 33 36 20 32 30 32
30 2d 31 31 2d 30 32 ff ff ff ff ff ff ff ff ff
ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff
ff ff ff ff ff ff ff ff ff ff ff
```

The following table describes the significant fields in the command output:

Table 191: show cable video session logical-edge-device Field Descriptions

Field	Description
Session ID	Session identifier.
Output Port	Output port for the session.
Streaming Type	Streaming type of the session.
Session Type	Session type information.
Session Ucast Dest	Unicast session destination IP address.
Source IP/Mcast IP (S,G)	Source IP address and multicast session IP address.
UDP Port	UDP port information for the session.
Input program	Input program information of the session.
Output Program	Output program information of the session.
Input State	Session input state.
Output State	Session output state.
Input Bitrate	Session input bitrate.
Output Bitrate	Session output bitrate.
Encrypt Type	Session encryption type.
Encrypt Status	Session encryption status.
Session Name	Session name.

Related Commands

Command	Description
encrypt	Encrypts the virtual carrier group.
rf-channel	Specifies the virtual RF channel in a virtual carrier group.

show cable video snmp-alarms

To display the active alarms in the system, use the **show cable video snmp-alarms** command in privileged EXEC mode.

show cable video snmp-alarms

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE Fuji 16.7.1	This command was indroduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE Fuji 16.8.1d	Three alarms—Alarm ID 10, 11, and 12 are added.

Examples

The following sample output shows the active alarms in the system.

```
Router# show cable video snmp-alarms
Displaying the Alarms MIB alarmsLogTable

Total number of alarm entries: 4106

Alarm Log  Time                      Alarm ID  Instance     Instance_Ext Severity Slot
Alarm Message
Index
-------------------------------------------------------------------------------------------------------------------------------


1          2018-06-21 18:30:34 IST   10        3993698591   1            2        1
INPUT_STREAM_FAILURE:SET:0:0: Source 176.53.1.2:238.11.1.31:5194 input stream is not present.
 LED ID = 1, slot = 1
2          2018-06-21 18:29:50 IST   10        3993698591   2            2        2
INPUT_STREAM_FAILURE:SET:0:0: Source 176.53.1.2:238.11.1.31:5194 input stream is not present.
 LED ID = 2, slot = 2
3          2018-06-21 18:29:44 IST   10        3993698591   3            2        3
INPUT_STREAM_FAILURE:SET:0:0: Source 176.52.1.2:238.11.1.31:5194 input stream is not present.
 LED ID = 3, slot = 3
4          2018-06-21 18:29:50 IST   10        3993698591   6            2        6
INPUT_STREAM_FAILURE:SET:0:0: Source 176.53.1.2:238.11.1.31:5194 input stream is not present.
 LED ID = 6, slot = 6
5          2018-06-21 18:29:37 IST   10        3993698591   7            2        7
INPUT_STREAM_FAILURE:SET:0:0: Source 176.52.1.2:238.11.1.31:5194 input stream is not present.
 LED ID = 7, slot = 7
```

Related Commands

Command	Description
show cable video snmp-alarm-config	Display the alarm configuration in the system.
report-stream-error input-stream-failure report-interval syslog	Configure a timeout value and syslog message for input stream failure trap for multicast sources.

Command	Description
snmp-trap input-stream-failure multicast	Disable input stream failure trap for EAS stream.
snmp-server enable traps video-cable	Enable alarm event traps for cable related events.

show cable video snmp-alarm-config

To display the alarm configuration in the system, use the **show cable video snmp-alarm-config** command in privileged EXEC mode.

show cable video snmp-alarm-config

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE Fuji 16.8.1d	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows the alarm configuration in the system.

```
Router# show cable video snmp-alarm-config
Trap Configuration:
-------------------

Alarm ID   Name                        Status
-------------------------------------------
0          CEM Connection Loss         Enabled
1          D6 Connection Loss          Enabled
2          GQI Connection Loss         Enabled
3          PME ECM Missing             Enabled
4          QAM Oversubscription        Enabled
5          PID Conflict                Enabled
6          Program Conflict            Enabled
7          ECMG Connection Loss        Enabled
8          EIS Connection Loss         Enabled
10         In Stream Failure           Enabled
11         Backup Source Active        Enabled
12         PMT Missing                 Enabled
```

Related Commands

Command	Description
showccable video snmp-alarms	Display the active alarms in the system.
report-stream-error input-stream-failure report-interval syslog	Configure a timeout value and syslog message for input stream failure trap for multicast sources.
snmp-trap input-stream-failure multicast	Disable input stream failure trap for EAS stream.
snmp-server enable traps video-cable	Enable alarm event traps for cable related events.

show cable video vei-bundle

To display the virtual edge input bundle information, use the **show cable video vei-bundle** command in privileged EXEC mode.

show cable video vei-bundle {*id* | **all**}

Syntax Description

id	Displays the information of the virtual edge input bundle with this ID.
all	Displays all virtual edge input bundles.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the virtual edge input bundle information.

Examples

The following sample output shows the virtual edge input bundle information:

```
Router# show cable video vei-bundle all
Total VEI Bundles: 1
Bundle       LED          Input Port   VEI              Slot/Bay     Gateway
ID           ID           ID           IP                            IP
-------------------------------------------------------------------------------
40000        1            33           33.33.33.33      7/0          177.0.10.3
40000        1            44           44.44.44.44      7/0          177.0.10.3
40000        1            66           66.66.66.66      7/0          177.0.10.3
40000        1            77           77.77.77.77      7/0          177.0.10.3
40000        1            222          222.222.222.222  7/0          177.0.10.3
```

Related Commands

Command	Description
virtual-edge-input-ip	Configures a virtual edge input.
logical-edge-device	Define a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
vei-bundle	Bundles the virtual edge inputs for a particular LED.
show cable video logical-edge-device	Displays the logical edge device information.

show cable video virtual-carrier-group

To display the virtual carrier group information, use the **show cable video virtual-carrier-group** command in privileged EXEC mode.

show cable video virtual-carrier-group {**all** | **id** *id* | **name** *name*}

Syntax Description

all	Displays all virtual carrier groups.
id *id*	Displays the information of the virtual carrier group with this ID.
name *name*	Displays the information of the virtual carrier group with this name.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 16.4.1	This command was modified on the Cisco cBR Series Converged Broadband Routers. Low latency status was added in the output.

Usage Guidelines

This command displays the virtual carrier group information.

Examples

The following sample output shows the virtual carrier group information:

```
Router# show cable video virtual-carrier-group all
Number of Virtual Carrier Groups: 1
ID    Name   Input        Service-Distribution-Group   Logical-Edge-Device     Total
             IP Address   Name                         Name                    RF-Channel
-------------------------------------------------------------------------------------
1     vcg-0    -            vcg                          vcgcast                 5
```

Examples

The following sample output shows the information of a specific virtual carrier group with low latency status:

```
Router# show cable video virtual-carrier-group id 1
Name: vcg1
  ID: 1
  Service Distribution Group Name: sdg1
  Service Distribution Group ID: 1
  Logical Edge Device Name: led1
  Logical Edge Device ID: 1
  ServiceType: narrowcast
  Encrypted: N
  Low Latency: Y
  Number of VEIs: 0
```

```
Virtual Edge Input:
Input Port   VEI                 Bundle
ID           IP                  ID
-----------------------------------------------
Number of RF-Channels: 8
RF-Channel Range   TSID Range   Output Port Number Range
-------------------------------------------------------
0-7                  100-107             100-107
```

Related Commands

Command	Description
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
encrypt	Encrypts the virtual carrier group.
service-type	Specifies the service type of the virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
virtual-carrier-group	Defines a virtual carrier group.
low-latency	Sets low latency VCG.



Cable Commands: show ch through show cr

- show checkpoint, on page 2528
- show cmts ipc-cable client base, on page 2535
- show controller gigabitethernet, on page 2540
- show controller integrated-cable, on page 2542
- show controllers integrated-cable counter ofdm-channel snmp-rolling-avg, on page 2574
- show controller integrated-cable counter rf-channel, on page 2576
- show controllers integrated-cable counter rf-channel snmp-rolling-avg, on page 2578
- show controller tengigabitethernet, on page 2580
- show controllers cable, on page 2586
- show controllers cable jib, on page 2608
- show controllers cable upstream spectrum, on page 2615
- show controllers clock-reference, on page 2620
- show controllers downstream-cable, on page 2626
- show controllers downstream-cable rf-channel prof-order, on page 2629
- show controllers jacket, on page 2631
- show controllers modular-cable, on page 2633
- show controllers upstream-cable, on page 2646
- show cpd, on page 2649
- show cr10k-rp cable, on page 2650
- show cr10k-rp controller, on page 2654
- show cr10k-rp queue, on page 2657
- show cr10k-rp slots, on page 2661
- show crypto entropy sample, on page 2664
- show crypto entropy status, on page 2665
- show crypto ikev2|ipsec sa detail, on page 2666

show checkpoint

To display information about the Checkpoint Facility (CF) subsystem on a Cisco CMTS, use the **show checkpoint** command in privileged EXEC mode.

show checkpoint {**clients** [*client-id*] | **entities** | **statistics**}

Cisco cBR Series Converged Broadband Router
show checkpoint [**domain default**] {**clients** [*client-id*] | **entities** [*entity-id*] | **statistics [buffer-usage]**}

Syntax Description

domain default	Specifies the RF domain. The **default** keyword specifes the default RF domain. This option is supported only on the Cisco cBR router.
clients	Displays a list of current checkpoint clients.
client-id	(Optional) Particular client statistics.
entities	Displays a list of current checkpoint entities.
statistics	Displays the current status for checkpoint operations.
buffer-usage	Displays the checkpoint client statistics using a large number of buffers.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(11)BC3	This command was introduced to support High Availability (HA) redundancy operations.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command was implemented on theCisco cBR Series Converged Broadband Router. The **domain default** and **buffer-usage** keywords were added. This option is supported only on the Cisco cBR router.

Usage Guidelines

The Checkpoint Facility (CF) subsystem manages the passing of messages from the Active to Standby interfaces. It also handles sequencing and throttling, as needed during redundancy operations. Checkpoint clients, such as line cards and other subsystems, register with the CF subsystem so that they can update the Protect card or standby processor with state changes as necessary.

The **show checkpoint** command displays information about the clients (other processes on the CMTS that are sending checkpoint messages), entities, and run-time status for checkpoint operations.

The **show checkpoint clients** *client-id* command displays information about the client with a particular client ID.

Examples

The following shows typical output for the **show checkpoint clients** command:

```
Router# show checkpoint clients
                          Check Point List of Clients
 CHKPT on ACTIVE server.
Client Name    Client ID     Msg Send     Msg len  Bundling
                            (number of)   (Total)
-------------------------------------------------------------
CHKPT DevTest         3         0           0             On
CHKPT EXAMPLE         2         0           0             On
CR10K RP CHKPT       20         0           0             On
Router#
```

The following shows typical output for the **show checkpoint clients** command with the *client-id* parameter:

```
Router# show checkpoint clients 1
-------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
                          ID          ID       Mode
-------------------------------------------------------------------------------
CHKPT Test client           1         --        On
  Total API Messages Sent:                       0
  Total Transport Messages Sent:                 0
  Length of Sent Messages:                       0
  Total Blocked Messages Sent:                   0
  Length of Sent Blocked Messages:               0
  Total Non-blocked Messages Sent:               0
  Length of Sent Non-blocked Messages:           0
  Total Messages Received:                       0
  Total Rcv Message Len:                         0
  Total Bytes Allocated:                         0
  Buffers Held:                                  0
  Huge Buffers Requested:                        0
  Transport Frag Count:                          0
  Transport Frag Peak:                           0
  Transport Sends w/Flow Off:                    0
  Send Errs:                                     0
  Send Peer Errs:                                0
  Rcv Xform Errs:                                0
  Xmit Xform Errs:                               0
  Incompatible Messages:                         0
  Client Unbundles to Process Memory:            T
Router#
```

The following shows typical output for the **show checkpoint entities** command:

```
 Router# show checkpoint entities

Check Point List of Entities
CHKPT on ACTIVE server.
-------------------------------------------------------------------------------
Entity Name Entity
ID
-------------------------------------------------------------------------------
UBR10k HA Entity Gro 4
Total API Messages Sent: 0
Total IPC Sent: 0
Total Message Len: 0
Total Bytes Allocated: 0
```

The following shows typical output for the **show checkpoint statistics** command:

```
Router# show checkpoint statistics
```

```
            Check Point Status
 CHKPT on ACTIVE server.
Number of chkpt messages currently in hold queue 0
CHKPT MAX MTU size = 1422
IPC MAX MTU size = 4096
CHKPT Pending msg timer  = 100 ms
Router#
```

Examples for Cisco cBR Router

This example shows the output of the **show checkpoint client** command on the Cisco cBR router:

```
Router#show checkpoint clients

                        Check Point List of Clients
                        For domain 0
--------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
                          ID          ID       Mode
--------------------------------------------------------------------------------
CHKPT Test client          1          --       Off

  Total Messages Received:                      0
  Total Rcv Message Len:                        0
  Total API Messages Sent:                      0
  Total Transport Messages Sent:                0
  Length of Sent Messages:                      0
  Total Blocked Messages Sent:                  0
  Length of Sent Blocked Messages:              0
  Total Non-blocked Messages Sent:              0
  Length of Sent Non-blocked Messages:          0
  Total Bytes Allocated:                        0
  Buffers Held:                                 0
  Buffers Held Peak:                            0
  Huge Buffers Requested:                       0
  Transport Frag Count:                         0
  Transport Frag Peak:                          0
  Transport Sends w/Flow Off:                   0
  Send Errs:                                    0
  Send Peer Errs:                               0
  Rcv Xform Errs:                               0
  Xmit Xform Errs:                              0
  Incompatible Messages:                        0
  Client Unbundles to Process Memory:           T
--------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
                          ID          ID       Mode
--------------------------------------------------------------------------------
Network RF Client          3          --       Off

  Total Messages Received:                      0
  Total Rcv Message Len:                        0
  Total API Messages Sent:                      0
  Total Transport Messages Sent:                0
  Length of Sent Messages:                      0
  Total Blocked Messages Sent:                  0
  Length of Sent Blocked Messages:              0
  Total Non-blocked Messages Sent:              0
  Length of Sent Non-blocked Messages:          0
```

```
  Total Bytes Allocated:                          0
  Buffers Held:                                   0
  Buffers Held Peak:                              0
  Huge Buffers Requested:                         0
  Transport Frag Count:                           0
  Transport Frag Peak:                            0
  Transport Sends w/Flow Off:                     0
  Send Errs:                                      0
  Send Peer Errs:                                 0
  Rcv Xform Errs:                                 0
  Xmit Xform Errs:                                0
  Incompatible Messages:                          0
  Client Unbundles to Process Memory:             T
------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
                           ID         ID       Mode
------------------------------------------------------------------------------
Frame Relay                 6         --       Off

  Total Messages Received:                        0
  Total Rcv Message Len:                          0
  Total API Messages Sent:                        0
  Total Transport Messages Sent:                  0
  Length of Sent Messages:                        0

Router#
```

This example displays the output of the **show checkpoint client** for a specific Client ID:

```
Router#show checkpoint clients 1
------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
                           ID         ID       Mode
------------------------------------------------------------------------------
CHKPT Test client           1         --       Off

  Total Messages Received:                        0
  Total Rcv Message Len:                          0
  Total API Messages Sent:                        0
  Total Transport Messages Sent:                  0
  Length of Sent Messages:                        0
  Total Blocked Messages Sent:                    0
  Length of Sent Blocked Messages:                0
  Total Non-blocked Messages Sent:                0
  Length of Sent Non-blocked Messages:            0
  Total Bytes Allocated:                          0
  Buffers Held:                                   0
  Buffers Held Peak:                              0
  Huge Buffers Requested:                         0
  Transport Frag Count:                           0
  Transport Frag Peak:                            0
  Transport Sends w/Flow Off:                     0
  Send Errs:                                      0
  Send Peer Errs:                                 0
  Rcv Xform Errs:                                 0
  Xmit Xform Errs:                                0
  Incompatible Messages:                          0
  Client Unbundles to Process Memory:             T
Router#
```

This example displays the output of the **show checkpoint entities** for a specific Client ID:

```
Router#show checkpoint entities

                        Check Point List of Entities
                        For domain 0
------------------------------------------------------------------------------
Entity ID         Entity Name
------------------------------------------------------------------------------
        4         UBR HA Entity Group

  Total API Messages Sent:             0
  Total Messages Sent:                 0
  Total Sent Message Len:              0
  Total Bytes Allocated:               0
  Total Messages Received:             0
  Total Rcv Message Len:               0
  Total Number of Members:             2

  Member(s) of entity 4 are:
    Client ID          Client Name
-----------------------------------------
          151          UBRCCE PLFM CHKPT
          153          UBRCCE SUP CHKPT



Router#
```

This example displays the output of the **show checkpoint statistics** for a specific Client ID:

```
Router#show checkpoint statistics

             Check Point Status
             For domain 0in ACTIVE

  Number Of Msgs In Hold Q:              0
  CHKPT MAX Message Size:                0
  TP MAX Message Size:               65248
  CHKPT Pending Msg Timer:             100 ms

  FLOW_ON  total:                        0
  FLOW_OFF total:                        0
  Current FLOW status is:               ON
  Total API Messages Sent:               0
  Total Messages Sent:                   0
  Total Sent Message Len:                0
  Total Bytes Allocated:                 0
  Total Messages Received:               0
  Total Rcv Message Len:                 0
  Rcv  Msg Q Peak:                       0
  Hold Msg Q Peak:                       0
  Buffers Held Peak:                     0
  Current Buffers Held:                  0
  Huge Buffers Requested:                0
Router#
```

This example shows the output of the **buffer-usage** option for the **statistics** keyword on the default domain of the Cisco cBR router:

```
Router#show checkpoint domain default statistics buffer-usage
----------------------------------------
 Checkpoint Client using Large No. Buffers
 For Domain 0
----------------------------------------
------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
                           ID         ID       Mode
------------------------------------------------------------------------------
UBRCCE SUP CHKPT          153          4        On

  Total Messages Received:                     103
  Total Rcv Message Len:                      2856
  Total API Messages Sent:                    3380
  Total Transport Messages Sent:                --
  Length of Sent Messages:                 1654929
  Total Blocked Messages Sent:                   0
  Length of Sent Blocked Messages:               0
  Total Non-blocked Messages Sent:            3380
  Length of Sent Non-blocked Messages:     1654929
  Total Bytes Allocated:                  16102840
  Buffers Held:                                  0
  Buffers Held Peak:                            85
  Huge Buffers Requested:                        0
  Transport Frag Count:                          0
  Transport Frag Peak:                           0
  Transport Sends w/Flow Off:                  372
  Send Errs:                                     0
  Send Peer Errs:                                0
  Rcv Xform Errs:                                0
  Xmit Xform Errs:                               0
  Incompatible Messages:                         0
  Client Unbundles to Process Memory:            T
------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
                           ID         ID       Mode
------------------------------------------------------------------------------
Archive                    87         --       Off

  Total Messages Received:                      11
  Total Rcv Message Len:                       276
  Total API Messages Sent:                      39
  Total Transport Messages Sent:                39
  Length of Sent Messages:                   15550
  Total Blocked Messages Sent:                   0
  Length of Sent Blocked Messages:               0
  Total Non-blocked Messages Sent:              39
  Length of Sent Non-blocked Messages:       15550
  Total Bytes Allocated:                     18046
  Buffers Held:                                  0
  Buffers Held Peak:                            33
  Huge Buffers Requested:                        0
  Transport Frag Count:                          0
  Transport Frag Peak:                           0
  Transport Sends w/Flow Off:                    0
  Send Errs:                                     0
  Send Peer Errs:                                0
  Rcv Xform Errs:                                0
  Xmit Xform Errs:                               0
  Incompatible Messages:                         0
  Client Unbundles to Process Memory:            T
------------------------------------------------------------------------------
Client Name            Client     Entity     Bundle
```

```
                             ID         ID       Mode
--------------------------------------------------------------------------------
CCM                         108         --        On

  Total Messages Received:                       541
  Total Rcv Message Len:                       35952

Router#
```

Related Commands

These related commands are not supported on Cisco cBR Series Converged Broadband Router.

Command	Description
hccp authentication	Changes the minimum time between frequency hops.
hccp check version	Exits bypass version mode, and returns to normal HCCP operation.
hccp ds-switch	Specifies the downstream upconverter module for a Working CMTS or Protect CMTS (deprecated command).
hccp protect	Allows you to configure a Cisco CMTS to be a Protect CMTS for a specified Working CMTS in a 1+1 redundancy environment.
hccp working	Allows you to designate a Cisco CMTS to be a Working CMTS in a 1+1 redundancy environment.
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

show cmts ipc-cable client base

To display the interprocess communication (IPC) session status, the service information for all the slots and subslots on the line cards, and statistics for each session on the Cisco uBR10012 router, use the **show cmts ipc-cable client base** command in user EXEC or privileged EXEC mode.

show cmts ipc-cable client base {**client** | **service** | **stats**}

Syntax Description

client	Displays the IPC session status information.
service	Displays all the IPC services for the slots and subslots on the Cisco uBR10012 router.
stats	Displays the IPC layer statistics information for every session.

Command Default

None

Command Modes

User EXEC (>) or

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCF	The **service** keyword was added to this command.
IOS-XE 3.15.0S	This command was removed.

Usage Guidelines

The **show cmts ipc-cable client base client** command displays the IPC session information for a group of messages that are exchanged between a route processor (RP) and a line card or between two line cards. This information includes the client ID, client name, IPC transport information, slot and subslot information, session state to identify whether the session is ready for message exchange, number of messages that are pending, and number of messages dropped.

The **show cmts ipc-cable client base service** command displays the IPC service information for all the slots and subslots on the Cisco uBR10012 router. This information includes IPC port information, such as type of service and port ID, retry and timeout information of the IPC messages, and watermark information in the request queue.

The **show cmts ipc-cable client base stats** command displays the IPC layer error statistics for every session and is used for internal debugging purposes. The error statistics information includes the client ID, client name, transport type, slot and subslot information, client buffer, IPC layer state, error counter information for the sent and received messages, and IPC In Service Software Upgrade (ISSU) register information.

Examples

The following is a sample output of the **show cmts ipc-cable client base client** command:

```
Router# show cmts ipc-cable client base client
```

```
Client Id: 0     Name: CLNT DOCSIS
Slot/Subslot Seat    ISSU Sid Connection State Ready Transport Msg-Pending Msg-D
ropped ISSU MTU
5/0          0x70000 17       RP-CLC     Up    Yes   IPC       0           0
       32
6/1          0x50000 65540    RP-CLC     Up    Yes   IPC       0           0
       32
8/0          0x60000 589827   RP-CLC     Up    Yes   IPC       0           0
       32
Client Id: 1     Name: CLNT HCCP
Slot/Subslot Seat    ISSU Sid Connection State Ready Transport Msg-Pending Msg-D
ropped ISSU MTU
5/0          0x70000 17       RP-CLC     Up    Yes   IPC       0           0
       32
6/1          0x50000 65540    RP-CLC     Up    Yes   IPC       0           0
       32
8/0          0x60000 589827   RP-CLC     Up    Yes   IPC       0           0
       32
Client Id: 2     Name: CLNT PKTCBL
Slot/Subslot Seat    ISSU Sid Connection State Ready Transport Msg-Pending Msg-D
ropped ISSU MTU
5/0          0x70000 17       RP-CLC     Up    Yes   IPC       0           0
       32
6/1          0x50000 65540    RP-CLC     Up    Yes   IPC       0           0
       32
8/0          0x60000 589827   RP-CLC     Up    Yes   IPC       0           0
       32
Client Id: 3     Name: CLNT PNEGO
Slot/Subslot Seat    ISSU Sid Connection State Ready Transport Msg-Pending Msg-D
ropped ISSU MTU
5/0          0x70000 17       RP-CLC     Up    Yes   IPC       0           0
       32
6/1          0x50000 65540    RP-CLC     Up    Yes   IPC       0           0
       32
8/0          0x60000 589827   RP-CLC     Up    Yes   IPC       0           0
       32
Client Id: 4     Name: CLNT PLATFORM
Slot/Subslot Seat    ISSU Sid Connection State Ready Transport Msg-Pending Msg-D
ropped ISSU MTU
5/0          0x70000 17       RP-CLC     Up    Yes   IPC       0           0
       32
6/1          0x50000 65540    RP-CLC     Up    Yes   IPC       0           0
       32
!
.
.
.
```

The table below describes the significant fields shown in the display:

Table 192: show cmts ipc-cable client base client Field Descriptions

Field	Description
Client Id	ISSU client ID.
Name	Client session name.
Slot/subslot	Slot and subslot.
Seat	IPC seat number for the session.

Field	Description
ISSU Sid	ISSU application client session service identifier.
Connection	Connection type.
State	Connection state that is established.
Ready	Readiness of the session.
Transport	Transport stream that is used.
Msg-Pending	Total number of messages waiting for acknowledgement.
Msd-Dropped	Total number of messages dropped.
ISSU MTU	IPC Maximum Transmission Unit (MTU) of the ISSU session.

The following is a sample output of the **show cmts ipc-cable client base service** command:

```
Router# show cmts ipc-cable client base service
CMTS IPC service 1/0: default
        ipc_port_info  = 0x69390F4      ipc_port_id = A0000
        retry_max = 20  retry_period = 1        rpc_timeout = 120
        context = 0x6939164     pid = 399       name = ReqXmt 1/0: default
in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = True      block_done = False
CMTS IPC service 3/0: default
        ipc_port_info  = 0x6939084      ipc_port_id = B0000
        retry_max = 20  retry_period = 1        rpc_timeout = 120
        context = 0x6937FE4     pid = 405       name = ReqXmt 3/0: default
in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = True      block_done = False
CMTS IPC service 5/0: default
        ipc_port_info  = 0x465C0C14     ipc_port_id = D000A
        retry_max = 20  retry_period = 1        rpc_timeout = 120
        context = 0x6937874     pid = 420       name = ReqXmt 5/0: default
in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = True      block_done = True
CMTS IPC service 5/0: inband
        ipc_port_info  = 0xE6C7F50      ipc_port_id = D000B
        retry_max = 20  retry_period = 1        rpc_timeout = 20
        context = 0x6937644     pid = 424       name = ReqXmt 5/0: inband
in_transit = 0  reqQ size = 0   inband = True
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = False     block_done = False
CMTS IPC service 5/0: expedite
        ipc_port_info  = 0x34C3FA4      ipc_port_id = D000C
        retry_max = 3   retry_period = 1        rpc_timeout = 5
        context = 0x69380C4     pid = 353       name = ReqXmt 5/0: expedite
in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = True      block_done = False
CMTS IPC service 5/0: non critical
        ipc_port_info  = 0x4CFFBD34     ipc_port_id = D000D
        retry_max = 3   retry_period = 10       rpc_timeout = 30
        context = 0x6937954     pid = 419       name = ReqXmt 5/0: non critical
```

```
in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = False     block_done = False
CMTS IPC service 5/1: default
        ipc_port_info  = 0x6938134      ipc_port_id = C000A
        retry_max = 20  retry_period = 1        rpc_timeout = 120
        context = 0x69387C4     pid = 226       name = ReqXmt 5/1: default
in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = True      block_done = True
CMTS IPC service 5/1: inband
        ipc_port_info  = 0x34C1F4C      ipc_port_id = C000B
        retry_max = 20  retry_period = 1        rpc_timeout = 20
in_transit = 0  reqQ size = 0   inband = True
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = False     block_done = False
CMTS IPC service 5/1: expedite
        ipc_port_info  = 0x2DFFF38      ipc_port_id = C000C
        retry_max = 3   retry_period = 1        rpc_timeout = 5
        context = 0x465B73D4    pid = 96        name = ReqXmt 5/1: expedite
        in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = True      block_done = False
CMTS IPC service 5/1: non critical
        ipc_port_info  = 0x2E00100      ipc_port_id = C000D
        retry_max = 3   retry_period = 10       rpc_timeout = 30
        context = 0x465BE054    pid = 164       name = ReqXmt 5/1: non critical
in_transit = 0  reqQ size = 0   inband = False
        reqQ watermark low = 200        med = 500       high = 1000
        resume_send = False     block_done = False
```

The table below describes the significant fields shown in the display:

Table 193: show cmts ipc-cable client base service Field Descriptions

Field	Description
CMTS IPC service 1/0: default	Slot and subslot. Describes the type of service—default, inband, expedite, or non-critical.
ipc_port_info	IPC port information.
ipc_port_id	IPC port ID.
retry_max	Maximum retries in Cisco IOS software IPC layer.
retry_period	Time period of the retry interval in the IOS IPC layer.
rpc_timeout	RPC timeout value.
context	Context value.
pid	Program identifier value.
name	Type of IPC service.
in_transit	Indicates total number of messages waiting for acknowledgement
inband	Inband service type.

Field	Description
reqQ size	Size of the request queue.
reqQ watermark	Threshold value of the queue.
resume_send	IPC message sent is resumed.
block_done	IPC message is blocked.

The following is a sample output of the **show cmts ipc-cable client base stats** command:

```
Router# show cmts ipc-cable client base stats
Client Id: 0           Name: CLNT DOCSIS
Slot/subslot: 5 /0     Transport Type = RP-CLC
IPC getbuffer fail     : 0
IPC layer is down      : 0
Sender msg has error   : 0
Rcvd msg fail parser   : 0
Sender drop - Misc.    : 0
SID mgmt Q drop-No CM  : 0
SID mgmt Q drop-Misc   : 0
SID mgmt Q full        : 0
SID mgmt Q drop-IF down: 0
IPC timeout            : 0
IPC - no watch boolean : 0
Rcvd client no callback          : 0
CR10K IPC Header transform error : 0
CR10K IPC ISSU send nego failed  : 0
CR10K IPC ISSU not compatible    : 0
CR10K IPC ISSU start nego failed : 0
CR10K IPC ISSU register failed   : 0
```

The table below describes the significant fields shown in the display:

Table 194: show cmts ipc-cable client base stats Field Descriptions

Field	Description
Client Id	ISSU client ID.
Name	Client session name.
Slot/subslot	Slot and subslot.
Transport Type	Transport type.

Related Commands

Command	Description
show cable ipc-stats	Displays the statistics of all IPC messages on the Cisco CMTS router.

show controller gigabitethernet

To display information about the Gigabit Ethernet interface used by the Downstream External PHY Interface (DEPI), use the **show controller gigabitethernet** command in privileged EXEC mode.

show controller gigabitethernet *slot/subslot/* {*bayport*}

Syntax Description

slot	The slot where a SIP or cable line card resides.
	• Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• Cisco uBR7225VXR router—The valid range is from 1 to 2.
	• Cisco uBR10012 router—The valid range for:
	  • Cable line card is from 5 to 8
	  • SIP is 1 and 3

subslot	The subslot where a SIP or cable line card resides.
	• Cisco uBR10012 router—The valid value for:
	  • Cable line card in slot 5 to 8 is 0 or 1
	  • SPAs in a SIP in slot 1 or 3, prior to Cisco IOS Release 12.2(33)SCB is 0 or 1. For Cisco IOS Release 12.2(33)SCB and later, subslot is not specified.

bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).

port	Specifies the port number.
	• Cisco uBR7246VXR router and Cisco uBR7225VXR router—The valid range is from 0 to 1.
	• Cisco uBR10012 router—The valid value for:
	  • Slot 1 and 3 is 0
	  • Slot 5 to 8 is from 0 to 4

Command Default

None

Command Modes

Privilege EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **show controllers TenGigabitEthernet** command.

Examples

This is a sample output for the **show controller gigabitethernet** command:

```
Router# show controller gigabitethernet 6/1/0
```

```
DEPI INTERFACE : GigabitEthernet6/1/0
slot           : 6
subunit        : 256
unit           : 0
slotunit       : 24
type           : 27
fci            : 0x65D
ph_state       : 0x6
MAC            : 0013.5f06.7f74
status         : 0x210040
status2        : 0x80200010
state          : 0x4
encsz          : 14
oir            : 0x0
max_pak_size   : 1524
visible_bw     : 10000
visible_bw_def : 10000
IB CHANNEL     : 3074
Port0 Status   : 1
Port1 Status   : 1
DS             : 11B7A40C
```

The table below describes the significant fields shown in the display:

Table 195: show controller gigabitethernet Field Descriptions

Field	Description
visible_bw	Configured bandwidth for bypass traffic
IB CHANNEL	Ironbus channel ID for bypass traffic
Port0 Status	Status of GigE port 0
Port1 Status	Status of GigE port 1

Related Commands

Command	Description
show controller ethernet	Displays the hardware status of the backplane ethernet (BPE) device.

show controller integrated-cable

To view information about the Cisco UBR-MC20X20V or Cisco uBR-MC88V line card, Cisco cBR Series Converged Broadband Router statistics or profile downgrade ordering on a given OFDM channel, use the **show controller integrated-cable** command in privileged EXEC mode.

This command also displays the details of the OFDM Channel power profile applied to the Cisco cBR Series Router.

show controller integrated-cable {*slot/portslot/subslot/port*} [**all** | **association** | **bpi-entry** *bpi-index* | **brief** | **config** | **counters** {**rf-channel** [*rf-channel*] | **wb-channel** [*wb-channel*]} | **errors** | **fpga_version** | **iofpga** | **mapping** {**rf-channel** [*rf-channel*] | **wb-channel** [*wb-channel*]} | **registers** | **rf-channel** [*rf-channel*] | **status** | **wideband-channel** [*wb-channel*]]

Cisco cBR Series Converged Broadband Routers
show controllers integrated-cable *slot/subslot/port* {**acfe** { **cluster** *index*} | **all** | **association** | **bandwidth** { **rf-channel** [*rf-channel*] | **wb-channel** [*wb-channel*] } | **counter** {**ofdm-channel** | **rf-channel** [*rf-channel*] | **wb-channel** [*wb-channel*] } | **mapping** { **rf-channel** [*rf-channel*] | **wb-channel** [*wb-channel*] } | **rf-channel** *grouplist* [**verbose** | **prof-order**] | **rf-port** | **wideband-channel**}

Syntax Description

slot/port | *slot/subslot/port*	Identifies the cable interface on the Cisco uBR7225VXR, Cisco uBR7246VXR, or Cisco uBR10012 router.
	• *slot* —Slot where the line card resides.
	  • Cisco uBR7225VXR router: The valid range is from 1 to 2.
	  • Cisco uBR7246VXR router: The valid range is from 3 to 6.
	  • Cisco uBR10012 router: The valid range is from 5 to 8.
	  • Cisco cBR Series Converged Broadband Routers: The valid range is from 0 to 3 and from 6 to 9.
	• *subslot* —Subslot where the line card resides. Available slots are 0 or 1. This option is available on the Cisco uBR10012 router. For Cisco cBR Series Converged Broadband Routers, the available slot is 0.
	• *port* —Downstream port number on the line card.
	  • Cisco uBR10012 router: The valid range is from 0 to 4.
	  • Cisco uBR7246VXR and Cisco uBR7225VXR routers: The valid port value is 0 or 1.
	  • Cisco cBR Series Converged Broadband Routers: The valid range is from 0 to 7.

all	(Optional) Displays the complete information about the line card statistics.

(For Cisco cBR Series Converged Broadband Routers only) **acfe**	(Optional) Displays controller acfe information.
association	(Optional) Displays the controller association information.
bpi-entry	(Optional) Displays the controller Baseline Privacy Interface (BPI) information. • *bpi-index*—BPI index number. The valid range is from 0 to 24575.
brief	(Optional) Displays brief information about the line card statistics.
(For Cisco cBR Series Converged Broadband Routers only) **bandwidth**	(Optional) Displays information about RF and Wideband channels.
config	(Optional) Displays statistics about the JIB hardware and downstream PHY configuration.
counters	(Optional) Displays information about the RF and wideband (WB) channel counters.
(For Cisco cBR Series Converged Broadband Routers only) **counter**	(Optional) Displays information about channel counters.
ofdm-channel	Displays the OFDM channel information.
rf-channel	Displays the RF channel information.
rf-channel	(Optional) RF channel number. The valid range is from 0 to 3.
wb-channel	Displays the wideband channel information.
wb-channel	(Optional) Wideband channel number. The valid range is from 0 to 5.
errors	(Optional) Displays information about the error counters, such as DOCSIS processor error counters, BPI error counters, and queue manager error counters.
fpga_version	(Optional) Displays the FPGA version information.
iofpga	(Optional) Displays the IOFPGA information.
mapping	(Optional) Displays mapping statistics of the RF and WB channels.
registers	(Optional) Displays the list of JIB hardware downstream register values.
(For Cisco cBR Series Converged Broadband Routers only) **rf-channel**	(Optional) Displays information about RF channels.
(For Cisco cBR Series Converged Broadband Routers only) **prof-order**	(Optional) Displays information about the profile downgrade ordering on a given OFDM channel.

(For Cisco cBR Series Converged Broadband Routers only) **rf-port**	(Optional) Displays information about RF port.
status	(Optional) Displays the JIB hardware and downstream PHY status.
wideband-channel	(Optional) Displays the controller wideband cable information.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCD	The command was modified. Added support for the Cisco uBR-MC88V line card on Cisco uBR7246VXR and Cisco uBR7225VXR universal broadband routers.
12.2(33)SCE	This command was modified. The following optional keywords were added: • fgpa_version • iofpga • rf-channel • wideband-channel
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0SP	This command was modified. The **prof-order** and **ofdm-channel** keywords were added.
IOS-XE 3.18.1SP	This command was modified. The command output was updated to include the guardband override status indication.
Cisco IOS XE 16.8.1	The output of the command with the **verbose** keyword was modified to display the ZBL related information.

Usage Guidelines

This command allows the user to view the following line card statistics:

- Controller association
- JIB hardware downstream configuration
- Channel counters
- Errors
- Mapping of WB and RF channels
- JIB hardware downstream registers
- JIB hardware downstream status

Examples

The following example shows a typical display of the **show controller integrated-cable** command and the **acfe cluster** keyword:

```
Router# show controller integrated-Cable 3/0/0 acfe cluster 0
Integrated-Cable 3/0/0 status:
Topology changed: No

========Cluster 0========
Number of RF:   2
RF      FlexBW      WB        ExcessBW  Quanta
0       35625       -         35438     35438
                    0         187       187
1       35250       0         35250     35250

Number of BG:   2
Intf    Demand        CIR     Max     CstrMin   Alloc   NBonus  Ratio
WB0     1000          0       70875   35250     35437   35438   14855190400
IC0     1000          0       35625   0         35438   187     14855609600
```

The following example shows a typical display of the **show controller integrated-cable** command and the **all** keyword:

```
Router# show controllers integrated-Cable 6/0/0 all
Integrated Cable Controller 6/0/0:
----------------------------------
  Channel 1  Annex = B  Modulation = 256 QAM
  Channel 2  Annex = B  Modulation = 256 QAM
  Channel 3  Annex = B  Modulation = 256 QAM
  Channel 4  Annex = B  Modulation = 256 QAM
JIB3_DS BPI registers (base address 0xF8880000)
bpi_int_isr_0                       [0x00000000] = 0x00000000
bpi_int_ier_0                       [0x00000004] = 0x0000000F
glb_int_isr_0                       [0x00000010] = 0x00000000
glb_int_ier_0                       [0x00000014] = 0x000003FF
glb_int_isr_1                       [0x00000020] = 0x00000000
glb_int_ier_1                       [0x00000024] = 0x000003FF
bpi_int_fesr_0                      [0x00000040] = 0x00000000
bpi_tst_tp_sel_reg                  [0x00000050] = 0x00000000
bpi_tst_tp_reg                      [0x00000054] = 0x00000000
bpi_cnt_good_packet_in_cnt          [0x00000064] = 0x61308806
bpi_cnt_bad_packet_in_cnt           [0x00000068] = 0x00006538
bpi_cnt_good_packet_out_cnt         [0x0000006C] = 0x61308806
bpi_cnt_bad_packet_out_cnt          [0x00000070] = 0x00006538
bpi_ecc_sbit_err_cnt                [0x00000074] = 0x00000000
glb_sw_rev_id                       [0x00000078] = 0x00020002
glb_hw_rev_id                       [0x0000007C] = 0x00010008
frz_reg                             [0x00000080] = 0x00000000
frz_en                              [0x00000084] = 0x00000001
glb_dcm_status                      [0x00000088] = 0x00000007
glb_sw_rst                          [0x0000008C] = 0x00000000
JIB3_DS ERP registers (base address 0xF8881000)
erp_irq_src_reg                     [0x00000000] = 0x00000000
erp_irq_en_reg                      [0x00000004] = 0x80000FFF
erp_tp_sel_reg                      [0x00000050] = 0x00000000
erp_tp_reg                          [0x00000054] = 0x00000000
erp_cfg_reg                         [0x00000060] = 0x00000000
erp_err_record_reg                  [0x00000064] = 0x00000000
erp_err_addr_record_reg             [0x00000068] = 0x00000000
erp_err_wd_record_reg               [0x0000006C] = 0x00000000
erp_proc_err_addr_record_reg        [0x00000090] = 0x00000000
JIB3_DS RX SPI registers (base address 0xF8882000)
rxspi_irq_src_reg                   [0x00000000] = 0x00000000
```

```
rxspi_irq_en_reg                    [0x00000004] = 0x000001FF
rxspi_ferr_src_reg                  [0x00000040] = 0x00000000
rxspi_testpoint_sel_reg             [0x00000050] = 0x00000000
rxspi_testpoint_reg                 [0x00000054] = 0x00000000
rxspi_rst_cntl_reg                  [0x00000060] = 0x00000000
rxspi_cntl_status_reg               [0x00000064] = 0x00000005
rxspi_cfg_cntl_reg                  [0x00000068] = 0x00000021
rxspi_afthres_reg                   [0x0000006C] = 0x01C00180
rxspi_cal_dur_reg                   [0x00000070] = 0x00030000
rxspi_non_drop_err_cnt_reg          [0x00000088] = 0x00000000
rxspi_drop_byte_cnt_reg             [0x0000008C] = 0x00000000
rxspi_rx_byte_cnt_reg[0]            [0x000000B0] = 0xFFFFFFFF
rxspi_rx_byte_cnt_reg[1]            [0x000000B4] = 0xFFFFFFFF
rxspi_rx_byte_cnt_reg[2]            [0x000000B8] = 0x14B49467
rxspi_rx_pkt_cnt_reg[0]             [0x000000C0] = 0x3FF2F36C
rxspi_rx_pkt_cnt_reg[1]             [0x000000C4] = 0x20F3AFA9
rxspi_rx_pkt_cnt_reg[2]             [0x000000C8] = 0x004A4A35
rxspi_fifo_pkt_drop_cnt_reg[0]      [0x000000E0] = 0x00000000
rxspi_fifo_pkt_drop_cnt_reg[1]      [0x000000E4] = 0x00000000
rxspi_fifo_pkt_drop_cnt_reg[2]      [0x000000E8] = 0x00000000
rxspi_calendar_table_reg[0]         [0x00000800] = 0x00000000
rxspi_calendar_table_reg[1]         [0x00000804] = 0x00000001
rxspi_calendar_table_reg[2]         [0x00000808] = 0x00000002
rxspi_calendar_table_reg[3]         [0x0000080C] = 0x00000003
JIB3_DS TX SPI registers (base address 0xF8883000)
txspi_irq_src_reg                   [0x00000000] = 0x00000000
txspi_irq_en_reg                    [0x00000004] = 0x0000001F
txspi_ferr_src_reg                  [0x00000040] = 0x00000000
txspi_testpoint_sel_reg             [0x00000050] = 0x00000000
txspi_testpoint_reg                 [0x00000054] = 0x00000000
txspi_rst_cntl_reg                  [0x00000060] = 0x00000000
txspi_cntl_status_reg               [0x00000064] = 0x00000009
txspi_cfg_cntl_reg                  [0x00000068] = 0x00000001
txspi_afthres_reg                   [0x0000006C] = 0x01EC01E8
txspi_cal_dur_reg                   [0x00000070] = 0x00040000
txspi_train_cntl_reg                [0x00000074] = 0x00000000
txspi_nonfatalerr_cnt_reg           [0x00000080] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[0]      [0x00000090] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[1]      [0x00000094] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[2]      [0x00000098] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[3]      [0x0000009C] = 0x00000000
txspi_eop_abort_byte_cnt_reg[0]     [0x000000A0] = 0x00000000
txspi_eop_abort_byte_cnt_reg[1]     [0x000000A4] = 0x00000000
txspi_eop_abort_byte_cnt_reg[2]     [0x000000A8] = 0x00000000
txspi_eop_abort_byte_cnt_reg[3]     [0x000000AC] = 0x00000000
txspi_tx_byte_cnt_reg[0]            [0x000000C0] = 0x00000000
txspi_tx_byte_cnt_reg[1]            [0x000000C4] = 0x00000000
txspi_tx_byte_cnt_reg[2]            [0x000000C8] = 0x00000000
txspi_tx_byte_cnt_reg[3]            [0x000000CC] = 0x00000000
txspi_tx_pkt_cnt_reg[0]             [0x00000100] = 0x00000000
txspi_tx_pkt_cnt_reg[1]             [0x00000104] = 0x00000000
txspi_tx_pkt_cnt_reg[2]             [0x00000108] = 0x00000000
txspi_tx_pkt_cnt_reg[3]             [0x0000010C] = 0x00000000
txspi_calendar_table_reg[0]         [0x00000800] = 0x00000000
txspi_calendar_table_reg[1]         [0x00000804] = 0x00000001
txspi_calendar_table_reg[2]         [0x00000808] = 0x00000002
txspi_calendar_table_reg[3]         [0x0000080C] = 0x00000003
txspi_calendar_table_reg[4]         [0x00000810] = 0x00000004
JIB3_DS DOC registers (base address 0xF8884000)
doc_int_err0                        [0x00000000] = 0x00000000
doc_int_err0_ier                    [0x00000004] = 0xFFBFBFFD
doc_int_err1                        [0x00000010] = 0x00000000
doc_int_err1_ier                    [0x00000014] = 0x003FFFF8
doc_int_fesr                        [0x00000040] = 0x00000000
```

```
doc_test_sel                          [0x00000050] = 0x00000000
doc_testpoint                         [0x00000054] = 0x00000000
doc_cfg_ctrl                          [0x00000060] = 0x031A0000
doc_err_cap_ctrl                      [0x00000064] = 0x001F0001
doc_err_cap_addr                      [0x00000068] = 0x00000000
doc_err_cap_data                      [0x0000006C] = 0x000080F7
doc_seg_num                           [0x00000070] = 0x00000001
doc_wb_chan_stats_sel                 [0x00000074] = 0x00000077
doc_wb_pkt_cnt                        [0x00000078] = 0x00000000
doc_wb_byte_cnt                       [0x0000007C] = 0x00000000
doc_wb_police_sel                     [0x00000080] = 0x00000000
doc_wb_police_data                    [0x00000084] = 0x00000000
doc_wb_police_intv                    [0x00000088] = 0x00000000
doc_nb_chan_stats_sel                 [0x0000008C] = 0x0000004C
doc_nb_pkt_cnt                        [0x00000090] = 0x00000000
doc_nb_byte_cnt                       [0x00000094] = 0x00000000
doc_nb_police_sel                     [0x00000098] = 0x00000000
doc_nb_police_data                    [0x0000009C] = 0x00000000
doc_nb_police_intv                    [0x000000A0] = 0x00000000
doc_int_doc_cnt                       [0x000000D4] = 0x00000000
doc_int_ecc_sbiterr_cnt               [0x000000D8] = 0x00000000
doc_pkt_good_in_cnt                   [0x000000DC] = 0x6130ED6F
doc_pkt_good_out_cnt                  [0x000000E0] = 0x61308837
doc_pkt_err_in_cnt                    [0x000000E4] = 0x00000000
doc_pkt_err_out_cnt                   [0x000000E8] = 0x00006538
doc_pkt_drop_cnt                      [0x000000EC] = 0x00000000
doc_efc_all_cnt                       [0x000000F0] = 0x00000000
doc_efc_hi_cnt                        [0x000000F4] = 0x00000000
doc_efc_me_cnt                        [0x000000F8] = 0x00000000
doc_efc_lo_cnt                        [0x000000FC] = 0x00000000
doc_efc_ch_sel                        [0x00000100] = 0x00000000
doc_efc_debug_ctrl                    [0x00000104] = 0x00000000
doc_rldram_ext_ecc                    [0x00000114] = 0x00000000
doc_rldram_cfg                        [0x00000118] = 0x00101544
doc_rldram_ctrl                       [0x0000011C] = 0x00100389
doc_rldram_status                     [0x00000120] = 0x039D7403
doc_rldram_blk_clr                    [0x00000124] = 0x0B7FFFFF
doc_rldram_cal_match_win_h            [0x00000128] = 0x00000000
doc_rldram_cal_match_win_l            [0x0000012C] = 0x1FFFFFFF
doc_rldram_ecc_err_rec_addr           [0x00000130] = 0x00000000
doc_magic_num_err_pkt_ctrl            [0x00000150] = 0x00000000
doc_magic_num_err_pkt_addr            [0x00000154] = 0x00000000
doc_magic_num_err_pkt_data            [0x00000158] = 0x00000000
JIB3_DS RIF registers (base address 0xF8885000)
rif_int_err0                          [0x00000000] = 0x00000000
rif_int_ier0                          [0x00000004] = 0x00000007
rif_int_fesr0                         [0x00000040] = 0x00000000
rif_tp_sel                            [0x00000050] = 0x00000000
rif_tp                                [0x00000054] = 0x00000000
rif_cfg_ctrl                          [0x00000060] = 0x00000000
rif_cnt_in_mpeg_cnt                   [0x00000064] = 0xFFFFFFFF
rif_cnt_out_good_mpeg_cnt             [0x00000068] = 0xFFFFFFFF
rif_cnt_out_bad_mpeg_cnt              [0x0000006C] = 0x00000000
rif_cnt_drop_mpeg_cnt                 [0x00000070] = 0x00000000
rif_1bit_ecc_err_stat                 [0x00000074] = 0x00000000
JIB3_DS RTN registers (base address 0xF8886000)
return_int_isr                        [0x00000000] = 0x00000000
return_int_ier                        [0x00000004] = 0x000001FF
return_int_fesr                       [0x00000040] = 0x00000000
return_tp_sel                         [0x00000050] = 0x00000000
return_tp                             [0x00000054] = 0x00000000
return_ctrl_reg                       [0x00000060] = 0x00000000
return_pif_loopback_chnl              [0x00000064] = 0x00000000
return_sniffer_nonbonded_en           [0x00000068] = 0x00000000
```

```
return_sniffer_bonded_en            [0x0000006C] = 0x00000000
return_spi_chnl_sel                 [0x00000070] = 0x0000013A
return_err_drop_en                  [0x00000074] = 0x0000000F
return_snf_macda_cfg_addr           [0x00000078] = 0x00000000
return_snf_macda_cfg_data_hi        [0x0000007C] = 0x00000000
return_snf_macda_cfg_data_lo        [0x00000080] = 0x00000000
return_in_pifrx_good_cnt            [0x000000A0] = 0x00000000
return_in_pifrx_bad_cnt             [0x000000A4] = 0x00000000
return_in_piflp_good_cnt            [0x000000A8] = 0xFFFFFFFF
return_in_piflp_bad_cnt             [0x000000AC] = 0x00000000
return_in_sniffer_good_cnt          [0x000000B0] = 0x61308845
return_in_sniffer_bad_cnt           [0x000000B4] = 0x00006538
return_in_spi_loop_good_cnt         [0x000000B8] = 0x00000000
return_in_spi_loop_bad_cnt          [0x000000BC] = 0x00000000
return_out_spi0_cnt                 [0x000000C0] = 0x00000000
return_out_spi1_cnt                 [0x000000C4] = 0x00000000
return_out_spi2_cnt                 [0x000000C8] = 0x00000000
return_out_spi3_cnt                 [0x000000CC] = 0x00000000
return_out_spi4_cnt                 [0x000000D0] = 0x00000000
return_pifrx_if_par_err_drop_cnt    [0x000000D4] = 0x00000000
return_pifrx_if_len_err_drop_cnt    [0x000000D8] = 0x00000000
return_piflp_if_err_drop_cnt        [0x000000DC] = 0x00000000
return_piflp_if_chnl_drop_cnt       [0x000000E0] = 0x00000000
return_snf_pb_err_drop_cnt          [0x000000E4] = 0x00006538
return_snf_pkt_type_err_drop_cnt    [0x000000E8] = 0x61308845
return_spilp_if_err_drop_cnt        [0x000000EC] = 0x00000000
return_pifrx_traffic_mux_drop_cnt   [0x000000F0] = 0x00000000
return_piflp_traffic_mux_drop_cnt   [0x000000F4] = 0x00000000
return_snf_traffic_mux_drop_cnt     [0x000000F8] = 0x00000000
return_spilp_traffic_mux_drop_cnt   [0x000000FC] = 0x00000000
return_pifrx_fifo_overflow_drop_cnt [0x00000100] = 0x00000000
return_piflp_fifo_overflow_drop_cnt [0x00000104] = 0x00000000
return_snf_fifo_overflow_drop_cnt   [0x00000108] = 0x00000000
return_spilp_fifo_overflow_drop_cnt [0x0000010C] = 0x00000000
return_pifrx_if_par_err_cnt         [0x00000110] = 0x00000000
return_pifrx_if_len_err_cnt         [0x00000114] = 0x00000000
return_pifrx_fifo_ecc_1berr_cnt     [0x00000118] = 0x00000000
return_piflp_fifo_ecc_1berr_cnt     [0x0000011C] = 0x00000000
return_snf_fifo_ecc_1berr_cnt       [0x00000120] = 0x00000000
return_spilp_fifo_ecc_1berr_cnt     [0x00000124] = 0x00000000
JIB3_DS DLM registers (base address 0xF8890000)
dlm_int_isr_0                       [0x00000000] = 0x00000005
dlm_int_ier_0                       [0x00000004] = 0x00000000
dlm_cnt_local_ts_reg                [0x00000064] = 0x5B00EB07
dlm_cfg_tss_comp_reg                [0x00000068] = 0x00000027
dlm_cfg_tss_ctrl_reg                [0x0000006C] = 0x00000000
dlm_cfg_tss_cmd_reg                 [0x00000070] = 0x00000000
dlm_cnt_ts_load_cnt                 [0x000000BC] = 0x00000000
dlm_cnt_ts_chk_failed_cnt           [0x000000C4] = 0x00000000
dlm_cnt_tss_perr_cnt                [0x000000C8] = 0x00000000
dlm_cnt_load_ts_reg                 [0x000000D0] = 0x003F52EF
JIB3_DS SEQ registers (base address 0xF8892000)
seq_int_err0                        [0x00000000] = 0x0000000F
seq_int_ier0                        [0x00000004] = 0x000FFFFF
seq_int_err3                        [0x00000030] = 0x00000000
seq_int_ier3                        [0x00000034] = 0x00000001
seq_int_fatal_err                   [0x00000040] = 0x00000000
seq_tp_sel                          [0x00000050] = 0x00000000
seq_tp                              [0x00000054] = 0x00000000
seq_cfg_en                          [0x00000060] = 0x00000001
seq_cfg_sync_timer_sel              [0x00000064] = 0x00000004
seq_cfg_sync_timer_data             [0x00000068] = 0x00000000
seq_cfg_sync_sa_sel                 [0x0000006C] = 0x00000004
seq_cfg_sync_sa_data_lo             [0x00000070] = 0x70CC0B91
```

```
seq_cfg_sync_sa_data_hi             [0x00000074] = 0x00000000
seq_cfg_tkb_timer_sel               [0x00000078] = 0x00000014
seq_cfg_tkb_timer_data              [0x0000007C] = 0x00000000
seq_cfg_tkb_max                     [0x00000080] = 0x00000000
seq_hwdbg_dpv_proc_table_addr       [0x00000090] = 0x00000000
seq_hwdbg_dpv_ptr_mod_table         [0x00000094] = 0x00000000
seq_hwdbg_dpv_timestamp_table       [0x00000098] = 0x00000000
seq_hwdbg_dpv_hcs_table             [0x0000009C] = 0x00000000
seq_cnt_blkram_oecc_err_stat        [0x000000A4] = 0x00000000
seq_cnt_tran_mpeg_stat              [0x000000A8] = 0xFFFFFFFF
seq_cnt_tran_mpeg_sync_stat         [0x000000AC] = 0x00000000
seq_cnt_tran_only_sync_stat         [0x000000B0] = 0x00000000
seq_cnt_tran_dpv_stat               [0x000000B8] = 0x00000000
JIB3_DS QM registers (base address 0xF8893000)
qm_int_isr0                         [0x00000000] = 0x00000000
qm_int_ier0                         [0x00000004] = 0x0000007F
qm_int_isr1                         [0x00000010] = 0x00000000
qm_int_ier1                         [0x00000014] = 0x000FFFFF
qm_int_fat_err_isr                  [0x00000040] = 0x00000000
qm_tst_tp_sel                       [0x00000050] = 0x00000000
qm_tst_tp                           [0x00000054] = 0x00000000
qm_cfg_chnl_rst_0                   [0x00000060] = 0x00000000
qm_cfg_ctl                          [0x0000006C] = 0x00000011
qm_cfg_sqf_fac_addr                 [0x0000008C] = 0x00000014
qm_cfg_sqf_fac_data                 [0x00000090] = 0x00000000
qm_cfg_bond_chnl_map_addr           [0x00000094] = 0x00000020
qm_cfg_bond_chnl_map_data_lo        [0x00000098] = 0x00000000
qm_cfg_flt_thr_addr                 [0x000000A4] = 0x0000024F
qm_cfg_flt_thr_data                 [0x000000A8] = 0x00000000
qm_cfg_repl_addr                    [0x000000AC] = 0x0000002D
qm_cfg_repl_data_lo                 [0x000000B0] = 0x00000000
qm_hwdbg_buf_mag_addr               [0x000000BC] = 0x00000000
qm_hwdbg_wptr_data_lo               [0x000000C0] = 0x00000C60
qm_hwdbg_wptr_data_mi               [0x000000C4] = 0x00016080
qm_hwdbg_wptr_data_hi               [0x000000C8] = 0x000012A0
qm_hwdbg_rptr_data_lo               [0x000000CC] = 0x00000C60
qm_hwdbg_rptr_data_mi               [0x000000D0] = 0x00016080
qm_hwdbg_rptr_data_hi               [0x000000D4] = 0x000012A0
qm_hwdbg_qulen_data_lo              [0x000000D8] = 0x00000000
qm_hwdbg_qulen_data_mi              [0x000000DC] = 0x00000000
qm_hwdbg_qulen_data_hi              [0x000000E0] = 0x00000000
qm_hwdbg_contex_data                [0x000000E4] = 0x00000000
qm_cfg_dir_stat_addr                [0x000000E8] = 0x0000004E
qm_cnt_dir_pkt_stat                 [0x000000EC] = 0x00000000
qm_cnt_dir_byte_stat                [0x000000F0] = 0x00000000
qm_cfg_qam_stat_addr                [0x000000F4] = 0x0000004C
qm_cnt_qam_chnl_pkt_stat            [0x000000F8] = 0x00000000
qm_cnt_qam_chnl_byte_stat           [0x000000FC] = 0x00000000
qm_cnt_qam_chnl_sync_stat           [0x00000100] = 0x00000000
qm_cnt_bpram_ovrflw_stat            [0x00000108] = 0x00000000
qm_cnt_que_ovrflw_stat              [0x0000010C] = 0x00000000
qm_cnt_good_bpi_pkt_stat            [0x00000110] = 0x6130886C
qm_cnt_bad_bpi_pkt_stat             [0x00000114] = 0x000000FF
qm_cnt_bpram_out_good_pkt_stat      [0x0000011C] = 0xC38C8639
qm_cnt_bpram_out_dir_pkt_stat       [0x00000120] = 0x213DFA0E
qm_cnt_bpram_out_bonded_pkt_stat    [0x00000124] = 0x3486CDA6
qm_cnt_replicated_pkt_stat          [0x00000128] = 0x8399F7DB
qm_cnt_bpram_bad_type_pkt_stat      [0x00000134] = 0x00000000
qm_cnt_bpram_bad_eop_pkt_stat       [0x00000138] = 0x00000000
qm_cnt_bpram_bad_dir_pkt_stat       [0x0000013C] = 0x00000000
qm_cnt_bpram_bad_bonded_pkt_stat    [0x00000140] = 0x00000000
qm_cnt_bpram_oecc_err_pkt_stat      [0x00000144] = 0x00000000
qm_cnt_bpram_bad_pkt_stat           [0x00000148] = 0x000000FF
qm_cnt_wr_good_pkt_stat             [0x0000014C] = 0xC38C863A
```

```
qm_cnt_wr_bad_pkt_stat              [0x00000150] = 0x00000000
qm_cnt_drop_bad_pkt_stat            [0x00000154] = 0x000000FF
qm_cnt_drop_ovrflw_pkt_stat         [0x00000158] = 0x00000000
qm_cnt_rd_pkt_stat                  [0x0000015C] = 0xC38C8664
qm_cnt_rd_mpeg_stat                 [0x00000160] = 0xFFFFFFFF
qm_cnt_rd_mpeg_sync_stat            [0x00000164] = 0x06A0FC65
qm_cnt_rd_mpeg_only_sync_stat       [0x00000168] = 0x0620376C
qm_cnt_tran_pkt_stat                [0x00000170] = 0xC38C8664
qm_cnt_tran_oecc_err_pkt_stat       [0x00000174] = 0x00000000
qm_cnt_tran_mpeg_stat               [0x00000178] = 0xFFFFFFFF
qm_cnt_tran_mpeg_sync_stat          [0x0000017C] = 0x06A0FC65
qm_cnt_tran_mpeg_only_sync_stat     [0x00000180] = 0x0620376C
qm_cnt_tran_dpv_stat                [0x00000188] = 0x00000000
qm_rldram_ext_ecc                   [0x00000198] = 0x00000000
qm_rldram_cfg                       [0x0000019C] = 0x00101544
qm_rldram_ctrl                      [0x000001A0] = 0x00100389
qm_rldram_status                    [0x000001A4] = 0x03DF7C03
qm_rldram_cal_match_win_h           [0x000001A8] = 0x00000000
qm_rldram_cal_match_win_l           [0x000001AC] = 0x7FFFFFFF
JIB3_DS PG registers (base address 0xF8898000)
pg_mod                              [0x00000050] = 0x00000000
pg_dhs                              [0x00000054] = 0x00000000
pg_ipg                              [0x0000005C] = 0x00000000
pg_num                              [0x00000058] = 0x00000000
pg_payload_length                   [0x00000060] = 0x00000000
pg_payload_value                    [0x00000064] = 0x00000000
pg_pkt_hdr_prog_0                   [0x00000068] = 0x00000000
pg_pkt_hdr_prog_1                   [0x0000006C] = 0x00000000
pg_pkt_hdr_1                        [0x00000070] = 0x00000000
pg_pkt_hdr_2                        [0x00000074] = 0x00000000
pg_pkt_hdr_3                        [0x00000078] = 0x00000000
pg_pkt_hdr_4                        [0x0000007C] = 0x00000000
pg_pkt_hdr_5                        [0x00000080] = 0x00000000
pg_pkt_hdr_6                        [0x00000084] = 0x00000000
JIB3_DS PMBIST registers (base address 0xF8899000)
pmbist_ena_addr                     [0x00000060] = 0x00000002
pmbist_din_addr                     [0x00000064] = 0x00000000
pmbist_dout_addr                    [0x0000006C] = 0x00008101
pmbist_trgt_select_addr             [0x00000074] = 0x00000000
pmbist_ff_status                    [0x00000078] = 0x00000000
pmbist_num_wr_fr_pmbist             [0x0000007C] = 0x00000000
pmbist_num_rd_fr_pmbist             [0x00000080] = 0x00000000
pmbist_um_wr_2cmd_ff                [0x00000084] = 0x00000000
pmbist_num_rd_2cmd_ff               [0x00000088] = 0x00000000
pmbist_num_rd_rtn_pmbist            [0x0000008C] = 0x00000000
pmbist_num_wr_2dram                 [0x00000090] = 0x00000000
pmbist_num_rd_2dram                 [0x00000094] = 0x00000000
pmbist_num_rd_fr_dram               [0x00000098] = 0x00000000

DS PHY Configuration of Controller 0:
---------------------
  Base Frequency = 555000000Hz
  RF-Power = 52.0dBmV
  Annex = B Modulation = 256QAM
  Channel Status Interleave
  ------- ------ ----------
     0   Active     32
     1   Active     32
     2   Active     32
     3   Active     32
  DS_PHY PLL set for Annex-B
  DS PHY Device Information:
  -------------------
    Remora Version = 3.10
```

```
    UPX SW Version = 0x10D
    Upconverter Type:Unknown
    UPX Part Number =
  Device Status:
  --------------
    UPX Alarm Status = 0x3FF
    UPX Alarm Mask   = 0x19000
Remora registers (base address 0xF8900000)
------------------------------------------
Remora General Registers (0xF8900000):
--------------------------------------
revision                            [0x00000000] = 0x00000003
hw_fpga_rev_id                      [0x00000004] = 0x0000000A
erp_scratch_pad0                    [0x00000008] = 0x00000000
erp_scratch_pad1                    [0x0000000C] = 0x00000000
Remora Reset and DCM Lock Registers (0xF8900100):
-------------------------------------------------
reset_ctrl                          [0x00000100] = 0x00000000
dcm_lock                            [0x00000104] = 0x0000000F
Remora Configuration Registers (0xF8900200):
--------------------------------------------
port_cfg[0]                         [0x00000200] = 0x00155549
port_cfg[1]                         [0x00000204] = 0x00155548
port_cfg[2]                         [0x00000208] = 0x00155548
port_cfg[3]                         [0x0000020C] = 0x00155548
port_cfg[4]                         [0x00000210] = 0x00155548
core_config_status                  [0x00000214] = 0x00000020
port_rm2tififo_prog_flags[0]        [0x00000218] = 0xBBA20C0D
port_rm2tififo_prog_flags[1]        [0x0000021C] = 0xBBA20C0D
port_rm2tififo_prog_flags[2]        [0x00000220] = 0xBBA20C0D
port_rm2tififo_prog_flags[3]        [0x00000224] = 0xBBA20C0D
port_rm2tififo_prog_flags[4]        [0x00000228] = 0xBBA20C0D
Remora DFT/Pattern Inject Registers (0xF8900300):
-------------------------------------------------
alt_sym_tst_mode                    [0x00000300] = 0x00005A69
alt_sym_tst_en_reg                  [0x00000304] = 0x00000000
qdr_mem_test_en_reg                 [0x00000308] = 0x00000000
qdr_mem_test_rd_wr_reg              [0x0000030C] = 0x00000A12
ready_for_data_input                [0x00000318] = 0x0000001F
Remora ECC Registers (0xF8900400):
----------------------------------
debug_cfg                           [0x00000400] = 0x00000000
sniff_frame_cnt                     [0x00000404] = 0x00000000
ecc_parity_conf_reg                 [0x00000408] = 0x00000003
ecc_uncorrect_data_log_reg          [0x0000040C] = 0x00002814
ecc_uncorrect_log_reg               [0x00000410] = 0x00000020
ecc_correctable_data_log_reg        [0x00000414] = 0x00002C14
ecc_correctable_log_reg             [0x00000418] = 0x00000028
qdr_ecc_corr_cnt_reg                [0x0000041C] = 0x00000000
fatal_err_log                       [0x00000420] = 0x00000000
err_inj_reg                         [0x00000424] = 0x00000000
Remora QDR Registers (0xF8900500):
----------------------------------
qdr_phy_idelayctrl_rst_reg          [0x00000500] = 0x00000000
qdr_phy_idelayctrl_rdy_err_reg      [0x00000504] = 0x00000261
qdr_phy_cal_tap_dly_reg             [0x00000508] = 0x00000ADB
qdr_phy_idelayctrl_ctrl_reg         [0x0000050C] = 0x00000002
qdr_init_ctrl_reg                   [0x00000510] = 0x801FFFFF
Remora Interrupt Status Registers (0xF8900600):
-----------------------------------------------
glb_int_stat_reg                    [0x00000600] = 0x00000000
int_stat_gr_reg[0]                  [0x00000604] = 0x00000000
int_stat_gr_reg[1]                  [0x00000608] = 0x00000000
int_stat_gr_reg[2]                  [0x0000060C] = 0x00000000
```

```
int_stat_gr_reg[3]                  [0x00000610] = 0x00000000
int_stat_gr_reg[4]                  [0x00000614] = 0x00000000
misc_int_stat_reg                   [0x00000618] = 0x00000001
fatal_err_src_reg                   [0x0000061C] = 0x00000000
port_local_interrupt_enable[0]      [0x00000620] = 0x0001FFFF
port_local_interrupt_enable[1]      [0x00000624] = 0x0001FFFF
port_local_interrupt_enable[2]      [0x00000628] = 0x0001FFFF
port_local_interrupt_enable[3]      [0x0000062C] = 0x0001FFFF
port_local_interrupt_enable[4]      [0x00000630] = 0x0001FFFF
misc_int_en_reg                     [0x00000634] = 0x00001FF8
fatal_err_en_reg                    [0x00000638] = 0x00000EFF
port_local_interrupt_override[0]    [0x0000063C] = 0x00000000
port_local_interrupt_override[1]    [0x00000640] = 0x00000000
port_local_interrupt_override[2]    [0x00000644] = 0x00000000
port_local_interrupt_override[3]    [0x00000648] = 0x00000000
port_local_interrupt_override[4]    [0x0000064C] = 0x00000000
misc_int_override                   [0x00000650] = 0x00000000
fatal_err_override                  [0x00000654] = 0x00000000
Remora Counts Registers (0xF8900800):
-------------------------------------
illegal_ch_num_pkt_drop_count       [0x00000800] = 0x00000000
fifo_full_mpeg_pkt_drop_count_hi    [0x00000804] = 0x00000000
fifo_full_mpeg_pkt_drop_count_lo    [0x00000808] = 0x00000000
channel_mpeg_pkt_count[0]           [0x0000080C] = 0x00000EE7
channel_mpeg_pkt_count[1]           [0x00000810] = 0x00000E8C
channel_mpeg_pkt_count[2]           [0x00000814] = 0x00000839
channel_mpeg_pkt_count[3]           [0x00000818] = 0x000009DF
channel_mpeg_pkt_count[4]           [0x0000081C] = 0x00000000
channel_mpeg_pkt_count[5]           [0x00000820] = 0x00000000
channel_mpeg_pkt_count[6]           [0x00000824] = 0x00000000
channel_mpeg_pkt_count[7]           [0x00000828] = 0x00000000
channel_mpeg_pkt_count[8]           [0x0000082C] = 0x00000000
channel_mpeg_pkt_count[9]           [0x00000830] = 0x00000000
channel_mpeg_pkt_count[10]          [0x00000834] = 0x00000000
channel_mpeg_pkt_count[11]          [0x00000838] = 0x00000000
channel_mpeg_pkt_count[12]          [0x0000083C] = 0x00000000
channel_mpeg_pkt_count[13]          [0x00000840] = 0x00000000
channel_mpeg_pkt_count[14]          [0x00000844] = 0x00000000
channel_mpeg_pkt_count[15]          [0x00000848] = 0x00000000
channel_mpeg_pkt_count[16]          [0x0000084C] = 0x00000000
channel_mpeg_pkt_count[17]          [0x00000850] = 0x00000000
channel_mpeg_pkt_count[18]          [0x00000854] = 0x00000000
channel_mpeg_pkt_count[19]          [0x00000858] = 0x00000000
port_re_timestamp_count[0]          [0x0000085C] = 0x97979796
port_re_timestamp_count[1]          [0x00000860] = 0x00000000
port_re_timestamp_count[2]          [0x00000864] = 0x00000000
port_re_timestamp_count[3]          [0x00000868] = 0x00000000
port_re_timestamp_count[4]          [0x0000086C] = 0x00000000
port_rx_fifo_overflow_drop_count[0] [0x00000870] = 0x00000000
port_rx_fifo_overflow_drop_count[1] [0x00000874] = 0x00000000
port_rx_fifo_overflow_drop_count[2] [0x00000878] = 0x00000000
port_rx_fifo_overflow_drop_count[3] [0x0000087C] = 0x00000000
port_rx_fifo_overflow_drop_count[4] [0x00000880] = 0x00000000
channel_jib_if_pkt_count[0]         [0x00000884] = 0x4AFC8612
channel_jib_if_pkt_count[1]         [0x00000888] = 0x44C96772
channel_jib_if_pkt_count[2]         [0x0000088C] = 0x42A048EA
channel_jib_if_pkt_count[3]         [0x00000890] = 0x43E61FF6
channel_jib_if_pkt_count[4]         [0x00000894] = 0x00000000
channel_jib_if_pkt_count[5]         [0x00000898] = 0x00000000
channel_jib_if_pkt_count[6]         [0x0000089C] = 0x00000000
channel_jib_if_pkt_count[7]         [0x000008A0] = 0x00000000
channel_jib_if_pkt_count[8]         [0x000008A4] = 0x00000000
channel_jib_if_pkt_count[9]         [0x000008A8] = 0x00000000
channel_jib_if_pkt_count[10]        [0x000008AC] = 0x00000000
```

```
channel_jib_if_pkt_count[11]        [0x000008B0] = 0x00000000
channel_jib_if_pkt_count[12]        [0x000008B4] = 0x00000000
channel_jib_if_pkt_count[13]        [0x000008B8] = 0x00000000
channel_jib_if_pkt_count[14]        [0x000008BC] = 0x00000000
channel_jib_if_pkt_count[15]        [0x000008C0] = 0x00000000
channel_jib_if_pkt_count[16]        [0x000008C4] = 0x00000000
channel_jib_if_pkt_count[17]        [0x000008C8] = 0x00000000
channel_jib_if_pkt_count[18]        [0x000008CC] = 0x00000000
channel_jib_if_pkt_count[19]        [0x000008D0] = 0x00000000
Remora Timestamp Registers (0xF8900900):
----------------------------------------
local_1024_ts_ctrl                  [0x00000900] = 0x00000039
local_1024_current_ts               [0x00000904] = 0xC354FFA0
local_1024_tcc_ts_latch             [0x00000908] = 0x7291125F
doc_ts_offset_ch_0_1                [0x0000090C] = 0x04AF04AF
doc_ts_offset_ch_2_3                [0x00000910] = 0x04AF04AF
doc_ts_offset_ch_4_5                [0x00000914] = 0x04F704F7
doc_ts_offset_ch_6_7                [0x00000918] = 0x04F704F7
doc_ts_offset_ch_8_9                [0x0000091C] = 0x04F704F7
doc_ts_offset_ch_10_11              [0x00000920] = 0x04F704F7
doc_ts_offset_ch_12_13              [0x00000924] = 0x04F704F7
doc_ts_offset_ch_14_15              [0x00000928] = 0x04F704F7
doc_ts_offset_ch_16_17              [0x0000092C] = 0x04F704F7
doc_ts_offset_ch_18_19              [0x00000930] = 0x04F704F7
Remora PRATE/SRATE Registers (0xF8900A00):
------------------------------------------
port_prate_regs[0].prate_ctrl       [0x00000A00] = 0x00000003
port_prate_regs[0].prate_m_prime_lo [0x00000A04] = 0x0005971E
port_prate_regs[0].prate_n_prime_lo [0x00000A08] = 0x08AA5B88
port_prate_regs[0].prate_m_prime_hi [0x00000A0C] = 0x00000000
port_prate_regs[1].prate_ctrl       [0x00000A10] = 0x00000003
port_prate_regs[1].prate_m_prime_lo [0x00000A14] = 0x00000191
port_prate_regs[1].prate_n_prime_lo [0x00000A18] = 0x00037E78
port_prate_regs[1].prate_m_prime_hi [0x00000A1C] = 0x00000000
port_prate_regs[2].prate_ctrl       [0x00000A20] = 0x00000003
port_prate_regs[2].prate_m_prime_lo [0x00000A24] = 0x00000191
port_prate_regs[2].prate_n_prime_lo [0x00000A28] = 0x00037E78
port_prate_regs[2].prate_m_prime_hi [0x00000A2C] = 0x00000000
port_prate_regs[3].prate_ctrl       [0x00000A30] = 0x00000003
port_prate_regs[3].prate_m_prime_lo [0x00000A34] = 0x00000191
port_prate_regs[3].prate_n_prime_lo [0x00000A38] = 0x00037E78
port_prate_regs[3].prate_m_prime_hi [0x00000A3C] = 0x00000000
port_prate_regs[4].prate_ctrl       [0x00000A40] = 0x00000003
port_prate_regs[4].prate_m_prime_lo [0x00000A44] = 0x00000191
port_prate_regs[4].prate_n_prime_lo [0x00000A48] = 0x00037E78
port_prate_regs[4].prate_m_prime_hi [0x00000A4C] = 0x00000000
port_srate_regs[0].srate_ctrl       [0x00000A50] = 0x00000003
port_srate_regs[0].srate_mn         [0x00000A54] = 0x004E0095
port_srate_regs[1].srate_ctrl       [0x00000A58] = 0x00000003
port_srate_regs[1].srate_mn         [0x00000A5C] = 0x0191032C
port_srate_regs[2].srate_ctrl       [0x00000A60] = 0x00000003
port_srate_regs[2].srate_mn         [0x00000A64] = 0x0191032C
port_srate_regs[3].srate_ctrl       [0x00000A68] = 0x00000003
port_srate_regs[3].srate_mn         [0x00000A6C] = 0x0191032C
port_srate_regs[4].srate_ctrl       [0x00000A70] = 0x00000003
port_srate_regs[4].srate_mn         [0x00000A74] = 0x0191032C
```

The following example shows a typical display of the **show controller integrated-cable** command and the **association** keyword:

```
Router# show controller integrated-Cable 7/1/0 association
WB Association Info for 7/1 No of WB 30
WB                     BG   Bundle  NB          NB chan  Reserved  Total
```

```
channel                 ID   num     channel     ID       CIR       CIR
Wideband-Cable7/1/0:0   1057 1       Cable7/1/0  121      0         21751500
                                     Multicast            0         21751500
Wideband-Cable7/1/3:0   1153 1       Cable7/1/3  133      0         12481000
                                     Multicast            0         12481000
```

The following example shows a typical display of the **show controller integrated-cable** command and the **brief** keyword:

```
Router# show controllers integrated-Cable 6/0/0  brief
Integrated Cable Controller 6/0/0:
----------------------------------
  Channel 1  Annex = B  Modulation = 256 QAM
  Channel 2  Annex = B  Modulation = 256 QAM
  Channel 3  Annex = B  Modulation = 256 QAM
  Channel 4  Annex = B  Modulation = 256 QAM
Jib3-DS Device Information:
---------------------------
   Jib3-DS Version = 2.2.1.8
   SW Rev ID = 0x00020002 HW Rev ID = 0x00010008
   Device Type: Coldplay
   Driver State: 3
Channel Resources:
------------------
   Total Non-bonded Channels..........= 20
   Per-Controller Non-bonded Channels = 4
   Total Bonded Channels..............= 32
   Per-Controller Bonded Channels.....= 6
Slot-Wide Resources:
--------------------
   Number of PHS Rules...........= 12K (0x3000)
   Number of BPI Table Entries...= 24K (0x6000)
   Number of Service Flows.......= 64K (0x10000)
  DS PHY Device Information:
  -------------------
    Remora Version = 3.10
    UPX SW Version = 0x10D
    Upconverter Type:Unknown
    UPX Part Number =
  Device Status:
  --------------
    UPX Alarm Status = 0x3FF
    UPX Alarm Mask   = 0x19000
```

The following example shows a typical display of the **show controller integrated-cable** command and the **bpi-entry** keyword:

```
Router# show controller integrated-cable 7/1/4 bpi-entry 3
BPI index:3 segment:0 key_no:3 said:2 key_seq:7 AES
Even  5A4B-68E8-5948-FD84-F5E2-1D28-311C-37D8
  Iv  4E33-379E-6FCF-9A8E-01CB-AC95-5B4D-AE76
 Odd  A871-76EA-1D3E-02F8-5EDA-8A8E-1F15-52E6
  Iv  6F62-765C-C9E7-DB8A-6FA5-91E8-BE41-3075
```

Effective from Cisco IOS Release 12.2(33)SCD, the BPI key information stored on the Cisco UBR-MC20X20V line card is displayed using the show controller integrated-cable command with the bpi-entry keyword.

The following is a sample output of the**show controller integrated-cable** command with the **bpi-entry** keyword:

```
Router# show controller integrated-cable 6/0/0 bpi-entry 1
BPI Index: 1 Segment: 0
 Even Key: Valid, Odd Key: Valid
 Key Sequence Number: 1 Security Association: 0x2
 Key Type: DES
 Even Key: 1CE8-45A1-1903-E5  IV: 1513-236D-1FF7-046E
  Odd Key: 10EC-6DB2-5441-EC  IV: 07C7-1089-0E34-026B
```

The following example provides information about all controllers using the **show controller integrated-cable**command and the **wideband** keyword:

```
Router# show controller integrated-cable 7/1/4 wideband
WB                      BG    WB Host       Primary
channel                 ID    Slot/Subslot  BG
Wideband-Cable7/1/4:0   1185  7/1           Yes
Wideband-Cable7/1/4:1   1186  7/1           Yes
Wideband-Cable7/1/4:2   1187  7/1           Yes
Wideband-Cable7/1/4:3   1188  7/1           Yes
Wideband-Cable7/1/4:4   1189  7/1           Yes
Wideband-Cable7/1/4:5   1190  7/1           Yes
```

The following example provides information about all controllers using the**show controller integrated-cable** command and the **config** keyword:

```
Router# show controllers integrated-Cable 6/0/0 config
Integrated Cable Controller 6/0/0:
----------------------------------
  Channel 1  Annex = B  Modulation = 256 QAM
  Channel 2  Annex = B  Modulation = 256 QAM
  Channel 3  Annex = B  Modulation = 256 QAM
  Channel 4  Annex = B  Modulation = 256 QAM
Jib3-DS Device Information:
---------------------------
   Jib3-DS Version = 2.2.1.8
   SW Rev ID = 0x00020002 HW Rev ID = 0x00010008
   Device Type: Coldplay
   Driver State: 3
Channel Resources:
------------------
   Total Non-bonded Channels..........= 20
   Per-Controller Non-bonded Channels = 4
   Total Bonded Channels..............= 32
   Per-Controller Bonded Channels.....= 6
Slot-Wide Resources:
--------------------
   Number of PHS Rules............= 12K (0x3000)
   Number of BPI Table Entries...= 24K (0x6000)
   Number of Service Flows.......= 64K (0x10000)

Sniffer Configuration:
----------------------
Non-Bonded Channel Mask = 0x00000000
Bonded Channel Mask.....= 0x00000000
Sniff All Enable........= False
Configured Sniffer MAC Addresses:
Entry     MAC Address     Enabled
-----   --------------   -------
0       0000.0000.0000     False
1       0000.0000.0000     False
2       0000.0000.0000     False
3       0000.0000.0000     False
4       0000.0000.0000     False
```

```
5       0000.0000.0000     False
6       0000.0000.0000     False
7       0000.0000.0000     False
8       0000.0000.0000     False
9       0000.0000.0000     False
10      0000.0000.0000     False
11      0000.0000.0000     False
12      0000.0000.0000     False
13      0000.0000.0000     False
14      0000.0000.0000     False
15      0000.0000.0000     False

Replication Table:
------------------
Replication Entry Index   Channel Mask
-----------------------   ------------
41                        0x0000000F
42                        0x0000000F
43                        0x0000000F
44                        0x0000000F

Configured Bonding Groups:
--------------------------
Bonded Channel   Channels in Bonding Group
--------------   -------------------------
00               0, 1, 2, 3

Sync Configuration:
-------------------
Channel   MAC Address      Interval
-------   --------------   --------
0         001d.70cc.0b90      10 ms
1         001d.70cc.0b90      10 ms
2         001d.70cc.0b90      10 ms
3         001d.70cc.0b90      10 ms

DS PHY Configuration of Controller 0:
---------------------
  Base Frequency = 555000000Hz
  RF-Power = 52.0dBmV
  Annex = B Modulation = 256QAM
  Channel Status Interleave
  ------- ------ ----------
     0   Active     32
     1   Active     32
     2   Active     32
     3   Active     32
  DS_PHY PLL set for Annex-B
```

The following example provides information about all controllers using the **show controller integrated-cable** command and the **counters** keyword:

```
Router# show controller integrated-Cable card 7/1 counters rf-channel
Controller  RF    MPEG       MPEG       MPEG       Sync       MAP/UCD
Chan  Packets    bps        Mbps       Packets    Packets
                  Tx                               Tx         Tx
7/1/0       0     510617849   1411052    1.411052   45424209   894786143
7/1/0       1     511430476   1415614    1.415614   45424208   894786138
7/1/0       2     510750271   1412707    1.412707   45424208   894786121
7/1/0       3     512009268   1416818    1.416818   45424207   894786108
7/1/1       0     268915155   743427     0.74347    45424206   223046013
7/1/1       1     0           0          0.0        0          0
7/1/1       2     0           0          0.0        0          0
```

```
7/1/1       3     0          0          0.0        0          0
7/1/2       0     0          0          0.0        0          0
7/1/2       1     0          0          0.0        0          0
7/1/2       2     0          0          0.0        0          0
7/1/2       3     0          0          0.0        0          0
7/1/3       0     269847377   746886     0.746886   45424206   223769698
7/1/3       1     269850587   746936     0.746936   45424205   223769696
7/1/3       2     269851105   746886     0.746886   45424204   223769690
7/1/3       3     269868256   747036     0.747036   45424199   223769663
7/1/4       0     0          0          0.0        0          0
7/1/4       1     0          0          0.0        0          0
7/1/4       2     0          0          0.0        0          0
7/1/4       3     0          0          0.0        0          0
Router# show controllers integrated-Cable 6/0/0 counters wb-channel
Controller      WB channel       Tx packets       Tx octets
6/0/0           0                881249714         466143984373
6/0/0           1                0                0
6/0/0           2                0                0
6/0/0           3                0                0
6/0/0           4                0                0
6/0/0           5                0                0
```

The following example provides information about all controllers using the **show controller integrated-cable** command and the **errors** keyword:

```
Router# show controllers integrated-Cable 6/0/0 errors
Rx SPI Error Counters:
----------------------
Non-Droppable Errors Channel 0 = 00  FIFO Pkt Drop Count Channel 0 = 00000000
Non-Droppable Errors Channel 1 = 00  FIFO Pkt Drop Count Channel 1 = 00000000
Non-Droppable Errors Channel 2 = 00  FIFO Pkt Drop Count Channel 2 = 00000000
Non-Droppable Errors Channel 3 = 00  Dropped Bytes                 = 00000000
Tx SPI Error Counters:
----------------------
DIP2 Errors              = 00        Illegal Src Pattern Errs  = 00
EOP Abort Pkts Channel 0 = 00000000  EOP Abort Bytes Channel 0 = 00000000
EOP Abort Pkts Channel 1 = 00000000  EOP Abort Bytes Channel 1 = 00000000
EOP Abort Pkts Channel 2 = 00000000  EOP Abort Bytes Channel 2 = 00000000
EOP Abort Pkts Channel 3 = 00000000  EOP Abort Bytes Channel 3 = 00000000
DOCSIS Processor Error Counters:
--------------------------------
EFC and Stats Errors = 00000000  DOCSIS Engine Errors = 00025934
PHS Errors           = 00000000  Parser Errors        = 00000000
Output Packet Errors = 00000000  Dropped Packets      = 00000000
Input Packet Errors  = 00000000  ECC Errors           = 00000000
BPI Error Counters:
-------------------
Bad Input Pkts  = 22  Single-bit ECC Errors = 0
Bad Output Pkts = 22
Queue Manager Error Counters:
-----------------------------
BPRAM Bad End of Packets..= 00000000  Bonded Map Errors............= 00000000
BPRAM Overflows...........= 00000000  BPRAM Bad Packet Type Errors = 00000000
Directed Map Error Counts = 00000000  BPRAM ECC Errors.............= 00000000
RLDRAM ECC Errors.........= 00000000  Queue Overflows..............= 00000000
Sequencer Error Counters:
-------------------------
BlkRAM ECC Errors = 00000000
ERP Error Counters:
-------------------
Processor Bus Errored Address = 0x00000000
Return Interface Error Counters:
--------------------------------
```

```
Phys If Rx FIFO Oflow Drops = 00000000  Phys If LB FIFO Oflow Drops = 00000000
Sniffer FIFO Oflow Drops....= 00000000  Phys If Rx Parity Errors....= 00000000
Phys If Length Errors.......= 00000000  Phys If Rx FIFO ECC Errors..= 00000000
Phys If LB FIFO ECC Errors..= 00000000  Sniffer FIFO ECC Errors.....= 00000000
SPI LB FIFO ECC Errors......= 00000000
Jib3-DS (Coldplay) interrupt events
      count
 current   total    bursts  Event name
      21     25921       0  DOCSIS Processing Block: DSID Valid Error
Internal error packet buffer:
-----------------------------
IPH Header:
Packet type......... = 0x00
Flags............... = 0x00
Packet Length....... = 33015 (0x80F7)
DOCSIS Header Length = 11
Replication Index... = 0
Stats Index......... = 0x0546
Flags2.............. = 0x01040000
Service Flow........ = 0x00000000
Packet Body:
0x010500E1 0x4411C0FA 0x00895500 0x118072C7
0x6A001D70 0xCC0BE208 0x0045B800 0xCA000000
0x003F1121 0x42AC2200 0x63AC2200 0x82C004C0
0x0200B600 0x008000F1 0x318FF541 0x1BA16AE2
0xB303AF17 0x1652643F 0x4498F48E 0xE278F16B
0x167521EC 0x3CBF34DD 0xDCBEA10E 0x0B5AA70C
0xE6B9B77F 0x8E3590ED 0x4EC9388A 0x9B886A51
Internal magic number error packet buffer:
------------------------------------------
No magic number errored packet available
```

The following example provides information about all controllers using the **show controller integrated-cable** command and the **fpga_version** keyword:

```
Router# show controllers integrated-Cable 7/0/0 fpga_version
2020 CARD FPGA VERSION
CORABI FPGA               :  0.53
SPARROW FPGA              :  0.309
WAXBILL FPGA              :  1.7D
COLDPLAY FPGA             :  2.2.1.D
REMORA FPGA               :  0.1.0.14
FAUNA FPGA                :  0.8.0.3
FLORA FPGA                :  0.6.0.7
```

The following example provides information about all controllers using the **show controller integrated-cable** command and the **iofpga** keyword:

```
Router# show controllers integrated-Cable 7/0/0 iofpga
SPARROW PHY IOFPGA Registers - Address 0xF8800000:
    OFFSET    REGISTER                        VALUE
      0x00    Revision                        0x00000309
      0x08    DS RF Control                   0x80000003
      0x0C    FFT Process Low                 0x80007006
      0x1C    DCM Lock status                 0x00077411
      0x20    UPX SPI Control                 0x00000000
      0x24    UPX SPI Respond                 0x00000703
      0xB0    BCM 3140 SPI Start              0x00000000 0x00000000 0x00000000 0x00000000
 0x00000000
      0xC4    BCM 3140 SPI Done               0x00000000 0x00000000 0x00000000 0x00000000
 0x00000000
      0xD8    BCM3140 Reset                   0x000003FF
      0x100   FATAL Interrupt                 0x00002000
```

```
      0x104   FATAL Interrupt Enable           0x001FD8FF
      0x108   HIGH Priority Interrupt          0x00000000
      0x10C   HIGH Priority Interrupt Enable   0x00000000
      0x110   Low Priority Interrupt           0x00100000
      0x114   Low Priority Interrupt Enable    0x03E03C00
      0x118   CPU LB Data Parity Error         0x00000000
      0x200   Fauna ERP Interrupt Status       0x00000000
      0x204   Flora ERP Interrupt Status       0x00000000
      0x208   Coldplay ERP Interrupt Status    0x00000000
      0x20C   Remora ERP Interrupt Status      0x00000000
      0x210   VGA SPI RF Channel Selection     0x00000000
      0x214   VGA SPI RW Gain                  0x0000009E
      0x218   VGA SPI Write Gain(raven)        0x00000000
      0x220   VGA Enable                       0x000FFFFF
      0x300   Fauna Reset                      0x00000003
      0x304   Flora Reset                      0x00000003
      0x308   Coldplay Reset                   0x00000003
      0x30C   Remora Reset                     0x00000007
      0x310   Upstream LED                     0x00003C00
      0x380   Downstream Density License LED   0x00000000
** Sparrow PHY I/O FPGA counters ****
Spurious FFT Interrupts: 0        Spurious FFT CHIP ID: 0        FFT RDY CLEAR Err: 0

FFT Data Ready: 2A6
UPX:  SPI 0        Non-fatal 0        Boot OK 3
BCM3140: SPIA 0        SPIB 0        SPIC 0        SPID 0        SPIE 0
Non fatal US JIB Flora:    1         US JIB Fauna: 1
Non fatal DS JIB Coldplay: 1
Non fatal Remora FPGA:  1
US Port (BCM3140 channels):
0: 0       1: 0       2: 0       3: 0
4: 0       5: 0       6: 0       7: 0
8: 0       9: 0       10: 0       11: 0
12: 0       13: 0       14: 0       15: 0
16: 0       17: 0       18: 0       19: 0
```

The following example provides information about all controllers using the **show controller integrated-cable** command and the **mapping** keyword:

```
Router# show controllers integrated-Cable 6/0/0 mapping rf-channel
Ctrlr    RF       MC         MC Rem.    WB         WB         WB Rem.
         channel  BW %       Ratio      channel    BW %       Ratio
6/0/0    0        33         1          6/0/0:0     63        1
6/0/0    1        33         1          6/0/0:0     63        1
6/0/0    2        33         1          6/0/0:0     63        1
6/0/0    3        33         1          6/0/0:0     63        1
Router# show controllers integrated-Cable 6/0/0 mapping wb-channel
Load for five secs: 18%/1%; one minute: 11%; five minutes: 13%
Time source is NTP, *15:07:17.566 EDT Sun Mar 21 2010
Ctrlr    WB       RF         BW %       Remaining
         channel  channel               Ratio
6/0/0    0        6/0/0:0     63        1
                  6/0/0:1     63        1
                  6/0/0:2     63        1
                  6/0/0:3     63        1
```

The following example provides information about all controllers using the **show controller integrated-cable** command and the **registers** keyword:

```
Router# show controllers integrated-Cable 6/0/0 registers
JIB3_DS BPI registers (base address 0xF8880000)
bpi_int_isr_0                       [0x00000000] = 0x00000000
bpi_int_ier_0                       [0x00000004] = 0x0000000F
```

```
glb_int_isr_0                       [0x00000010] = 0x00000000
glb_int_ier_0                       [0x00000014] = 0x000003FF
glb_int_isr_1                       [0x00000020] = 0x00000000
glb_int_ier_1                       [0x00000024] = 0x000003FF
bpi_int_fesr_0                      [0x00000040] = 0x00000000
bpi_tst_tp_sel_reg                  [0x00000050] = 0x00000000
bpi_tst_tp_reg                      [0x00000054] = 0x00000000
bpi_cnt_good_packet_in_cnt          [0x00000064] = 0x00045B37
bpi_cnt_bad_packet_in_cnt           [0x00000068] = 0x0000000D
bpi_cnt_good_packet_out_cnt         [0x0000006C] = 0x00045B37
bpi_cnt_bad_packet_out_cnt          [0x00000070] = 0x0000000D
bpi_ecc_sbit_err_cnt                [0x00000074] = 0x00000000
glb_sw_rev_id                       [0x00000078] = 0x00020002
glb_hw_rev_id                       [0x0000007C] = 0x00010008
frz_reg                             [0x00000080] = 0x00000000
frz_en                              [0x00000084] = 0x00000001
glb_dcm_status                      [0x00000088] = 0x00000007
glb_sw_rst                          [0x0000008C] = 0x00000000
JIB3_DS ERP registers (base address 0xF8881000)
erp_irq_src_reg                     [0x00000000] = 0x00000000
erp_irq_en_reg                      [0x00000004] = 0x80000FFF
erp_tp_sel_reg                      [0x00000050] = 0x00000000
erp_tp_reg                          [0x00000054] = 0x00000000
erp_cfg_reg                         [0x00000060] = 0x00000000
erp_err_record_reg                  [0x00000064] = 0x00000000
erp_err_addr_record_reg             [0x00000068] = 0x00000000
erp_err_wd_record_reg               [0x0000006C] = 0x00000000
erp_proc_err_addr_record_reg        [0x00000090] = 0x00000000
JIB3_DS RX SPI registers (base address 0xF8882000)
rxspi_irq_src_reg                   [0x00000000] = 0x00000000
rxspi_irq_en_reg                    [0x00000004] = 0x000001FF
rxspi_ferr_src_reg                  [0x00000040] = 0x00000000
rxspi_testpoint_sel_reg             [0x00000050] = 0x00000000
rxspi_testpoint_reg                 [0x00000054] = 0x00000000
rxspi_rst_cntl_reg                  [0x00000060] = 0x00000000
rxspi_cntl_status_reg               [0x00000064] = 0x00000005
rxspi_cfg_cntl_reg                  [0x00000068] = 0x00000021
rxspi_afthres_reg                   [0x0000006C] = 0x01C00180
rxspi_cal_dur_reg                   [0x00000070] = 0x00030000
rxspi_non_drop_err_cnt_reg          [0x00000088] = 0x00000000
rxspi_drop_byte_cnt_reg             [0x0000008C] = 0x00000000
rxspi_rx_byte_cnt_reg[0]            [0x000000B0] = 0x01A499EF
rxspi_rx_byte_cnt_reg[1]            [0x000000B4] = 0x00CF4ED0
rxspi_rx_byte_cnt_reg[2]            [0x000000B8] = 0x0001F030
rxspi_rx_pkt_cnt_reg[0]             [0x000000C0] = 0x0001D242
rxspi_rx_pkt_cnt_reg[1]             [0x000000C4] = 0x0002828C
rxspi_rx_pkt_cnt_reg[2]             [0x000000C8] = 0x00000684
rxspi_fifo_pkt_drop_cnt_reg[0]      [0x000000E0] = 0x00000000
rxspi_fifo_pkt_drop_cnt_reg[1]      [0x000000E4] = 0x00000000
rxspi_fifo_pkt_drop_cnt_reg[2]      [0x000000E8] = 0x00000000
rxspi_calendar_table_reg[0]         [0x00000800] = 0x00000000
rxspi_calendar_table_reg[1]         [0x00000804] = 0x00000001
rxspi_calendar_table_reg[2]         [0x00000808] = 0x00000002
rxspi_calendar_table_reg[3]         [0x0000080C] = 0x00000003
JIB3_DS TX SPI registers (base address 0xF8883000)
txspi_irq_src_reg                   [0x00000000] = 0x00000000
txspi_irq_en_reg                    [0x00000004] = 0x0000001F
txspi_ferr_src_reg                  [0x00000040] = 0x00000000
txspi_testpoint_sel_reg             [0x00000050] = 0x00000000
txspi_testpoint_reg                 [0x00000054] = 0x00000000
txspi_rst_cntl_reg                  [0x00000060] = 0x00000000
txspi_cntl_status_reg               [0x00000064] = 0x00000009
txspi_cfg_cntl_reg                  [0x00000068] = 0x00000001
txspi_afthres_reg                   [0x0000006C] = 0x01EC01E8
```

```
txspi_cal_dur_reg                    [0x00000070] = 0x00040000
txspi_train_cntl_reg                 [0x00000074] = 0x00000000
txspi_nonfatalerr_cnt_reg            [0x00000080] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[0]       [0x00000090] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[1]       [0x00000094] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[2]       [0x00000098] = 0x00000000
txspi_eop_abort_pkt_cnt_reg[3]       [0x0000009C] = 0x00000000
txspi_eop_abort_byte_cnt_reg[0]      [0x000000A0] = 0x00000000
txspi_eop_abort_byte_cnt_reg[1]      [0x000000A4] = 0x00000000
txspi_eop_abort_byte_cnt_reg[2]      [0x000000A8] = 0x00000000
txspi_eop_abort_byte_cnt_reg[3]      [0x000000AC] = 0x00000000
txspi_tx_byte_cnt_reg[0]             [0x000000C0] = 0x00000000
txspi_tx_byte_cnt_reg[1]             [0x000000C4] = 0x00000000
txspi_tx_byte_cnt_reg[2]             [0x000000C8] = 0x00000000
txspi_tx_byte_cnt_reg[3]             [0x000000CC] = 0x00000000
txspi_tx_pkt_cnt_reg[0]              [0x00000100] = 0x00000000
txspi_tx_pkt_cnt_reg[1]              [0x00000104] = 0x00000000
txspi_tx_pkt_cnt_reg[2]              [0x00000108] = 0x00000000
txspi_tx_pkt_cnt_reg[3]              [0x0000010C] = 0x00000000
txspi_calendar_table_reg[0]          [0x00000800] = 0x00000000
txspi_calendar_table_reg[1]          [0x00000804] = 0x00000001
txspi_calendar_table_reg[2]          [0x00000808] = 0x00000002
txspi_calendar_table_reg[3]          [0x0000080C] = 0x00000003
txspi_calendar_table_reg[4]          [0x00000810] = 0x00000004
JIB3_DS DOC registers (base address 0xF8884000)
doc_int_err0                         [0x00000000] = 0x00000000
doc_int_err0_ier                     [0x00000004] = 0xFFBFBFFD
doc_int_err1                         [0x00000010] = 0x00000000
doc_int_err1_ier                     [0x00000014] = 0x003FFFF8
doc_int_fesr                         [0x00000040] = 0x00000000
doc_test_sel                         [0x00000050] = 0x00000000
doc_testpoint                        [0x00000054] = 0x00000000
doc_cfg_ctrl                         [0x00000060] = 0x031A0000
doc_err_cap_ctrl                     [0x00000064] = 0x001F0001
doc_err_cap_addr                     [0x00000068] = 0x00000020
doc_err_cap_data                     [0x0000006C] = 0x000080F7
doc_seg_num                          [0x00000070] = 0x00000001
doc_wb_chan_stats_sel                [0x00000074] = 0x00000077
doc_wb_pkt_cnt                       [0x00000078] = 0x00000000
doc_wb_byte_cnt                      [0x0000007C] = 0x00000000
doc_wb_police_sel                    [0x00000080] = 0x00000001
doc_wb_police_data                   [0x00000084] = 0x00000000
doc_wb_police_intv                   [0x00000088] = 0x00000000
doc_nb_chan_stats_sel                [0x0000008C] = 0x0000004C
doc_nb_pkt_cnt                       [0x00000090] = 0x00000000
doc_nb_byte_cnt                      [0x00000094] = 0x00000000
doc_nb_police_sel                    [0x00000098] = 0x00000001
doc_nb_police_data                   [0x0000009C] = 0x00000000
doc_nb_police_intv                   [0x000000A0] = 0x00000000
doc_int_doc_cnt                      [0x000000D4] = 0x00000000
doc_int_ecc_sbiterr_cnt              [0x000000D8] = 0x00000000
doc_pkt_good_in_cnt                  [0x000000DC] = 0x00045B5C
doc_pkt_good_out_cnt                 [0x000000E0] = 0x00045B39
doc_pkt_err_in_cnt                   [0x000000E4] = 0x00000000
doc_pkt_err_out_cnt                  [0x000000E8] = 0x00000023
doc_pkt_drop_cnt                     [0x000000EC] = 0x00000000
doc_efc_all_cnt                      [0x000000F0] = 0x00000000
doc_efc_hi_cnt                       [0x000000F4] = 0x00000000
doc_efc_me_cnt                       [0x000000F8] = 0x00000000
doc_efc_lo_cnt                       [0x000000FC] = 0x00000000
doc_efc_ch_sel                       [0x00000100] = 0x00000000
doc_efc_debug_ctrl                   [0x00000104] = 0x00000000
doc_rldram_ext_ecc                   [0x00000114] = 0x00000000
doc_rldram_cfg                       [0x00000118] = 0x00101544
```

```
doc_rldram_ctrl                     [0x0000011C] = 0x00100389
doc_rldram_status                   [0x00000120] = 0x039D7403
doc_rldram_blk_clr                  [0x00000124] = 0x0B7FFFFF
doc_rldram_cal_match_win_h          [0x00000128] = 0x00000000
doc_rldram_cal_match_win_l          [0x0000012C] = 0x1FFFFFFF
doc_rldram_ecc_err_rec_addr         [0x00000130] = 0x00000000
doc_magic_num_err_pkt_ctrl          [0x00000150] = 0x00000000
doc_magic_num_err_pkt_addr          [0x00000154] = 0x00000001
doc_magic_num_err_pkt_data          [0x00000158] = 0x00000000
JIB3_DS RIF registers (base address 0xF8885000)
rif_int_err0                        [0x00000000] = 0x00000000
rif_int_ier0                        [0x00000004] = 0x00000007
rif_int_fesr0                       [0x00000040] = 0x00000000
rif_tp_sel                          [0x00000050] = 0x00000000
rif_tp                              [0x00000054] = 0x00000000
rif_cfg_ctrl                        [0x00000060] = 0x00000000
rif_cnt_in_mpeg_cnt                 [0x00000064] = 0x000A6226
rif_cnt_out_good_mpeg_cnt           [0x00000068] = 0x000A6226
rif_cnt_out_bad_mpeg_cnt            [0x0000006C] = 0x00000000
rif_cnt_drop_mpeg_cnt               [0x00000070] = 0x00000000
rif_1bit_ecc_err_stat               [0x00000074] = 0x00000000
JIB3_DS RTN registers (base address 0xF8886000)
return_int_isr                      [0x00000000] = 0x00000000
return_int_ier                      [0x00000004] = 0x000001FF
return_int_fesr                     [0x00000040] = 0x00000000
return_tp_sel                       [0x00000050] = 0x00000000
return_tp                           [0x00000054] = 0x00000000
return_ctrl_reg                     [0x00000060] = 0x00000000
return_pif_loopback_chnl            [0x00000064] = 0x00000000
return_sniffer_nonbonded_en         [0x00000068] = 0x00000000
return_sniffer_bonded_en            [0x0000006C] = 0x00000000
return_spi_chnl_sel                 [0x00000070] = 0x0000013A
return_err_drop_en                  [0x00000074] = 0x0000000F
return_snf_macda_cfg_addr           [0x00000078] = 0x0000000F
return_snf_macda_cfg_data_hi        [0x0000007C] = 0x00000000
return_snf_macda_cfg_data_lo        [0x00000080] = 0x00000000
return_in_pifrx_good_cnt            [0x000000A0] = 0x00000000
return_in_pifrx_bad_cnt             [0x000000A4] = 0x00000000
return_in_piflp_good_cnt            [0x000000A8] = 0x000A6224
return_in_piflp_bad_cnt             [0x000000AC] = 0x00000000
return_in_sniffer_good_cnt          [0x000000B0] = 0x00045B3A
return_in_sniffer_bad_cnt           [0x000000B4] = 0x00000023
return_in_spi_loop_good_cnt         [0x000000B8] = 0x00000000
return_in_spi_loop_bad_cnt          [0x000000BC] = 0x00000000
return_out_spi0_cnt                 [0x000000C0] = 0x00000000
return_out_spi1_cnt                 [0x000000C4] = 0x00000000
return_out_spi2_cnt                 [0x000000C8] = 0x00000000
return_out_spi3_cnt                 [0x000000CC] = 0x00000000
return_out_spi4_cnt                 [0x000000D0] = 0x00000000
return_pifrx_if_par_err_drop_cnt    [0x000000D4] = 0x00000000
return_pifrx_if_len_err_drop_cnt    [0x000000D8] = 0x00000000
return_piflp_if_err_drop_cnt        [0x000000DC] = 0x00000000
return_piflp_if_chnl_drop_cnt       [0x000000E0] = 0x00000000
return_snf_pb_err_drop_cnt          [0x000000E4] = 0x00000023
return_snf_pkt_type_err_drop_cnt    [0x000000E8] = 0x00045B3A
return_spilp_if_err_drop_cnt        [0x000000EC] = 0x00000000
return_pifrx_traffic_mux_drop_cnt   [0x000000F0] = 0x00000000
return_piflp_traffic_mux_drop_cnt   [0x000000F4] = 0x00000000
return_snf_traffic_mux_drop_cnt     [0x000000F8] = 0x00000000
return_spilp_traffic_mux_drop_cnt   [0x000000FC] = 0x00000000
return_pifrx_fifo_overflow_drop_cnt [0x00000100] = 0x00000000
return_piflp_fifo_overflow_drop_cnt [0x00000104] = 0x00000000
return_snf_fifo_overflow_drop_cnt   [0x00000108] = 0x00000000
return_spilp_fifo_overflow_drop_cnt [0x0000010C] = 0x00000000
```

```
return_pifrx_if_par_err_cnt         [0x00000110] = 0x00000000
return_pifrx_if_len_err_cnt         [0x00000114] = 0x00000000
return_pifrx_fifo_ecc_1berr_cnt     [0x00000118] = 0x00000000
return_piflp_fifo_ecc_1berr_cnt     [0x0000011C] = 0x00000000
return_snf_fifo_ecc_1berr_cnt       [0x00000120] = 0x00000000
return_spilp_fifo_ecc_1berr_cnt     [0x00000124] = 0x00000000
JIB3_DS DLM registers (base address 0xF8890000)
dlm_int_isr_0                       [0x00000000] = 0x00000004
dlm_int_ier_0                       [0x00000004] = 0x00000000
dlm_cnt_local_ts_reg                [0x00000064] = 0x8D7DF4CD
dlm_cfg_tss_comp_reg                [0x00000068] = 0x00000027
dlm_cfg_tss_ctrl_reg                [0x0000006C] = 0x00000000
dlm_cfg_tss_cmd_reg                 [0x00000070] = 0x00000000
dlm_cnt_ts_load_cnt                 [0x000000BC] = 0x00000000
dlm_cnt_ts_chk_failed_cnt           [0x000000C4] = 0x00000000
dlm_cnt_tss_perr_cnt                [0x000000C8] = 0x00000000
dlm_cnt_load_ts_reg                 [0x000000D0] = 0x003F52EF
JIB3_DS SEQ registers (base address 0xF8892000)
seq_int_err0                        [0x00000000] = 0x0000000F
seq_int_ier0                        [0x00000004] = 0x000FFFFF
seq_int_err3                        [0x00000030] = 0x00000000
seq_int_ier3                        [0x00000034] = 0x00000001
seq_int_fatal_err                   [0x00000040] = 0x00000000
seq_tp_sel                          [0x00000050] = 0x00000000
seq_tp                              [0x00000054] = 0x00000000
seq_cfg_en                          [0x00000060] = 0x00000001
seq_cfg_sync_timer_sel              [0x00000064] = 0x00000014
seq_cfg_sync_timer_data             [0x00000068] = 0x00000000
seq_cfg_sync_sa_sel                 [0x0000006C] = 0x00000014
seq_cfg_sync_sa_data_lo             [0x00000070] = 0x00000000
seq_cfg_sync_sa_data_hi             [0x00000074] = 0x00000000
seq_cfg_tkb_timer_sel               [0x00000078] = 0x00000015
seq_cfg_tkb_timer_data              [0x0000007C] = 0x00000000
seq_cfg_tkb_max                     [0x00000080] = 0x00000000
seq_hwdbg_dpv_proc_table_addr       [0x00000090] = 0x00000001
seq_hwdbg_dpv_ptr_mod_table         [0x00000094] = 0x00000000
seq_hwdbg_dpv_timestamp_table       [0x00000098] = 0x00000000
seq_hwdbg_dpv_hcs_table             [0x0000009C] = 0x00000000
seq_cnt_blkram_oecc_err_stat        [0x000000A4] = 0x00000000
seq_cnt_tran_mpeg_stat              [0x000000A8] = 0x000A6224
seq_cnt_tran_mpeg_sync_stat         [0x000000AC] = 0x00000000
seq_cnt_tran_only_sync_stat         [0x000000B0] = 0x00000000
seq_cnt_tran_dpv_stat               [0x000000B8] = 0x00000000
JIB3_DS QM registers (base address 0xF8893000)
qm_int_isr0                         [0x00000000] = 0x00000000
qm_int_ier0                         [0x00000004] = 0x0000007F
qm_int_isr1                         [0x00000010] = 0x00000000
qm_int_ier1                         [0x00000014] = 0x000FFFFF
qm_int_fat_err_isr                  [0x00000040] = 0x00000000
qm_tst_tp_sel                       [0x00000050] = 0x00000000
qm_tst_tp                           [0x00000054] = 0x00000000
qm_cfg_chnl_rst_0                   [0x00000060] = 0x00000000
qm_cfg_ctl                          [0x0000006C] = 0x00000011
qm_cfg_sqf_fac_addr                 [0x0000008C] = 0x00000015
qm_cfg_sqf_fac_data                 [0x00000090] = 0x00000000
qm_cfg_bond_chnl_map_addr           [0x00000094] = 0x00000020
qm_cfg_bond_chnl_map_data_lo        [0x00000098] = 0x00000000
qm_cfg_flt_thr_addr                 [0x000000A4] = 0x00000250
qm_cfg_flt_thr_data                 [0x000000A8] = 0x00000000
qm_cfg_repl_addr                    [0x000000AC] = 0x00000000
qm_cfg_repl_data_lo                 [0x000000B0] = 0x00000000
qm_hwdbg_buf_mag_addr               [0x000000BC] = 0x00000001
qm_hwdbg_wptr_data_lo               [0x000000C0] = 0x00014F60
qm_hwdbg_wptr_data_mi               [0x000000C4] = 0x000033A0
```

```
qm_hwdbg_wptr_data_hi               [0x000000C8] = 0x00000AA0
qm_hwdbg_rptr_data_lo               [0x000000CC] = 0x00014F60
qm_hwdbg_rptr_data_mi               [0x000000D0] = 0x000033A0
qm_hwdbg_rptr_data_hi               [0x000000D4] = 0x00000AA0
qm_hwdbg_qulen_data_lo              [0x000000D8] = 0x00000000
qm_hwdbg_qulen_data_mi              [0x000000DC] = 0x000000E7
qm_hwdbg_qulen_data_hi              [0x000000E0] = 0x00000000
qm_hwdbg_contex_data                [0x000000E4] = 0x00000000
qm_cfg_dir_stat_addr                [0x000000E8] = 0x0000004E
qm_cnt_dir_pkt_stat                 [0x000000EC] = 0x00000000
qm_cnt_dir_byte_stat                [0x000000F0] = 0x00000000
qm_cfg_qam_stat_addr                [0x000000F4] = 0x0000004C
qm_cnt_qam_chnl_pkt_stat            [0x000000F8] = 0x00000000
qm_cnt_qam_chnl_byte_stat           [0x000000FC] = 0x00000000
qm_cnt_qam_chnl_sync_stat           [0x00000100] = 0x00000000
qm_cnt_bpram_ovrflw_stat            [0x00000108] = 0x00000000
qm_cnt_que_ovrflw_stat              [0x0000010C] = 0x00000000
qm_cnt_good_bpi_pkt_stat            [0x00000110] = 0x00045B3C
qm_cnt_bad_bpi_pkt_stat             [0x00000114] = 0x0000000D
qm_cnt_bpram_out_good_pkt_stat      [0x0000011C] = 0x000BD95D
qm_cnt_bpram_out_dir_pkt_stat       [0x00000120] = 0x00028918
qm_cnt_bpram_out_bonded_pkt_stat    [0x00000124] = 0x00000029
qm_cnt_replicated_pkt_stat          [0x00000128] = 0x000A0738
qm_cnt_bpram_bad_type_pkt_stat      [0x00000134] = 0x00000000
qm_cnt_bpram_bad_eop_pkt_stat       [0x00000138] = 0x00000000
qm_cnt_bpram_bad_dir_pkt_stat       [0x0000013C] = 0x00000000
qm_cnt_bpram_bad_bonded_pkt_stat    [0x00000140] = 0x00000000
qm_cnt_bpram_oecc_err_pkt_stat      [0x00000144] = 0x00000000
qm_cnt_bpram_bad_pkt_stat           [0x00000148] = 0x0000000D
qm_cnt_wr_good_pkt_stat             [0x0000014C] = 0x000BD95D
qm_cnt_wr_bad_pkt_stat              [0x00000150] = 0x00000000
qm_cnt_drop_bad_pkt_stat            [0x00000154] = 0x0000000D
qm_cnt_drop_ovrflw_pkt_stat         [0x00000158] = 0x00000000
qm_cnt_rd_pkt_stat                  [0x0000015C] = 0x000BD933
qm_cnt_rd_mpeg_stat                 [0x00000160] = 0x000A6226
qm_cnt_rd_mpeg_sync_stat            [0x00000164] = 0x00008140
qm_cnt_rd_mpeg_only_sync_stat       [0x00000168] = 0x00007E93
qm_cnt_tran_pkt_stat                [0x00000170] = 0x000BD95E
qm_cnt_tran_oecc_err_pkt_stat       [0x00000174] = 0x00000000
qm_cnt_tran_mpeg_stat               [0x00000178] = 0x000A6226
qm_cnt_tran_mpeg_sync_stat          [0x0000017C] = 0x00008140
qm_cnt_tran_mpeg_only_sync_stat     [0x00000180] = 0x00007E93
qm_cnt_tran_dpv_stat                [0x00000188] = 0x00000000
qm_rldram_ext_ecc                   [0x00000198] = 0x00000000
qm_rldram_cfg                       [0x0000019C] = 0x00101544
qm_rldram_ctrl                      [0x000001A0] = 0x00100389
qm_rldram_status                    [0x000001A4] = 0x03DF7C03
qm_rldram_cal_match_win_h           [0x000001A8] = 0x00000000
qm_rldram_cal_match_win_l           [0x000001AC] = 0x7FFFFFFF
JIB3_DS PG registers (base address 0xF8898000)
pg_mod                              [0x00000050] = 0x00000000
pg_dhs                              [0x00000054] = 0x00000000
pg_ipg                              [0x0000005C] = 0x00000000
pg_num                              [0x00000058] = 0x00000000
pg_payload_length                   [0x00000060] = 0x00000000
pg_payload_value                    [0x00000064] = 0x00000000
pg_pkt_hdr_prog_0                   [0x00000068] = 0x00000000
pg_pkt_hdr_prog_1                   [0x0000006C] = 0x00000000
pg_pkt_hdr_1                        [0x00000070] = 0x00000000
pg_pkt_hdr_2                        [0x00000074] = 0x00000000
pg_pkt_hdr_3                        [0x00000078] = 0x00000000
pg_pkt_hdr_4                        [0x0000007C] = 0x00000000
pg_pkt_hdr_5                        [0x00000080] = 0x00000000
pg_pkt_hdr_6                        [0x00000084] = 0x00000000
```

```
JIB3_DS PMBIST registers (base address 0xF8899000)
pmbist_ena_addr                      [0x00000060] = 0x00000002
pmbist_din_addr                      [0x00000064] = 0x00000000
pmbist_dout_addr                     [0x0000006C] = 0x00008101
pmbist_trgt_select_addr              [0x00000074] = 0x00000000
pmbist_ff_status                     [0x00000078] = 0x00000000
pmbist_num_wr_fr_pmbist              [0x0000007C] = 0x00000000
pmbist_num_rd_fr_pmbist              [0x00000080] = 0x00000000
pmbist_um_wr_2cmd_ff                 [0x00000084] = 0x00000000
pmbist_num_rd_2cmd_ff                [0x00000088] = 0x00000000
pmbist_num_rd_rtn_pmbist             [0x0000008C] = 0x00000000
pmbist_num_wr_2dram                  [0x00000090] = 0x00000000
pmbist_num_rd_2dram                  [0x00000094] = 0x00000000
pmbist_num_rd_fr_dram                [0x00000098] = 0x00000000
Remora registers (base address 0xF8900000)
-----------------------------------------
Remora General Registers (0xF8900000):
--------------------------------------
revision                             [0x00000000] = 0x00000003
hw_fpga_rev_id                       [0x00000004] = 0x0000000A
erp_scratch_pad0                     [0x00000008] = 0x00000000
erp_scratch_pad1                     [0x0000000C] = 0x00000000
Remora Reset and DCM Lock Registers (0xF8900100):
-------------------------------------------------
reset_ctrl                           [0x00000100] = 0x00000000
dcm_lock                             [0x00000104] = 0x0000000F
Remora Configuration Registers (0xF8900200):
--------------------------------------------
port_cfg[0]                          [0x00000200] = 0x00155549
port_cfg[1]                          [0x00000204] = 0x00155548
port_cfg[2]                          [0x00000208] = 0x00155548
port_cfg[3]                          [0x0000020C] = 0x00155548
port_cfg[4]                          [0x00000210] = 0x00155548
core_config_status                   [0x00000214] = 0x00000020
port_rm2tififo_prog_flags[0]         [0x00000218] = 0xBBA20C0D
port_rm2tififo_prog_flags[1]         [0x0000021C] = 0xBBA20C0D
port_rm2tififo_prog_flags[2]         [0x00000220] = 0xBBA20C0D
port_rm2tififo_prog_flags[3]         [0x00000224] = 0xBBA20C0D
port_rm2tififo_prog_flags[4]         [0x00000228] = 0xBBA20C0D
Remora DFT/Pattern Inject Registers (0xF8900300):
-------------------------------------------------
alt_sym_tst_mode                     [0x00000300] = 0x00005A69
alt_sym_tst_en_reg                   [0x00000304] = 0x00000000
qdr_mem_test_en_reg                  [0x00000308] = 0x00000000
qdr_mem_test_rd_wr_reg               [0x0000030C] = 0x00000A12
ready_for_data_input                 [0x00000318] = 0x0000001F
Remora ECC Registers (0xF8900400):
----------------------------------
debug_cfg                            [0x00000400] = 0x00000000
sniff_frame_cnt                      [0x00000404] = 0x00000000
ecc_parity_conf_reg                  [0x00000408] = 0x00000003
ecc_uncorrect_data_log_reg           [0x0000040C] = 0x00002814
ecc_uncorrect_log_reg                [0x00000410] = 0x00000020
ecc_correctable_data_log_reg         [0x00000414] = 0x00002C14
ecc_correctable_log_reg              [0x00000418] = 0x00000028
qdr_ecc_corr_cnt_reg                 [0x0000041C] = 0x00000000
fatal_err_log                        [0x00000420] = 0x00000000
err_inj_reg                          [0x00000424] = 0x00000000
Remora QDR Registers (0xF8900500):
----------------------------------
qdr_phy_idelayctrl_rst_reg           [0x00000500] = 0x00000000
qdr_phy_idelayctrl_rdy_err_reg       [0x00000504] = 0x00000261
qdr_phy_cal_tap_dly_reg              [0x00000508] = 0x00000ADB
qdr_phy_idelayctrl_ctrl_reg          [0x0000050C] = 0x00000002
```

```
qdr_init_ctrl_reg                   [0x00000510] = 0x801FFFFF
Remora Interrupt Status Registers (0xF8900600):
-----------------------------------------------
glb_int_stat_reg                    [0x00000600] = 0x00000000
int_stat_gr_reg[0]                  [0x00000604] = 0x00000000
int_stat_gr_reg[1]                  [0x00000608] = 0x00000000
int_stat_gr_reg[2]                  [0x0000060C] = 0x00000000
int_stat_gr_reg[3]                  [0x00000610] = 0x00000000
int_stat_gr_reg[4]                  [0x00000614] = 0x00000000
misc_int_stat_reg                   [0x00000618] = 0x00000001
fatal_err_src_reg                   [0x0000061C] = 0x00000000
port_local_interrupt_enable[0]      [0x00000620] = 0x0001FFFF
port_local_interrupt_enable[1]      [0x00000624] = 0x0001FFFF
port_local_interrupt_enable[2]      [0x00000628] = 0x0001FFFF
port_local_interrupt_enable[3]      [0x0000062C] = 0x0001FFFF
port_local_interrupt_enable[4]      [0x00000630] = 0x0001FFFF
misc_int_en_reg                     [0x00000634] = 0x00001FF8
fatal_err_en_reg                    [0x00000638] = 0x00000EFF
port_local_interrupt_override[0]    [0x0000063C] = 0x00000000
port_local_interrupt_override[1]    [0x00000640] = 0x00000000
port_local_interrupt_override[2]    [0x00000644] = 0x00000000
port_local_interrupt_override[3]    [0x00000648] = 0x00000000
port_local_interrupt_override[4]    [0x0000064C] = 0x00000000
misc_int_override                   [0x00000650] = 0x00000000
fatal_err_override                  [0x00000654] = 0x00000000
Remora Counts Registers (0xF8900800):
-------------------------------------
illegal_ch_num_pkt_drop_count       [0x00000800] = 0x00000000
fifo_full_mpeg_pkt_drop_count_hi    [0x00000804] = 0x00000000
fifo_full_mpeg_pkt_drop_count_lo    [0x00000808] = 0x00000000
channel_mpeg_pkt_count[0]           [0x0000080C] = 0x00001118
channel_mpeg_pkt_count[1]           [0x00000810] = 0x0000106B
channel_mpeg_pkt_count[2]           [0x00000814] = 0x00000913
channel_mpeg_pkt_count[3]           [0x00000818] = 0x00000A6D
channel_mpeg_pkt_count[4]           [0x0000081C] = 0x00000000
channel_mpeg_pkt_count[5]           [0x00000820] = 0x00000000
channel_mpeg_pkt_count[6]           [0x00000824] = 0x00000000
channel_mpeg_pkt_count[7]           [0x00000828] = 0x00000000
channel_mpeg_pkt_count[8]           [0x0000082C] = 0x00000000
channel_mpeg_pkt_count[9]           [0x00000830] = 0x00000000
channel_mpeg_pkt_count[10]          [0x00000834] = 0x00000000
channel_mpeg_pkt_count[11]          [0x00000838] = 0x00000000
channel_mpeg_pkt_count[12]          [0x0000083C] = 0x00000000
channel_mpeg_pkt_count[13]          [0x00000840] = 0x00000000
channel_mpeg_pkt_count[14]          [0x00000844] = 0x00000000
channel_mpeg_pkt_count[15]          [0x00000848] = 0x00000000
channel_mpeg_pkt_count[16]          [0x0000084C] = 0x00000000
channel_mpeg_pkt_count[17]          [0x00000850] = 0x00000000
channel_mpeg_pkt_count[18]          [0x00000854] = 0x00000000
channel_mpeg_pkt_count[19]          [0x00000858] = 0x00000000
port_re_timestamp_count[0]          [0x0000085C] = 0xA6A5A6A6
port_re_timestamp_count[1]          [0x00000860] = 0x00000000
port_re_timestamp_count[2]          [0x00000864] = 0x00000000
port_re_timestamp_count[3]          [0x00000868] = 0x00000000
port_re_timestamp_count[4]          [0x0000086C] = 0x00000000
port_rx_fifo_overflow_drop_count[0] [0x00000870] = 0x00000000
port_rx_fifo_overflow_drop_count[1] [0x00000874] = 0x00000000
port_rx_fifo_overflow_drop_count[2] [0x00000878] = 0x00000000
port_rx_fifo_overflow_drop_count[3] [0x0000087C] = 0x00000000
port_rx_fifo_overflow_drop_count[4] [0x00000880] = 0x00000000
channel_jib_if_pkt_count[0]         [0x00000884] = 0x00038EA2
channel_jib_if_pkt_count[1]         [0x00000888] = 0x00031ADE
channel_jib_if_pkt_count[2]         [0x0000088C] = 0x0001B869
channel_jib_if_pkt_count[3]         [0x00000890] = 0x00020053
```

```
channel_jib_if_pkt_count[4]         [0x00000894] = 0x00000000
channel_jib_if_pkt_count[5]         [0x00000898] = 0x00000000
channel_jib_if_pkt_count[6]         [0x0000089C] = 0x00000000
channel_jib_if_pkt_count[7]         [0x000008A0] = 0x00000000
channel_jib_if_pkt_count[8]         [0x000008A4] = 0x00000000
channel_jib_if_pkt_count[9]         [0x000008A8] = 0x00000000
channel_jib_if_pkt_count[10]        [0x000008AC] = 0x00000000
channel_jib_if_pkt_count[11]        [0x000008B0] = 0x00000000
channel_jib_if_pkt_count[12]        [0x000008B4] = 0x00000000
channel_jib_if_pkt_count[13]        [0x000008B8] = 0x00000000
channel_jib_if_pkt_count[14]        [0x000008BC] = 0x00000000
channel_jib_if_pkt_count[15]        [0x000008C0] = 0x00000000
channel_jib_if_pkt_count[16]        [0x000008C4] = 0x00000000
channel_jib_if_pkt_count[17]        [0x000008C8] = 0x00000000
channel_jib_if_pkt_count[18]        [0x000008CC] = 0x00000000
channel_jib_if_pkt_count[19]        [0x000008D0] = 0x00000000
Remora Timestamp Registers (0xF8900900):
----------------------------------------
local_1024_ts_ctrl                  [0x00000900] = 0x00000039
local_1024_current_ts               [0x00000904] = 0xF5D27575
local_1024_tcc_ts_latch             [0x00000908] = 0x7291125F
doc_ts_offset_ch_0_1                [0x0000090C] = 0x04AF04AF
doc_ts_offset_ch_2_3                [0x00000910] = 0x04AF04AF
doc_ts_offset_ch_4_5                [0x00000914] = 0x04F704F7
doc_ts_offset_ch_6_7                [0x00000918] = 0x04F704F7
doc_ts_offset_ch_8_9                [0x0000091C] = 0x04F704F7
doc_ts_offset_ch_10_11              [0x00000920] = 0x04F704F7
doc_ts_offset_ch_12_13              [0x00000924] = 0x04F704F7
doc_ts_offset_ch_14_15              [0x00000928] = 0x04F704F7
doc_ts_offset_ch_16_17              [0x0000092C] = 0x04F704F7
doc_ts_offset_ch_18_19              [0x00000930] = 0x04F704F7
Remora PRATE/SRATE Registers (0xF8900A00):
------------------------------------------
port_prate_regs[0].prate_ctrl       [0x00000A00] = 0x00000003
port_prate_regs[0].prate_m_prime_lo [0x00000A04] = 0x0005971E
port_prate_regs[0].prate_n_prime_lo [0x00000A08] = 0x08AA5B88
port_prate_regs[0].prate_m_prime_hi [0x00000A0C] = 0x00000000
port_prate_regs[1].prate_ctrl       [0x00000A10] = 0x00000003
port_prate_regs[1].prate_m_prime_lo [0x00000A14] = 0x00000191
port_prate_regs[1].prate_n_prime_lo [0x00000A18] = 0x00037E78
port_prate_regs[1].prate_m_prime_hi [0x00000A1C] = 0x00000000
port_prate_regs[2].prate_ctrl       [0x00000A20] = 0x00000003
port_prate_regs[2].prate_m_prime_lo [0x00000A24] = 0x00000191
port_prate_regs[2].prate_n_prime_lo [0x00000A28] = 0x00037E78
port_prate_regs[2].prate_m_prime_hi [0x00000A2C] = 0x00000000
port_prate_regs[3].prate_ctrl       [0x00000A30] = 0x00000003
port_prate_regs[3].prate_m_prime_lo [0x00000A34] = 0x00000191
port_prate_regs[3].prate_n_prime_lo [0x00000A38] = 0x00037E78
port_prate_regs[3].prate_m_prime_hi [0x00000A3C] = 0x00000000
port_prate_regs[4].prate_ctrl       [0x00000A40] = 0x00000003
port_prate_regs[4].prate_m_prime_lo [0x00000A44] = 0x00000191
port_prate_regs[4].prate_n_prime_lo [0x00000A48] = 0x00037E78
port_prate_regs[4].prate_m_prime_hi [0x00000A4C] = 0x00000000
port_srate_regs[0].srate_ctrl       [0x00000A50] = 0x00000003
port_srate_regs[0].srate_mn         [0x00000A54] = 0x004E0095
port_srate_regs[1].srate_ctrl       [0x00000A58] = 0x00000003
port_srate_regs[1].srate_mn         [0x00000A5C] = 0x0191032C
port_srate_regs[2].srate_ctrl       [0x00000A60] = 0x00000003
port_srate_regs[2].srate_mn         [0x00000A64] = 0x0191032C
port_srate_regs[3].srate_ctrl       [0x00000A68] = 0x00000003
port_srate_regs[3].srate_mn         [0x00000A6C] = 0x0191032C
port_srate_regs[4].srate_ctrl       [0x00000A70] = 0x00000003
port_srate_regs[4].srate_mn         [0x00000A74] = 0x0191032C
TW_UBR10k_34.13#
```

The following example provides information about all controllers using the **show controller integrated-cable** command and the **status** keyword:

```
Router# show controllers integrated-Cable 6/0/0 status
Load for five secs: 9%/0%; one minute: 11%; five minutes: 13%
Time source is NTP, *15:07:31.309 EDT Sun Mar 21 2010
Jib3-DS Status:
---------------
   Rx SPI.............: OK
   Tx SPI.............: OK
   DCM Status.........: OK
   ERP Status.........: OK
   DOCSIS RLDRAM Status: OK
   QM RLDRAM Status....: OK
  DS PHY Device Information:
  -------------------
    Remora Version = 3.10
    UPX SW Version = 0x10D
    Upconverter Type:Unknown
    UPX Part Number =
  Device Status:
  --------------
    UPX Alarm Status = 0x3FF
    UPX Alarm Mask   = 0x19000
```

The following example shows a typical display of the **show controller integrated-cable** command on Cisco cBR Series Converged Broadband Routers:

```
Router# show controllers integrated-Cable 7/0/0 ?
  acfe              Show contrller acfe
  all               Show all M-CMTS information
  association       Show interface association info
  bandwidth         Show bandwidth of WB/RF channels
  counter           Show channel counters
  mapping           Show mapping of WB/RF channels
  rf-channel        Show rf channels
  rf-port           Show rf port
  wideband-channel  Show wideband channels
```

The following example shows a sample output for the **show controllers integrated-cable rf-channel** command on Cisco cBR Series Converged Broadband Routers:

```
Router# show controller Integrated-Cable 3/0/4 rf-channel 158 verbose
Chan State Admin Mod-Type  Start      Width     PLC       Profile-ID    dcid
                           Frequency
 158   UP   UP   OFDM      627000000  96000000  663000000      0        159

 Resource status:   OK
 License: granted <18:53:14 UTC Jan 5 2012>
 QAM Modulation type: OFDM
 OFDM config state: Configured

 OFDM channel details: [3/0/4:158]
----------------------------------------
 OFDM channel frequency/subcarrier range     : 627000000[1088] - 722950000[3007]
 OFDM spectrum frequency/subcarrier range    : 572600000[   0] - 777350000[4095]
 Active spectrum frequency/subcarrier range  : 629000000[1128] - 721000000[2968]
 PLC spectrum start frequency/subcarrier     : 663000000[1808]
 PLC frequency/subcarrier                    : 665800000[1864]
 Channel width                               : 96000000
 Active Channel width                        : 92000000
 OFDM Spectrum width                         : 204800000
 Chan prof id                                : 0
```

```
Cyclic Prefix                                 : 1024
Roll off                                      : 128
Interleave depth                              : 16
Spacing                                       : 50KHZ
Control mod profile                           : 0
NCP mod profile                               : 1
Data mod profiles                             : None

PLC spectrum frequencies [subcarriers]     :
 663000000[1808] - 668950000[1927]

PLC channel frequencies [subcarriers]        :
 665800000[1864] - 666150000[1871]   Size: 8 subcarriers

Excluded frequencies [subcarriers]                 :
 572600000[   0] - 628950000[1127]     721050000[2969] - 777350000[4095]
 Count: 2255

Active frequencies [subcarriers]                   :
 629000000[1128] - 721000000[2968]
 Count: 1841

Pilot frequencies [subcarriers]                    :
 *:PLC pilots
 630800000[1164]   634400000[1236]   638000000[1308]   641600000[1380]
 645200000[1452]   648800000[1524]   652400000[1596]   656000000[1668]
 659600000[1740]   663450000[1817]*  664050000[1829]*  664600000[1840]*
 665050000[1849]*  666900000[1886]*  667350000[1895]*  667900000[1906]*
 668500000[1918]*  669200000[1932]   672800000[2004]   676400000[2076]
 680000000[2148]   683600000[2220]   687200000[2292]   690800000[2364]
 694400000[2436]   698000000[2508]   701600000[2580]   705200000[2652]
 708800000[2724]   712400000[2796]   716000000[2868]   719600000[2940]
 Count: 32

Profiles:
 Number of profiles: 2
 CTRL profile: mod_prof_id: 0 rate: 769861 kbps
 Active frequencies [subcarriers]:
 Modulation:Start-freq[start-subcarrier] - End-freq[end-subcarrier]
 ---------------------------------------------------------------------
 1024 :629000000[1128] - 630750000[1163]     1024 :630850000[1165] - 634350000[1235]
 1024 :634450000[1237] - 637950000[1307]     1024 :638050000[1309] - 641550000[1379]
 1024 :641650000[1381] - 645150000[1451]     1024 :645250000[1453] - 648750000[1523]
 1024 :648850000[1525] - 652350000[1595]     1024 :652450000[1597] - 655950000[1667]
 1024 :656050000[1669] - 659550000[1739]     1024 :659650000[1741] - 663400000[1816]
 1024 :663500000[1818] - 664000000[1828]     1024 :664100000[1830] - 664550000[1839]
 1024 :664650000[1841] - 665000000[1848]     1024 :665100000[1850] - 665750000[1863]
 1024 :666200000[1872] - 666850000[1885]     1024 :666950000[1887] - 667300000[1894]
 1024 :667400000[1896] - 667850000[1905]     1024 :667950000[1907] - 668450000[1917]
 1024 :668550000[1919] - 669150000[1931]     1024 :669250000[1933] - 672750000[2003]
 1024 :672850000[2005] - 676350000[2075]     1024 :676450000[2077] - 679950000[2147]
 1024 :680050000[2149] - 683550000[2219]     1024 :683650000[2221] - 687150000[2291]
 1024 :687250000[2293] - 690750000[2363]     1024 :690850000[2365] - 694350000[2435]
 1024 :694450000[2437] - 697950000[2507]     1024 :698050000[2509] - 701550000[2579]
 1024 :701650000[2581] - 705150000[2651]     1024 :705250000[2653] - 708750000[2723]
 1024 :708850000[2725] - 712350000[2795]     1024 :712450000[2797] - 715950000[2867]
 1024 :716050000[2869] - 719550000[2939]     1024 :719650000[2941] - 721000000[2968]
 Active subcarrier count: 1801, ZBL count: 0

 NCP profile: mod_prof_id: 1 rate: 307944 kbps
 Active frequencies [subcarriers]:
 Modulation:Start-freq[start-subcarrier] - End-freq[end-subcarrier]
 ---------------------------------------------------------------------
 16   :629000000[1128] - 630750000[1163]     16   :630850000[1165] - 634350000[1235]
```

```
  16   :634450000[1237] - 637950000[1307]     16   :638050000[1309] - 641550000[1379]
  16   :641650000[1381] - 645150000[1451]     16   :645250000[1453] - 648750000[1523]
  16   :648850000[1525] - 652350000[1595]     16   :652450000[1597] - 655950000[1667]
  16   :656050000[1669] - 659550000[1739]     16   :659650000[1741] - 663400000[1816]
  16   :663500000[1818] - 664000000[1828]     16   :664100000[1830] - 664550000[1839]
  16   :664650000[1841] - 665000000[1848]     16   :665100000[1850] - 665750000[1863]
  16   :666200000[1872] - 666850000[1885]     16   :666950000[1887] - 667300000[1894]
  16   :667400000[1896] - 667850000[1905]     16   :667950000[1907] - 668450000[1917]
  16   :668550000[1919] - 669150000[1931]     16   :669250000[1933] - 672750000[2003]
  16   :672850000[2005] - 676350000[2075]     16   :676450000[2077] - 679950000[2147]
  16   :680050000[2149] - 683550000[2219]     16   :683650000[2221] - 687150000[2291]
  16   :687250000[2293] - 690750000[2363]     16   :690850000[2365] - 694350000[2435]
  16   :694450000[2437] - 697950000[2507]     16   :698050000[2509] - 701550000[2579]
  16   :701650000[2581] - 705150000[2651]     16   :705250000[2653] - 708750000[2723]
  16   :708850000[2725] - 712350000[2795]     16   :712450000[2797] - 715950000[2867]
  16   :716050000[2869] - 719550000[2939]     16   :719650000[2941] - 721000000[2968]
 Active subcarrier count: 1801, ZBL count: 0
JIB channel number: 776
```

The following example shows a sample output for the **show controllers integrated-cable rf-channel prof-order** command on Cisco cBR Series Converged Broadband Routers:

```
Router# show controllers integrated-Cable 2/0/3 rf-channel 158 prof-order
OFDM channel data profile order: [2/0/3:158]
-----------------------------------------------
Data Profile:       Downgrade Profile:
 Profile 1     ->    Profile 0
 Profile 2     ->    Profile 1
 Profile 3     ->    Profile 2
```

The following example shows a sample output for the **show controllers integrated-cable counter ofdm-channel** command on Cisco cBR Series Converged Broadband Routers:

```
Router# show controllers integrated-Cable 1/0/0 counter ofdm-channel
Controller  Chan#  Profile/PLC  Packets  Bytes        MaxRate(Mbps)  Rate(Mbps)
Utilization(%)
1/0/0       158    Total        50910825 71180994007  -              953.319829  63.00
1/0/0       158    0            9389     597096       1216           0.006359    0.0
1/0/0       158    1            50880045 70579288749  1512           953.251033  63.0
1/0/0       158    2            3753     150120       1664           0.001599    0.0
1/0/0       158    3            3753     150120       1360           0.001599    0.0
1/0/0       158                 11262    1009826      0.010758       PLC-MMM
1/0/0       158                 0        0            0.000000       PLC-EM
1/0/0       158                 0        0            0.000000       PLC-TR
```

The following example shows a sample output for the **show controllers integrated-cable** command on Cisco cBR Series Converged Broadband Routers to display the use of the OFDM channel power profile.

```
Router#show controller Integrated-Cable 3/0/0 rf-channel 158 verbose
Chan State Admin Mod-Type  Start  Width     PLC        Profile-ID    dcid  power  output
                          Frequency
 158   UP   UP   OFDM      849000000   96000000  856000000       20       159   33.0
NORMAL
 Resource status:   OK
 License: granted <09:23:14 EDT Aug 1 2016>
 OFDM channel license spectrum width: 92200000
 OFDM config state: Configured

 OFDM Power Profile: 3
Power-Band:
[00-07]   32.0   32.0   32.0   32.0   32.0   32.0   32.0   32.0
[08-15]   32.5   32.5   32.5   32.5   32.5   32.5   32.5   32.5
[16-23]   33.5   33.5   33.5   33.5   33.5   33.5   33.5   33.5
[24-31]   34.5   34.5   34.5   34.5   34.5   34.5   34.5   34.5
```

```
OFDM channel details: [3/0/0:158]
----------------------------------------
```

The following example shows a sample output for the **show controllers integrated-cable** command on Cisco cBR Series Converged Broadband Routers. If there is an asterisk next to Lower and Upper guardband, it indicates the guardband is configured by guardband-override. Otherwise it is the default guardband based on roll off and spacing.

```
Router# show controllers integrated-Cable 6/0/4 rf-channel 158 verbose | b Lower
Lower guardband width in freq/subcarriers   : 2400000[48]*
Upper guardband width in freq/subcarriers   : 2400000[48]*

Router# show controllers integrated-Cable 6/0/4 all verbose | b Lower
Lower guardband width in freq/subcarriers   : 1900000[38]
Upper guardband width in freq/subcarriers   : 1900000[38]
```

The following example shows a sample output for the **show controllers integrated-cable** command with ZBL related information.

```
Router# show controllers integrated-Cable 1/0/0 rf-channel 158 verbose | in ZBL
1024 :634350000[1235] - 636950000[1287]     ZBL  :637000000[1288] - 637850000[1305]
ZBL  :637950000[1307] - 637950000[1307]     1024 :638000000[1308] - 641450000[1377]
Active subcarrier count: 1804, ZBL count: 19
ZBL  :641000000[1368] - 641000000[1368]     16   :641050000[1369] - 641450000[1377]
Active subcarrier count: 1804, ZBL count: 1
```

The table below describes the fields displayed in the show controller integrated-cable command output with various keywords (as described in preceding examples):

Table 196: show controller integrated-cable Field Descriptions

Field	Description
WB channel	Wideband channel number.
BG ID	Bonding group ID.
Bundle num	Bundle number.
NB channel	Narrowband channel number.
NB chan ID	Narrowband channel ID.
Reserved CIR	Reserved committed information rate (CIR) value.
Total CIR	Total committed information rate (CIR) value.
Controller Chan	Controller channel number.
RF Packets	RF packets.
MPEG bps	MPEG value in bps.
MPEG mbps	MPEG value in Mbps.
MPEG Packets	MPEG packets.

Field	Description
Sync Packets	Synchronization packets.
MAP/UCD	MAP/ UCD value
Tx Packets	Tx packets
Tx Octets	Tx octets
Offset	Memory offset
Register	Line card registers
Value	Register values.
BPI Index	Baseline Privacy Interface (BPI) index number.
Segment	Hardware segment being used by DOCSIS MAC.
Even Key	Current value of the Even Key in the BPI entry.
Odd Key	Current value of the Odd Key in the BPI entry.
Key Sequence Number	Key sequence number.
Security Association	Security association identifier.
Key Type	The type of key stored based on the encryption algorithm (Data Encryption Standard [DES] or Advanced Encryption Standard [AES]).
Demand	EIR demand used, which is the weight used to balance the bandwidth between bonding groups.
ZBL count	The number of zero bit loading subcarrier.

Related Commands

Command	Description
cable rf-bandwidth-percent	Enables static or dynamic bandwidth sharing for a modular cable (MC) interface.
cable upstream connector	Maps an upstream port to a physical port on the Cisco UBR-MC20X20V cable interface line card for use with a particular downstream.
show controller cable	Displays information about the interface controllers for a cable interface on the Cisco CMTS router.
show hw-module bay	Displays information about the wideband channels or RF channels on a Wideband SPA.
show interface cable	Displays the current configuration and status of a cable interface.

Command	Description
show cable modem phy ofdm-profile	Displays information about the profiles associated with the cable modems (CMs).
show cable modem prof-mgmt	Displays detailed profile management data associated with each cable modem.

show controllers integrated-cable counter ofdm-channel snmp-rolling-avg

To display the rolling average value computed for each of the OFDM channels, use the **show controllers integrated-cable** *slot/subslot/port* **counter ofdm-channel snmp-rolling-avg** command in privileged EXEC mode.

show controllers integrated-cable *slot/subslot/port* **counter ofdm-channel snmp-rolling-avg**

Syntax Description

controllers	Interface controller status.
counter	(Optional) Displays information about channel counters.
integrated-Cable	Integrated Cable controller.
ofdm-channel	OFDM channel counters.
slot/subslot/port	Identifies the cable interface. • *slot* — Slot where the line card resides. The valid range is 0–3 and 6–9. • *subslot* — Subslot where the line card resides. The available slot is 0. • *port* — Downstream port number on the line card. The valid range is 0–7.
snmp-rolling-avg	Calculates of SNMP Rolling average.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1y	This command is introduced on the Cisco cBR-8 Series Converged Broadband Routers

Examples

The following example shows a sample output for the **show controllers integrated-cable** *slot/subslot/port* **counter ofdm-channel snmp-rolling-avg** command on Cisco cBR-8 Series Converged Broadband Routers:

```
Router# show controllers integrated-Cable 8/0/0 counter ofdm-channel snmp-rolling-avg
Controller Chan# Profile/PLC Packets Bytes    MaxRate   Rate       SnmpRollingAvg
                                              (Mbps)    (Mbps)       (%)
8/0/0      158    Total       79233  5542905     -      0.026307       0
8/0/0      158    0           28662  1817508   539      0.008625
8/0/0      158    1               0        0   673      0.000000
8/0/0      158    PLC-MMM     50571  3725397            0.017682
8/0/0      158    PLC-EM          0        0            0.000000
8/0/0      158    PLC-TR          0        0            0.000000
```

Related Commands

Command	Description
show controller cable	Displays information about the interface controllers for a cable interface on the Cisco CMTS router.

show controller integrated-cable counter rf-channel

To display the rolling RF channel counter information use the **show controllers integrated-cable** *slot/subslot/port* **counter rf-channel** command in privileged EXEC mode.

show controller integrated-cable *slot/subslot/port* **counter rf-channel**

Syntax Description

controller	Interface controller status.
counter	(Optional) Displays information about channel counters.
integrated-Cable	Integrated Cable controller.
rf-channel	RF channel counters.
slot/subslot/port	Identifies the cable interface. • *slot* — Slot where the line card resides. The valid range is 0–3 and 6–9. • *subslot* — Subslot where the line card resides. The available slot is 0. • *port* — Downstream port number on the line card. The valid range is 0–7.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 3.15.0S	This command is introduced on the Cisco cBR-8 Series Converged Broadband Routers and Integrated CMTS (I-CMTS).

Examples

The following example shows a sample output for the **show controller integrated-cable** *slot/subslot/port* **counter rf-channel** command on Cisco cBR-8 Series Converged Broadband Routers:

```
Router# show controller integrated-Cable 1/0/0 counter rf-channel
Contr- RF   MPEG      MPEG       MPEG   Sync     MAP/UCD   User   QAM
oller  Chan Packets   bps        Mbps   Packets  Packets   Mbps   Util
            Tx                          Tx       Tx             Percentage

1/0/0   0   415493136  26208574  26.20   6072807 121515450 20.75  67.52
1/0/0   1   314326447  25700155  25.70   0       9         21.74  66.21
1/0/0   2   314326446  25700607  25.70   0       9         21.74  66.22
1/0/0   3   314326415  25699905  25.69   0       9         21.74  66.21
1/0/0   4   314326442  25699303  25.69   0       9         21.74  66.21
1/0/0   5   314326386  25700306  25.70   0       9         21.74  66.21
1/0/0   6   314326380  25696897  25.69   0       9         21.74  66.21
1/0/0   7   314326356  25698551  25.69   0       9         21.74  66.21
```

Related Commands

Command	Description
show controller cable	Displays information about the interface controllers for a cable interface on the Cisco CMTS router.

show controllers integrated-cable counter rf-channel snmp-rolling-avg

To display the rolling average value computed for each of the SCQAM channels, use the **show controllers integrated-cable** *slot/subslot/port* **counter rf-channel snmp-rolling-avg** command in privileged EXEC mode.



Note The **show controllers integrated-cable** *slot/subslot/port* **counter rf-channel snmp-rolling-avg** command uses a slightly different algorithm to compute the **snmp-rolling-avg** when compared to QAM Util Percentage calculated for the **show controllers integrated-cable** *slot/subslot/port* **counter rf-channel** command.

show controllers integrated-cable *slot/subslot/port* **counter rf-channel snmp-rolling-avg**

Syntax Description

controllers	Interface controller status.
counter	(Optional) Displays information about channel counters.
integrated-Cable	Integrated Cable controller.
rf-channel	RF channel counters.
slot/subslot/port	Identifies the cable interface. • *slot* — Slot where the line card resides. The valid range is 0–3 and 6–9. • *subslot* — Subslot where the line card resides. The available slot is 0. • *port* — Downstream port number on the line card. The valid range is 0–7.
snmp-rolling-avg	Calculates of SNMP Rolling average.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1y	This command is introduced on the Cisco cBR-8 Series Converged Broadband Routers and Integrated CMTS (I-CMTS).

Examples

The following example shows a sample output for the **show controllers integrated-cable** *slot/subslot/port* **counter rf-channel snmp-rolling-avg** command on Cisco cBR-8 Series Converged Broadband Routers:

```
Router# show controllers integrated-Cable 8/0/0 counter rf-channel snmp-rolling-avg
Controller  RF    MPEG      MPEG      MPEG   Sync      MAP/UCD  User   SnmpRollingAvg
            Chan  Packets   bps       Mbps   Packets   Packets  Mbps   (%)
                  Tx                         Tx        Tx
8/0/0       0     2916005   10186915  10.18  108597    2146705  06.46  25
8/0/0       1     828550    8880578   08.88  0         11       07.75  22
8/0/0       2     828514    8881029   08.88  0         11       07.75  22
8/0/0       3     828473    8880633   08.88  0         11       07.75  22
8/0/0       4     828511    8880883   08.88  0         11       07.75  22
8/0/0       5     828530    8881079   08.88  0         11       07.75  22
```

Related Commands

Command	Description
show controller cable	Displays information about the interface controllers for a cable interface on the Cisco CMTS router.

show controller tengigabitethernet

To display information about the Gigabit Ethernet interface used by the Downstream External PHY Interface (DEPI), use the **show controllers tengigabitethernet** command in privileged EXEC mode.

show controller tengigabitethernet
tengigabitethernet-interface-number/port-adapter-number/tengigabitethernet-interface-number

Syntax Description

tengigabitethernet-interface-number/port-adapter-number/tengigabitethernet-interface-number	For the Cisco cBR route • *tengigabitethernet-inte* to the Supervisor P valid values for the *tengigabitethernet-i* 4 or 5. • *port-adapter-numb* is 0. • *tengigabitethernet-inte* to the Ten Gigabit E the Supervisor PIC 0 to 7.

Command Default

None

Command Modes

Privilege EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Router. This command replaces the **show controllers gigabitethernet** command.

Examples

This example shows the output of the **show controllers tengigabitethernet** command on the Cisco cBR router:

```
Router#show controller tenGigabitEthernet 4/1/0
Show Controller Information for TenGigabitEthernet4/1/0

SFP Information:
================
SFP not present or SFP IDPROM read error
Global Debug Statistics:
==================

ESI Probus Master IF
    gpio_uncorr_ecc_cnt     : 0
    pb_uncorr_ecc_cnt       : 0
    gpio_corr_ecc_cnt       : 0
    pb_corr_ecc_cnt         : 0

ESI SEM
```

```
    sem_corr_irq0_cnt       : 0
    sem_corr_irq1_cnt       : 0
    sem_corr_irq2_cnt       : 0
    sem_corr_irq3_cnt       : 0
MAC Probus Slave IF
    gpio_uncorr_ecc_cnt     : 0
    pb_uncorr_ecc_cnt       : 0
    gpio_corr_ecc_cnt       : 0
    pb_corr_ecc_cnt         : 0

MAC SEM
    sem_corr_irq0_cnt       : 0
    sem_corr_irq1_cnt       : 0
    sem_corr_irq2_cnt       : 0
    sem_corr_irq3_cnt       : 0


Interface Debug Statistics:
===========================

Ingress Modules:
-------------
MAC 10G
    mac_rx_dropped_pkt_cnt  : 0
    mac_rx_ts_crc_bad_cnt   : 0

MAC Ingress QoS
    dropped_pkt_cnt_hi_priority  : 0
    dropped_pkt_cnt_lo_priority  : 0

MAC FIFO Control
    hi_pkt_cnt         : 0
    lo_pkt_cnt         : 0
    hi_drop_pkt_cnt    : 0
    lo_drop_pkt_cnt    : 0
    hi_buf_fullness    : 0
    lo_buf_fullness    : 0

MAC Serdes Pktbus IF
    tx_pkt_cnt               : 0

ESI Serdes Pktbus IF
    rx_pkt_cnt                : 0
    pkt_crc_err_cnt           : 0
    ser_soft_err_cnt          : 0

ESI Ingress Scheduler
    hiq_pkt_count       : 0
    loq_pkt_count       : 0
    hiq_drop_pkt_cnt    : 0
    loq_drop_pkt_cnt    : 0
    buf_hiq_fullness    : 0
     buf_loq_fullness    : 0

MAC Priority FC
     rx_hi_pause_cnt   : 0
     rx_low_pause_cnt  : 0
     tx_hi_pause_cnt   : 0
     tx_low_pause_cnt  : 0

Egress Modules:
------------
ESI Egress Header (DP0)
```

```
    esi_pkt_count                 : 0
    dropped_pkt_channel_not_found : 0
    dropped_pkt_invalid_slot_id   : 0

ESI Egress Scheduler
    hiq_pkt_count       : 0
    loq_pkt_count       : 0
    hiq_drop_pkt_cnt    : 0
    loq_drop_pkt_cnt    : 0
    buf_hiq_fullness    : 0
    buf_loq_fullness    : 0

ESI Flow Control
    enable              : 0x00000000
    status              : 0x00000000
    total_tx_pause_cnt  : 0
    tx_pause_cnt_hi     : 0
    tx_pause_cnt_low    : 0

ESI Serdes Pktbus IF
    tx_pkt_cnt        : 0

MAC Serdes Pktbus IF
    rx_pkt_cnt               : 0
    pkt_crc_err_cnt          : 0
    ser_soft_err_cnt         : 0

MAC Scheduler
    hiq_pkt_count       : 0
    loq_pkt_count       : 0
    hiq_drop_pkt_cnt    : 0
    loq_drop_pkt_cnt    : 0
    buf_hiq_fullness    : 0
    buf_loq_fullness    : 0

MAC 10G
    mac_tx_dropped_pkt_cnt  : 0


Low Priority IRQ Counts
==================

PCIE Local
--------------------------------------------------------------------------------
    tx_terr_drp:                      0, tx_src_dis:                          0
    tx_err_fwd:                       0, rcv_regaccess_err_fwd:               0
    rcv_regaccess_ecrc_err:           0, cfg_err_ur_regaccess                 0
    cfg_err_ur_pktdma:                0, cfg_pktdma_err_poison:               0
    msi_req_fail:                     0, msi_numvec_mismatch:                 0
    cfg_err_cpl_unexp:                0, cfg_err_cpl_timeout_pktdma:          0
    cfg_err_cpl_abort_regaccess:      0, from_cpu_timeout_regaccess:          0
    phy_8b10b_err:                    0
    from_cpu_rd_cpl_trgt_err_regaccess:                                       0
    from_cpu_wr_invalid_trgt_err_regaccess:                                   0
    from_cpu_wr_trgt_err_regaccess:                                           0
    i2c_wrong_sl_id:                  0, i2c_excess_data:                     0
    i2c_insuf_wdata:                  0, i2c_insuf_addr_bytes:                0
     dma_missing_eop:                  0

PCIE Peer
--------------------------------------------------------------------------------
    tx_terr_drp:                      0, tx_src_dis:                          0
    tx_err_fwd:                       0, rcv_regaccess_err_fwd:               0
    rcv_regaccess_ecrc_err:           0, cfg_err_ur_regaccess                 0
```

```
    cfg_err_ur_pktdma:                0, cfg_pktdma_err_poison:              0
    msi_req_fail:                     0, msi_numvec_mismatch:                0
    cfg_err_cpl_unexp:                0, cfg_err_cpl_timeout_pktdma:         0
    cfg_err_cpl_abort_regaccess:      0, from_cpu_timeout_regaccess:         0
    phy_8b10b_err:                    0
    from_cpu_rd_cpl_trgt_err_regaccess:                                      0
    from_cpu_wr_invalid_trgt_err_regaccess:                                  0
    from_cpu_wr_trgt_err_regaccess:                                          0
    i2c_wrong_sl_id:                  0, i2c_excess_data:                    0
    i2c_insuf_wdata:                  0, i2c_insuf_addr_bytes:               0
    dma_missing_eop:                  0

ESI ProcBus
------------------------------------------------------------------------------
    uncorr_proc_bus_ecc_err:          0, uncorr_gpio_ecc_err:                0
    corr_proc_bus_ecc_err:            0, corr_gpio_ecc_err:                  0

ESI PktBus
------------------------------------------------------------------------------
    frame_sync_err_lane0:             0, frame_sync_err_lane1:               0
    descrambler_err:                  0, decode_block_err:                   0
    rx_ifg_err:                       0, serdes_pkt_crc_error:               0
    input_pkt_error:                  0, input_fifo_sync_err:                0
    uncorr_fifo_err:                  0, corr_fifo_err:                      0
    rx_fifo_wr_err:                   0, rx_fifo_rd_err:                     0

ESI Ingress Scheduler
------------------------------------------------------------------------------
    fifo_sgl_ecc_err:                 0, fifo_dbl_ecc_err:                   0
    fifo_flushed:                     0, pkt_len_mismatch_err:               0
    fifo_eop_err:                     0, fifo_sop_err:                       0
    packet_dropped_err:               0, lo_desc_fifo_full_pkt_dropped:      0
    hi_desc_fifo_full_pkt_dropped:    0, lo_buf_fifo_full_pkt_dropped:       0
    hi_buf_fifo_full_pkt_dropped:     0, pkt_dropped_pb_if_err:              0
    pkt_dropped_pb_err:               0, pkt_dropped_too_big:                0
    pkt_dropped_too_small:            0, pkt_len_mismatch_lo_err:            0
    pkt_len_mismatch_hi_err:          0

ESI Egress Header
------------------------------------------------------------------------------
    slot_id_mismatch_err:             0, channel_not_found_err:              0
    pkt_too_small_err:                0, fifo_parity_err:                    0
    fifo_rd_err:                      0, fifo_wr_err:                        0

ESI Egress Scheduler
------------------------------------------------------------------------------
    buf_fifo_rd_err:                  0, buf_fifo_wr_err:                    0
    desc_fifo_rd_err:                 0, desc_fifo_wr_err:                   0
    desc_fifo_dbl_ecc_err:            0, fifo_sop_err:                       0
    fifo_eop_err:                     0, fifo_len_err:                       0
    fifo_flushed:                     0, buf_fifo_dbl_ecc_err:               0
    buf_fifo_sgl_ecc_err:             0, buf_fifo_pkt_dropped_full:          0
    desc_fifo_pkt_dropped_full:       0, desc_fifo_sgl_ecc_err:              0
    pkt_len_mismatch_hi_err:          0, pkt_len_mismatch_low_err:           0
    pkt_too_small:                    0, pkt_too_big:                        0
    pb_err:                           0, pb_if_err:                          0

ESI Flow Control
------------------------------------------------------------------------------
    channel_not_found_err:            0, qstat_rx_error:                     0

MAC ProcBus
------------------------------------------------------------------------------
    uncorr_proc_bus_ecc_err:          0, uncorr_gpio_ecc_err:                0
```

```
    corr_proc_bus_ecc_err:              0, corr_gpio_ecc_err:                   0

MAC PktBus
-------------------------------------------------------------------------------
    frame_sync_err_lane0:               0, frame_sync_err_lane1:                0
    descrambler_err:                    0, decode_block_err:                    0
    rx_ifg_err:                         0, serdes_pkt_crc_error:                0
    input_pkt_error:                    0, input_fifo_sync_err:                 0
    uncorr_fifo_err:                    0, corr_fifo_err:                       0
    rx_fifo_wr_err:                     0, rx_fifo_rd_err:                      0

MAC 10g MAC
-------------------------------------------------------------------------------
    rx_fifos_flushed_error:             0, rx_buffer_read_error:                0
    rx_buffer_write_error:              0, rx_pkt_sync_error:                   0
    tx_fifos_flushed_error:             0, tx_buffer_read_error:                0
    tx_buffer_write_error:              0, tx_pkt_sync_error:                   0
    rx_buffer_pkt_drp:                  0, rx_frame_too_long:                   0
    rx_frame_too_short:                 0, tx_buffer_pkt_drp:                   0
    tx_frame_too_long:                  0, tx_frame_too_short:                  0
    tx_header_len_chk_err:              0, tx_pb_if_err:                        0
    rx_ts_crc_bad:                      0

MAC Ingress QoS
-------------------------------------------------------------------------------
    data_fifo_rd_err:                   0, data_fifo_wr_err:                    0
    desc_fifo_rd_err:                   0, desc_fifo_wr_err:                    0
    desc_fifo_dbl_ecc_err:              0, fifo_sop_err:                        0
    fifo_eop_err:                       0, fifo_len_err:                        0
    fifo_flushed:                       0, data_fifo_dbl_ecc_err:               0
    data_fifo_sgl_ecc_err:              0, desc_fifo_sgl_ecc_err:               0
    ipv4_hdr_checksum_err:              0, pkt_len_mismatch_hi_err:             0
    pkt_len_mismatch_low_err:           0, pkt_too_small:                       0
    pkt_too_big:                        0, pb_err:                              0
    pb_if_err:                          0

MAC FIFO Ctl LOW
-------------------------------------------------------------------------------
    pkt_drop_rld_buffer_full:           0, pkt_drop_bypass_mode:                0
    pkt_drop_incoming_pkt_err:          0, pkt_drop_rld_output_pkt_err:         0
    uncorr_ecc_data_fifo_out:           0, corr_ecc:                            0

MAC RLDRAM
-------------------------------------------------------------------------------
    corr_rld_ecc_err:                   0, corr_bram_ecc_err:                   0
    ecc_cntr_over:                      0, ima_when_bist:                       0

MAC FIFO CTRL MUX
-------------------------------------------------------------------------------
   hi_priority_fifo_ovf_err:            0, hi_priority_fifo_ufl_err:            0
   lo_priority_fifo_ovf_err:            0, lo_priority_fifo_ufl_err:            0
   data_fifo_dbl_ecc_err:               0, data_fifo_sgl_ecc_err:               0

   MAC MAC Shceduler
-------------------------------------------------------------------------------
    buf_fifo_rd_err:                    0, buf_fifo_wr_err:                     0
    desc_fifo_rd_err:                   0, desc_fifo_wr_err:                    0
    desc_fifo_dbl_ecc_err:              0, fifo_sop_err:                        0
    fifo_eop_err:                       0, fifo_len_err:                        0
    fifo_flushed:                       0, buf_fifo_dbl_ecc_err:                0
    buf_fifo_sgl_ecc_err:               0, buf_fifo_pkt_dropped_full:           0
    desc_fifo_pkt_dropped_full:         0, desc_fifo_sgl_ecc_err:               0
    pkt_len_mismatch_hi_err:            0, pkt_len_mismatch_low_err:            0
    pkt_too_small:                      0, pkt_too_big:                         0
```

```
    pb_err:                          0, pb_if_err:                          0


Router#
```

Related Commands

Command	Description
show controller ethernet	Displays the hardware status of the backplane ethernet (BPE) device.

show controllers cable

To display information about the interface controllers on a cable interface on the Cisco CMTS router, use the **show controllers cable** command in user EXEC or privileged EXEC mode.

show controllers cable {*slot/portslot/subslot/port*} [**downstream** | **upstream** [*port*][**ipc**] [**mem-stat**] [**memory**] [**proc-cpu**][**tech-support**]]
Cisco IOS Release 12.2(33)SCE and Later
show controllers cable {*slot/cable-interface-indexslot/subslot/cable-interface-index*} [**downstream** | **upstream** [*upstream-index*][**ipc**] [**mem-stat**] [**memory**] [**proc-cpu**][**tech-support**]]

Cisco cBR Series Converged Broadband Router
show controllers cable *slot/subslot/cable-interface-index* [**downstream** | **upstream** [*port*]]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR7225VXR router—The valid range is from 1 to 2. • Cisco uBR7100 series router—The valid value is 1. • Cisco cBR routers—The valid values are 0 to 3 and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary subslot of the cable interface line card. The valid slots are 0 or 1. For Cisco cBR routers—The valid values is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router-The valid value is 0 or 1. • Cisco uBR10012 router-The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR routers—The valid values are 0 to 15.
downstream	(Optional) Displays the downstream interface status.
upstream	(Optional) Displays the upstream interface status.
port	(Optional) Specifies the desired upstream port. Valid values start with 0 for the first upstream port on the cable interface line card. For Cisco cBR routers—The valid values are 0 to 7.

upstream-index	(Optional) Specifies the desired index for the upstream port. Valid values for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards range from 0 to 3.
ipc	(Optional) Displays the Inter-Process Communication (IPC) information between different line cards. This option is not supported on the Cisco cBR router.
mem-stat	(Optional) Displays the output from the **show memory statistics** command that contains a summary of memory statistics for a Broadband Processing Engine (BPE) cable interface line card. This option is not supported on the Cisco cBR router.
memory	(Optional) Displays the output from the **show memory** command that contains a summary of memory statistics, including the memory as it is allocated per process, for a BPE cable interface line card. This option is not supported on the Cisco cBR router.
proc-cpu	(Optional) Displays the output from the **show processes cpu** command that contains the processor status for a BPE cable interface line card. This option is not supported on the Cisco cBR router.
tech-support	(Optional, privileged EXEC mode only) Displays the output from the **show tech-support** command for a BPE cable interface line card. This option is not supported on the Cisco cBR router.

Command Modes

User EXEC (all options except **tech-support**), Privileged EXEC (#)

Command History

Release	Modification
11.3 NA	This command was introduced.
12.0(2)XC	This command was modified to show a number of additional fields.
12.1(5)EC1	Support was added for the Cisco uBR7100 series router, including information about the Cisco uBR7100 series integrated upconverter.
12.2(1)XF1	Support was added for the Cisco uBR10012 router.
12.0(16)SC2, 12.1(10)EC1, 12.2(4)BC1b	The algorithm for calculating the SNR value was enhanced for a more accurate value.
12.2(15)CX	Support was added for the Cisco uBR-MC28U/X cable interface line card, including the display of the number of packets dropped because they were for a Service Flow ID (SFID) of 0.
12.2(15)BC2b	The **mem-stat**, **memory**, and **proc-cpu keywords** were added to obtain processor information from the onboard processor on Broadband Processing Engine (BPE) cable interface line cards, such as the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR10-MC5X20S/U cards.

Release	Modification
12.3(9a)BC	Added the optional **tech-support** keyword to optimize the collection of line card information without consuming the console session for a long period of time.
12.3(17a)BC	Added support for Dynamic Channel Change (DCC) for Load Balancing on the Cisco CMTS.
12.3(17a)BC2	Added support for the Cisco uBR10-MC5X20H interface line cards.
12.3(23)BC	The **downstream** keyword displays status and characteristics of modular cable interfaces associated with the Cisco uBR10-MC5X20 line card MAC domain host interface.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC	The command output was modified to show logical channels information when multiple logical channels are configured.
12.2(33)SCE	The command syntax was modified. The *port* parameter was changed to *cable-interface-index* to indicate the MAC domain index for the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards. The upstream *port* parameter was changed to *upstream-index*.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **ipc**, **mem-stat**, **memory**, **proc-cpu**, **tech-support** keywords were removed.

Usage Guidelines

The **mem-stat**, **memory**, and **proc-cpu** keywords are used to obtain the relevant information from the onboard processor on BPE cable interface line cards, such as the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR10-MC5X20S/U/H cards. This allows you to obtain information that is specific to a line card, as opposed to having to run these commands on the entire router.

The *logical-index* is shown only when multiple logical channels are configured using the **cable upstream max-logical-chans** command.

Note The **mem-stat**, **memory**, and **proc-cpu** options are not available for cable interface line cards that do not contain an onboard processor (for example, the Cisco uBR-MC16C card).

Dynamic Channel Change (DCC) Support for Load Balancing

The following commands and fields illustrate the show controllers command used with DCC:

```
Router# show controllers cable x/y upstream | i DCC
DCC: 0 REQs  n2 RSPs  0 ACKs
Router# show controllers cx/y downstream| i DCC
DCC: n1  REQs  0 RSPs  n3 ACKs
n4 Successful DCCs  n5 DCC Failures
DCC end of transaction counts:
DCC unknown cause(e1) offline(e2) if down(e3) no cm(e4)
DCC no resource(e5) no retries(e6) reject(e7) unknown state (e8)
```

```
DCC rebuild err (e9) T15 timeout(e10) reinit MAC (e11) dcc succeeds(e12)
```

The fields in this example are as follows:

- n1—The number of DCC REQ messages traversing an interface, nonzero on downstream.
- n2—The number of DCC RSP messages traversing an interface, nonzero on upstream.
- n3—The number of DCC ACK messages traversing an interface, nonzero on downstream.
- n4—The number of successful DCC transactions, nonzero on downstream direction.
- n5—The number of failed DCC transactions, nonzero only on downstream direction

The above counters are DOCSIS-specific DCC counters, which can also be collected via SNMP MIB.

The following summary illustrates classified DCC transaction end counts originated from the interface with the above **show controllers** command example:

- e1—The number of DCC transactions ended with unknown causes.
- e2—The number of DCC transactions ended due to modems going offline.
- e3—The number of DCC transactions ended due to interface down.
- e4—The number of DCC transactions ended due to a nonexistent cable modem.
- e5—The number of DCC transactions ended due to insufficient resources on target.
- e6—The number of DCC transactions ended due to exhausted DCC-REQ retries.
- e7—The number of DCC transactions ended due to rejected DCC-REQ.
- e8—The number of DCC transactions ended due to unknown DCC state.
- e9—The number of DCC transactions ended due to failure to assign a cable modem on the target.
- e10—The number of DCC transactions ended due to T15 time out.
- e11—The number of DCC transactions ended due to CM MAC reinitialization.
- e12—The number of DCC transactions ended successfully.

This command is subject to the restrictions and prerequisites described in the *Configuring Load Balancing and Dynamic Channel Change (DCC) on the Cisco CMTS feature guide* on Cisco.com.

Examples

The following abbreviated example illustrates the initial information for the **tech-support** keyword for the Cisco uBR10012 router on which Cisco IOS Release 12.3(9a)BC is installed:

```
Router# show controllers cable 8/1/0 tech-support
------------------ show version ------------------
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (UBR10KCLC-LC-M), Experimental Version 12.3(20040708:1441
55) [bguckel-geo_cable-l2 102]
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Mon 19-Oct-04 11:28 by bguckel
Image text-base: 0x60008EB8, data-base: 0x60CB0000
ROM: System Bootstrap, Version 12.2(20011031:221132) [maheshj-cr10k-rommon 15],
DEVELOPMENT SOFTWARE
BOOTLDR: 7200 Software (UBR10KCLC-LC-M), Experimental Version 12.2(20011107:2331
03) [janez-v122_2_xf_throttle.Nov5A 101]
clc_8_1 uptime is 1 week, 9 hours, 54 minutes
System returned to ROM by power-on
System restarted at 08:59:44 UTC Wed Jul 21 2004
Running default software
cisco uBR10K CLC (NPE-CLC) processor (revision A) with 196608K/65536K bytes of m
emory.
Processor board ID
R7000 CPU at 262MHz, Implementation 39, Rev 2.1, 256KB L2 Cache
```

```
6 slot midplane, Version 1.0
.
```

The following is a sample output of the **show controllers cable downstream** command for downstream connection at slot 3 on a Cisco CMTS router:

```
Router# show controllers cable 3/0 downstream
Cable 3/0 Downstream is up
Frequency not set, Channel Width 6 MHz, 64-QAM, Symbol Rate 5.056941 Msps
FEC ITU-T J.83 Annex A, R/S Interleave I=12, J=17
```

The table below describes the fields shown in the **show controllers cable downstream** command display.

Table 197: show controllers cable downstream Field Descriptions

Field	Description
Cable	Slot and port number indicating the location of the Cisco cable interface line card.
Downstream is up	RF downstream interface is enabled.
Frequency	Transmission frequency of the RF downstream. (This information may not match the current transmission frequency, which is external on Cisco CMTS platforms that use an external upconverter.)
Channel Width	Width of the RF downstream channel.
QAM	Modulation scheme.
Symbol Rate	Transmission rate (in number of symbols per second).
FEC ITU-T	Motion Picture Experts Group (MPEG) framing standard.
Annex	Annex for the RF downstream channel.
R/S Interleave I/J	Reed Solomon framing based on ITU S.83-B.

For cable interfaces that include an integrated upconverter, the **show controllers cable** command includes the frequency and power settings for the integrated upconverter. The following example shows a typical output for the **show controllers cable** command that includes the information for the integrated upconverter:

```
Router# show controllers cable 1/0

Interface Cable1/0
Hardware is IMC11
 BCM3210 revision=0x56B2
 Cable1/0 Upconverter is Enabled Output is Enabled
  Model: 74-2094-01 Serial Number: 0WAV04480010 CLEI Code:      CLEI#
  HW Rev:    PC2D0107 SW Rev: 007, NVRAM Rev: 006 ECI number 123456
  Downstream Frequency 525.0000 MHz
  IF Power 0.3 dBmv  RF Power 51.0 dBmv
...
```

The following example is a sample output of the **show controllers cable** command with the cable interface index 0. on the Cisco UBR-MC3XG60V line card. The downstream channel ID and RFID are also displayed in the output:

```
Router# show controller cable 5/0/0
Interface Cable5/0/0
Hardware is M3G60
HCCP HA FLAGS:
  linestate: TRUE hccp_if_inited: FALSE hccphopready: TRUE
  hccp_keepalive: FALSE hccp_critical: FALSE ha_critical: FALSE
  drop_mac_msgs: FALSE current_active_segment: 0
HCCP HA UPStream FLAGS:
  US 1 first_time_up: FALSE    US 2 first_time_up: TRUE
  US 3 first_time_up: TRUE    US 4 first_time_up: TRUE
JIB Base: 0x20000000, JIB Revision: 0x00000002,  Release: 0x00000033
Cable5/0/0 JIB hardware status:
  JIB Downstream port   Enabled
  JIB Upstream   port 0 Enabled
  JIB Upstream   port 1 Disabled
  JIB Upstream   port 2 Disabled
  JIB Upstream   port 3 Disabled
JIB CURRENT ACTIVE BPI/PHS Segment: DS: 0 US: 0
S/W CURRENT ACTIVE BPI/PHS Segment: 0
 H/W Spectrum Management Information:
   Sextant FPGA Revision: 0x1B
   FFT Transform Revision: 0x2
   IRQ status 0x0, IRQ mask 0x1F
   time_stamp_lsb 0x739D, time_stamp_msb 0xB8D3
   time_stamp_gen_csr 0x100
   FFT Engine State: 1, Busy Count: 0,  Wrong State Count: 0
   FFT Device Trigger Time Miss Count: 0
   FFT Device Sample Overflow: 0, Transform Overflow: 0
   FFT Device TSRM Parity: 0, TSRM/TSG Comparison Error: 0, TSG Reload: 1
  Upconverter:  vcom
 Cable5/0/0 Upconverter is Disabled Output is Disabled
  Model: 74-3153-05 Serial Number: 0WAV10250089
  HW Rev:    PC2D0109 SW Rev: 204, NVRAM Rev: 021 ECI number FFFFFF
  Downstream Frequency 537.0000 MHz
  RF Power Disabled
 idb 0x6565E520 MAC regs 0x20000000 SDRAM 0x28000000
 mac ring entries 32 bandwidth ring entries 128 tx ring entries 128 MAP tx ri
entries 128
 MAC ring 0xC7A7E00 shadow 0x65745D08 head 8 count 1136840 full 0
 Bandwidth ring 0xC7A7EC0 shadow 0x65745E08 head 61 count 189 full 0
 PCI low priority ring 0xC7A8100 shadow 0x65746088 head 19 count 19 full 0
 US CCF ring 0xC7A8340 shadow 0x65746308 head 0 count 0 full 0
 FIB ring 0xC7A87C0 shadow 0x65746808 head 0 count 0 full 0
 IPC packets received 0
 Drops: Par 0 CRC 0 Len 0
 Force Drops IPC 0 Lo/Hi 0/0, 0/0
 snfr_fibipc_dmastatus 0x0
 Sniffer ring 0xC7A8580 shadow 0x65746588 head 0 count 0 full 0
 High priority Tx ring 0xC7A7140 shadow 0x65744388 head 6 tail 8 count 2 full
 Low priority Tx ring 0xC7A6D00 shadow 0x65743B08 head 0 tail 0 count 0 full
 TIB Tx ring 0xC7A7580 shadow 0x65744C08 head 105 tail 105 count 0 full 0 stu
0
 PCCF Tx ring 0xC7A79C0 shadow 0x65745488 head 0 tail 0 count 0 full 0 stuck
 JIB SDRAM Correctable ECC Count: 0
     SDRAM_CECC_INFO_REG_0: 0x0, SDRAM_CECC_INFO_REG_1: 0x0
 JIB SSRAM Correctable ECC Count: 0
 JIB Timestamp Mismatch Count: 0
 JIB Timestamp Reload Count: 0
 Timestamp is from TCC card
```

```
throttled 0 enabled 0 disabled 0
Rx: spurious 0 framing_err 0 hcs_err 0 no_buffer 0 short_pkt 0
    no_enqueue 0 no_enp 0 miss_count 0 latency 0
    invalid_sid 0 invalid_mac 0 bad_ext_hdr_pdu 0 concat 0 bad-concat 0
Tx:  full 0 drop 0 stuck 0 latency 0
MTx: full 0 drop 0 stuck 0 latency 0
Slots 0 NoUWCollNoEngy 0 FECorHCS 0 HCS 0
Req 186 ReqColl 0 ReqNoise 0 ReqNoEnergy 2198449112
ReqData 0 ReqDataColl 0 ReqDataNoise 0 ReqDataNoEnergy 0
Rng 1136720 RngColl 0 RngNoise 0
FECBlks 1137342 UnCorFECBlks 0 CorFECBlks 0
MAP FIFO overflow 0, Rx FIFO overflow 0, No rx buf 0
DS FIFO overflow 0, US FIFO overflow 0, US stuck 0
Bandwidth Requests= 0xBA
Piggyback Requests= 0x3
Ranging Requests= 0x115852
Timing Offset = 0x0
Master Clock Timestamp = 0xB8D5DBCD
Bad bandwidth Requests= 0x0
Bad REG_ACK= 0x0
No REG_RESP buffer= 0x0
Cable5/0/0 Downstream is up
 Frequency 537.0000 MHz, Channel Width 6 MHz, 64-QAM, Symbol Rate 5.056941 M
 FEC ITU-T J.83 Annex B, R/S Interleave I=32, J=4
 Downstream channel ID: 255
 Dynamic Services Stats (All Downstreams):
 DSA: 0  REQs  0 RSPs  0 ACKs
 0 Successful DSAs  0 DSA Failures
 DSC: 0  REQs  0 RSPs  0 ACKs
 0 Successful DSCs  0 DSC Failures
 DSD:  0 REQs  0 RSPs
 0 Successful DSDs  0 DSD Failures
 DBC: 0 REQs  0 RSPs(Rcvd)  0 ACKs
 0 Successful DBCs  0 DBC Failures  0 DBC Partial
 0 DBC Protocol Violations
 DCC: 0  REQs  0 RSPs  0 ACKs
 0 Successful DCCs  0 DCC Failures
 0 DCC Departs 0 DCC Arrives
 DCC end of transaction counts:
 DCC unknown cause(0) offline(0) if down(0) no cm(0)
 DCC no resource(0) no retries(0) reject(0) unknown state (0)
 DCC rebuild err (0) T15 timeout(0) wrong channel(0) reinit MAC (0)
 DCC dcc succeeds(0)
 DCC wcm(0)
 CM STATUS Stats:
 0 invalid_event  0 tlv_error
 0 disabled_event  0 invalid_state
 0 invalid_chid  0 prim_chid
Local total modems 0, modems active 0, total DS flows 2
 NB DS Mo1/1/0:0, STATE: UP
  Frequency 55.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 550 (usec)
  Bandwidth (Kbps): 13800,  Load Percent: 0
  Channel ID: 193, US MAP: 0x0001
  Total modems: 2, modems active : 2, total DS flows: 3
 NB DS Cable5/0/0, STATE: DOWN
  Frequency 537.0000 MHz 64-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 0 (usec)
  Bandwidth (Kbps): 20800,  Load Percent: 0
  Channel ID: 255, US MAP: 0x000F
// Output displaying the DS_chan_id and RFID IDs//
 DS_chan_id  RFID  Interface
 ------------------------------------
   193       24    Mo1/1/0:0
```

```
  ---------------------------------------
  MDDs           Primary          Non-Primary
  -----------------------------------------------
  1/1/0:0        582033           0
  1/1/0:1        0                582030
  -----------------------------------------------
..
...
```

The following is a sample output of the **show controllers cable downstream** command for a downstream on the Cisco uBR-MC28U cable interface line card or a cable interface line card with integrated upconverter:

```
Router# show controllers cable 6/0 downstream

Interface Cable6/0
Hardware is MC28U (F-connector) with Integrated Up-converter
Primary rommon version is: 11.4
Secondary rommon version is: 6553.5
Current rommon is Primary
Late input drops = 0
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
JIB version 372
 H/W Spectrum Management Information:
   BCM3138 Chip State: 1 1 1 1, Serial Port State 1, Busy Count: 0 25 0 0
 Spectrum Management IPC Statistics:
   Tx Statistics
      Pkts: 48413, Lock Errs: 0, MB not Empty: 0, No Buffs: 0
   Rx Statistics
      Pkts: 46097, Timeout: 1, Unexpected: 0, No Buffs: 0, Lock Errs: 0
   Inuse band lower=0 upper=0 CNR=56
   candidate band lower=0 upper=0 Mod=0
   Inuse band lower=0 upper=0 CNR=52
   candidate band lower=0 upper=0 Mod=0
   Inuse band lower=0 upper=0 CNR=55
   candidate band lower=0 upper=0 Mod=0
   Inuse band lower=23000 upper=26200 CNR=55
   candidate band lower=23000 upper=26200 Mod=0
 Cable6/0 Upconverter is Enabled Output is Enabled
  Model: 74-2094-05 Serial Number: 0WAV06530029 CLEI Code: FFFFFFFFFF
  HW Rev:    PC2D0108 SW Rev: 010, NVRAM Rev: 006 ECI number FFFFFF
  Downstream Frequency 471.0000 MHz
  RF Power 54.9 dBmv
```

The following is a sample output of the **show controllers cable downstream** command for the cable interface line card on slot 8, subslot 0, and port 0 on a Cisco CMTS router:

```
Router# show controllers cable 8/0/0 downstream

 Cable8/0/0 Downstream is up
  Frequency 453.0000 MHz, Channel Width 6 MHz, 64-QAM, Symbol Rate 5.056941 Msps
  FEC ITU-T J.83 Annex B, R/S Interleave I=32, J=4
  Downstream channel ID: 191
  Dynamic Services Stats:
  DSA: 0  REQs  0 RSPs  0 ACKs
  0 Successful DSAs  0 DSA Failures
  DSC: 0  REQs  0 RSPs  0 ACKs
  0 Successful DSCs  0 DSC Failures
  DSD:  0 REQs  0 RSPs
  0 Successful DSDs  0 DSD Failures
```

```
 DCC: 0  REQs  0 RSPs  0 ACKs
 0 Successful DCCs  0 DCC Failures
 DCC end of transaction counts:
 DCC unknown cause(0) offline(0) if down(0) no cm(0)
 DCC no resource(0) no retries(0) reject(0) unknown state (0)
 DCC rebuild err (0) T15 timeout(0) wrong channel(0) reinit MAC (0)
 DCC dcc succeeds(0)
 DCC wcm(0)
Local total modems 800, modems active 800, total DS flows 801
 NB DS Mo3/0/1:0, STATE: UP
  Frequency 555.0000 MHz 64-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 550 (usec)
  Bandwidth (Kbps): 4315,  Load Percent: 0
  Channel ID: 48, US MAP: 0x0037
  Total modems: 4, modems active : 4, total DS flows: 5
 NB DS Mo3/0/1:1, STATE: UP
  Frequency 561.0000 MHz 64-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 550 (usec)
  Bandwidth (Kbps): 4315,  Load Percent: 0
  Channel ID: 49, US MAP: 0x0037
  Total modems: 2, modems active : 2, total DS flows: 3
 NB DS Mo3/0/1:2, STATE: UP
  Frequency 567.0000 MHz 64-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 550 (usec)
  Bandwidth (Kbps): 4315,  Load Percent: 0
  Channel ID: 50, US MAP: 0x0037
  Total modems: 1, modems active : 1, total DS flows: 2
 NB DS Mo3/0/1:3, STATE: UP
  Frequency 573.0000 MHz 64-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 550 (usec)
  Bandwidth (Kbps): 13485,  Load Percent: 0
  Channel ID: 51, US MAP: 0x0037
  Total modems: 3, modems active : 3, total DS flows: 4
```

The following example is a sample output of the **show controllers cable downstream** command for the Cisco uBR-MC3GX60V line card sharing downstreams with the Cisco Wideband SPA, in Cisco IOS Release 12.2(33)SCG:

```
Router# show controllers cable 8/0/0 downstream
  Dynamic Services Stats (All Downstreams):
  DSA: 0  REQs  0 RSPs  0 ACKs
  0 Successful DSAs  0 DSA Failures
  DSC: 0  REQs  0 RSPs  0 ACKs
  0 Successful DSCs  0 DSC Failures
  DSD:  0 REQs  29 RSPs
  0 Successful DSDs  0 DSD Failures
  DBC:  0 REQs  96 RSPs(Rcvd)  0 ACKs
  0 Successful DBCs  0 DBC Failures  0 DBC Partial
  96 DBC Protocol Violations
  0 Total DBC Pending Q-Size
  DCC: 0  REQs  0 RSPs  0 ACKs
  0 Successful DCCs  0 DCC Failures
  0 DCC Departs 0 DCC Arrives
  DCC end of transaction counts:
  DCC unknown cause(0) offline(0) if down(0) no cm(0)
  DCC no resource(0) no retries(0) reject(0) unknown state (0)
  DCC rebuild err (0) T15 timeout(0) wrong channel(0) reinit MAC (0)
  DCC dcc succeeds(0)
  DCC wcm(0)
  CM STATUS Stats:
  0 invalid_event  4 tlv_error
  0 disabled_event  598985 invalid_state
```

```
 0 invalid_chid  0 prim_chid
Local total modems 0, modems active 0, total DS flows 3
 NB DS Mo1/1/0:0, STATE: UP
  Frequency 699.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 550 (usec)
  Bandwidth (Kbps): 6000,  Load Percent: 0
  Channel ID: 5, US MAP: 0x000F
  Total modems: 51, modems active : 37, total DS flows: 158
 DS_chan_id  RFID  Interface
 ------------------------------------
   5         24    Mo1/1/0:0
 ------------------------------------
 MDDs            Primary          Non-Primary
 ------------------------------------------------
 1/1/0:0         1148012          0
 1/1/0:1         0                1148011
 1/1/0:2         0                1148011
 1/1/0:3         0                1148011
 1/3/0:0         0                1148011
 1/3/0:1         0                1148011
 1/3/0:2         0                1148011
 1/3/0:3         0                1148011
 7/0/0:0         0                1148011
 7/0/0:1         0                1148011
 7/0/0:2         0                1148011
 7/0/0:3         0                1148011
 8/0/2:0         0                1148011
 8/0/2:1         0                1148011
 8/0/2:2         0                1148011
 8/0/2:3         0                1148011
 ------------------------------------------------
```

The table below describes the fields shown in the **show controllers cable downstream** command display.

Table 198: show controllers cable downstream Field Descriptions

Field	Description
Downstream Frequency	Center frequency (in MHz) for which the integrated upconverter is configured.
IF Power	Power level (in dBmV) of the signal that the integrated upconverter is receiving from the cable interface line card in the Cisco uBR7100 series router.
RF Power	Power level (in dBmV) of the RF output signal that the integrated upconverter is transmitting on the DS0 RF port.
Dynamic Services Stats	Dynamic downstream service statistics for a specific cable interface.
CM STATUS Stats	Cable modem status statistics for a specific cable interface.
DS_chan_id	Downstream channel ID for a specific cable interface.
RFID	RF ID associated to a specific cable interface.
MDDs	MAC Domain Descriptor (MDD).
Primary	Primary MDD.

Field	Description
Non-Primary	Non-primary MDD.

The following is sample output from the **show controllers cable upstream** command for a Cisco CMTS router with a cable interface line card located in slot 4, port 0:

```
Router# show controllers cable 4/0 upstream 2

Cable4/0 Upstream 2 is administratively down
  Frequency 5.008 MHz, Channel Width 0.200 MHz, QPSK Symbol Rate 0.160 Msps
  Spectrum Group 4
  SNR measurement - 27.2340 dB
  Nominal Input Power Level 5 dBmV, Tx Timing Offset 0
  Ranging Backoff Start 16, Ranging Backoff End 16, Tx Backoff Start 16
  Tx Backoff End 16, Modulation Profile Group 1
  part_id=0x3137, rev_id=0x01, rev2_id=0xFF
  nb_agc_thr=0x0000, nb_agc_nom=0x0000
  Range Load Reg Size=0x58
  Request Load Reg Size=0x0E
  Minislot Size in number of Timebase Ticks is = 8
  Minislot Size in Symbols =8
  Bandwidth Requests = 0x0
  Piggyback Requests = 0x0
  Invalid BW Requests= 0x0
  Minislots Requested= 0x0
  Minislots Granted  = 0x0
  Minislot Size in Bytes = 2
  UCD Count = 0
  DES Ctrl Reg#0 = C00C0C43, Reg#1 = 0
Router#
```

The following example shows a sample output of the **show controllers cable upstream** command for a cable interface line card with *upstream-index* 0:

```
Router# show controller cable 5/0/0 upstream 0
 Cable5/0/0 Upstream 0 is up
  Frequency 15.000 MHz, Channel Width 1.600 MHz, Symbol Rate 1.280 Msps
  Modulations (QPSK) - Short QPSK, Long QPSK
  Mapped to non-shared connector 0 and receiver 0 //Output displaying the connector and
receiver used by the upstream channel //
  Spectrum Group is overridden
  US phy MER(SNR)_estimate for good packets - 31.5968 dB
  Nominal Input Power Level 0 dBmV, Tx Timing Offset 2000
  Ranging Backoff Start 3, Ranging Backoff End 6
  US timing offset adjustment type 2, value 505
  Ranging Insertion Interval automatic (60 ms)
  US throttling off
  Tx Backoff Start 3, Tx Backoff End 5
  Modulation Profile Group 21
  Concatenation is enabled
  Fragmentation is enabled
  part_id=0x0952, rev_id=0x00, rev2_id=0x00
  nb_agc_thr=0x0000, nb_agc_nom=0x0000
  Range Load Reg Size=0x58
  Request Load Reg Size=0x0E
  Minislot Size in number of Timebase Ticks is = 4
  Minislot Size in Symbols = 32
  Bandwidth Requests = 0xBC
  Piggyback Requests = 0x3
```

```
  Invalid BW Requests= 0x0
```

The following example shows a typical output of the **show controllers cable upstream** command for a cable interface line card that includes onboard hardware-based spectrum management capabilities:

```
Router# show controllers cable 3/0 upstream 3

Cable6/0 Upstream 3 is up
  Frequency 24.600 MHz, Channel Width 3.200 MHz, 64-QAM Symbol Rate 2.560 Msps
  This upstream is mapped to physical port 3
  Spectrum Group 14, Last Frequency Hop Data Error: NO(0)
  MC28U CNR measurement - better than 50 db
  Nominal Input Power Level 0 dBmV, Tx Timing Offset 2815
  Ranging Backoff automatic (Start 0, End 3)
  Ranging Insertion Interval automatic (60 ms)
  Tx Backoff Start 0, Tx Backoff End 4
  Modulation Profile Group 241
  Concatenation is enabled
  Fragmentation is enabled
  part_id=0x3138, rev_id=0x02, rev2_id=0x00
  nb_agc_thr=0x0000, nb_agc_nom=0x0000
  Range Load Reg Size=0x58
  Request Load Reg Size=0x0E
  Minislot Size in number of Timebase Ticks is = 2
  Minislot Size in Symbols = 32
  Bandwidth Requests = 0x23C800
  Piggyback Requests = 0x489FB8
  Invalid BW Requests= 0x0
  Minislots Requested= 0x4499EBE
  Minislots Granted  = 0x6C67B7
  Minislot Size in Bytes = 24
  Map Advance (Dynamic) : 2454 usecs
  UCD Count = 429798
  ATDMA mode enabled
Multicast/Broadcast RateLimit Dropped Pkts : 0
```

The following example shows a typical output of the **show controllers cable upstream** command for the Cisco uBR10-MC5X20H cable interface line card that is configured with multiple logical channels:

```
Router# show controllers cable 7/1/0 upstream 0
 Cable7/1/0 Upstream 0 is up
  Frequency 30.000 MHz, Channel Width 1.600 MHz, Symbol Rate 1.280 Msps
  Modulations - Short QPSK, Long QPSK
  This upstream is mapped to physical port 0
  Spectrum Group is overridden
  US phy MER(SNR)_estimate for good packets - 30.2024 dB
  Nominal Input Power Level 3 dBmV, Tx Timing Offset 1419
  Ranging Backoff Start 0, Ranging Backoff End 1
  US timing offset adjustment type 0, value 0
  Ranging Insertion Interval automatic (60 ms)
  US throttling off
  Tx Backoff Start 3, Tx Backoff End 5
  Modulation Profile Group 21
  Concatenation is disabled
  Fragmentation is enabled
  part_id=0x3140, rev_id=0x03, rev2_id=0x00
  nb_agc_thr=0x0000, nb_agc_nom=0x0000
  Range Load Reg Size=0x58
  Request Load Reg Size=0x0E
```

```
 Minislot Size in number of Timebase Ticks is = 4
 Minislot Size in Symbols = 32
 Bandwidth Requests = 0x25
 Piggyback Requests = 0x3
 Invalid BW Requests= 0x0
 Minislots Requested= 0x5B4
 Minislots Granted  = 0x28
 Minislot Size in Bytes = 8
 Map Advance (Dynamic) : 2418 usecs
 Map Count = 11744156
 Remote Map Counts: (none)
 UCD Count = 12067
 Remote UCD Counts: (none)
 PHY: us errors 0  us recoveries 0
 MAC PHY TSS: tss error start 0  tss error end 0
 MAC PHY Status: bcm3140 status 0  lookout status 0
 MAP/UCD Replication Instructions:
Cable7/1/0 Upstream 8 is administratively down
 Frequency 30.000 MHz, Channel Width 1.600 MHz, Symbol Rate 1.280 Msps
 Modulations - Short QPSK, Long QPSK
 This upstream is mapped to physical port 0
 Spectrum Group is overridden
 MER(SNR) - Unknown - no modems online.
 Nominal Input Power Level 3 dBmV, Tx Timing Offset 0
 Ranging Backoff Start 3, Ranging Backoff End 6
 US timing offset adjustment type 0, value 0
 Ranging Insertion Interval automatic (60 ms)
 US throttling off
 Tx Backoff Start 3, Tx Backoff End 5
 Modulation Profile Group 21
 Concatenation is disabled
 Fragmentation is enabled
 part_id=0x3140, rev_id=0x03, rev2_id=0x00
 nb_agc_thr=0x0000, nb_agc_nom=0x0000
 Range Load Reg Size=0x58
 Request Load Reg Size=0x0E
 Minislot Size in number of Timebase Ticks is = 4
 Minislot Size in Symbols = 32
 Bandwidth Requests = 0x0
 Piggyback Requests = 0x0
 Invalid BW Requests= 0x0
 Minislots Requested= 0x0
 Minislots Granted  = 0x0
 Minislot Size in Bytes = 8
 Map Advance (Dynamic) : 2280 usecs
 Map Count = 0
 Remote Map Counts: (none)
 UCD Count = 0
 Remote UCD Counts: (none)
 PHY: us errors 0  us recoveries 0
 MAC PHY TSS: tss error start 0  tss error end 0
 MAC PHY Status: bcm3140 status 0  lookout status 0
 MAP/UCD Replication Instructions:
```

For Broadband Processing Engine (BPE) cards and other cable interfaces that include onboard upconverters, the **show controllers cable** command also displays the upconverter status and configuration information. The following excerpt from the show controllers cable command output shows the information that is displayed for the Cisco uBR10-MC5X20S cable interface line card:

```
Router# show controllers cable 5/1/4

Interface Cable5/1/4
```

```
Hardware is MC520S
JIB version 66
 Cable5/1/4 Upconverter is Enabled Output is Enabled
  Model: 74-2094-04 Serial Number: 0WAV0649000L CLEI Code: FFFFFFFFFF
  HW Rev:    PC2D0108 SW Rev: 010, NVRAM Rev: 006 ECI number FFFFFF
  Downstream Frequency 255.0000 MHz
  RF Power 49.8 dBmv
...
```

The following example is a sample output of the **show controllers cable upstream** command for the Cisco uBR-MC3GX60V line card sharing downstreams with the Cisco Wideband SPA, in Cisco IOS Release 12.2(33)SCG:

```
Router# show controllers cable 8/0/0 upstream
 Cable8/0/0 Upstream 0 is up
  Frequency 15.000 MHz, Channel Width 0.800 MHz, Symbol Rate 0.640 Msps
  Modulations (16-QAM) - Short 16-QAM, Long 16-QAM
  Mapped to shared connector 0 and receiver 0
  Spectrum Group is overridden
  US phy MER(SNR)_estimate for good packets - 36.1280 dB
  Nominal Input Power Level -4 dBmV, Tx Timing Offset 5734
  Ranging Backoff Start 3, Ranging Backoff End 6
  US timing offset adjustment type 0, value 0
  Ranging Insertion Interval automatic (60 ms)
  US throttling off
  Tx Backoff Start 3, Tx Backoff End 5
  Modulation Profile Group 21
  Concatenation is enabled
  Fragmentation is enabled
  part_id=0x3142, rev_id=0xB1, rev2_id=0x00
  nb_agc_thr=0x0000, nb_agc_nom=0x0000
  Range Load Reg Size=0x58
  Request Load Reg Size=0x0E
  Minislot Size in number of Timebase Ticks is = 8
  Minislot Size in Symbols = 32
  Bandwidth Requests = 0xC7957
  Piggyback Requests = 0x19899
  Invalid BW Requests= 0x4BF
  Minislots Requested= 0xF2E365
  Minislots Granted  = 0xE240A
  Minislot Size in Bytes = 16
  Map Advance (Dynamic) : 3389 usecs
  Map Count Internal = 1134448325
  No MAP buffer= 0x0   No Remote MAP buffer= 0x0
  Map Counts: Controller 1/1/0 = 1134446105
  UCD Counts:
    Controller 1/1/0:0 = 1150386
  UCD procedures on lch 0
  UCD ucd-succeeds(2) ucd-shut(0) init-state-err(0)
  UCD init-tss-err(0) init-timeout(0) init-start-err(0)
  UCD ucd-ccc-time(0) ucd-timeout(0) ucd-tss-err(0)
  UCD ucd-state-err(0) ucd-process(0) ucd-retries(0)
  UCD stale-tss(0)
  PHY: us errors 0  us recoveries 0 (enp 0)
  MAC PHY TSS: tss error start 0  tss error end 0
  MAC PHY Status: bcm3140 status 0  lookout status 0
  PHY: TSS late 0  discontinuous 0
  PHY: TSS mis-match 0  not-aligned 0
  PHY: TSS missed snapshots from phy 0
  MAP/UCD Replication Instructions:
    Controller 1/1/0 index = 361, bitmap = 0x0001
 Cable8/0/0 Upstream 1 is up
```

```
  Frequency 16.000 MHz, Channel Width 0.800 MHz, Symbol Rate 0.640 Msps
  Modulations (16-QAM) - Short 16-QAM, Long 16-QAM
  Mapped to shared connector 0 and receiver 1
  Spectrum Group is overridden
  US phy MER(SNR)_estimate for good packets - 36.1280 dB
  Nominal Input Power Level -4 dBmV, Tx Timing Offset 2330
  Ranging Backoff Start 3, Ranging Backoff End 6
  US timing offset adjustment type 0, value 0
  Ranging Insertion Interval automatic (60 ms)
  US throttling off
  Tx Backoff Start 3, Tx Backoff End 5
  Modulation Profile Group 21
  Concatenation is enabled
  Fragmentation is enabled
  part_id=0x3142, rev_id=0xB1, rev2_id=0x00
  nb_agc_thr=0x0000, nb_agc_nom=0x0000
  Range Load Reg Size=0x58
  Request Load Reg Size=0x0E
  Minislot Size in number of Timebase Ticks is = 8
  Minislot Size in Symbols = 32
  Bandwidth Requests = 0xC0BFF
  Piggyback Requests = 0x18BFB
  Invalid BW Requests= 0x1B248
  Minislots Requested= 0xE50E2A
  Minislots Granted  = 0xDA909
  Minislot Size in Bytes = 16
  Map Advance (Dynamic) : 3057 usecs
  Map Count Internal = 1134268243
  No MAP buffer= 0x0   No Remote MAP buffer= 0x0
  Map Counts: Controller 1/1/0 = 1134266034
  UCD Counts:
    Controller 1/1/0:0 = 1150386

  UCD procedures on lch 0
  UCD ucd-succeeds(2) ucd-shut(0) init-state-err(0)
  UCD init-tss-err(0) init-timeout(0) init-start-err(0)
  UCD ucd-ccc-time(0) ucd-timeout(0) ucd-tss-err(0)
  UCD ucd-state-err(0) ucd-process(0) ucd-retries(0)
  UCD stale-tss(0)
  PHY: us errors 0  us recoveries 0 (enp 0)
  MAC PHY TSS: tss error start 0  tss error end 0
  MAC PHY Status: bcm3140 status 0  lookout status 0
  PHY: TSS late 0  discontinuous 0
  PHY: TSS mis-match 0  not-aligned 0
  PHY: TSS missed snapshots from phy 0
  MAP/UCD Replication Instructions:
    Controller 1/1/0 index = 362, bitmap = 0x0001
....
```

The table below describes the fields shown in the **show controllers cable upstream** command display.

Table 199: show controllers cable upstream Field Descriptions

Field	Description
Cable	Slot and port number indicating the location of the Cisco cable interface line card.
Upstream is up/administratively down	Administrative state of the upstream (whether it is shutdown or not).

Field	Description
Channel Width	Width of the RF upstream channel.
QPSK Symbol Rate	Modulation technique for upstream transmission.
Spectrum Group 4	Spectrum group associated with this slot and port.
Frequency	Transmission frequency of the RF upstream channel. **Note** Cisco cable interface line cards always program the upstream center frequency in 16 KHz increments. This is the frequency displayed in the router configuration and the **show controllers cable upstream** command. For example, if you use the **cable upstream frequency** command to specify a center frequency of 27 MHz, the actual center frequency will be 27.008 MHz, which is the next highest 16 KHz boundary.
Modulations	Spectrum group associated with this slot and port.
SNR measurement	Estimate for the overall signal-to-noise ratio (SNR) for cable interfaces that do not include onboard hardware-based spectrum management. For most cable interface line cards, this value reflects the modulation error rate (MER) value for the upstream (as calculated according to the IEEE 802.14 PHY layer specifications). The MER is sometimes incorrectly referred to as the carrier-to-noise ratio (CNR), and the SNR value is generally lower than the CNR value. **Note** In Cisco IOS Release 12.1(10)EC1 and Cisco IOS Release 12.2(4)BC1b, the algorithm for calculating the SNR estimate was refined for a more accurate value. Depending on the plant characteristics, the new SNR estimate could be up to 6 dB lower than the values shown in earlier software releases. This value is only an estimate—for the most accurate value, use a spectrum analyzer.
<card-name> CNR measurement	Estimate for the overall carrier-to-noise ratio (CNR) for the upstream on cable interfaces that include onboard hardware-based spectrum management. When the CNR measurement exceeds 40 dB, this line states “better than 40 dB.” As a general rule, the CNR is greater than the SNR value. **Note** This value is only an estimate—for the most accurate value, use a spectrum analyzer or use the **show controllers cable upstream spectrum** command. For individual cable modems, you can also use the **show cable modem cnr** command.
Nominal Input Power level	Desired power level coming into the receiver.
Tx Timing Offset	Largest ranging offset reported by CMs on the upstream.
Ranging Backoff Start/End	Ranging slots (expressed as an exponent of 2) to back off before resending the ranging bursts after an upstream collision. These values are configured using the **cable upstream range-backoff** *start end* command.

Field	Description
Ranging Backoff Automatic	Start and end ranging backoff exponents, which are set automatically, using the **cable upstream range-backoff automatic** command. **Note** These counters are not accurately updated on the Cisco uBR10-MC5X20S cable interface line card, which should manually configure the ranging backoff instead.
US timing offset	Upstream timing offset adjustment type and value.
Ranging Insertion Interval	Ranging insertion interval.
US throttling	Status of the upstream throttling.
Tx Backoff Start	Starting exponential backoff value for data collisions.
Tx Backoff End	Ending exponential backoff value for data collisions.
Modulation Profile Group	Set of burst profiles defining an upstream range.
part_id=	Part number of the PHY chip. FFFF means the PHY chip is turned off.
rev_id=	PHY chip revision number.
rev2_id=	PHY chip subrevision number.
nb_agc_thr=	Threshold used to control gain.
nb_agc_nom=	Accelerate convergence of input power level.
Range Load Reg Size=	Size in symbols for range request bursts.
Request Load Reg Size=	Size in symbols for request bursts.
Minislot Size in number of Timebase Ticks is	Size in tick units of upstream minislot. A tick is 6.25 microseconds.
Minislot Size in Symbols	Size in symbols of the upstream minislot.
Bandwidth Requests	Number of successful bandwidth requests received in the contention minislots.
Piggyback Requests	Number of successful bandwidth requests piggybacked with regular data transmissions.
Invalid BW Requests	Number of invalid bandwidth (BW) requests. An example of an invalid bandwidth request is a modem using a nonexistent service identifier (SID) to request bandwidth.
Minislots Requested	Total number of minislots requested.
Minislots Granted	Total number of minislots granted.
Minislot Size in Bytes	Size of the minislot in bytes.

Field	Description
Map Advance (Dynamic)	Dynamic map advance time.
Map Count	Total number of map counts.
Remote Map Counts	Total number of remote map counts.
UCD Count	Number of Upstream Channel Descriptors (UCDs) sent for this upstream.
Remote UCD Counts	Number of remote UCDs sent for this upstream.
PHY	Physical layer information for the following: • us errors—Number of upstream errors. • us recoveries—Number of upstream recoveries.
MAC PHY TSS	Statistics on the integrity of sync status of timestamp snapshot values between MAC and PHY.
MAC PHY Status	MAC physical status for the following: • bcm3140 status • lookout status
MAP/UCD Replication Instructions	MAP/UCD replication instructions.
DES Ctrl Reg # =	Interval data encryption standard (DES) controller register dump.
Null Modem RateLimit Dropped Pkts	(Cisco uBR-MC16U/X, Cisco uBR-MC28U/X only) Number of packets that were dropped because they had a Service Flow ID (SFID) of 0, which occurs when the packets are dropped due to rate-limiting on their original service flow.
Additional Information for Broadband Processing Engine (BPE) Cable Interface Line Cards	
JIB Version	Revision of the JIB circuitry, which is the custom processor onboard the BPE cards that handles the MAC-layer processing.
Upconverter is Enabled Output is Enabled	Status of the upconverter and the signal output. If this field shows that the output is disabled, use the **no cable downstream rf-shutdown** command to re-enable it.
Downstream Frequency	Configured frequency, in MHz, for the integrated upconverter (if present).
RF Power	Current RF power, in dBmV, as measured on the cable interface line card upconverter. The upconverter circuitry is accurate to a few tenths of a dBmV, but might vary +/- 1 dBmV depending on the transient noise that occurs when the power is measured.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in the line configuration mode.

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show controllers cable upstream** command:

```
Router#show controllers cable 1/0/0 upstream
Controller 1/0/0 upstream 0  AdminState:UP OpState: UP
  Frequency 13.200 MHz, Channel Width 6.400 MHz, Symbol Rate 5.120 Msps
  atdma mode enabled
  Modulation Profile Group 221
  Modulations (64-QAM) - A-short 64-QAM, A-long 64-QAM, A-ugs 64-QAM
  Mapped to connector 0 and receiver 8
  Bind to Cable3/0/0 US0
  US phy MER(SNR)_estimate for good packets - 36.1280 dB
  Spectrum Group is overridden
  Nominal Input Power Level -1 dBmV

  PHY Dev status: UP
  PHY: us errors 0  us recoveries 0 (enp 0)
  PHY: TSS late 0  discontinuous 0
  PHY: TSS mis-match 0  not-aligned 0
  PHY: TSS missed snapshots from phy 0

  UCD LCH state: RUN_STEADY
  UCD change count = 4
  UCD Tx Counts = 86418

  Bandwidth Requests = 7612
  Piggyback Requests = 17
  Invalid BW Requests= 0
  Bytes Requested = 1393405
  Bytes Granted = 1393405
  Ranging Insertion Interval automatic (120 ms)
  Map Advance (Dynamic) : 2356 usecs
  Map Count S/W = 14254599
  Map Count Error = 0
  No MAP buffer= 0
  Map Count Internal = 14254898
  Map Count External = 14237090

  Attribute Mask = 0x0

Controller 1/0/0 upstream 1  AdminState:UP OpState: UP
  Frequency 19.600 MHz, Channel Width 6.400 MHz, Symbol Rate 5.120 Msps
  atdma mode enabled
  Modulation Profile Group 221
  Modulations (64-QAM) - A-short 64-QAM, A-long 64-QAM, A-ugs 64-QAM
  Mapped to connector 0 and receiver 9
  Bind to Cable3/0/0 US1
  US phy MER(SNR)_estimate for good packets - 36.1280 dB
  Spectrum Group is overridden
  Nominal Input Power Level -1 dBmV

  PHY Dev status: UP
  PHY: us errors 0  us recoveries 0 (enp 0)
  PHY: TSS late 0  discontinuous 0
  PHY: TSS mis-match 0  not-aligned 0
  PHY: TSS missed snapshots from phy 0

  UCD LCH state: RUN_STEADY
  UCD change count = 4
  UCD Tx Counts = 86418
```

```
  Bandwidth Requests = 7479
  Piggyback Requests = 28
  Invalid BW Requests= 0
  Bytes Requested = 1480962
  Bytes Granted = 1481073
  Ranging Insertion Interval automatic (120 ms)
  Map Advance (Dynamic) : 2356 usecs
  Map Count S/W = 14254591
  Map Count Error = 0
  No MAP buffer= 0
  Map Count Internal = 14254894


Router#show controllers cable 1/0/0 upstream 0
Controller 1/0/0 upstream 0  AdminState:UP OpState: UP
  Frequency 13.200 MHz, Channel Width 6.400 MHz, Symbol Rate 5.120 Msps
  atdma mode enabled
  Modulation Profile Group 221
  Modulations (64-QAM) - A-short 64-QAM, A-long 64-QAM, A-ugs 64-QAM
  Mapped to connector 0 and receiver 8
  Bind to Cable3/0/0 US0
  US phy MER(SNR)_estimate for good packets - 36.1280 dB
  Spectrum Group is overridden
  Nominal Input Power Level -1 dBmV

  PHY Dev status: UP
  PHY: us errors 0  us recoveries 0 (enp 0)
  PHY: TSS late 0  discontinuous 0
  PHY: TSS mis-match 0  not-aligned 0
  PHY: TSS missed snapshots from phy 0

  UCD LCH state: RUN_STEADY
  UCD change count = 4
  UCD Tx Counts = 86418

  Bandwidth Requests = 7612
  Piggyback Requests = 17
  Invalid BW Requests= 0
  Bytes Requested = 1393405
  Bytes Granted = 1393405
  Ranging Insertion Interval automatic (120 ms)
  Map Advance (Dynamic) : 2356 usecs
  Map Count S/W = 14254599
  Map Count Error = 0
  No MAP buffer= 0
  Map Count Internal = 14254898
  Map Count External = 14237090

  Attribute Mask = 0x0

Router#
```

This example shows the output of the **show controllers cable downstream** command:

```
Router#show controllers cable 1/0/0 downstream
  Dynamic Services Stats (All Downstreams):
  DSA: 0  REQs  0 RSPs  0 ACKs
  0 Successful DSAs  0 DSA Failures
  DSC: 0  REQs  0 RSPs  0 ACKs
  0 Successful DSCs  0 DSC Failures
  DSD:  0 REQs  0 RSPs
  0 Successful DSDs  0 DSD Failures
```

```
 DBC:  0 REQs  0 RSPs(Rcvd)  0 ACKs
 0 Successful DBCs  0 DBC Failures  0 DBC Partial
 0 DBC Protocol Violations
 0 Total DBC Pending Q-Size
 DCC: 4  REQs  0 RSPs  0 ACKs
 4 Successful DCCs  0 DCC Failures
 0 DCC Departs 0 DCC Arrives
 DCC end of transaction counts:
 DCC unknown cause(0) offline(0) if down(0) no cm(0)
 DCC no resource(0) no retries(0) reject(0) unknown state (0)
 DCC rebuild err (0) T15 timeout(0) wrong channel(0) dcc-req not send(0)
 DCC reinit MAC (4) dcc succeeds(0)
 DCC wcm(0)
 CM STATUS Stats:
 0 invalid_event  0 tlv_error
 0 disabled_event  0 invalid_state
 0 invalid_chid  0 prim_chid
 DOCSIS SF Stats:
 821 num_ds_sf_alloc,    124 num_ds_sf_free
 659 num_us_sf_alloc,      0 num_us_sf_free
 659 num_null_sf_alloc,    0 num_null_sf_free
   0 num_ds_sf_lock,       0 num_ds_sf_unlock
   0 num_us_sf_lock,       0 num_us_sf_unlock
   0 inv_cm_state,         0 inv_sfid_free,     0 invalid_sids
   0 null_idbs,            0 null_mds,          0 null_cms
   0 null_flows,           0 null_templates,    0 null_app_data
 486 num_tmr_sf_insert,  486 num_tmr_sf_remove
   0 num_tmr_sf_tmout,     0 stale_tmr_flows

Local total modems 0, modems active 0, total DS flows 0
 NB DS In3/0/0:8, STATE: UP
  Frequency 141.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 300 (usec)
  Bandwidth (Kbps): 6000,  Load Percent: 0
  Channel ID: 9, US MAP: 0x0003
  Total modems: 0, modems active : 0, modems wb : 0 total DS flows: 1
 NB DS In3/0/0:16, STATE: UP
  Frequency 189.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 300 (usec)
  Bandwidth (Kbps): 6000,  Load Percent: 0
  Channel ID: 17, US MAP: 0x0003
  Total modems: 0, modems active : 0, modems wb : 0 total DS flows: 1
 NB DS In3/0/0:24, STATE: UP
  Frequency 237.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 300 (usec)
  Bandwidth (Kbps): 6000,  Load Percent: 0
  Channel ID: 25, US MAP: 0x0003
  Total modems: 0, modems active : 0, modems wb : 0 total DS flows: 1
 NB DS In3/0/0:32, STATE: UP
  Frequency 285.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 300 (usec)
  Bandwidth (Kbps): 6000,  Load Percent: 0
  Channel ID: 33, US MAP: 0x0003
  Total modems: 3, modems active : 3, modems wb : 0 total DS flows: 7
 NB DS In3/0/0:33, STATE: UP
  Frequency 291.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
  Network Delay 300 (usec)
  Bandwidth (Kbps): 6000,  Load Percent: 0
  Channel ID: 34, US MAP: 0x0003
  Total modems: 3, modems active : 3, modems wb : 0 total DS flows: 7
 NB DS In3/0/0:40, STATE: UP
  Frequency 333.0000 MHz 256-QAM,  ANNEX B, R/S Interleave I=32, J=4
```

Related Commands

Command	Description
cable downstream frequency	Configures the downstream center frequency on the integrated upconverter.
cable downstream rf-power	Configures the desired RF output power on the integrated upconverter.
cable spectrum-group (global configuration)	Creates spectrum groups, which contain one or more upstream frequencies.
cable upstream frequency	Specifies that the upstream should be set to either a specific center frequency or be set dynamically.
show controllers cable upstream spectrum	(Cisco uBR-MC16 line card only) Displays the noise levels for a particular CM or displays the background noise for an entire upstream .
show interface cable sid	Displays interface controller information for a specific cable access router card slot.

show controllers cable jib

To display the ASIC processor (JIB) register information on a cable interface on the Cisco CMTS router, use the **show controllers cable jib**command in user EXEC or privileged EXEC mode.

show controllers cable {*slot/cable-interface-indexslot/subslot/cable-interface-index*} **jib us-partial-reset**

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
jib	Displays JIB register information.
us-partial-reset	Displays JIB3 upstream partial reset data.

Command Modes

User EXEC (>) or

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show controllers cable jib** command displays the packet capture buffers retrieved during the partial reset. It displays all of the capture buffers associated with the last partial reset event and also other information useful for determining the Partial Reset state.

Examples

The following is a sample output of the **show controllers cable jib** command:

```
Router# show controllers cable 5/0/0 jib us-partial-reset
```

```
Jib3 Upstream Partial Reset Information
Jib3 Upstream Debug Partial Reset Data
Partial Reset S/W Counts
------------------------
TOTAL Partial Resets  : 3
  PHY Side Partial Resets : 1
  CCF Partial Resets      : 1
  FrameP Partial Resets   : 0
  FragP Partial Resets    : 0
  PktP Partial Resets     : 0
  C2C Partial Resets      : 1
Partial Reset States
--------------------
PHY Side          : PR_NORMAL
Fauna             : PR_NORMAL
Partial Reset H/W Counts & Status
---------------------------------
  PHY Side Partial Resets  : 0x80300001
  PHY Side Partial Status0 : 0x00000000
  PHY Side Partial Status1 : 0x00000000
  CCF Partial Resets       : 0x8C000001
  CCF Partial Status1      : 0x00000000
  CCF Partial Status2      : 0x00000000
  FrameP Partial Resets    : 0x0C000000
  FrameP Partial Status    : 0x00000000
  FragP Partial Resets     : 0x0C000000
  FragP Partial Status     : 0x00000000
  PktP Partial Resets      : 0x0C000000
  PktP Partial Status1     : 0x00000000
  PktP Partial Status2     : 0x00000000
  PktP Partial Status3     : 0x00000000
  PktP Partial Status4     : 0x00000000
  C2C Partial Resets       : 0x8C000001
  C2C Partial Status       : 0x00000000
Partial Reset Packet Capture Buffers
------------------------------------
PHY Side Buf Ptr1 : 0x1F3DC35C
PHY Side Buf Ptr2 : 0x1F3E4390
PHY Side Buf Cnt  : 4079
FA1 Buf Ptr1      : 0x1F3EC3C4
FA1 Buf Ptr2      : 0x1F3F43F8
FA1 Buf Cnt       : 2663
FA2 Buf Ptr1      : 0x1F3FC42C
FA2 Buf Ptr2      : 0x1F404460
FA2 Buf Cnt       : 1109
FA3 Buf Ptr1      : 0x1F40C494
FA3 Buf Ptr2      : 0x1F4144C8
FA3 Buf Cnt       : 1109
FA4 Buf Ptr1      : 0x1F41C4FC
FA4 Buf Ptr2      : 0x1F424530
FA4 Buf Cnt       : 1109
PHY Side Capture FIFO Data (0xFEF entries, format: eop, data[31:0]):
----
0, 0xB            0, 0x0            0, 0x20163        0, 0x5440900
1, 0x6000000      0, 0x805000C      0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x8000006      0, 0x1632F40      1, 0x20000
0, 0x50050006     0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x4060002      1, 0x400002       0, 0x400F0004     0, 0x0
0, 0xB            0, 0xFFF0001      1, 0x0            0, 0x230F0009
0, 0x0            0, 0xB            0, 0x0            0, 0x20163
0, 0x1C20900      1, 0x6000000      0, 0x805000C      0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x8000006      0, 0x16345C2
1, 0x20000        0, 0x50050006     0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x4060002      1, 0x400002       0, 0x400F0004
```

```
0, 0x0            0, 0xB            0, 0xFFF0001      1, 0x0
0, 0x230F0009     0, 0x0            0, 0xB            0, 0x0
0, 0x20163        0, 0x8470900      1, 0x6000000      0, 0x805000C
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x8000006
0, 0x1637402      1, 0x20000        0, 0x50050006     0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x4060002      1, 0x400002
0, 0x400F0004     0, 0x0            0, 0xB            0, 0xFFF0001
1, 0x0            0, 0x230F0009     0, 0x0            0, 0xB
0, 0x0            0, 0x20163        0, 0x6840900      1, 0x6000000
0, 0x805000C      0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x8000006      0, 0x1639C03      1, 0x20000        0, 0x50050006
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x4060002
1, 0x400002       0, 0x400F0004     0, 0x0            0, 0xB
0, 0xFFF0001      1, 0x0            0, 0x230F0009     0, 0x0
0, 0xB            0, 0x0            0, 0x20163        0, 0xE850900
1, 0x6000000      0, 0x1C06002E     0, 0x0            0, 0x5
0, 0x10004        0, 0x1C           0, 0xA1D0005      0, 0xE4E8F7
0, 0x1E6BFB       0, 0x794000A      0, 0x830301       0, 0x4008001
0, 0x800F5C6      0, 0x3D30B06      0, 0x44080        0, 0xF8FFFFF
1, 0xFF2FFFF      0, 0x400F0004     0, 0x0            0, 0x5
0, 0x10004        1, 0x10000        0, 0x1C06002E     0, 0x0
0, 0x1            0, 0x10004        0, 0x1C           0, 0xA1D0005
0, 0xE4E8F6       0, 0x23BE85       0, 0x906000A      0, 0xA60301
0, 0x4000001      0, 0x100BDD7      0, 0xE90B06       0, 0x24300
0, 0x220000       1, 0x15A0000      0, 0x400F0004     0, 0x0
0, 0x1            0, 0x10004        1, 0x10000        0, 0x805000C
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x800001E
0, 0x1651CB2      1, 0x10000        0, 0x50050006     0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x41E0001      1, 0xC310001
0, 0x400F0004     0, 0x0            0, 0xB            0, 0xFFF0001
1, 0x0            0, 0x230F0009     0, 0x0            0, 0xB
0, 0x0            0, 0x10165        0, 0xE560A00      1, 0xE000000
0, 0x805000C      0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x800001E      0, 0x165229C      1, 0x10000        0, 0x50050006
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x41E0001
1, 0xC310001      0, 0x400F0004     0, 0x0            0, 0xB
0, 0xFFF0001      1, 0x0            0, 0x230F0009     0, 0x0
0, 0xB            0, 0x0            0, 0x10165        0, 0x4940A00
1, 0xE000000      0, 0x805000C      0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x800001E      0, 0x1652647      1, 0x10000
0, 0x50050006     0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x41E0001      1, 0xC310001      0, 0x400F0004     0, 0x0
0, 0xB            0, 0xFFF0001      1, 0x0            0, 0x230F0009
0, 0x0            0, 0xB            0, 0x0            0, 0x10165
0, 0x2560A00      1, 0xE000000      0, 0x805000C      0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x800001E      0, 0x1653424
1, 0x10000        0, 0x50050006     0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x41E0001      1, 0xC310001      0, 0x400F0004
0, 0x0            0, 0xB            0, 0xFFF0001      1, 0x0
0, 0x230F0009     0, 0x0            0, 0xB            0, 0x0
0, 0x10165        0, 0x1D70A00      1, 0xE000000      0, 0x805000C
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x800001E
0, 0x1656396      1, 0x10000        0, 0x50050006     0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x41E0001      1, 0xC310001
0, 0x400F0004     0, 0x0            0, 0xB            0, 0xFFF0001
1, 0x0            0, 0x230F0009     0, 0x0            0, 0xB
0, 0x0            0, 0x10165        0, 0x1A0A00       1, 0xE000000
0, 0x805000C      0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x800001E      0, 0x16591E8      1, 0x10000        0, 0x50050006
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x41E0001
1, 0xC310001      0, 0x400F0004     0, 0x0            0, 0xB
0, 0xFFF0001      1, 0x0            0, 0x230F0009     0, 0x0
0, 0xB            0, 0x0            0, 0x10165        0, 0xDC0A00
1, 0xE000000      0, 0x805000C      0, 0x0            0, 0xB
```

```
0, 0xFFF0001      0, 0x800001E      0, 0x165C292      1, 0x10000
0, 0x50050006     0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x41E0001      1, 0xC310001      0, 0x400F0004     0, 0x0
0, 0xB            0, 0xFFF0001      1, 0x0            0, 0x230F0009
0, 0x0            0, 0xB            0, 0x0            0, 0x10165
0, 0xDDE0A00      1, 0xE000000      0, 0x805000C      0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x800001E      0, 0x165EFA0
1, 0x10000        0, 0x50050006     0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x41E0001      1, 0xC310001      0, 0x400F0004
0, 0x0            0, 0xB            0, 0xFFF0001      1, 0x0
0, 0x230F0009     0, 0x0            0, 0xB            0, 0x0
0, 0x10166        0, 0xD5F0A00      1, 0xE000000      0, 0x805000C
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x800001E
0, 0x1661F6C      1, 0x10000        0, 0x50050006     0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x41E0001      1, 0xC310001
0, 0x400F0004     0, 0x0            0, 0xB            0, 0xFFF0001
1, 0x0            0, 0x230F0009     0, 0x0            0, 0xB
0, 0x0            0, 0x10166        0, 0xE2F0A00      1, 0xE000000
0, 0x805000C      0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x800001E      0, 0x1665018      1, 0x10000        0, 0x50050006
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x41E0001
1, 0xC310001      0, 0x400F0004     0, 0x0            0, 0xB
0, 0xFFF0001      1, 0x0            0, 0x230F0009     0, 0x0
0, 0xB            0, 0x0            0, 0x10166        0, 0x9E40A00
1, 0xE000000      0, 0x805000C      0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x800001E      0, 0x1667BAC      1, 0x10000
0, 0x50050006     0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x41E0001      1, 0xC310001      0, 0x400F0004     0, 0x0
0, 0xB            0, 0xFFF0001      1, 0x0            0, 0x1C06002E
0, 0x0            0, 0x6            0, 0x30004        0, 0x1C
0, 0xA1D0005      0, 0xE4E8F7       0, 0x1E6BFC       0, 0x222000A
0, 0x870301       0, 0x4008003      0, 0x800CE55      0, 0x19A0B06
0, 0x244C0        0, 0xF1F0000      1, 0x570000       0, 0x400F0004
0, 0x0            0, 0x6            0, 0x30004        1, 0x10000
0, 0x230F0009     0, 0x0            0, 0xB            0, 0x0
0, 0x10166        0, 0x9650A00      1, 0xE000000      0, 0x805000C
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x800001E
0, 0x166AB3F      1, 0x10000        0, 0x50050006     0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x41E0001      1, 0xC310001
0, 0x400F0004     0, 0x0            0, 0xB            0, 0xFFF0001
1, 0x0            0, 0x230F0009     0, 0x0            0, 0xB
0, 0x0            0, 0x10166        0, 0x8E60A00      1, 0xE000000
0, 0x805000C      0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x800001E      0, 0x166DAB7      1, 0x10000        0, 0x50050006
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x41E0001
1, 0xC310001      0, 0x400F0004     0, 0x0            0, 0xB
0, 0xFFF0001      1, 0x0            0, 0x230F0009     0, 0x0
0, 0xB            0, 0x0            0, 0x10167        0, 0x9B00A00
1, 0xE000000      0, 0x805000C      0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x800001E      0, 0x1670B84      1, 0x10000
0, 0x50050006     0, 0x0            0, 0xB            0, 0xFFF0001
0, 0x41E0001      1, 0xC310001      0, 0x400F0004     0, 0x0
0, 0xB            0, 0xFFF0001      1, 0x0            0, 0x230F0009
0, 0x0            0, 0xB            0, 0x0            0, 0x10167
0, 0x5680A00      1, 0xE000000      0, 0x805000C      0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x800001E      0, 0x167375D
1, 0x10000        0, 0x50050006     0, 0x0            0, 0xB
0, 0xFFF0001      0, 0x41E0001      1, 0xC310001      0, 0x400F0004
0, 0x0            0, 0xB            0, 0xFFF0001      1, 0x0
0, 0x230F0009     0, 0x0            0, 0xB            0, 0x0
0, 0x10167        0, 0x4EC0A00      1, 0xE000000      0, 0x805000C
0, 0x0            0, 0xB            0, 0xFFF0001      0, 0x800001E
0, 0x16766D2      1, 0x10000        0, 0x50050006     0, 0x0
0, 0xB            0, 0xFFF0001      0, 0x41E0001      1, 0xC310001
```

```
0, 0x400F0004     0, 0x0           0, 0xB           0, 0xFFF0001
1, 0x0            0, 0x805000C     0, 0x0           0, 0xB
0, 0xFFF0001      0, 0x8000006     0, 0x16781A8     1, 0x20000
0, 0x50050006     0, 0x0           0, 0xB           0, 0xFFF0001
0, 0x4060002      1, 0x400002      0, 0x400F0004    0, 0x0
0, 0xB            0, 0xFFF0001     1, 0x0           0, 0x230F0009
0, 0x0            0, 0xB           0, 0x0           0, 0x20167
0, 0x42D0900      1, 0x6000000     0, 0x805000C     0, 0x0
0, 0xB            0, 0xFFF0001     0, 0x8000006     0, 0x1678A69
1, 0x20000        0, 0x50050006    0, 0x0           0, 0xB
0, 0xFFF0001      0, 0x4060002     1, 0x400002      0, 0x400F0004
0, 0x0            0, 0xB           0, 0xFFF0001     1, 0x0
0, 0x230F0009     0, 0x0           0, 0xB           0, 0x0
0, 0x20167        0, 0xCEE0900     1, 0x6000000     0, 0x230F0009
0, 0x0            0, 0xB           0, 0x0           0, 0x10167
0, 0x32D0A00      1, 0xE000000     0, 0x805000C     0, 0x0
0, 0xB            0, 0xFFF0001     0, 0x800001E     0, 0x16794F2
1, 0x10000        0, 0x50050006    0, 0x0           0, 0xB
0, 0xFFF0001      0, 0x41E0001     1, 0xC310001     0, 0x400F0004
0, 0x0            0, 0xB           0, 0xFFF0001     1, 0x0
0, 0x805000C      0, 0x0           0, 0xB           0, 0xFFF0001
0, 0x8000006      0, 0x1679969     1, 0x20000       0, 0x50050006
0, 0x0            0, 0xB           0, 0xFFF0001     0, 0x4060002
1, 0x400002       0, 0x400F0004    0, 0x0           0, 0xB
0, 0xFFF0001      1, 0x0           0, 0x230F0009    0, 0x0
0, 0xB            0, 0x0           0, 0x20167       0, 0xBEE0900
1, 0x6000000      0, 0x805000C     0, 0x0           0, 0xB
0, 0xFFF0001      0, 0x8000006     0, 0x167BDAA     1, 0x20000
0, 0x50050006     0, 0x0           0, 0xB           0, 0xFFF0001
0, 0x4060002      1, 0x400002      0, 0x400F0004    0, 0x0
0, 0xB            0, 0xFFF0001     1, 0x0           0, 0x230F0009
0, 0x0            0, 0xB           0, 0x0           0, 0x20167
0, 0x2F0900       1, 0x6000000     0, 0x230F0009    0, 0x0
0, 0xB            0, 0x0           0, 0x10167       0, 0x52F0A00
1, 0xE000000      0, 0x805000C     0, 0x0           0, 0xB
0, 0xFFF0001      0, 0x8000006     0, 0x167C7AB     1, 0x20000
0, 0x50050006     0, 0x0           0, 0xB           0, 0xFFF0001
0, 0x4060002      1, 0x400002      0, 0x400F0004    0, 0x0
0, 0xB            0, 0xFFF0001     1, 0x0           0, 0x230F0009
007095: SLOT 5/0: Apr 27 04:43:17.502 Eastern: %UBR10000-5-UNREGSIDTIMEOUT: CM
 deleted unregistered Cable Modem 001e.6bfc.da8e0, 0x0           0, 0xB
    0, 0x0           0, 0x20167
0, 0xA300900      1, 0x6000000     0, 0x805000C     0, 0x0
0, 0xB            0, 0xFFF0001     0, 0x8000006     0, 0x167E6EC
1, 0x20000        0, 0x50050006    0, 0x0           0, 0xB
0, 0xFFF0001      0, 0x4060002     1, 0x400002      0, 0x400F0004
0, 0x0            0, 0xB           0, 0xFFF0001     1, 0x0
0, 0x10040048     0, 0x8003        0, 0xB           0, 0x20009
0, 0x1020042      0, 0x1006F2A     0, 0xFFFFFFF     0, 0xFFF001E
.
.
.
```

The table below describes the fields shown in the **show controllers cable jib** command display.

Table 200: show controllers cable jib Field Descriptions

Field	Description
TOTAL Partial Resets	Total number of partial resets.
PHY Side Partial Resets	Number of partial resets that occurred on the PHY side of the network.

Field	Description
CCF Partial Resets	Number of partial resets that occurred on the Continuous Concatenation and Fragmentation (CCF) processor.
FrameP Partial Resets	Number of partial resets that occurred on the Frame Processor (FrameP).
FragP Partial Resets	Number of partial resets that occurred on the Fragmentation Processor (FragP).
PktP Partial Resets	Number of partial resets that occurred on the Packet Processor (PktP).
C2C Partial Resets	Number of partial resets that occurred on the Chip to Chip (also called FL2FA—Flora to Fauna) (C2C) processor.
PHY Side	Partial reset status on the PHY side.
Fauna	Partial reset status on the Fauna.
PHY Side Partial Resets	Number of partial resets that occurred on the PHY side processor.
PHY Side Partial Status	Partial reset status on the PHY side.
CCF Partial Resets	Number of partial resets that occurred on the CCF processor.
CCF Partial Status	Partial reset status on the CCF processor.
FrameP Partial Resets	Number of partial resets that occurred on the Frame processor.
FrameP Partial Status	Partial reset status on the Frame processor.
FragP Partial Resets	Number of partial resets that occurred on the Fragmentation processor.
FragP Partial Status	Partial reset status on the Fragmentation processor.
PktP Partial Resets	Number of partial resets that occurred on the Packet processor.
PktP Partial Status	Partial reset status on the Packet processor.
C2C Partial Resets	Number of partial resets that occurred on the C2C processor.
C2C Partial Status	Partial reset status on the C2C processor.
PHY Side Buf Ptr	PHY partial reset packet capture buffer pointer.
PHY Side Buf Cnt	PHY partial reset packet capture buffer count.
FA1 Buf Ptr	Partial reset packet capture buffer 1 pointer on the Fauna processor.
FA1 Buf Cnt	Number of packet capture buffer 1 counts associated with the partial reset on the Fauna processor.
FA2 Buf Ptr	Partial reset packet capture buffer 2 pointer on the Fauna processor.
FA2 Buf Cnt	Number of packet capture buffer 2 counts associated with the partial reset on the Fauna processor.

Field	Description
FA3 Buf Ptr	Partial reset packet capture buffer 3 pointer on the Fauna processor.
FA3 Buf Cnt	Number of packet capture buffer 3 counts associated with the partial reset on the Fauna processor.
FA4 Buf Ptr	Partial reset packet capture buffer 4 pointer on the Fauna processor.
FA4 Buf Cnt	Number of packet capture buffer 4 counts associated with the partial reset on the Fauna processor.

Related Commands

Command	Description
show controllers cable	Displays information about the interface controllers on a cable interface on the Cisco CMTS router.

show controllers cable upstream spectrum

To display the noise levels for a particular CM or to display the background noise for an entire upstream on the Cisco uBR-MC16 line card, use the **show controllers cable upstream spectrum** command in user EXEC or privileged EXEC mode.

show controllers cable {*slot/portslot/subslot/port*} **upstream** *n* **spectrum** [*ip-addressmac-address*] *start-freq end-freq res-freq*

Syntax Description

slot/port	Identifies the cable interface and downstream port on the Cisco uBR7100 series and Cisco uBR7200 series routers. On the Cisco uBR7100 series router, the only valid value is **1/0**. On the Cisco uBR7200 series router, *slot* can range from 3 to 6, and *port* can be 0 or 1, depending on the cable interface.
slot/subslot/port	Identifies the cable interface on the Cisco uBR10012 router. The following are the valid values: • *slot* = 5 to 8 • *subslot* = 0 or 1 • *port* = 0 to 4 (depending on the cable interface)
n	Port number for the desired upstream (0 to 5).
ip-address	(Optional) IP address, in dotted decimal notation, for a CM on the specified upstream.
mac-address	(Optional) MAC address, in dotted hexadecimal notation, for a CM on the specified upstream.
start-freq	Starting frequency for the frequency range that is being reported (5 to 42 MHz; can also be specified as 5000 to 42000 KHz or 5000000 to 42000000 Hz).
end-freq	Ending frequency for the frequency range that is being reported (5 to 42 MHz). **Note** The ending frequency must be greater than the starting frequency and must be specified using the same units as the starting frequency (MHz, KHz, Hz).
res-freq	Resolution frequency to determine the number of data points for the report (12 to 37000 KHz). **Note** The resolution frequency must be specified in the same units as the starting and ending frequency (MHz, KHz, Hz). To use a resolution value less than 1 MHz, you must specify the other parameters in either Hz or KHz.

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.1(7)CX1	This command was introduced for Cisco CMTS routers using the Cisco uBR-MC16S cable interface line card.
12.2(8)BC2	Support was added for the Cisco uBR10012 router and the Cisco uBR-LCP2-MC16S cable interface line card.
12.3(21)BC	This command is obsolete.
IOS-XE 3.15.0S	This command was replaced by the **show cable spectrum-analysis** command.

Usage Guidelines

Cisco IOS Release 12.3(9a)BC adds the **tech-support** keyword to the **show controllers cable** command. This change allows users with large numbers of online cable modems to collect the necessary line card information without consuming the console session for a long period of time.

Additional and related improvements are also available for the **show cable tech-support** command.

For all supported releases, the **show controllers cable upstream spectrum** command displays the power in dBmV for a given frequency range for the specified upstream. The frequency range can cover any portion of the DOCSIS upstream frequency range (5 to 42 MHz), and the frequency range can be divided into a resolution as small as 12 KHz.

If a CM is specified by its IP address or MAC address, the power information for that particular CM is given. If no IP or MAC address is given, the command displays the background noise for the entire upstream. All displays use historical averaging of data collected at the time the command is used; historical information is not saved.



Note Cisco cable interface line cards always program the upstream's center frequency in 16-KHz increments, and this is the frequency displayed by the **show controller cable upstream** command. For example, if you use the **cable upstream frequency** command to specify a center frequency of 27 MHz (**cable upstream** *x* **frequency 27000000**), the actual center frequency will be 27.008 MHz, which is the next-highest 16-KHz boundary.



Tip By default, the **show controller cable upstream** command displays its output to the router's console port. To display the command's output when logged in during a Telnet session over an Ethernet port, use the **terminal monitor** command before giving the **show controller cable upstream** command.

Examples

The following example shows the **show controllers cable upstream** command displaying the power information for a particular CM on upstream 5 of cable interface slot 3/0. The power information is displayed over the entire upstream (5–42 MHz), with a resolution of 5 MHz:

```
Router# show cable modem

MAC Address    IP Address      I/F     MAC         Prim  RxPwr Timing Num  BPI
                                       State       Sid   (db)  Offset CPEs Enbld
...
00d0.ba77.7595 10.20.114.34    C3/0/U5 online      1     0.25  2740   1    yes
```

```
00d0.ba77.7621 10.20.114.17    C3/0/U5 online      2     0.25  2740   2    yes
00d0.ba77.7533 10.20.114.55    C3/0/U5 online      3     0.25  2740   1    yes
...
Router# show controllers cable 3/0 upstream 5 spectrum 10.20.114.34 5 42 5

02:16:49: Spectrum DATA(@0x4B060004) for u5: 4995-41991KHz(resolution 4992KHz, sid 1):
02:16:49: Freq(KHz) dBmV Chart
02:16:49: 4995 :    -5   *************************
02:16:49: 9987 :    -7   ************************
02:16:49: 14979:    -24  ****************
02:16:49: 19971:    -35  **********
02:16:49: 24963:    -39  ********
02:16:49: 29955:    -35  **********
02:16:49: 34947:    -37  *********
02:16:49:
Router#
```

Note The output for each frequency range includes a time-stamp, the ending frequency for each range (in KHz), the historical average power level for that range (in dBmV), and a series of asterisks that provides a graphical representation of the noise floor level for the signal (a stronger signal is indicated by more asterisks).

The following example shows a partial display of the background noise data for upstream 4 of cable interface slot 6/0. The command covers the entire upstream spectrum (5–42 MHz) at the minimum resolution of 12 KHz.

```
Router# show controller cable 6/0 upstream 4 spectrum 5000 42000 12


02:15:54: Spectrum DATA(@0x4B060004) for u5: 4995-41991KHz(resolution 12KHz, sid 1):
02:15:54: Freq(KHz) dBmV Chart
02:15:54: 4995 :    -100
02:15:54: 5007 :    -67
02:15:54: 5019 :    -67
02:15:54: 5031 :    -67
02:15:54: 5043 :    -64
02:15:54: 5055 :    -64
02:15:54: 5067 :    -61
...
02:15:54: 8199 :    -67
02:15:54: 8211 :    -61
02:15:54: 8223 :    -64
02:15:54: 8235 :    -57
02:15:54: 8247 :    -49  ***
02:15:54: 8259 :    -52  **
02:15:54: 8271 :    -46  *****
02:15:54: 8283 :    -45  *****
02:15:54: 8295 :    -52  **
02:15:54: 8307 :    -48  ****
02:15:54: 8319 :    -45  *****
02:15:54: 8331 :    -41  *******
02:15:54: 8343 :    -39  ********
02:15:54: 8355 :    -39  ********
02:15:54: 8367 :    -40  ********
02:15:54: 8379 :    -43  ******
02:15:54: 8391 :    -44  ******
02:15:54: 8403 :    -33  ***********
02:15:54: 8415 :    -32  ************
02:15:54: 8427 :    -30  *************
```

```
02:15:54: 8439 :    -27  **************
02:15:54: 8451 :    -28  **************
02:15:54: 8463 :    -36  **********
02:15:54: 8475 :    -40  ********
02:15:54: 8487 :    -37  *********
02:15:54: 8499 :    -40  ********
02:15:54: 8511 :    -39  ********
02:15:54: 8523 :    -28  **************
02:15:54: 8535 :    -29  *************
02:15:54: 8547 :    -27  **************
02:15:54: 8559 :    -29  *************
02:15:54: 8571 :    -40  ********
02:15:54: 8583 :    -36  **********
02:15:54: 8595 :    -28  **************
02:15:54: 8607 :    -30  *************
...
02:15:54: 11247:    -40  ********
02:15:54: 11259:    -44  ******
02:15:54: 11271:    -44  ******
02:15:54: 11283:    -46  *****
02:15:54: 11295:    -46  *****
02:15:54: 11307:    -42  *******
02:15:54: 11319:    -46  *****
02:15:54: 11331:    -48  ****
02:15:54: 11343:    -53  *
02:15:54: 11355:    -55
02:15:54: 11367:    -54  *
02:15:54: 11379:    -57
02:15:54: 11391:    -61
02:15:54: 11403:    -60
02:15:54: 11415:    -60
02:15:54: 11427:    -60
02:15:54: 11439:    -61
02:15:54: 11451:    -57
02:15:54: 11463:    -58
02:15:54: 11475:    -67
02:15:54: 11487:    -58
...
```

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable upstream hop-priority	Determines the order of the corrective actions to be taken when ingress noise exceeds the allowable value for an upstream.
cable upstream modulation-profile	Configures an upstream for one modulation profile (static profile) or two modulation profiles (Dynamic Upstream Modulation).
show cable hop	Displays the current hop period and threshold for an upstream, along with other statistics.
show cable modem cnr	Displays information about the upstream carrier-to-noise ratio (CNR) for a particular cable modem.

Command	Description
show cable modulation-profile	Displays the cable modulation profiles that have been created.
show controllers cable	Displays detailed statistics for the cable interface.

show controllers clock-reference

To display hardware information, register values, and current counters for the TCC+ card or the Cisco cable clock card, use the **show controllers clock-reference** command in privileged EXEC mode.

show controllers clock-reference

Syntax Description

This command has no keywords or arguments.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(1a)T1	This command was introduced.
12.1(2)EC1	This command was supported on the EC train.
12.2(2)XF	This command was supported for the TCC+ card on Cisco uBR10012 routers.
12.2(4)BC1	Support was added to the Release 12.2 BC train.

Usage Guidelines

To reset the counters that are displayed with the **show controllers clock-reference** command, use the **cable clock clear-counters** command.

Note This command is not applicable on the SC train.

This command supports the Cisco CMTS clock feature set, which provides a synchronized clock for improved Voice-over-IP (VoIP) operations. The clock feature set requires one of the following configurations:

- A Cisco uBR10012 router with one or two TCC+ cards that are connected to an external national clock source.
- A Cisco uBR7246 VXR router using a Cisco uBR-MC16S, Cisco uBR-MC16E, Cisco uBR-MC28C, or Cisco uBR-MC28C-BNC cable interface line card. The router must also be equipped with a Cisco cable clock card and be running Cisco IOS 12.1(1a)T1, 12.1(2)EC1, or a later release. The Cisco cable clock card should be connected to an external national clock source.

Only these cable interface cards support the external clock card reference from a clock card to distribute that signal to CMs or set-top boxes (STBs) attached to the specific network segments. You can use other cable interface cards, such as the Cisco uBR-MC16C, with the clock card, but these other cable interfaces will not synchronize their downstream SYNC messages with the external clock source.

Each CM or STB must also support VoIP applications and the clock feature set. For example, the Cisco uBR924, running Cisco IOS Release 12.0(7)T or later, supports clock card feature automatically.

Examples

The following is sample output from the **show controllers clock-reference** command for a Cisco uBR7246 VXR router with a national clock card:

```
Router# show controllers clock-reference

National clock card with T1 controller
Control register     :0x4
Status register      :0x54
LIU Config Register 0:0x0
LIU Config Register 1:0x0
1 events reported in 266636 seconds
Primary active :1, LOS :0
Secondary active :0, LOS :1
Holdovers :0, HW faults :0
Router#
```

The following is sample output from the **show controllers clock-reference** command for a Cisco uBR10012 router with two TCC+ cards.



Note Each TCC+ card—Active and Backup—has its own separate set of registers.

```
Router# show controllers clock-reference

Controllers for Card in Slot: 1
Interrupt Status Reg                 : 0x0
Interrupt Mask Reg                   : 0x0
UCPC Bus Control Status Reg          : 0x4035
Push Button Status Reg               : 0x0
Line Card Presence Status Reg        : 0x21
TSRG Control Reg                     : 0xB800
LC Power off Control Reg             : 0x0
PEMA Voltage Monitor High Time Reg   : 0x0
PEMA Voltage Monitor Total Time Reg  : 0x0
PEMA Current Monitor High Time Reg   : 0x0
PEMA Current Monitor Total Time Reg  : 0x0
PEMB Voltage Monitor High Time Reg   : 0x66
PEMB Voltage Monitor Total Time Reg  : 0xCD
PEMB Current Monitor High Time Reg   : 0x1C
PEMB Current Monitor Total Time Reg  : 0x34
LIU0 Read Write Reg                  : 0x11
LIU1 Read Write Reg                  : 0x11
LCD Control Reg RS0                  : 0x39
LCD Control Reg RS1                  : 0x39
General Purpose Control Reg 0        : 0x2
General Purpose Control Reg 1        : 0x2
General Purpose Control Reg 2        : 0x40
LC Power off Status Reg              : 0x0
Sec Clock Control Reg                : 0x81
Sec Clock Status Reg                 : 0x1
Push Button Input Reg                : 0x0
LC Presence Input Reg                : 0x21
Compare Errors rcvd from 1/1: 0
Parity Errors rcvd from 1/1 : 0
Controllers for Card in Slot: 2
Interrupt Status Reg                 : 0x0
Interrupt Mask Reg                   : 0x0
UCPC Bus Control Status Reg          : 0x4053
Push Button Status Reg               : 0x0
Line Card Presence Status Reg        : 0x21
TSRG Control Reg                     : 0xB800
LC Power off Control Reg             : 0x0
PEMA Voltage Monitor High Time Reg   : 0x0
```

```
PEMA Voltage Monitor Total Time Reg  : 0x0
PEMA Current Monitor High Time Reg   : 0x0
PEMA Current Monitor Total Time Reg  : 0x0
PEMB Voltage Monitor High Time Reg   : 0x66
PEMB Voltage Monitor Total Time Reg  : 0xCD
PEMB Current Monitor High Time Reg   : 0x1C
PEMB Current Monitor Total Time Reg  : 0x34
LIU0 Read Write Reg                  : 0x30
LIU1 Read Write Reg                  : 0x11
LCD Control Reg RS0                  : 0x66
LCD Control Reg RS1                  : 0x20
General Purpose Control Reg 0        : 0x0
General Purpose Control Reg 1        : 0x1
General Purpose Control Reg 2        : 0x43
LC Power off Status Reg              : 0x0
Sec Clock Control Reg                : 0x80
Sec Clock Status Reg                 : 0x1
Push Button Input Reg                : 0x0
LC Presence Input Reg                : 0x21
Compare Errors rcvd from 2/1: 0
Parity Errors rcvd from 2/1 : 0
PEM A Power = 0w, PEM B Power = 343w
Router#
```



Note The **show controllers clock-reference** command might display compare errors on the Cisco uBR10012 router because there could be a slight delay at system startup before the TCC+ cards synchronize with each other. These initial compare errors can be ignored and cleared with the **cable clock clear-counters** command.

Most of the information shown by the **show controllers clock-reference** command is in the form of a hexadecimal bitfield that is not meaningful for normal operations, but the following fields can be useful in troubleshooting problems with the TCC+ and cable interface line cards:

- UCPC Bus Control Status Reg—Displays the status of both TCC+ cards and whether the LCD Display Panel is present.
- Line Card Presence Status Reg—Provides a software view of whether a cable interface line card is physically present in the Cisco uBR10012 chassis.
- LC Presence Input Reg—Provides a hardware view of whether a cable interface line card is physically present in the Cisco uBR10012 chassis.
- LC Power off Status Reg—Indicates whether a cable interface line card slot has been powered off using the **cable power** command.

The table below shows how to interpret these fields:

Table 201: show controllers clock-reference Field Descriptions

Field	Description

UCPC Bus Control Status Reg	Displays the status of both TCC+ cards and of the LCD Display Panel. Each TCC+ card displays this field from its own point of view, where "this card" refers to itself and "the other card" refers to the other TCC+ card slot.
	• Bits 2–0 display the status of the other TCC+ card:
	  • 0x00=No card.
	  • 0x03=The other card is the backup card.
	  • 0x05=The other card is the active card.
	• Bit 3 is set to 1 upon a state change for the other TCC+ card.
	• Bits 6–4 display the status of this TCC+ card:
	  • 0x00=No card.
	  • 0x03=This card is the backup card.
	  • 0x05=This card is the active card.
	  • 0x06=This card has assumed the active card role, because the other card had been active but is now unresponsive.
	• Bit 7 is set to 1 upon a state change for this TCC+ card.
	• Bits 13–8 are unused.
	• Bit 14 is set to 1 if the LCD Display Panel is present.
	• Bit 15 is set to 1 if the presence of the LCD Display Panel has changed since the counters were last cleared.

The most common bit patterns for the UCPC Bus Control Status Reg field are: • 0x4003—This TCC+ card is not present, the other card is the active card, and an LCD Display is present. • 0x4030—This TCC+ card is the active card, the other card is not present, and an LCD Display is present. • 0x4035—This TCC+ card is the backup card, the other card is the active card, and an LCD Display is present. • 0x4053—This TCC+ card is the active card, the other card is the backup card, and an LCD Display is present. • 0x4065—This TCC+ card has assumed the active card role, because the other card had been active but is now unresponsive. The LCD Display is present.	

Field	Description
Line Card Presence Status Reg	The first eight bits indicate whether the line card is physically present, and the high eight bits indicate whether the card's physical state has changed since the counters were last cleared using the **cable clock clear-counters** command. 0x0001=slot 5/0 contains a cable interface card 0x0002=slot 5/1 contains a cable interface card 0x0004=slot 6/0 contains a cable interface card 0x0008=slot 6/1 contains a cable interface card 0x0010=slot 7/0 contains a cable interface card 0x0020=slot 7/1 contains a cable interface card 0x0040=slot 8/0 contains a cable interface card 0x0080=slot 8/1 contains a cable interface card 0x0100=slot 5/0 has changed physical state 0x0200=slot 5/1 has changed physical state 0x0400=slot 6/0 has changed physical state 0x0800=slot 6/1 has changed physical state 0x1000=slot 7/0 has changed physical state 0x2000=slot 7/1 has changed physical state 0x4000=slot 8/0 has changed physical state 0x8000=slot 8/1 has changed physical state
LC Presence Input Reg	The lower eight bits of this register indicate whether a cable interface line card is physically present in the chassis slot. The bit meanings are the same as the lower eight bits the Line Card Presence Status Reg. The upper eight bits of this register are unused.
Note The Line Card Presence Status Reg displays the line card state as determined by the Cisco IOS software, while the LC Presence Input Reg displays the state as determined by the chassis hardware.	

Field	Description
LC Power off Status Reg	0x01=slot 5/0 is powered off 0x02=slot 5/1 is powered off 0x04=slot 6/0 is powered off 0x08=slot 6/1 is powered off 0x10=slot 7/0 is powered off 0x20=slot 7/1 is powered off 0x40=slot 8/0 is powered off 0x80=slot 8/1 is powered off



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable clock clear-counters	Clears the counters displayed with the **show controllers clock-reference** command.
cable power	On the Cisco uBR10012 routers, turns a cable interface line card on or off, which updates the LC Power off Status registers displayed with the **show controllers clock-reference** command.
show cable clock	Displays the status of the Cisco cable clock card and the TCC+ card.

show controllers downstream-cable

To display information about an OFDM channel or RF channel on the Cisco cBR Series Converged Broadband Routers, use the **show controllers downstream-cable** command in user EXEC or privileged EXEC mode.

show controllers downstream-cable { *slot/port slot/subslot/port* } [**prof-order** | **verbose**] [**counter ofdm-channel** | **counter rf-channel** | { **snmp-rolling-avg** }]

Syntax Description

slot	Slot where the line card resides. For Cisco cBR Series Converged Broadband Routers routers, the valid values are 0–3 and 6–9.
subslot	For Cisco cBR Series Converged Broadband Routers routers, the valid value is 0.
port	Downstream port number. For Cisco cBR Series Converged Broadband Routers, the permitted range is 0–15.
prof-order	Displays information about the profile downgrade ordering on a specific OFDM channel.
verbose	Displays the details of an OFDM channel profile.
counter ofdm-channel	Displays the details of an OFDM channel.
rf-channel	Displays the RF channel information.
snmp-rolling-avg	Displays the rolling average value that is computed for each of the DS SCQAM channels.

Command Modes

User EXEC (all options except **tech-support**), Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Gibraltar 16.10.1f	QAM utilization percentage is now displayed in the **show controllers downstream-Cable counter rf-channel** command output.
Cisco IOS XE Dublin 17.12.1y	The **snmp-rolling-avg** option is introduced.

This example shows the output of the **show controllers downstream-cable***3/0/0* **counter ofdm-channel snmp-rolling-avg** command (Cisco IOS XE Dublin 17.12.1y):

```
Router#show controller downstream-cable 3/0/0 counter ofdm-channel snmp-rolling-avg
Contr- Chan# Profile/  Packets  Bytes     MaxRate  Rate       SnmpRollingAvg
oller        PLC                         (Mbps)   (Mbps)     (%)
3/0/0  158   Total     359757   280164645   -      23.148686  99
3/0/0  158   0         64644    3734106    252     0.003928
3/0/0  158   1         177103   268665251  315     23.136879
```

```
3/0/0  158   PLC-MMM   117999   7748601           0.007879
3/0/0  158   PLC-EM    0        0                 0.000000
3/0/0  158   PLC-TR    0        0                 0.000000
```

This example shows the output of the **show controllers downstream-cable***3/0/0* **counter rf-channel snmp-rolling-avg** command (Cisco IOS XE Dublin 17.12.1y and later):

```
Router#show controllers downstream-Cable 3/0/0 counter rf-channel snmp-rolling-avg
Contr- RF   RF      MPEG/DEPI  MPEG/ MPEG/DEPI  MPEG/DEPI MPEG/  MAP/UCD  User   Snmp-
oller  Chan chan    Packets    DEPI  bytes      bps       DEPI   Packets  Mbps   Rolling-
             type    Tx         pps                        Mbps   Tx              Avg (%)
3/0/0   0   DOCSIS  6419007    7899  445639303  4360088   04.36  6417998  00.00   11
3/0/0   1   DOCSIS  6419056    7901  442926814  4360254   04.36  6418004  00.00   11
3/0/0   2   DOCSIS  6418980    7900  442911624  4360234   04.36  6417964  00.00   11
3/0/0   3   DOCSIS  6416635    7901  442746294  4360234   04.36  6415608  00.00   11
3/0/0   4   DOCSIS  6416595    7901  442746671  4360275   04.36  6415539  00.00   11
3/0/0   5   DOCSIS  6416460    7901  442735654  4360254   04.36  6415401  00.00   11
```

Note The **show controller downstream-cable** *slot/subslot/port* **counter rf-channel snmp-rolling-avg** command uses a slightly different algorithm to compute the **snmp-rolling-avg** when compared to QAM Util Percentage calculated for the **show controller downstream-cable** *slot/subslot/port* **counter rf-channel** command.

This example shows the output of the **show controllers downstream-cable** *2/0/0* **counter rf-channel** command (Cisco IOS XE Dublin 17.12.1y and later):

```
Router#show controller downstream-Cable 2/0/0 counter rf-channel
Load for five secs: 5%/0%; one minute: 5%; five minutes: 5%
No time source, *11:11:29.375 EDT Fri May 3 2024

Contr- RF   RF      MPEG/DEPI MPEG/ MPEG/DEPI   MPEG/DEPI MPEG/  MAP/UCD   User   QAM
oller  Chan chan    Packets   DEPI  bytes       bps       DEPI   Packets   Mbps   Util
             type    Tx        pps                       Mbps   Tx              Percentage
2/0/0  0    DOCSIS  32670276  3986  2656553760  2640173   02.64  32656745  00.00  7.04
2/0/0  1    DOCSIS  32690310  3986  2658170580  2640173   02.64  32676770  00.00  7.04
2/0/0  2    DOCSIS  32690310  3986  2658170652  2640173   02.64  32676771  00.00  7.04
2/0/0  3    DOCSIS  32690305  3986  2658170652  2640173   02.64  32676772  00.00  7.04
2/0/0  4    DOCSIS  32690288  3986  2658169108  2640260   02.64  32676748  00.00  7.04
2/0/0  5    DOCSIS  32690280  3986  2658168524  2640260   02.64  32676742  00.00  7.04
2/0/0  6    DOCSIS  32690283  3986  2658168676  2640260   02.64  32676743  00.00  7.04
2/0/0  7    DOCSIS  32710300  3986  2658168676  2640260   02.64  32676744  00.00  7.04
2/0/0  8    DOCSIS  32828426  3986  2868702301  2640260   02.64  32676744  00.00  7.04
```

This example shows the output of the **show controllers downstream-cable** *6/0/0* **counter rf-channel** command:

```
Router#show controllers downstream-Cable 6/0/0 counter rf-channel
Contr- RF   RF          MPEG/DEPI  MPEG/  MPEG/DEPI MPEG/  MPEG/  Sync
oller  Chan chan        Packets    DEPI   bytes     DEPI   DEPI   Packets
             type        Tx         pps              bps    Mbps   Tx
7/0/3  50   VIDEO-SYNC  15208      9      2859104   15033  00.01   0
7/0/3  51   VIDEO-SYNC  15208      9      2859104   15033  00.01   0
7/0/3  52   VIDEO-SYNC  15208      9      2859104   15033  00.01   0
7/0/3  53   VIDEO-SYNC  15208      9      2859104   15033  00.01   0
```

```
7/0/3  54   VIDEO-SYNC  15208      9      2859104   15034  00.01   0
7/0/3  55   VIDEO-SYNC  15208      9      2859104   15034  00.01   0
7/0/3  56   VIDEO-SYNC  15208      9      2859104   15034  00.01   0
7/0/3  57   VIDEO-SYNC  15208      9      2859104   15034  00.01   0
7/0/3  58   VIDEO-SYNC  15208      9      2859104   15034  00.01   0

MAP/UCD  User    QAM
Packets  Mbps    Util
Tx               Percentage
0        00.01    0.04
0        00.01    0.04
0        00.01    0.04
0        00.01    0.04
0        00.01    0.04
0        00.01    0.04
0        00.01    0.04
0        00.01    0.04
0        00.01    0.04
```

This example shows the output of the **show controllers downstream-cable** *7/0/0* **counter ofdm-channel** command:

```
Router#show controllers downstream-Cable 7/0/0 counter ofdm-channel

Controller Chan# Profile/PLC  Packets  Bytes   MaxRate Rate     Utilization
                                                (Mbps)  (Mbps)     (%)
7/0/0      158   Total         37252   3427288  -      0.011039   0.0
7/0/0      158   0             0       0        688    0.000000   0.0
7/0/0      158   1             0       0        864    0.000000   0.0
7/0/0      158   PLC-MMM       37252   3427288         0.011039
7/0/0      158   PLC-EM        0       0               0.000000
7/0/0      158   PLC-TR        0       0               0.000000
```

Related Commands

Command	Description
show downstream ofdm configuration	Displays OCD and DPD messages from RPD.
show downstream ofdm counter profile	Displays per-profile counter on RPD.
show downstream channel counter	Displays the drop counter in the DPS module.

show controllers downstream-cable rf-channel prof-order

To display which OFDM Profile Downgrade method is configured, use the **show controllers integrated-cable** *slot/subslot/port* **rf-channel** *rf-channel* **prof-order** command in privileged EXEC mode.

show controllers downstream-cable *slot/subslot/port* **rf-channel** *rf-channel* **prof-order**

Syntax Description

controllers	Interface controller status.
downstream-cable	Downstream Cable controller.
rf-channel *rf-channel*	RF channel counters.
slot/subslot/port	Identifies the cable interface. • *slot* — Slot where the line card resides. The valid range is 0–3 and 6–9. • *subslot* — Subslot where the line card resides. The available slot is 0. • *port* — Downstream port number on the line card. The valid range is 0–15.
prof-order	Displays OFDM Profile Downgrade method. The two methods are: • **bit-loading** - Legacy method of profile downgrade. • **capacity** - This option is configure if you wish to downgrade the profile based on the capacity. This option does not skip any good profiles.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1z	The **Ordering method** is displayed in the command output.
Cisco IOS XE Everest 16.6.1	This command is introduced on the Cisco cBR-8 Series Converged Broadband Routers.

Examples

The following example shows a sample output for the **show controllers downstream-cable** *slot/subslot/port* **rf-channel** *rf-channel* **prof-order** command on Cisco cBR-8 Series Converged Broadband Routers, when the Capacity method is configured:

```
Router# show controllers downstream-cable 8/0/0 rf-channel 160 prof-order
OFDM channel data profile order: [8/0/0:160]
Ordering method  : Capacity
RxMER Subcarrier Difference Tolerance: 2%
-----------------------------------------------
Data Profile:       Downgrade Profile:
 Profile 1     ->    Profile 2
 Profile 2     ->    Profile 3
```

```
 Profile 3     ->    Profile 4
 Profile 4     ->    Profile 0
```

Examples

The following example shows a sample output for the **show controllers downstream-cable** *slot/subslot/port* **rf-channel** *rf-channel* **prof-order** command on Cisco cBR-8 Series Converged Broadband Routers, when the Bit-loading method is configured:

```
Router# show controllers downstream-cable 8/0/0 rf-channel 160 prof-order
OFDM channel data profile order: [8/0/0:160]
Ordering method  : Bit-loading
RxMER Subcarrier Difference Tolerance: 2%
-----------------------------------------------
Data Profile:       Downgrade Profile:
 Profile 1     ->    Profile 3
 Profile 2     ->    Profile 4
 Profile 3     ->    Profile 0
 Profile 4     ->    Profile 0
```

Related Commands

Command	Description
show controller cable	Displays information about the interface controllers for a cable interface on the Cisco CMTS router.

show controllers jacket

To display Wideband SIP register values, use the **show controllers jacket** command in privileged EXEC mode.

show controllers jacket *slot/subslot* [**all** | **cpld** | **processor** | **vanadium** | **spi_fpga**]

Syntax Description

slot	The slot where the Wideband SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for the Wideband SIP.
subslot	The subslot where the Wideband SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
all	(Optional) Displays values for all registers.
cpld	(Optional) Displays values for the CPLD registers.
processor	(Optional) Displays values for the processor registers.
vanadium	(Optional) Displays values for the Vanadium registers.
spi_fpga	(Optional) Displays values for the SPI FPGA registers.

Command Default

If you do not specify **all** or the keyword for a specific register, **show controllers jacket** displays values for all registers.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Use the **show controllers jacket** command to display Wideband SIP register values. Values for the following Wideband SIP components can be displayed:

- CPLD—A Complex Programmable Logic Device (CPLD) that contains logic to control resets, the I/O bus, and SPA OIR.
- Processor—The Wideband SIP on-board processor that is responsible for configuring the chips on the SIP, communication to the PRE module, and communication with the SPA.
- Vanadium—A Cisco-designed ASIC that provides a link between the Wideband SIP and the PRE module.
- SPI FPGA—A bus converter that supports up to eight channels on a POS-PHY Level 3 (PL3) interface and up to eight channels shared between the two System Packet Interface Level 4 Phase 2 (SPI 4.2) interfaces. The SPI FPGA also interfaces the on-board processor complex to the Wideband SIP bus.

Examples

The following examples display **show controllers jacket** command output for the **cpld** and **processor** keywords:

```
Router# show controllers jacket 1/0 cpld
CPLD registers

[A4000000] Version:4
[A4000004] Clock frequency:32
[A4000008] Reset status and control:1
[A400000C] Software reset reason:0
[A4000010] Datapath reset: 19
[A4000014] SPA 0 OIR register: FF
[A4000018] SPA 1 OIR register: FF
[A400001C] SPA OIR interrupt status: (would clear on read)
[A4000020] SPA OIR interrupt mask: FF

Router# show controllers jacket 1/0 processor
Processor Registers
 Port A:
  Pin Assignment      C00000
  Data Direction      FF437C3A
  Open-Drain          1800F
  Data                A88005
  Special Options     0000
 Port B:
  Pin Assignment      0008
  Data Direction      FFFFBEF
  Open-Drain          0000
  Data                BF0FEFC
  Special Options     0008
 Port C:
  Pin Assignment      3580C
  Data Direction      FF7CA7F3
  Open-Drain          0000
  Data                84D004
  Special Options     0000
 Port D:
  Pin Assignment      30005
  Data Direction      FFCFFFE
  Open-Drain          30000
  Data                30000
  Special Options     30000
```

Related Commands

Command	Description
show controllers modular-cable	Displays Wideband SPA information.

show controllers modular-cable

To display information about the Cisco uBR-MC3GX60V cable line card and Wideband SPA, use the **show controllers modular-cable** command in privileged EXEC mode.

show controllers modular-cable slot/*subslot*/*bay* {**brief** | **fpga_registers** | {**all** | **sfp** [**port** *port_num*] | **ge_phy** [**port** *port_num*]}}

Cisco IOS Releases 12.3(23)BC5, 12.2(33)SCB and later releases
show controllers modular-cable *slot*/*bay* /*port*
slot/*subslot*/*controller* {**all** | **association** | **bpi-entry** *bpi-index* | **brief** | **config** | **crashinfo** | **dsid-log search** *min max* | **dsid-ref-log dsid** *n* | **errors** | **fpga_version** | **fpga_registers** | **ge_phy** [**port** *port_num*] | **iofpga** | **mapping** [*rf-channelwb-channel*] | **registers** | **rf-channel** *channel_number* | **sfp** [**port** *port_num*] | **spa-log-all** | **stat-index-log search** *min max* | **status** | **wideband-channel** *channel_number*}

Note The options mentioned in the syntax above are indicative and may vary with the cable interface line card used in the Cisco uBR10012 universal broadband router.

Syntax Description

slot/subslot/bay or slot/bay/port	Wideband SPA slot, subslot, bay, and port. • *slot*—Slot where the Wideband SIP resides. The valid values are 1 and 3. • *subslot*—Subslot where the Wideband SIP resides. The valid value is 0. • *bay*—Wideband SIP bay where the SPA resides. The valid range is from 0 to 3.
slot/subslot/controller	Modular-cable line card slot, subslot, and controller. • *slot*—Modular-cable line card slot. The valid value range is from 5 to 8. • *subslot*—Modular-cable line card subslot. The valid value is 0 or 1. • *controller*—Modular-cable line card controller. The valid range is from 0 to 2.
port	Specifies the interface number on the SPA.
all	(Optional) Displays all information about the modular-cable controller.
association	Displays associations between the MAC domains and wideband interfaces.
bpi-entry *bpi-index*	Displays information about Baseline Privacy Interface (BPI). • *bpi-index*—BPI index. The valid range is from 0 to 24575.
brief	(Optional) Displays a brief summary of the controller information.
config	Displays information about the configuration of the downstream field-programmable gate array (FPGA).
counters	Displays information about channel counters.
crashinfo	Displays crash information for the Wideband SPA.

dsid-log search *min max*	Searches for downstream IDs (DSID) in the Wideband SPA logs. • *min*—Minimum search value. The valid range is from 1 to 65535. • *max*—Maximum search value. The valid range is from 1 to 65535. **Note** This keyword is used to collect data only when requested by Cisco TAC.
dsid-ref-log dsid *n*	Retrieves last statistical index and ref count for DSID. • *n*—DSID search value. The valid range is from 1 to 65535. **Note** This keyword is used to collect data only when requested by Cisco TAC.
errors	Displays errors.
fpga_registers	(Optional) Displays information on the Wideband SPA Field-Programmable Gate Array (FPGA) (Blaze) registers.
fpga_version	Displays the FPGA version of the cable interface line cards.
ge_phy	(Optional) Displays physical layer (PHY) information on the Gigabit Ethernet ports.
iofpga	Displays information about I/O FPGA.
mapping	Displays information about the mapping of the configured RF channel and wideband channels. • *rf-channel*—RF channel counters. The valid range is from 0 to 31. If not specified all channels are displayed. • *wb-channel*—Wideband channel counters.The valid range is from 0 to 31. If not specified all channels are displayed.
registers	Displays registers for the downstream FPGAs.
rf-channel *channel-number*	Displays information for the RF channel indicated by *channel-number*. • *channel-number*—RF channel number. The valid values are from 0 to 23.
sfp	(Optional) Displays information about the small form-factor pluggable (SFP) modules.
stat-index-log search *min max*	Searches for downstream statistical indexes in SPA logs. • *min*—Minimum search value. The valid range is from 1 to 65535. • *max*—Maximum search value. The valid range is from 1 to 65535. **Note** This keyword is used to collect data only when requested by Cisco TAC.
spa-log-all	Displays SPA debug logs. **Note** This keyword is used to collect data only when requested by Cisco TAC.

port *port_num*	(Optional) When used with **sfp** or **ge_phy** keywords, the information displayed is for the specified Gigabit Ethernet port. If the **port** *port_num* argument is not used, the information displayed is for both Gigabit Ethernet ports.
status	Displays status of the downstream FPGAs.
wideband-channel *channel-number*	Displays information about the wideband channel indicated by *channel-number*. • *channel-number*—Wideband channel number. The valid values are from 0 to 31.

Command Default

If you specify no keyword or argument, all categories of information for both Gigabit Ethernet ports are displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.3(23)BC5	The command output was modified.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port.*
12.3(23)BC6	The command output was modified to capture the SPA environment monitoring information.
12.2(33)SCC	The command output was modified to capture the toggle information.
12.2(33)SCE	This command was modified to include multiple keywords for the Cisco uBR-MC3GX60V cable line card.
12.2(33)SCG	This command was modified to include **dsid-log**, **dsid-ref-log**, **stat-index-log**, and **spa-log-all** keywords.
12.2(33)SCH	Support was added for the Bonding Across 3G60 Controllers Support feature added. The valid ranges for *rf-channel* and *wb-channel* counters for the **mapping** option are specified.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

If you specify **all** instead of **sfp** or **ge_phy**, information for the SFP module and PHY is displayed.



Note This command will not provide crash dump information for the Cisco 10000 series SIP-600. Use the show diag 1/0 crashdump command to obtain this information for the Cisco 10000 Series SIP-600.

Example of the show controllers modular-cable Command that displays BPI key information stored on the Cisco uBR-MC3GX60V line card.

The following is a sample output of the show controller integrated-cable command with the bpi-entry keyword:

```
Router# show controllers modular-Cable card 8/1 bpi-entry 1
BPI Index: 1 Segment: 0
 Even Key: Invalid, Odd Key: Invalid
 Key Sequence Number: 0 Security Association: 0x0
 Key Type: DES
 Even Key: 0000-0000-0000-00  IV: 0000-0000-0000-0000
  Odd Key: 0000-0000-0000-00  IV: 0000-0000-0000-0000
```

Table 202: show controller modular-cable Field Descriptions

Field	Description
BPI Index	BPI index number.
Segment	Hardware segment used by the DOCSIS MAC address.
Even Key	Current value of the Even Key in the BPI entry.
Odd Key	Current value of the Odd Key in the BPI entry.
Key Sequence Number	Key sequence number.
Security Association	Security association identifier.
Key Type	Type of key stored based on the encryption algorithm (Data Encryption Standard [DES] or Advanced Encryption Standard [AES]).

The following is a sample output of the **show controllers modular-cable** command with **fpga_registers**, **sfp**, and **ge_phy** keywords. In some cases, only part of the output is shown.

```
Router# show controllers modular-cable 1/0/0 fpga_registers
REG blz_sw_rev_id offset 0x00000000 = 0x00000000
REG blz_hw_rev_id offset 0x00000004 = 0x04030422
REG rst_ctrl_reg_0 offset 0x00000008 = 0x00000000
REG led_ctrl_reg_0 offset 0x00000010 = 0x00000001
REG gp_config_reg_0 offset 0x00000030 = 0x80000000
REG test_reg offset 0x000000B0 = 0xDEADBEAF
REG adr_trap_reg offset 0x000000B4 = 0x00000040
REG spa_timeout_reg offset 0x000000B8 = 0x000003E8
REG spa_error_reg offset 0x000000BC = 0x0000000A
REG bm_int_stat_reg offset 0x00000100 = 0x00000000
REG sfp_all_int_stat_reg offset 0x00000104 = 0x00000000
REG spa_brd_int_stat_reg offset 0x00000108 = 0x00000203
REG spa_brd_int_en_reg offset 0x00000120 = 0x000000CC
REG spa_brd_int_ovrd_reg offset 0x00000130 = 0x00000000
REG sfp_int_stat_reg_0 offset 0x00000200 = 0x00000000
REG sfp_cfg_stat_reg_0 offset 0x00000204 = 0x00010007
REG sfp_int_stat_reg_1 offset 0x00000208 = 0x00000000
REG sfp_cfg_stat_reg_1 offset 0x0000020C = 0x00010007
REG blz_ctrl_stat_reg offset 0x00000300 = 0x0007FF01
REG dcm_status_reg offset 0x00000304 = 0x00000009
```

```
REG blz_sp_int_stat_reg_0 offset 0x00000310 = 0x00000008
...
Router# show controllers modular-cable 1/0/0 sfp port 1
SFP in port 1
SFP is present
SFP LOS is not detected
SFP TX FAULT is not detected
SFP TX is enabled
ID: SFP
        Extended ID: 4
        Connector: LC
        SONET compliance:  not specified
        Gigabit Ethernet compliance: 1000BASE-SX
        Fibre Channel link length:  not specified
        Fibre Channel transmitter technology:  not specified
        Fibre Channel transmission media:  not specified
        Fibre Channel speed:  not specified
        Encoding: 8B10B
        Bit Rate: 1300 Mbps
        50 micron-multimode fiber supported length: 550 m
        62.5 micron-multimode fiber supported length: 270 m
        Upper bit rate limit: not specified
        Lower bit rate limit: not specified
        Date code (yy/mm/dd): 05/02/23
        Vendor name: CISCO-AGILENT
        Vendor OUI: 12499
        Vendor Part Number (PN): QFBR-5766LP            Vendor Rev:
        Vendor SN (SN): AGS090855CE
        Options implemented:
                LOS Signal
                TX Fault Signal
                TX Disable Signal
        Enhanced options implemented: none
        Diagnostic monitoring implemented: none
        Idprom contents (hex):
        0x00:   03 04 07 00 00 00 01 00 00 00 00 01 0D 00 00 00
        0x10:   37 1B 00 00 43 49 53 43 4F 2D 41 47 49 4C 45 4E
        0x20:   54 20 20 20 00 00 30 D3 51 46 42 52 2D 35 37 36
        0x30:   36 4C 50 20 20 20 20 20 20 20 20 20 03 52 00 B5
        0x40:   00 1A 00 00 41 47 53 30 39 30 38 35 35 43 45 20
        0x50:   20 20 20 20 30 35 30 32 32 33 20 20 00 00 00 C4
        0x60:   00 00 06 C9 F0 FA 7C 01 B3 C8 41 6B 39 04 FC 85
        0x70:   BB 20 9E 00 00 00 00 00 00 00 00 00 B4 94 52 CC
        0x80:   FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        0x90:   FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        State: Initalized
Phased Initialization
        Phase Reached: 4
        Phase Exit Code: 0
        Phase Read Offset: 0
Socket Verification
Router# show controllers modular-cable 1/0/0 ge_phy port 0
Gigabit PHY information for port 0:
  PHY Status:
  status (reg 1) = 0x16D
    link is up, auto-negotiation is complete
    remote fault not detected, jabber not detected
  Extended status register (reg 15) = 0xC000
    1000BaseX full duplex capable    1000BaseX half duplex capable
  phy specific status (reg 17) = 0xAC14
    link is up (real-time), speed/duplex resolved
    speed: 1000 Mbps, duplex: full
    page not received, cable length is < 50m
    MDI cross-over status: MDI, downshift status: no
```

```
    energy detect status: sleep
    transmit pause: disabled, receive pause: enabled
    polarity: normal, jabber: no
  phy specific extended status (reg 27) = 0xB487
    Fiber/ copper auto selection disabled, fiber link
    Serial interface auto-negotiation bypass enabled
    Serial interface auto-negotiation bypass status:
      Link came up because regular fiber autoneg completed
    Interrupt polarity is active low
  receive error count: 0x0
  Auto-negotiation configuration and status:
    Auto-negotiation is enabled and is completed
    Speed/duplex is resolved to 1000 Mbps, full duplex
    Advertised capabilities: 1000BaseX/HD 1000BaseX/FD Pause capable (Asymmetric)
    Partner capabilities: 1000BaseX/FD
...
```



Note The above command output was modified to capture the SPA sensor temperature readings and error packet information.

The error information contains details about the:

- Timestamp of the capture.
- Interrupt state when packet is captured, which indicates the error type.
- Packet length.
- Blaze header part of the packet.

The following is a sample output of the show controllers modular-cable command with NO error packets.

```
Router# show controllers modular-Cable 1/0/1 | b reading
WBCMTS DOCSIS SPA temperature sensor 0, reading: 25C/77F
WBCMTS DOCSIS SPA temperature sensor 1, reading: 25C/77F
Error Packets Captured on Blaze SPI Interface:
Timestamp IntStat Len BlazeHeader
Detail Packet Content: (first 80 bytes, hex format)
```

The following is a sample output of the show controllers modular-cable command with captured error packets.

```
Router# show controllers modular-Cable 1/0/0
SPA 0 is present
status LED: [green]
Host 12V is enabled and is okay.
Power has been enabled to the SPA.
SPA reports power enabled and okay.
SPA reports it is okay and is NOT held in reset.
..................... <<< text omitted
WBCMTS DOCSIS SPA temperature sensor 0, reading: 26C/78F
WBCMTS DOCSIS SPA temperature sensor 1, reading: 25C/77F
Error Packets Captured on Blaze SPI Interface:
Timestamp IntStat Len BlazeHeader
000:00:12:49.190 C0000808 1510 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
000:00:13:04.948 C0000808 796 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
000:00:13:09.468 C0000808 60 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
000:00:13:14.320 C0000808 26 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
000:00:13:18.088 C0000808 496 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
Detail Packet Content: (first 80 bytes, hex format)
```

```
[Entry 00]
0x00: 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
0x10: 00 1C 9C 24 01 E0 2F 00 00 01 00 00 00 00 00 00
0x20: 00 0A 00 00 03 04 FD 00 00 48 03 FC 00 00 00 00
0x30: 00 00 00 00 00 00 00 05 00 00 00 00 80 06 12 78
0x40: 00 00 00 00 00 00 00 00 00 00 00 05 00 00 00 00
[Entry 01]
0x00: 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
0x10: 00 1C 9C 24 01 E0 2F 00 00 01 00 00 00 00 00 00
0x20: 00 0A 00 00 03 04 FD 00 00 48 03 FC 00 00 00 00
0x30: 00 00 00 00 00 00 00 05 00 00 00 00 80 06 12 78
0x40: 00 00 00 00 00 00 00 00 00 00 00 05 00 00 00 00
[Entry 02]
0x00: 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
0x10: 00 1C 9C 24 01 E0 2F 00 00 01 00 00 00 00 00 00
0x20: 00 0A 00 00 03 04 FD 00 00 48 03 FC 00 00 00 00
0x30: 00 00 00 00 00 00 00 05 00 00 00 00
[Entry 03]
0x00: 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
0x10: 00 1C 9C 24 01 E0 2F 00 00 01
[Entry 04]
0x00: 00 00 00 00 01 00 00 00 00 00 00 00 00 0F C2 00
0x10: 00 1C 9C 24 01 E0 2F 00 00 01 00 00 00 00 00 00
0x20: 00 0A 00 00 03 04 FD 00 00 48 03 FC 00 00 00 00
0x30: 00 00 00 00 00 00 00 05 00 00 00 00 80 06 12 78
0x40: 00 00 00 00 00 00 00 00 00 00 00 05 00 00 00 00
```

Note The temperature sensor readings in the command output shown above is specific to the Cisco IOS Release 12.3(23)BC and will not appear in the Cisco IOS Release 12.2(33)SCB and later releases.

Beginning in Cisco IOS Release 12.3(23)BC6, the command output was modified to capture the SPA environment monitoring information. The environment monitoring information includes:

Temperature sensor information:

- Sensor number
- Current sensor reading
- Low threshold
- Warning threshold
- Critical threshold
- Shutdown threshold

Voltage sensor information:

- Nominal value of the rail
- Current voltage reading
- Low shutdown threshold
- Low warning threshold
- High warning threshold
- High shutdown threshold

The following is a sample output of the show controllers modular-cable command that displays the SPA environment monitoring information.

```
Router# show controllers modular-cable 1/0/0 | b SPA Env
SPA Environment Monitoring Information:
```

```
Temperature sensors for SPA-24XDS-SFP[1/0]:
Sensor   Reading  Low      Warning  Critical Shutdown
0        26C      0C       58C      68C      85C
1        27C      0C       58C      68C      85C
Voltage sensors for SPA-24XDS-SFP[1/0]:
Nominal  Reading  LowShut  LowWarn  HighWarn HighShut
3.300V   3.276V   3.069V   3.135V   3.465V   3.531V
2.500V   2.485V   2.325V   2.375V   2.625V   2.675V
1.200V   1.186V   1.116V   1.140V   1.260V   1.284V
1.800V   1.801V   1.674V   1.710V   1.890V   1.926V
```



Note The SPAs are shut down automatically when the sensor readings go beyond the threshold shutdown value.

In Cisco IOS Release 12.2(33)SCC, when the primary link on the SPA toggles more than five times within 30 seconds, and the backup link is UP, the backup link is selected for traffic. The link switches back to the primary link during the next primary link transition after 30 seconds or when the backup link fails. The show controllers modular-cable command output was modified to capture the toggle information.

The following is a sample output of the show controllers modular-cable command that displays the toggle information.

```
Router# show controllers modular-cable 1/1/0
SPA 1 is present
status LED: [green]
Host 12V is enabled and is okay.
Power has been enabled to the SPA.
SPA reports power enabled and okay.
SPA reports it is okay and is NOT held in reset.
Gigabit Ethernet Port Selected : Port 0
Receive Interface              : Out of Reset
Receive Interface              : Enabled
Transmit Interface             : Out of Reset
Transmit Interface             : Enabled
Primary Receive Clock          : Enabled
Backup Receive Clock           : Enabled
SFP [Port 0] : 1000BASE-SX Present
 Tx Enabled , LOS Not Detected , TxFault Not Detected
 Link Status [Port 0] : UP
Primary port Link Up   Events : 2
Primary port Link Down Events : 0
Backup  port Link Up   Events : 2
Backup  port Link Down Events : 0
Current Link Toggle Count     : 0
Link Toggle Suppressed        : TRUE
Link Toggle Suppress Events   : 0
SFP [Port 1] : 1000BASE-SX Present
 Tx Enabled , LOS Not Detected , TxFault Not Detected
 Link Status [Port 1] : UP
Wideband Channel information
Channel    RF bitmap   Police Info: Bytes      Interval
0          0x7                     0            0 ms
1          0xC                     0            0 ms
2          0x0                     0            0 ms
3          0x0                     0            0 ms
4          0x0                     0            0 ms
5          0x0                     0            0 ms
6          0x0                     0            0 ms
```

```
7           0x0                     0            0 ms
8           0x0                     0            0 ms
9           0x0                     0            0 ms
10          0x0                     0            0 ms
11          0x0                     0            0 ms
```

The following is a sample output for the **rf-channel** keyword:

```
Router# show controllers Modular-Cable 8/1/0 rf-channel
Ctrl Chan Frequency  Mod Annex IP Address      MAC Address    DEPI Remote ID
0    0    453000000  256 B     10.31.136.100   0022.9084.4e3f 101231
0    1    459000000  256 B     10.31.136.100   0022.9084.4e3f 101232
0    2    465000000  256 B     10.31.136.100   0022.9084.4e3f 101233
0    3    471000000  256 B     10.31.136.100   0022.9084.4e3f 101234
0    4    477000000  256 B     10.31.136.100   0022.9084.4e3f 101241
0    5    483000000  256 B     10.31.136.100   0022.9084.4e3f 101242
0    6    489000000  256 B     10.31.136.100   0022.9084.4e3f 101243
0    7    495000000  256 B     10.31.136.100   0022.9084.4e3f 101244
0    8    0          64  B     0.0.0.0         0000.0000.0000 0
0    9    0          64  B     0.0.0.0         0000.0000.0000 0
0    10   0          64  B     0.0.0.0         0000.0000.0000 0
0    11   0          64  B     0.0.0.0         0000.0000.0000 0
0    12   0          64  B     0.0.0.0         0000.0000.0000 0
0    13   0          64  B     0.0.0.0         0000.0000.0000 0
0    14   0          64  B     0.0.0.0         0000.0000.0000 0
0    15   0          64  B     0.0.0.0         0000.0000.0000 0
0    16   0          64  B     0.0.0.0         0000.0000.0000 0
0    17   0          64  B     0.0.0.0         0000.0000.0000 0
0    18   0          64  B     0.0.0.0         0000.0000.0000 0
0    19   0          64  B     0.0.0.0         0000.0000.0000 0
0    20   0          64  B     0.0.0.0         0000.0000.0000 0
0    21   0          64  B     0.0.0.0         0000.0000.0000 0
0    22   0          64  B     0.0.0.0         0000.0000.0000 0
0    23   0          64  B     0.0.0.0         0000.0000.0000 0
Router# show controllers Modular-Cable 8/1/0 rf-channel 7
Ctrl Chan Frequency  Mod Annex IP Address      MAC Address    DEPI Remote ID
0    7    495000000  256 B     10.31.136.100   0022.9084.4e3f 101244
```

The following is a sample output for the **wideband-channel** keyword:

```
Router# show controllers Modular-Cable 8/1/0 wideband-channel

WB                      BG    Primary
channel                 ID    BG
Wideband-Cable8/1/0:0   1377  Yes
Wideband-Cable8/1/0:1   1378  Yes
Wideband-Cable8/1/0:2   1379  Yes
Wideband-Cable8/1/0:3   1380  Yes
Wideband-Cable8/1/0:4   1381  Yes
Wideband-Cable8/1/0:5   1382  Yes
Wideband-Cable8/1/0:6   1383  Yes
Wideband-Cable8/1/0:7   1384  Yes
Wideband-Cable8/1/0:8   1385  Yes
Wideband-Cable8/1/0:9   1386  Yes
Wideband-Cable8/1/0:10  1387  Yes
Wideband-Cable8/1/0:11  1388  Yes
Wideband-Cable8/1/0:12  1389  Yes
Wideband-Cable8/1/0:13  1390  Yes
Wideband-Cable8/1/0:14  1391  Yes
Wideband-Cable8/1/0:15  1392  Yes
Wideband-Cable8/1/0:16  1393  Yes
Wideband-Cable8/1/0:17  1394  Yes
Wideband-Cable8/1/0:18  1395  Yes
```

```
Wideband-Cable8/1/0:19  1396  Yes
Wideband-Cable8/1/0:20  1397  Yes
Wideband-Cable8/1/0:21  1398  Yes
Wideband-Cable8/1/0:22  1399  Yes
Wideband-Cable8/1/0:23  1400  Yes
Wideband-Cable8/1/0:24  1401  Yes
Wideband-Cable8/1/0:25  1402  Yes
Wideband-Cable8/1/0:26  1403  Yes
Wideband-Cable8/1/0:27  1404  Yes
Wideband-Cable8/1/0:28  1405  Yes
Wideband-Cable8/1/0:29  1406  Yes
Wideband-Cable8/1/0:30  1407  Yes
Wideband-Cable8/1/0:31  1408  Yes
Router# show controllers Modular-Cable 8/1/0 wideband-channel 0
WB                      BG    Primary
channel                 ID    BG
Wideband-Cable8/1/0:0   1377  Yes
```

The following is a sample output of the show controllers modular-cable mapping command:

```
router# show controllers modular-cable mapping
Ctrlr    RF       MC         MC Rem.    WB         WB         WB Rem.
         channel  BW %       Ratio      channel    BW %       Ratio
5/1/0    2        0          0
```

Effective with Cisco IOS Release 12.2(33)SCH, the Bonding Across 3G60 Controllers Support feature is introduced. The following example shows the output of the **show controllers modular-cable mapping** command to display bonding of RF channels across 3G60 controllers:

Router#show controllers modular-cable 7/0/0 mapping rf-channel 21

Ctrlr RF MC MC Rem. WB WB WB Rem.

channel BW % Ratio channel BW % Ratio

7/0/0 21 0 0 7/0/0:0 10 1

7/0/1:30 10 1

Router#show controllers modular-cable 7/0/1 mapping wb-channel 30

Ctrlr WB RF BW % Remaining

channel channel Ratio

7/0/1 30 7/0/0:20 10 1

The output of the *rf-channel* keyword above shows that the RF channel number 21 belongs to wideband interface bonding group 0 on controller 0 and bonding group 30 on controller 1, with 10 percent bandwidth allocated to it on each controller.

The following is a sample output of the **show controllers modular-cable registers** command:

```
router# show controllers modular-Cable 5/1/0 registers
JIB3_DS BPI registers (base address 0xF8880000)
bpi_int_isr_0                       [0x00000000] = 0x00000000
bpi_int_ier_0                       [0x00000004] = 0x0000000F
glb_int_isr_0                       [0x00000010] = 0x00000000
glb_int_ier_0                       [0x00000014] = 0x00001EFF
glb_int_isr_1                       [0x00000020] = 0x00000000
glb_int_ier_1                       [0x00000024] = 0x00001EFF
col_chip_mode_reg                   [0x00000030] = 0x00000001
bpi_int_fesr_0                      [0x00000040] = 0x00000000
```

```
bpi_tst_tp_sel_reg                  [0x00000050] = 0x00000000
bpi_tst_tp_reg                      [0x00000054] = 0x00000000
bpi_cnt_good_packet_in_cnt          [0x00000064] = 0x00013418
bpi_cnt_bad_packet_in_cnt           [0x00000068] = 0x00000000
bpi_cnt_good_packet_out_cnt         [0x0000006C] = 0x00013418
bpi_cnt_bad_packet_out_cnt          [0x00000070] = 0x00000000
bpi_ecc_sbit_err_cnt                [0x00000074] = 0x00000000
glb_sw_rev_id                       [0x00000078] = 0x00020002
glb_hw_rev_id                       [0x0000007C] = 0x0001000D
frz_reg                             [0x00000080] = 0x00000000
frz_en                              [0x00000084] = 0x00000001
glb_dcm_status                      [0x00000088] = 0x00000007
glb_sw_rst                          [0x0000008C] = 0x00000000
```

The following is a sample output for the **dsid-log** keyword:

```
Router# show controllers modular-Cable 1/0/0 dsid-log search 1 1000
SPA 0 DSID Info Log Count 17
Entry 5
00y:000d:00h:03m:11.908 ds_stat_index=00022 dsid=0x001A8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00009 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 6
00y:000d:00h:03m:11.972 ds_stat_index=00021 dsid=0x001A0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00010 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 7
00y:000d:00h:03m:12.208 ds_stat_index=00024 dsid=0x001B8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00011 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 8
00y:000d:00h:03m:12.632 ds_stat_index=00023 dsid=0x001B0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00012 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 9
00y:000d:00h:27m:13.024 ds_stat_index=00021 dsid=0x00000 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00010 WbIdx=000000 old_dsid=0x001A0 MD=01 (5/0/1) IPC_Port=0x000C0000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 10
00y:000d:00h:27m:13.090 ds_stat_index=00022 dsid=0x00000 seq_num_b4=0x00001
1st_seq_num=0x00001
slotIdx=10 5/0 sid=00009 WbIdx=000000 old_dsid=0x001A8 MD=01 (5/0/1) IPC_Port=0x000C0000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 11
00y:000d:00h:27m:13.156 ds_stat_index=00023 dsid=0x00000 seq_num_b4=0x00001
1st_seq_num=0x00001
slotIdx=10 5/0 sid=00012 WbIdx=000000 old_dsid=0x001B0 MD=01 (5/0/1) IPC_Port=0x000C0000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 12
00y:000d:00h:27m:13.220 ds_stat_index=00024 dsid=0x00000 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00011 WbIdx=000000 old_dsid=0x001B8 MD=01 (5/0/1) IPC_Port=0x000C0000
```

```
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 13
00y:000d:00h:29m:30.388 ds_stat_index=00025 dsid=0x001C0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00013 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 14
00y:000d:00h:29m:32.544 ds_stat_index=00026 dsid=0x001C8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00014 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 15
00y:000d:00h:29m:36.446 ds_stat_index=00028 dsid=0x001D8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00016 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 16
00y:000d:00h:29m:36.970 ds_stat_index=00027 dsid=0x001D0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00015 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
SPA 0 DSID Suspect Count 0
No entries in the DSID Suspect List Log for SPA 0
```

The following is a sample output with the **stat-index-log** keyword:

```
Router# show controllers modular-Cable 1/0/0 stat-index-log search 1 1000
SPA 0 DSID Info Log Count 17
Entry 5
00y:000d:00h:03m:11.908 ds_stat_index=00022 dsid=0x001A8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00009 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 6
00y:000d:00h:03m:11.972 ds_stat_index=00021 dsid=0x001A0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00010 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 7
00y:000d:00h:03m:12.208 ds_stat_index=00024 dsid=0x001B8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00011 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 8
00y:000d:00h:03m:12.632 ds_stat_index=00023 dsid=0x001B0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00012 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 9
00y:000d:00h:27m:13.024 ds_stat_index=00021 dsid=0x00000 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00010 WbIdx=000000 old_dsid=0x001A0 MD=01 (5/0/1) IPC_Port=0x000C0000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 10
```

```
00y:000d:00h:27m:13.090 ds_stat_index=00022 dsid=0x00000 seq_num_b4=0x00001
1st_seq_num=0x00001
slotIdx=10 5/0 sid=00009 WbIdx=000000 old_dsid=0x001A8 MD=01 (5/0/1) IPC_Port=0x000C0000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 11
00y:000d:00h:27m:13.156 ds_stat_index=00023 dsid=0x00000 seq_num_b4=0x00001
1st_seq_num=0x00001
slotIdx=10 5/0 sid=00012 WbIdx=000000 old_dsid=0x001B0 MD=01 (5/0/1) IPC_Port=0x000C0000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 12
00y:000d:00h:27m:13.220 ds_stat_index=00024 dsid=0x00000 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00011 WbIdx=000000 old_dsid=0x001B8 MD=01 (5/0/1) IPC_Port=0x000C0000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_CLEAR_CLEANUP
Entry 13
00y:000d:00h:29m:30.388 ds_stat_index=00025 dsid=0x001C0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00013 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 14
00y:000d:00h:29m:32.544 ds_stat_index=00026 dsid=0x001C8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00014 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 15
00y:000d:00h:29m:36.446 ds_stat_index=00028 dsid=0x001D8 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00016 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
Entry 16
00y:000d:00h:29m:36.970 ds_stat_index=00027 dsid=0x001D0 seq_num_b4=0x00000
1st_seq_num=0x00000
slotIdx=10 5/0 sid=00015 WbIdx=000000 old_dsid=0x00000 MD=01 (5/0/1) IPC_Port=0x00010000
this_bay=0
GblIdx=000000 slot=0 bay=0 src_thread=DSID_UPDATE
SPA 0 DSID Suspect Count 0
No entries in the DSID Suspect List Log for SPA 0
```

The following is a sample output with the **dsid-ref-log** keyword:

```
Router# show controllers modular-Cable 1/0/0 dsid-ref-log dsid 0xf000
dsid = 61440(0xF000) last_stat_index = 64936 ref_count = 1
```

Related Commands

Command	Description
show controllers jacket	Displays Wideband SIP register values.

show controllers upstream-cable

To display information about the OFDMA channel configuration on the Cisco cBR Series Converged Broadband Routers, use the **show controllers upstream-cable us-channel** command in user EXEC or privileged EXEC mode.

show controllers upstream-cable {*slot/port slot/subslot/port*} **us-channel** *n* {**cdm-ump**}

Syntax Description

slot	Slot where the line card resides. The valid values are 0 to 3 and 6 to 9.
subslot	Subslot where the line card resides. The available slot is 0.
port	Cable upstream port number. The valid range depends on the number of upstream channels configured in a MAC domain. For example, if the total number of upstream channels configured is 4, then the valid range for the upstream port number is from 0 to 3.
n	Physical upstream channel number. The valid range is from 0 to 15.
cdm-ump	Displays additional information about lower level modules.

Command Modes

User EXEC, Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was implemented on the Cisco cBR Series Converged Broadband Routers.
Cisco 1x2 RPD Software 4.1	The output of this command was updated when virtual combining of upstream channels was introduced in this release on Cisco Remote PHY Devices.
Cisco IOS XE Gibraltar 16.12.1z	The output of this command was updated to inlcude four columns for OFDMA channels.

Examples

The following is a sample output of the **show controllers upstream-cable us-channel** command:

```
Router# show controllers upstream-Cable 1/0/4 us-channel 12
USPHY OFDMA support: FULL

Controller 1/0/4 upstream 12  AdminState:UP OpState: UP ofdma mode enabled
 ofdma mode enabled
 Channel Freq Range 35.500 MHz to 79.500 MHz
 Channel Subcarrier Index Range Cfg: 74, 953 Op: 74, 953
 Channel SC0 Freq Cfg: 31.800 MHz Op: 31.800 MHz
 #Excl bands: 2
 ( 0, 73), ( 954, 2047),
 #Unused bands: 0
 Cyclic Prefix Size 96, Rolloff Period Size 64
 Subcarrier Spacing 50KHz, Symbols Per Frame 18 Subcarrier Per Minislot: 8
 Modulation Profile (ID 421, Subcarrier Spacing 25KHz)
```

```
    IUC type   Cfg   Act  Preamble Bit       Pilot   FEC      | FEC Post | FEC Post |
RxMER

               subc  subc Symbols  Loading   Pattern Tot. CWs | Pass CWs | Fail CWs |
Min/Max/Avg

    3  (IR)    32    32      4       -         -       2          2          0
0.0/0.0/0.0

    4  (FR)    192   192     1       -         -       25         25         0
0.0/0.0/0.0

    5  (data)  -     -       -     1024-QAM    8       12         0          0
44.0/45.0/44.0

    12 (data)  -     -       -     1024-QAM    8       0          0          0
0.0/0.0/0.0

    13 (data)  -     -       -     1024-QAM    8       26         0          0
39.25/42.25/41.0

 #Total mslots:110 #Fine Rng capable:95 #Initial Rng capable:103
  Initial Rng - Freq 50.000MHz mslotOffset:36 #mslot in frame:8
 Minislot mapping: mslot#(start_sc start_freq(Mhz) end_sc end_freq(Mhz)
  mslot type(E-Edge; B-Body; S-Share with SCQAM;
  -Initial rng capable; F-Fine rng capable)
  (next Fine Rng capable minislot if current is not capable))
0 ( 74, 35.500, 81, 35.850, EIF ( - )), 1 ( 82, 35.900, 89, 36.250, BIF ( - )),
2 ( 90, 36.300, 97, 36.650, BIF ( - )), 3 ( 98, 36.700,105, 37.050, BIF ( - )),
4 (106, 37.100,113, 37.450, BIF ( - )), 5 ( 114,37.500,121, 37.850, BIF ( - )),
6 ( 122, 37.900, 129, 38.250, BIF ( - )), 7 ( 130, 38.300, 137, 38.650, BIF ( - )),
8 ( 138, 38.700, 145, 39.050, BIF ( - )), 9 ( 146, 39.100, 153, 39.450, BIF ( - )),
10 ( 154, 39.500, 161, 39.850, BIF ( - )), 11 ( 162, 39.900, 169, 40.250, BIF ( - )),
12 ( 170, 40.300, 177, 40.650, BIF ( - )), 13 ( 178, 40.700, 185, 41.050, BIF ( - )),
14 ( 186, 41.100, 193, 41.450, BIF ( - )), 15 ( 194, 41.500, 201, 41.850, BIF ( - )),
16 ( 202, 41.900, 209, 42.250, BIF ( - )), 17 ( 210, 42.300, 217, 42.650, BIF ( - )),
18 ( 218, 42.700, 225, 43.050, BIF ( - )), 19 ( 226, 43.100, 233, 43.450, BIF ( - )),
20 ( 234, 43.500, 241, 43.850, BIF ( - )), 21 ( 242, 43.900, 249, 44.250, BIF ( - )),
22 ( 250, 44.300, 257, 44.650, BIF ( - )), 23 ( 258, 44.700, 265, 45.050, BIF ( - )),
24 ( 266, 45.100, 273, 45.450, BIF ( - )), 25 ( 274, 45.500, 281, 45.850, BIF ( - )),
...
Mapped to connector 4 and receiver 108
Bind to Cable1/0/4 US4
MER(SNR) - Unknown - no modems online.
Spectrum Group is unassigned
Nominal Input Power Level 0 dBmV
UCD procedures on lch 0
UCD ucd-proxy-timeout (0 ) ucd-proxy-wrong-ack (0 )
```

The following example shows the status of the virtual combining of the upstream channels:

```
show controllers upstream-cable 7/0/62 us-channel 0

Load for five secs: 5%/1%; one minute: 6%; five minutes: 5%
Time source is NTP, 18:05:11.271 CST Tue Feb 27 2018

Controller RPD US Port List:

DevID  RPD ID         US Port   I/F Name
------ -------------- -------- --------- ------------
 0      0004.9f03.0226 0 Te7/1/1 0004.9f03.0226
 1      0004.9f03.0286 0 Te7/1/1 0004.9f03.0286
 2      1004.9f30.1500 0 Te7/1/0 1004.9f30.1500
```

```
 3      1004.9f30.1500 1 Te7/1/0 1004.9f30.1500

USPHY OFDMA support: NO


Controller 7/0/62 upstream 0 AdminState:UP OpState: UP
  atdma mode enabled
  Frequency 21.800 MHz, Channel Width 1.600 MHz, Symbol Rate 1.280 Msps
  Modulation Profile Group 221
  Modulations (64-QAM) - A-short 64-QAM, A-long 64-QAM, A-ugs 64-QAM

  Mapped to connector 62 and receiver 0
  Bind to Cable7/0/0 US0
  US phy MER(SNR)_estimate for good packets - 42.410 dB
  Spectrum Group is overridden
  Nominal Input Power Level 0 dBmV
  part_id=0x0000, rev_id=0x00, rev2_id=0x00
  Range Load Reg Size=0x58
  Request Load Reg Size=0x0E
  Minislot Size in number of Timebase Ticks is = 4
  Minislot Size in Symbols = 32
  Minislot Size in Bytes = 24

  UCD procedures on lch 0
  UCD ucd-succeed (3 ) invalid-req (0 ) md-dispatch (0 )
  UCD mismatch-req (0 ) start-sw (0 ) start-state (0 )
  UCD ccc-time (0 ) end-sw (0 ) end-state (0 )
  UCD ucd-lch-tgc (0 ) ucd-rcvr (0 ) ucd-cdm-timeout (0 )
  UCD ucd-no-reqtxn (0 ) ucd-req-chn-mismatch(0 ) ucd-send-next-fail (0 )
  UCD ucd-rpd-np (0 ) ucd-upd-gcp-msg (0 ) ucd-cfg-gcp-msg (0 )
  UCD ucd-gcp-ack (0 ) ucd-gcp-ack-timeout (0 ) ucd-gcp-nack (0 )
  UCD ucd-gcp-timout (0 ) ucd-ack-err (0 ) ucd-timer-null (0 )
  UCD ucd-proxy-timeout (0 ) ucd-proxy-wrong-ack (0 )
  PHY: us errors 0 us recoveries 0 (enp 0)
  MAC PHY TSS: tss error start 0 tss error end 0
  MAC PHY Status: mask 0 int_index 0
  PHY: TSS late 0 discontinuous 0
  PHY: TSS mis-match 0 not-aligned 0
  PHY: TSS missed snapshots from phy 0
  Map Counts:0
  LCH_state RUN_STEADY , UCD_count 3, MD 0 chan 0
```

show cpd

To display the CPD functionality state, use the **show cpd** command in privileged EXEC mode.

show cpd

Command Default

Information for the CPD state is displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

This example shows the output of the **show cpd** command:

```
Router# show cpd
CPD enabled
CR ID :12345
```

Related Commands

Command	Description
cpd	Enables CPD.

show cr10k-rp cable

Note This command is meant for engineering debugging, and not for general customer use.

To display packet processing information for a particular service ID (SID) on a cable interface, use the **show cr10k-rp cable** command in user EXEC or privileged EXEC mode.

show cr10k-rp cable *slot/subslot/port sid* {**classifier** | **mac-rw-index** | **queue** | **service-flow** {**ds** | **us**}}

Syntax Description

cable *slot/subslot/port*	Identifies the cable interface on the Cisco uBR10012 router for which information should be displayed, where: • *slot*—0 to 8 • *subslot*—0 or 1 • *port*—0 to 4 (depending on the cable interface)
sid	(Optional) Identifies the service ID (SID) for which information should be displayed.
classifier	Displays classifier information for the SID.
mac-rw-index	Displays the MAC rewrite index for the SID.
queue	Displays information about the output packet queues for the modem identified by the SID.
service-flow ds	Displays the information of the downstream service-flows for the modem identified by the SID.
service-flow us	Displays the information of the upstream service-flows for the modem identified by the SID.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA.
IOS-XE 3.15.OS	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show cr10k-rp cable** command displays information that the PRE routing processor (RP) module has about a particular SID. This information includes configuration information about the SID, as well as internal status information that is useful only to Cisco engineers in troubleshooting problems.

Examples

The following example shows typical output for the **show cr10k-rp cable** command for a SID that identifies a cable modem:

```
Router# show cr10k-rp c6/1/0 2 classifier

Mac Rw Index: 5 CCB Index: 7
CM Classifiers:
id=4, sfid=14 CFR Index 16396 RP sfindex 16396,
  prio=10, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=17, tos=A0,E0
  sport = 0,750, dport = 1024,10000 matches = 0

id=2, sfid=13 CFR Index 16395 RP sfindex 16395,
  prio=9, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=17, tos=A0,E0
  sport = 0,65535, dport = 0,65535 matches = 0

id=3, sfid=12 CFR Index 16394 RP sfindex 16394,
  prio=8, sip=9.0.0.0, sip mask=255.255.0.0
  dip=1.11.22.0, dip mask=255.255.255.0, prot=256, tos=0,FF
  sport = 0,65535, dport = 0,65535 matches = 0

id=1, sfid=11 CFR Index 16393 RP sfindex 16393,
  prio=7, sip=0.0.0.0, sip mask=0.0.0.0
  dip=1.11.22.0, dip mask=255.255.255.0, prot=256, tos=0,FF
  sport = 0,65535, dport = 0,65535 matches = 0
```

The following example shows typical output for the **show cr10k-rp classifier** command for a SID that identifies a customer premises equipment (CPE) device:

```
Router# show cr10k-rp c6/0/0 70 classifier

CPE Classifiers:
Mac Rw Index: 390       CCB Index: 97
id=7, sfid=205 CFR Index 16484 RP sfindex 16484,
  prio=255, sip=0.0.0.0, sip mask=0.0.0.0
  dip=15.0.0.1, dip mask=255.255.255.255, prot=257, tos=0,FF
  sport = 0,65535, dport = 1001,1001 matches = 0
id=1, sfid=199 CFR Index 16478 RP sfindex 16478,
  prio=25, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=257, tos=0,FF
  sport = 0,65535, dport = 1000,1000 matches = 0
id=5, sfid=203 CFR Index 16482 RP sfindex 16482,
  prio=0, sip=0.0.0.0, sip mask=0.0.0.0
  dip=15.0.0.1, dip mask=255.255.255.255, prot=256, tos=0,FF
  sport = 0,65535, dport = 0,65535 matches = 0
id=0, sfid=0 CFR Index 0 RP sfindex 0,
  prio=0, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=0, tos=2,1
  sport = 1000,500, dport = 1000,500 matches = 0
-----------------------------------------------------------
CPE Classifiers:
Mac Rw Index: 387       CCB Index: 93
id=4, sfid=202 CFR Index 16481 RP sfindex 16481,
  prio=255, sip=0.0.0.0, sip mask=0.0.0.0
  dip=14.0.0.1, dip mask=255.255.255.255, prot=17, tos=0,FF
  sport = 0,65535, dport = 0,65535 matches = 0
```

```
id=1, sfid=199 CFR Index 16478 RP sfindex 16478,
  prio=25, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=257, tos=0,FF
  sport = 0,65535, dport = 1000,1000 matches = 0
id=0, sfid=0 CFR Index 0 RP sfindex 0,
  prio=0, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=0, tos=2,1
  sport = 1000,500, dport = 1000,500 matches = 0
id=0, sfid=0 CFR Index 0 RP sfindex 0,
  prio=0, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=0, tos=2,1
  sport = 1000,500, dport = 1000,500 matches = 0
-------------------------------------------------------
```

The following example shows typical output for the **mac-rw-index** option:

```
Router# show cr10k-rp c8/0/0 1 mac-rw-index

CPE Information for Interface Cable8/0/0 SID 1:
        Link Table Slot: 17  Mac-rw-index: 17
Router# show cr10k-rp c8/0/0 2 mac-rw-index

CPE Information for Interface Cable8/0/0 SID 2:
        Link Table Slot: 18  Mac-rw-index: 18
Router#
```



Tip To display more information about the max-rw-index, use the **show pxf cpu cef** command to display information for a specific IP address. The output of this command shows the max-rw-index value in the "rw_index" field.

The following example shows typical output for the **show cr10k-rp queue** command:

```
Router# show cr10k-rp c6/1/0 1 queue

RP SFID 16384 LC SFID 4
Queue Index: 293        QID 293 VCCI 6162       ClassID 5       Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 6067/6067 EIR 1260/1260
        Statsitics: Length 0 Pkts 1 Octets 52 TailDrops 0 BufferDrops 0
RP SFID 16385 LC SFID 7
Queue Index: 294        QID 294 VCCI 6162       ClassID 6       Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 0/1820 EIR 0/1260
        Statsitics: Length 0 Pkts 0 Octets 0 TailDrops 0 BufferDrops 0
RP SFID 16386 LC SFID 8
Queue Index: 295        QID 295 VCCI 6162       ClassID 7       Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 0/2427 EIR 0/1260
        Statsitics: Length 0 Pkts 0 Octets 0 TailDrops 0 BufferDrops 0
ubr-45#show cr10k-rp mod 1/2/0:0 queue
BE Queues:
Queue Index: 131241, GlobalQID 71, CBLT ID 131241
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32881, lc_sfid 29, min_rate(bps) 0, max_rate(bps) 0
CIR Queues:
Queue Index: 2049, GlobalQID 70, CBLT ID 2049
        MinRate(Kbps) 100, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32880, lc_sfid 8, min_rate(bps) 100000, max_rate(bps) 0
LL Queues:
```

The following example shows typical output for the **show cr10k-rp service-flow** command for both the downstream and upstream directions:

```
Router# show cr10k-rp c8/0/0 1 service-flow ds

RP DS SFID     LC SFID        Bytes          Packets        QID
16385          4              0              0              261
Router# show cr10k-rp c8/0/0 1 service-flow us

SFID           SID
3              1
```

Related Commands

Command	Description
show cr10k-rp queue	Displays information about the packet queues for a cable interface.

show cr10k-rp controller

Note This command is meant only for engineering debugging, and not for general customer use.

To display packet processing information for a particular service ID (SID) on a cable interface, use the **show cr10k-rp controller** command in user EXEC or privileged EXEC mode.

Cisco IOS Releases 12.3(21)BC, 12.3(23)BC, and 12.2(33)SCA
show cr10k-rp controller modular-cable *slot/subslot/port* {**lblt** | **pblt**}

Cisco IOS Release 12.2(33)SCB
show cr10k-rp controller modular-cable *slot/bay/port* {**lblt** | **pblt**}

Cisco IOS Release 12.2(33)SCF
show cr10k-rp controller modular-cable *slot/subslot/unit* {**acfe** [**cluster** *cluster-index*] | **lblt** | **pblt**}

Syntax Description

modular-cable *slot/bay/port*	Identifies the cable interface on the Cisco uBR10012 router for which information should be displayed, where: • *slot*—0 to 8 • *bay*—0 or 1 • *subslot*—0 to 3 • *port*—0 • *unit*—0
acfe	Identifies the Logical Bandwidth Limiting Traffic (LBLT) associated with the RF Physical Logical Bandwidth Limiting Traffic (PBLT). • *cluster-index*—Cluster index. The valid values range from 0 to 31.
lblt	Identifies the LBLT associated with the RF PBLT.
pblt	Identifies the PBLTs associated with the RF Channels.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS release 12.3BC. The modular-cable keyword was introduced.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA.

Release	Modification
12.2(33)SCB	This command was modified. The addressing format for the modular-cable interface and wideband-cable interface changed from *slot/subslot/bay* to *slot/bay/port*.
12.2(33)SCF	This command was modified. The acfe keyword was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show cr10k-rp controller** command displays information that the PRE route processor (RP) module has for a particular SID. This information includes configuration information about the SID, as well as internal status information that is useful only to Cisco engineers during troubleshooting.

Examples

The following examples show sample outputs for the **show cr10k-rp controller** command for a SID that identifies a cable modem:

```
Router# show cr10k-rp controller modular-cable 1/1/0 lblt

LBLTs on each RF Channel's PBLT
RFChnl WBChnl/LBLTGrp LBLTId Weight/Quantum
0          -/36        37          1/5520
          12/16        179         1/4478
1          -/37        39          1/0
          12/16        180         1/10000
2          -/38        41          1/0
          12/16        181         1/4473
          31/35        182         1/5526
3          -/39        43          1/0
          31/35        183         1/10000
4          -/40        45          1/0
5          -/41        47          1/0
6          -/42        49          1/0
7          -/43        51          1/0
8          -/44        53          1/0
9          -/45        55          1/0
10         -/46        57          1/0
11         -/47        59          1/0
12         -/48        61          1/0
13         -/49        63          1/0
14         -/50        65          1/0
15         -/51        67          1/0

Router# show cr10k-rp controller modular-cable 1/1/0 pblt

RF Channel PBLTs on Modular-Cable 1/0/0
Channel PBLTIndex BW(Kbps) Flowbit(prd/ofst) Rsrc/FlowRsrc
0       3         36000         512/0             3/3
1       4         37500         512/4             3/3
2       5         35625         512/8             3/3
3       6         37500         512/12            3/3
4       7         26000         512/16            3/3
5       8         26000         512/20            3/3
6       9         26000         512/24            3/3
7       10        26000         512/28            3/3
8       11        26000         512/32            3/3
9       12        26000         512/36            3/3
10      13        26000         512/40            3/3
11      14        26000         512/44            3/3
12      15        26000         512/48            3/3
```

```
13      16        26000         512/52            3/3
14      17        26000         512/56            3/3
15      18        26000         512/60            3/3
```

The following example shows a sample output for the **show cr10k-rp controller** command with the acfe keyword:

```
Router# show cr10k-rp controller modular-cable 1/1/0 acfe
Modular-Cable 1/0/0 status:
Topology changed: No
========Cluster 0========
Number of RF:   2
RF      FlexBW  WB      GuarBW  Quanta
0       28687   0       6028    2101
                -       22659   7898
1       28687   0       15030   5239
                -       13657   4760
Number of BG:   3
!
!
!
```

The following example shows a sample output for the **show cr10k-rp controller** command with the acfe keyword for a particular cluster:

```
Router# show cr10k-rp controller modular-cable 1/1/0 acfe cluster 1
Modular-Cable 1/0/0 status:
Topology changed: No
========Cluster 1========
Number of RF:   2
RF      FlexBW  WB      GuarBW  Quanta
2       28687   1       11695   4076
                -       16992   5923
3       28687   1       11696   4077
                -       16991   5922
Number of BG:   3
!
!
!
```

Related Commands

Command	Description
show cr10k-rp queue	Displays information about the packet queues for a cable interface.

show cr10k-rp queue

Note This command is meant for engineering debugging, and not for general customer use.

To display information about the packet queues for a cable interface, use the **show cr10k-rp queue** command in user EXEC or privileged EXEC mode.

Cisco IOS Releases 12.3(21)BC, 12.3(23)BC, and 12.2(33)SCA
show cr10k-rp {**cable** *slot/subslot/port* | **modular-cable** *slot/subslot/port:channel* | **wideband-cable** *slot/subslot/port:channel*} **queue** {**be** | **cir** | **llq**}

Cisco IOS Release 12.2(33)SCB
show cr10k-rp {**cable** *slot/subslot/port* | **modular-cable** *slot/bay/port:channel* | **wideband-cable** *slot/bay/port:channel*} **queue**

Syntax Description

cable *slot/subslot/port*	Identifies the cable interface on the Cisco uBR10012 router for which information should be displayed, where: • *slot*—0 to 8 • *subslot*—0 or 1 • *port*—0 to 4
modular-cable *slot/bay/port:channel*	Identifies the cable interface on the Cisco uBR10012 router for which information should be displayed, where: • *slot*—0 to 8 • *bay*—0 or 1 • *port*—0 • *channel*—0 **Note** Support for **modular-cable** keyword was introduced in Cisco IOS Release 12.3(23)BC.
wideband-cable *slot/bay/port:channel*	Identifies the wideband-cable interface on the Cisco uBR10012 router for which information should be displayed, where: • *slot*—0 to 8 • *bay*—0 or 1 • *port*—0 • *channel*—0 **Note** Support for **wideband-cable** keyword was introduced in Cisco IOS Release 12.3(21)BC.

queue	Displays information about the packet queues for the SID. **Note** Options for the keyword **queue** were removed from Cisco IOS Release 12.3(21)BC.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	The addressing format for the modular-cable interface and wideband-cable interface changed from *slot/subslot/bay* to *slot/bay/port from* Cisco IOS Release 12.2(33)SCB.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show cr10k-rp queue** command displays information about the queues on the Cisco uBR10012 router.

Examples

The following examples show typical displays for each form of the **show cr10k-rp queue** command:

```
Router# show cr10k-rp cable 7/0/0 queue
Docsis queues on the interface: 1
Total DOCSIS Queues Allocated: 19
Available/Maximal reservable rate(kbps): 26000/26000
HQF BLT Info (LBLT Group 125):
LBLT 173: wt/qntm 1/10000; PBLT 1325: BW 26000Kbps, flowbit prd/ofst 32/3, rsrc
BE Queues:
Queue Index: 131345, GlobalQID 125, CBLT ID 131345
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 10000000, QLimit 255
Service Flow(s): rp_sf_index 32925, lc_sfid 7, min_rate(bps) 0, max_rate(bps) 10
CIR Queues:
LL Queues:

Router# show cr10k-rp modular-cable1/0/0:0 queue
Docsis queues on the interface: 9
Total DOCSIS Queues Allocated: 19
Available/Maximal reservable rate(kbps): 18750/18750
HQF BLT Info (LBLT Group 36):
LBLT 37: wt/qntm 1/5520; PBLT 3: BW 36000Kbps, flowbit prd/ofst 512/0, rsrc/flr
BE Queues:
Queue Index: 131346, GlobalQID 126, CBLT ID 131346
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 10000000, QLimit 255
Service Flow(s): rp_sf_index 32927, lc_sfid 8, min_rate(bps) 0, max_rate(bps) 10
Queue Index: 131349, GlobalQID 127, CBLT ID 131349
        MinRate(Kbps) 0, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
```

```
Service Flow(s): rp_sf_index 32930, lc_sfid 10, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131350, GlobalQID 128, CBLT ID 131350
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32931, lc_sfid 13, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131351, GlobalQID 129, CBLT ID 131351
        MinRate(Kbps) 0, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32932, lc_sfid 12, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131352, GlobalQID 130, CBLT ID 131352
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32933, lc_sfid 14, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131359, GlobalQID 137, CBLT ID 131359
        MinRate(Kbps) 0, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32940, lc_sfid 16, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131360, GlobalQID 138, CBLT ID 131360
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32941, lc_sfid 28, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131361, GlobalQID 139, CBLT ID 131361
        MinRate(Kbps) 0, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32942, lc_sfid 22, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131362, GlobalQID 140, CBLT ID 131362
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32943, lc_sfid 29, min_rate(bps) 0, max_rate(bps) 0

CIR Queues:
LL Queues:

Router# show cr10k-rp wideband-cable1/0/0:12 queue
Docsis queues on the interface: 7
Total DOCSIS Queues Allocated: 19
Available/Maximal reservable rate(kbps): 67503/67503
HQF BLT Info (LBLT Group 16):
LBLT 179: wt/qntm 1/4478; PBLT 3: BW 36000Kbps, flowbit prd/ofst 512/0, rsrc/fl
LBLT 180: wt/qntm 1/10000; PBLT 4: BW 37500Kbps, flowbit prd/ofst 512/4, rsrc/f
LBLT 181: wt/qntm 1/4473; PBLT 5: BW 35625Kbps, flowbit prd/ofst 512/8, rsrc/fl
BE Queues:
Queue Index: 131347, GlobalQID 123, CBLT ID 131347
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 10000000, QLimit 255
Service Flow(s): rp_sf_index 32928, lc_sfid 8, min_rate(bps) 0, max_rate(bps) 10
Queue Index: 131353, GlobalQID 131, CBLT ID 131353
        MinRate(Kbps) 0, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32934, lc_sfid 18, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131354, GlobalQID 132, CBLT ID 131354
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32935, lc_sfid 23, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131355, GlobalQID 133, CBLT ID 131355
        MinRate(Kbps) 0, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32936, lc_sfid 20, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131356, GlobalQID 134, CBLT ID 131356
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32937, lc_sfid 24, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131357, GlobalQID 135, CBLT ID 131357
        MinRate(Kbps) 0, ExcessRatio 32, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32938, lc_sfid 26, min_rate(bps) 0, max_rate(bps) 0
Queue Index: 131358, GlobalQID 136, CBLT ID 131358
        MinRate(Kbps) 0, ExcessRatio 4, ShapeRate(bps) 0, QLimit 255
Service Flow(s): rp_sf_index 32939, lc_sfid 27, min_rate(bps) 0, max_rate(bps) 0
CIR Queues:
LL Queues:
```

Related Commands

Command	Description
show cr10k-rp	Displays packet processing information for a particular service ID (SID) on a cable interface.

show cr10k-rp slots

Note This command is meant for engineering debugging, and not for general customer use.

To display slot information for a particular service ID (SID) on a cable interface, use the **show cr10k-rp slots** command in user EXEC or privileged EXEC mode.

show cr10k-rp slots

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.2(15)BC1	This command was introduced for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show cr10k-rp slots** command displays information that the PRE remote processor (RP) module has about a particular SID. This information includes configuration information about the SID, as well as internal status information that is useful only to Cisco engineers in troubleshooting problems.

Examples

The following example shows typical output for the **show cr10k-rp slots** command for a SID that identifies a cable modem:

```
Router# show cr10k-rp slots

------------------------------------------------------------
Slot/Sub        Flags           (Address)
------------------------------------------------------------
1/0             0x0804          (0x6494E168)
1/1             0x0804          (0x6494E250)
2/0             0x0002          (0x6494E338)
2/1             0x0002          (0x6494E420)
3/0             0x0002          (0x6494E508)
3/1             0x0002          (0x6494E5F0)
4/0             0x0804          (0x6494E6D8)
4/1             0x0804          (0x6494E7C0)
```

```
5/0             0x0804          (0x6494E8A8)
5/1             0x0002          (0x6494E990)
6/0             0x0002          (0x6494EA78)
6/1             0x0002          (0x6494EB60)
7/0             0x0804          (0x6494EC48)
7/1             0x0002          (0x6494ED30)
8/0             0x0002          (0x6494EE18)
8/1             0x0002          (0x6494EF00)
OIR TABLE:
  slot: 0 type: 00000001 bays: 0 analyzed: 1
  slot: 1 type: 00000001 bays: 0 analyzed: 1
  slot: 2 type: 00000415 bays: 4 analyzed: 1
        bay: 0 type: 000004AE
        bay: 1 type: 000004AE
        bay: 2 type: 00000000
        bay: 3 type: 00000000
  slot: 3 type: 000005B0 bays: 0 analyzed: 1
  slot: 4 type: 00000000 bays: 0 analyzed: 0
  slot: 5 type: 000002AF bays: 0 analyzed: 1
  slot: 6 type: 00000000 bays: 0 analyzed: 0
  slot: 7 type: 00000000 bays: 0 analyzed: 0
  slot: 8 type: 00000390 bays: 0 analyzed: 1
  slot: 9 type: 00000390 bays: 0 analyzed: 1
  slot: 10 type: 00000487 bays: 0 analyzed: 1
  slot: 11 type: 00000000 bays: 0 analyzed: 0
  slot: 12 type: 00000000 bays: 0 analyzed: 0
  slot: 13 type: 00000000 bays: 0 analyzed: 0
  slot: 14 type: 000003D5 bays: 0 analyzed: 1
  slot: 15 type: 00000000 bays: 0 analyzed: 0
  slot: 16 type: 00000000 bays: 0 analyzed: 0
  slot: 17 type: 00000000 bays: 0 analyzed: 0
SLOT INFO:
  slot: 0 subslot: 0 index: 0 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 7178D9A0  ironbus i0
  slot: 0 subslot: 1 index: 1 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F000  ironbus i0
  slot: 1 subslot: 0 index: 2 num_bays: 4
  double wide: 1 type: 00000415 util type: FFFFFFFF plugin: 72CB529C  ironbus i1
        slot: 1 subslot: 0 index: 2 type: 000004AE
        slot: 1 subslot: 256 index: 2 type: 000004AE
        slot: 1 subslot: 512 index: 2 type: 00000000
        slot: 1 subslot: 768 index: 2 type: 00000000
  slot: 1 subslot: 1 index: 3 num_bays: 0
  double wide: 0 type: 000005B0 util type: FFFFFFFF plugin: 22900974  ironbus i1
  slot: 2 subslot: 0 index: 4 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F120  ironbus i0
  slot: 2 subslot: 1 index: 5 num_bays: 0
  double wide: 0 type: 000002AF util type: FFFFFFFF plugin: 26362104  ironbus i0
  slot: 3 subslot: 0 index: 6 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F1E0  ironbus i0
  slot: 3 subslot: 1 index: 7 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F240  ironbus i0
  slot: 4 subslot: 0 index: 8 num_bays: 0
  double wide: 0 type: 00000390 util type: FFFFFFFF plugin: 263621A4  ironbus i0
  slot: 4 subslot: 1 index: 9 num_bays: 0
  double wide: 0 type: 00000390 util type: FFFFFFFF plugin: 761EF050  ironbus i1
  slot: 5 subslot: 0 index: 10 num_bays: 0
  double wide: 0 type: 00000487 util type: FFFFFFFF plugin: 76200EFC  ironbus i0
  slot: 5 subslot: 1 index: 11 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F3C0  ironbus i0
  slot: 6 subslot: 0 index: 12 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F420  ironbus i0
  slot: 6 subslot: 1 index: 13 num_bays: 0
  double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F480  ironbus i0
```

```
slot: 7 subslot: 0 index: 14 num_bays: 0
double wide: 0 type: 000003D5 util type: FFFFFFFF plugin: 22900FA0  ironbus i0
slot: 7 subslot: 1 index: 15 num_bays: 0
double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F540  ironbus i0
slot: 8 subslot: 0 index: 16 num_bays: 0
double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F5A0  ironbus i0
slot: 8 subslot: 1 index: 17 num_bays: 0
double wide: 0 type: FFFFFFFF util type: FFFFFFFF plugin: 6494F600  ironbus i0
```

Related Commands

Command	Description
show cr10k-rp queue	Displays information about the packet queues for a cable interface.

show crypto entropy sample

To view the sample collection of an entropy source, use the **show crypto entropy status** command in user EXEC or privileged EXEC mode.

show crypto entropy sample *entropy-source-sample*

Syntax Description

entropy-source-sample	The value of the entropy source to sample. The valid range is 0-9.

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE 16.4.1	This command is introduced on the Cisco cBR-8 Converged Broadband Routers.

Usage Guidelines

The command displays the sample collection of an entropy source.

Examples

The following example shows typical output:

```
Router# show crypto entropy sample 2
Load for five secs: 3%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 21:05:45.964 EDT Mon Jun 19 2023
Entropy source ubr_entropy_rp provided this sample:
B4 3A F8 D0 02 C3 75 5E 88 95 53 39 79 32 F5 5D
7F F2 9C CE 49 53 84 1F D2 84 F8 3E 27 04 17 92
Sample consists of 32 bytes and contains 256 bits of entropy
```

show crypto entropy status

To view the status of entropy sources, use the **show crypto entropy status** command in user EXEC or privileged EXEC mode. This command is only supported on SUP IOSd.

show crypto entropy status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	**CPU jitter** entropy source is introduced.
Cisco IOS XE 16.4.1	This command is introduced on the Cisco cBR-8 Converged Broadband Routers.

Usage Guidelines

The command displays the status of entropy sources.

Examples

The following example shows the typical output for **show crypto entropy status**:

```
Router# show crypto entropy status
Load for five secs: 4%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 21:06:09.976 EDT Mon Jun 19 2023
# Entropy source       Type Status  Requests Entropy Bits
1 CPU jitter           Prim Working 126005     256/48011264
2 ubr_entropy_rp       Phy  Working    124     256/31744
3 randfill             NPhy Working    124     128/15872   (*)
4 getrandombytes       NPhy Working    124     160/19840   (*)

Secure mode enabled, SEC-CRY-PRIM enabled
(*) - The entropy collected from NPhy sources was not counted
        as a part of achieving the entropy target

Fresh entropy collected once every 60 minutes
Entropy most recently collected 27 minutes ago
Entropy target = 256 bits; entropy actually collected = 640 bits

-- Primary entropy source version 3.4.1 --

Crypto Version:
    IC2M Rel5a
    CiscoSSL 1.1.1l.7.2.289
```

Here, `CPU jitter` is the primary source and `ubr_entropy_rp` is the legacy source.

show crypto ikev2|ipsec sa detail

To view your IPsec information, use the **show crypto ikev2 | ipsec sa detail** command in user EXEC or privileged EXEC mode.

show crypto ikev2 | ipsec sa detail

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
17.2.1	This command was introduced for the Cisco cBR-8.

Usage Guidelines

The command displays information with regard to IPsec security.

Examples

The following example shows typical output:

```
Router# show crypto ipsec sa detail
Load for five secs: 3%/0%; one minute: 8%; five minutes: 4%
Time source is NTP, 12:40:49.195 EDT Wed Feb 26 2020
interface: Tunnel101
Crypto map tag: Tunnel101-head-0, local addr 102.0.0.2
protected vrf: (none)
local ident (addr/mask/prot/port): (102.0.0.2/255.255.255.255/47/0)
remote ident (addr/mask/prot/port): (102.0.0.1/255.255.255.255/47/0)
current_peer 102.0.0.1 port 500
PERMIT, flags={origin_is_acl,}
#pkts encaps: 0, #pkts encrypt: 0, #pkts digest: 0
#pkts decaps: 0, #pkts decrypt: 0, #pkts verify: 0
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 0, #pkts compr. failed: 0
#pkts not decompressed: 0, #pkts decompress failed: 0
#pkts no sa (send) 0, #pkts invalid sa (rcv) 0
#pkts encaps failed (send) 0, #pkts decaps failed (rcv) 0
#pkts invalid prot (recv) 0, #pkts verify failed: 0
#pkts invalid identity (recv) 0, #pkts invalid len (rcv) 0
#pkts replay rollover (send): 0, #pkts replay rollover (rcv) 0
##pkts replay failed (rcv): 0
#pkts tagged (send): 0, #pkts untagged (rcv): 0
#pkts not tagged (send): 0, #pkts not untagged (rcv): 0
#pkts internal err (send): 0, #pkts internal err (recv) 0
local crypto endpt.: 102.0.0.2, remote crypto endpt.: 102.0.0.1
plaintext mtu 1438, path mtu 1500, ip mtu 1500, ip mtu idb TenGigabitEthernet4/1/0
current outbound spi: 0xBD3A2CBF(3174706367)
PFS (Y/N): N, DH group: none
inbound esp sas:
```

```
spi: 0xC67787E8(3329722344)
transform: esp-aes esp-sha256-hmac ,
in use settings ={Tunnel, }
conn id: 2, flow_id: SW:2, sibling_flags FFFFFFFF80000040, crypto map:
Tunnel101-head-0
sa timing: remaining key lifetime (k/sec): (4242079/86293)
IV size: 16 bytes
replay detection support: Y
Status: ACTIVE(ACTIVE)
inbound ah sas:
inbound pcp sas:
outbound esp sas:
spi: 0xBD3A2CBF(3174706367)
transform: esp-aes esp-sha256-hmac ,
in use settings ={Tunnel, }
conn id: 1, flow_id: SW:1, sibling_flags FFFFFFFF80000040, crypto map:
Tunnel101-head-0
sa timing: remaining key lifetime (k/sec): (4242079/86293)
IV size: 16 bytes
replay detection support: Y
Status: ACTIVE(ACTIVE)
outbound ah sas:
outbound pcp sas:
```



Cable Commands: show d through show i

- show debug, on page 2672
- show depi, on page 2674
- show depi session, on page 2676
- show depi tunnel, on page 2684
- show derived-config interface cable, on page 2687
- show derived-config interface wideband-Cable, on page 2689
- show dhcp, on page 2691
- show diag all eeprom detail | include MAC, on page 2694
- show diagnostic bootup level, on page 2695
- show diagnostic content, on page 2696
- show diagnostic ood-status, on page 2700
- show diagnostic result, on page 2704
- show diagnostic schedule, on page 2708
- show diagnostic status, on page 2710
- show facility-alarm status, on page 2711
- show frame-clocks, on page 2714
- show hardware pxf, on page 2715
- show hccp, on page 2716
- show hccp channel-switch, on page 2726
- show hccp group, on page 2730
- show hccp interface, on page 2733
- show hccp linecard, on page 2735
- show hdd-devices summary, on page 2737
- show hw-module bay, on page 2738
- show hw-module bay oir, on page 2745
- show hw-module bay transceiver, on page 2749
- show hw-module subslot oir, on page 2751
- show ib statistic, on page 2754
- show interface bundle, on page 2755
- show interface cable, on page 2759
- show interface cable admission-control reservation, on page 2766
- show interface cable cable-monitor, on page 2770
- show interface cable controller, on page 2774

- show interface cable downstream, on page 2776
- show interface cable dsg downstream, on page 2779
- show interface cable dsg downstream tg, on page 2787
- show interface cable dynamic-service statistics, on page 2790
- show interface cable intercept, on page 2792
- show interface cable mac-scheduler, on page 2794
- show interface cable modem, on page 2807
- show interface cable monitor, on page 2817
- show interface cable multicast-sessions, on page 2819
- show interface cable packetcable statistics, on page 2822
- show interface cable privacy, on page 2825
- show interface cable qos paramset, on page 2829
- show interface cable service-flow, on page 2833
- show interface cable sid, on page 2847
- show interface cable signal-quality, on page 2859
- show interface cable upstream, on page 2861
- show interface cable upstream debug, on page 2874
- show interface gigabitethernet, on page 2878
- show interface integrated-cable, on page 2881
- show interface integrated-cable queue, on page 2888
- show interface modular-cable, on page 2893
- show interface modular-cable accounting, on page 2895
- show interface modular-cable description, on page 2897
- show interface modular-cable dlm, on page 2899
- show interface modular-cable downstream, on page 2901
- show interface modular-cable intercept, on page 2903
- show interface modular-cable multicast-sessions, on page 2905
- show interface modular-cable stats, on page 2908
- show interface modular-cable summary, on page 2910
- show interface modular-cable switching, on page 2912
- show interface multicast-gcr, on page 2914
- show interface port-channel, on page 2916
- show interface rf-status, on page 2919
- show interface resil-rf-status, on page 2921
- show interfaces tengigabitethernet, on page 2923
- show interfaces video accounting, on page 2925
- show interfaces VirtualPortGroup, on page 2926
- show interface wideband-cable, on page 2928
- show interface wideband-cable multicast-sessions, on page 2938
- show interface wideband-cable queue, on page 2941
- show ip arp vrf, on page 2945
- show ip interface brief, on page 2947
- show ipdr collector, on page 2949
- show ipdr exporter, on page 2950
- show ipdr session, on page 2952
- show ipdr session collector, on page 2954

• show ipdr session template, on page 2956

show debug

To display current debugging information that includes PacketCable COPS messages on the Cisco CMTS, use the **show debug** command in privileged EXEC mode.

show debug

Syntax Description

No additional keywords or arguments

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(13a)BC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

For additional information about this feature and related commands, refer to the following document on Cisco.com:

- *COPS Engine Operation on the Cisco CMTS*

Examples

The following example illustrates the use of the show debug command in relation to the COPS Engine Operation feature on the Cisco CMTS.

```
Router# show debug
PacketCable Client:
  Pktcbl COPS msgs debugging is on
PacketCable specific:
  Debugging is on for Subscriber 68.1.2.4, Mask 255.255.255.255
SLOT 6/0: Nov 19 04:57:09.219: %UBR10000-5-UNREGSIDTIMEOUT: CMTS deleted unregistered Cable
 Modem 0002.8a8c.8c1a
SLOT 6/0: Nov 19 04:57:12.279: %UBR10000-5-UNREGSIDTIMEOUT: CMTS deleted unregistered Cable
 Modem 0002.8a8c.92ae
*Nov 19 04:57:19.751: PktCbl(cops): Received callback [code 2, handle: 0x63982B08] from
COPS engine
*Nov 19 04:57:19.751: PktCbl(cops): Received a COPS DEC message, flags is 0x1
*Nov 19 04:57:19.755: PktCbl(cops): Received callback [code 2, handle: 0x63982B08] from
COPS engine
*Nov 19 04:57:19.755: PktCbl(cops): Received a COPS DEC message, flags is 0x1
*Nov 19 04:57:19.755: PktCbl(cops): Received callback [code 2, handle: 0x63982B08] from
COPS engine
*Nov 19 04:57:19.755: PktCbl(cops): Received a COPS DEC message, flags is 0x1
*Nov 19 04:57:19.755: PktCbl(cops): Received callback [code 2, handle: 0x63982B08] from
COPS engine
*Nov 19 04:57:19.755: PktCbl(ndle: 0x63982B08] from COPS engine
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show debug** command on the Cisco cBR router:

```
Router#show debug
network RF:
  network-rf idb-sync-history events debugging is on
IOSXE Conditional Debug Configs:

Conditional Debug Global State: Stop


IOSXE Packet Tracing Configs:



Packet Infra debugs:

Ip Address                                              Port
------------------------------------------------------|----------


                                                ^
% Invalid input detected at '^' marker.
```

Related Commands

Command	Description
cops ip dscp	Specifies the Common Open Policy Service (COPS) Differentiated Services Code Point (DSCP) markings for COPS messages that are transmitted by the Cisco router
cops listeners access-list	Configures access control lists (ACLs) for inbound connections to all COPS listener applications on the Cisco CMTS.
cops tcp window-size	Overrides the default TCP receive window size that is used by COPS processes.
debug packetcable cops	Enables debugging processes for PacketCable with the COPS engine.
debug packetcable gate control	Enables and displays debugging processes for PacketCable gate control.
debug packetcable subscriber	Enables and displays debugging processes for PacketCable subscribers.
show cops servers	Displays COPS server addresses, port, state, keepalives, and policy client information.
show ip rsvp policy	Displays policy server addresses, ACL IDs, and client/server connection status.

show depi

To display Downstream External PHY Interface (DEPI) tunnel and session information, use the **show depi** command in privileged EXEC mode.

show depi

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a sample output of the **show depi** command on a Cisco uBR10012 router:

```
Router# show depi
DEPI Tunnel and Session Information Total tunnels 3 sessions 12
LocTunID   RemTunID   Remote Name   State  Remote Address  Sessn L2TP Class
                                                          Count
555844637  4037701912 RFGW-10-1     est    11.30.14.100    4     test10
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252048235 1074332337 555844637  717,       est    1w0d     16         P
1252049362 1074332330 555844637  711,       est    1w0d     15         P
1252005266 1074332288 555844637  699,       est    1w0d     13         P
1252000641 1074332316 555844637  705,       est    1w0d     14         P
LocTunID   RemTunID   Remote Name   State  Remote Address  Sessn L2TP Class
                                                          Count
1486289361 1394811300 RFGW-10-1     est    12.30.14.100    4     test10
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252014460 1074332279 1486289361 549,       est    1w0d     20         P
1252059306 1074332234 1486289361 531,       est    1w0d     17         P
1252057709 1074332245 1486289361 537,       est    1w0d     18         P
1252006708 1074332262 1486289361 543,       est    1w0d     19         P
LocTunID   RemTunID   Remote Name   State  Remote Address  Sessn L2TP Class
                                                          Count
1688275168 1361251901 RFGW-10-1     est    24.30.14.100    4     test10
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252018493 1074332252 1688275168 537,       est    1w0d     22         S
1252054974 1074332286 1688275168 549,       est    1w0d     24         S
1252022230 1074332263 1688275168 543,       est    1w0d     23         S
1252059782 1074332236 1688275168 531,       est    1w0d     21         S
```

Table 203: show depi Field Descriptions

Field	Description
LocTunID	Identifier of the local tunnel.

Field	Description
RemTunID	Identifier of the remote tunnel.
Remote Name	Name of the remote tunnel.
State	State of the tunnel.
Remote Address	IP address of the remote tunnel.
Session Count	Number of sessions.
L2TP Class/VPDN Group	L2TP class name for the tunnel.
LocID	Identifier of the session.
RemID	Identifier of the remote session.
TunID	Identifier of the tunnel.
State	State of the session.
Last Chg	Last state change timestamp.
Uniq ID	Unique identifier of the QAM channel.
Type	Primary or secondary session.

Related Commands

Command	Description
depi-tunnel	Creates a template of DEPI tunnel configuration settings that can be inherited by different pseudowire classes.
rf-channel depi-tunnel	Binds the depi-tunnel to an rf-channel on a shared port adapter (SPA).
controller modular-cable	Enters controller configuration mode to configure the SPA controller.
show depi session	Displays information about DEPI sessions.
show depi tunnel	Displays information about DEPI tunnels.

show depi session

To display information about Downstream External PHY Interface (DEPI) sessions, use the **show depi session** command in privileged EXEC mode.

show depi session[*session-id* | **configured** | **name** *session-name* | **controller** **modular-cable***slot/subslot/unit-number* | **interface** *interface-name* | **primary** | **secondary** | **tsid** *ts-id* | **endpoints**] [**verbose**]

Syntax Description

session-id	(Optional) Local session ID value. The allowed range is from 1 to 4294967295.
verbose	(Optional) Displays detailed DEPI session information.
configured	(Optional) Displays all the DEPI sessions configured and their state. The states are IDLE and ACTIVE.
name *session-name*	(Optional) Specifies the name of the DEPI session.
controller **modular-cable***slot/subslot/unit-number*	(Optional) Specifies the controller modular cable interface. • *slot*—Controller modular cable interface slot. The valid range is from 0 to 8. • *subslot*—Controller modular cable interface subslot. The valid value is 0 or 1. • *unit-number*—Controller unit number. The valid range is from 0 to 2.
interface*interface-name*	(Optional) Specifies the interface type.
primary	(Optional) Specifies the primary DEPI session.
secondary	(Optional) Specifies the backup DEPI session.
tsid *ts-id*	(Optional) Specifies the Transport Stream Identifier (TSID).
endpoints	(Optional) Specifies DEPI session endpoints including tunnel ID and Edge Quadrature Amplitude Modulation (EQAM) RF port.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.

Release	Modification
12.2(33)SCE	This command was modified. The following keywords were added to this command: • **primary** • **secondary** • **tsid** • **name** • **controller Modular-Cable** • **interface** • **endpoints**
12.2(33)SCG	This command was modified to support **verbose** output with the **tsid** option.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output of the **show depi session** command for all the established DEPI data sessions:

```
Router# show depi session
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252048235 1074332337 555844637  717,       est    3d09h    16         P
1252049362 1074332330 555844637  711,       est    3d09h    15         P
1252005266 1074332288 555844637  699,       est    3d09h    13         P
1252000641 1074332316 555844637  705,       est    3d09h    14         P
1252014460 1074332279 1486289361 549,       est    3d09h    20         P
1252059306 1074332234 1486289361 531,       est    3d09h    17         P
1252057709 1074332245 1486289361 537,       est    3d09h    18         P
1252006708 1074332262 1486289361 543,       est    3d09h    19         P
1252018493 1074332252 1688275168 537,       est    3d09h    22         S
1252054974 1074332286 1688275168 549,       est    3d09h    24         S
1252022230 1074332263 1688275168 543,       est    3d09h    23         S
1252059782 1074332236 1688275168 531,       est    3d09h    21         S
```

The following is a sample output of the **show depi session** command for a specific DEPI data session identified by the session ID in Cisco IOS Release 12.2(33)SCC:

```
Router# show depi session 1252018468 verbose
Session id 1252018468 is up, tunnel id 1834727012
  Remote session id is 1252055513, remote tunnel id 3849925733
  Locally initiated session
Qam Channel Parameters
  Group Tsid is 0
  Frequency is 717000000
  Modulation is 64qam
  Annex is B
  Interleaver Depth I=32 J=4
  Power is 0
  Qam channel status is 0
  Unique ID is 1
Call serial number is 326100007
Remote tunnel name is RFGW-10
  Internet address is 1.3.4.155
Local tunnel name is myankows_ubr10k
  Internet address is 1.3.4.103
IP protocol 115
  Session is L2TP signaled
```

```
  Session state is established, time since change 04:06:24
    0 Packets sent, 0 received
    0 Bytes sent, 0 received
  Last clearing of counters never
  Counters, ignoring last clear:
    0 Packets sent, 0 received
    0 Bytes sent, 0 received
    Receive packets dropped:
      out-of-order:             0
      total:                    0
    Send packets dropped:
      exceeded session MTU:     0
      total:                    0
  DF bit on, ToS reflect enabled, ToS value 0, TTL value 255
  UDP checksums are disabled
  Session PMTU enabled, path MTU is 1492 bytes
  No session cookie information available
  FS cached header information:
    encap size = 28 bytes
    45000014 00004000 FF73706F 01030467
    0103049B 4AA0D9D9 00000000
  Sequencing is on
    Ns 0, Nr 0, 0 out of order packets received
    Packets switched/dropped by secondary path: Tx 0, Rx 0
  Conditional debugging is disabled
```

The following is a sample output of the **show depi session** command that displays EQAM statistics for a specific DEPI data session identified by the session ID in Cisco IOS Release 12.2(33)SCE:

```
Router# show depi session 1252063105 verbose
Session id 1252063105 is up, tunnel id 1867895303
  Remote session id is 1074332253, remote tunnel id 3468518668
  Locally initiated session
  Session Type: Primary
Qam Channel Parameters
  Tsid is 537
  Group Tsid is 57
  Frequency is 537000000
  Modulation is 256qam
  Annex is B
  Interleaver Depth I=32 J=4
  Power is 530
  Qam channel status is 0
  Unique ID is 30
Call serial number is 2801814825
Remote tunnel name is RFGW-10-1
  Internet address is 12.30.14.100
Local tunnel name is prasm_ubr10k
  Internet address is 12.30.14.200
IP protocol 115
  Session is L2TP signaled
  Session state is established, time since change 5d12h
    0 Packets sent, 0 received
    0 Bytes sent, 0 received
  Last clearing of counters never
  Counters, ignoring last clear:
    0 Packets sent, 0 received
    0 Bytes sent, 0 received
    Receive packets dropped:
      out-of-order:             0
      total:                    0
    Send packets dropped:
      exceeded session MTU:     0
```

```
     total:                    0
  DF bit on, ToS reflect enabled, ToS value 0, TTL value 255
  UDP checksums are disabled
  Session PMTU enabled, path MTU is 1492 bytes
  No session cookie information available
  FS cached header information:
    encap size = 28 bytes
    45000014 00004000 FF73460F 0C1E0EC8
    0C1E0E64 4009025D 00000000
  Sequencing is on
    Ns 0, Nr 0, 0 out of order packets received
    Packets switched/dropped by secondary path: Tx 0, Rx 0
Peer Session Details
        Peer Session ID     : 1074332253
        Peer Qam ID         : Qam7/10.2
        Peer Qam State      : ACTIVE
        Peer Qam Type       : Primary
Peer Qam Statistics
        Total Pkts          : 270971
        Total Octets        : 50942548
        Total Discards      : 0
        Total Errors        : 0
        Total In Pkt Rate   : 0
        Bad Sequence Num    : 0
        Total In DLM Pkts   : 0
  Conditional debugging is disabled
```

The following is a sample output of the **show depi session** command for all the configured DEPI data sessions:

```
Router# show depi session configured
Load for five secs: 2%/0%; one minute: 2%; five minutes: 2%
Time source is hardware calendar, *17:10:12.309 UTC Sun Jul 4 2010
Session Name                State  Reason                       Time
Modular-Cable5/0/0:0        ACTIVE -
Modular-Cable5/0/0:1        ACTIVE -
Modular-Cable5/0/0:2        ACTIVE -
Modular-Cable5/0/0:3        ACTIVE -
Modular-Cable5/0/1:0        ACTIVE -
Modular-Cable5/0/1:5/1/1:0  ACTIVE -
Modular-Cable5/0/1:1        ACTIVE -
Modular-Cable5/0/1:5/1/1:1  ACTIVE -
Modular-Cable5/0/1:2        ACTIVE -
Modular-Cable5/0/1:5/1/1:2  ACTIVE -
Modular-Cable5/0/1:3        ACTIVE -
Modular-Cable5/0/1:5/1/1:3  ACTIVE -
```

The following is a sample output of the **show depi session** command that displays all primary data sessions on the Cisco uBR10012 router:

```
Router# show depi session primary
Load for five secs: 5%/0%; one minute: 2%; five minutes: 2%
Time source is hardware calendar, *17:13:10.389 UTC Sun Jul 4 2010
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252048235 1074332337 555844637  717,       est    3d09h    16         P
1252049362 1074332330 555844637  711,       est    3d09h    15         P
1252005266 1074332288 555844637  699,       est    3d09h    13         P
1252000641 1074332316 555844637  705,       est    3d09h    14         P
1252014460 1074332279 1486289361 549,       est    3d09h    20         P
1252059306 1074332234 1486289361 531,       est    3d09h    17         P
1252057709 1074332245 1486289361 537,       est    3d09h    18         P
1252006708 1074332262 1486289361 543,       est    3d09h    19         P
```

The following is a sample output of the **show depi session** command that displays all secondary data sessions on the Cisco uBR10012 router:

```
Router# show depi session secondary
Load for five secs: 0%/0%; one minute: 2%; five minutes: 2%
Time source is hardware calendar, *17:13:56.777 UTC Sun Jul 4 2010
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252018493 1074332252 1688275168 537,       est    3d09h    22         S
1252054974 1074332286 1688275168 549,       est    3d09h    24         S
1252022230 1074332263 1688275168 543,       est    3d09h    23         S
1252059782 1074332236 1688275168 531,       est    3d09h    21         S
```

The following is a sample output of the **show depi session** command that shows details of a particular session identified by the session name:

```
Router# show depi session name Modular-Cable5/0/0:0
Load for five secs: 1%/0%; one minute: 2%; five minutes: 2%
Time source is hardware calendar, *17:12:43.281 UTC Sun Jul 4 2010
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252005266 1074332288 555844637  699,       est    3d09h    13         P
```

The following is a sample output of the **show depi session** command that shows all secondary data sessions on the Cisco uBR10012 router:

```
Router# show depi session tsid 537
Load for five secs: 1%/0%; one minute: 2%; five minutes: 2%
Time source is hardware calendar, *17:14:29.465 UTC Sun Jul 4 2010
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252057709 1074332245 1486289361 537,       est    3d09h    18         P
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252018493 1074332252 1688275168 537,       est    3d09h    22         S
```

The following is a sample output of the **show depi session** command that shows DEPI session endpoints in Cisco IOS Release 12.2(33)SCE and later:

```
Router# show depi session endpoints
DEPI Tunnel               RF Channel             EQAM rf-port Tsid  State  Type
depi_working_tunnel_8_0_0 Mod8/0/0:0             Qam3/7.1     371   est    P
depi_protect_tunnel_5_1_0 Mod8/0/0:5/1/0:0       Qam3/7.1     371   est    S
non_cisco_eqam_tunnel     Mod8/0/0:6             -            11012 est    P
```

The following is a sample output of the **show depi session** command with the **verbose** keyword in Cisco ISO Release 12.2(33)SCG:

```
Router# show depi session tsid 531 verbose
Load for five secs: 1%/0%; one minute: 2%; five minutes: 2%
Time source is hardware calendar, *10:10:34.349 UTC Thu Aug 18 2011
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252004030 1074332230 4168849253 531       est    1d02h    9          P

Session id 1252004030 is up, tunnel id 4168849253
  Remote session id is 1074332230, remote tunnel id 1302274286
  Locally initiated session
  Session Type: Primary
Qam Channel Parameters
  Tsid is 531
  Group Tsid is 57
  Frequency is 531000000
  Modulation is 256qam
  Annex is B
```

```
  Interleaver Depth I=32 J=4
  Power is 530
  Qam channel status is 0
  Unique ID is 9
Call serial number is 3208000008
Remote tunnel name is RFGW-10-1
  Internet address is 12.30.14.100
Local tunnel name is prasm_ubr10k
  Internet address is 12.30.14.200
IP protocol 115
  Session is L2TP signaled
  Session state is established, time since change 1d02h
   0 Packets sent, 0 received
   0 Bytes sent, 0 received
  Last clearing of counters never
  Counters, ignoring last clear:
   0 Packets sent, 0 received
   0 Bytes sent, 0 received
   Receive packets dropped:
      out-of-order:            0
      total:                   0
   Send packets dropped:
      exceeded session MTU:     0
      total:                   0
  DF bit on, ToS reflect enabled, ToS value 0, TTL value 255
  UDP checksums are disabled
  Session PMTU enabled, path MTU is 1492 bytes
  No session cookie information available
  FS cached header information:
   encap size = 28 bytes
   45000014 00004000 FF73460F 0C1E0EC8
   0C1E0E64 40090246 00000000
  Sequencing is on
   Ns 0, Nr 0, 0 out of order packets received
   Packets switched/dropped by secondary path: Tx 0, Rx 0

Peer Session Details
        Peer Session ID     : 1074332230
        Peer Qam ID        : Qam7/10.1
        Peer Qam State      : ACTIVE
        Peer Qam Type       : Primary
Peer Qam Statistics
        Total Pkts          : 104055078
        Total Octets        : 19562354664
        Total Discards      : 0
        Total Errors        : 0
        Total In Pkt Rate   : 1068
        Bad Sequence Num    : 0
        Total In DLM Pkts   : 0
  Conditional debugging is disabled
LocID      RemID      TunID      Tsid       State  Last Chg Uniq ID    Type
1252046589 1074332227 501350688  531        est    1d02h    13         S

Session id 1252046589 is up, tunnel id 501350688
  Remote session id is 1074332227, remote tunnel id 4220074353
  Locally initiated session
  Session Type: Secondary
Qam Channel Parameters
  Tsid is 531
  Group Tsid is 57
  Frequency is 531000000
  Modulation is 256qam
  Annex is B
  Interleaver Depth I=32 J=4
```

```
  Power is 530
  Qam channel status is 0
  Unique ID is 13
Call serial number is 3208000004
Remote tunnel name is RFGW-10-1
  Internet address is 24.30.14.100
Local tunnel name is prasm_ubr10k
  Internet address is 24.30.14.200
IP protocol 115
  Session is L2TP signaled
  Session state is established, time since change 1d02h
   0 Packets sent, 0 received
   0 Bytes sent, 0 received
  Last clearing of counters never
  Counters, ignoring last clear:
   0 Packets sent, 0 received
   0 Bytes sent, 0 received
   Receive packets dropped:
      out-of-order:            0
      total:                   0
   Send packets dropped:
      exceeded session MTU:     0
      total:                   0
  DF bit on, ToS reflect enabled, ToS value 0, TTL value 255
  UDP checksums are disabled
  Session PMTU enabled, path MTU is 1492 bytes
  No session cookie information available
  FS cached header information:
   encap size = 28 bytes
   45000014 00004000 FF732E0F 181E0EC8
   181E0E64 40090243 00000000
  Sequencing is on
   Ns 0, Nr 0, 0 out of order packets received
   Packets switched/dropped by secondary path: Tx 0, Rx 0

Peer Session Details
        Peer Session ID     : 1074332227
        Peer Qam ID        : Qam7/10.1
        Peer Qam State      : ACTIVE
        Peer Qam Type       : Secondary
Peer Qam Statistics
        Total Pkts          : 0
        Total Octets        : 0
        Total Discards      : 0
        Total Errors        : 0
        Total In Pkt Rate   : 8409
        Bad Sequence Num    : 0
        Total In DLM Pkts   : 0
  Conditional debugging is disabled
```

Table 204: show depi Field Descriptions

Field	Description
LocID	Identifier of the session.
RemID	Identifier of the remote session.
TunID	Identifier of the tunnel.
Tsid	Transport Stream Identifier.

Field	Description
State	State of the session.
Last Chg	Last state change timestamp.
Uniq ID	Unique identifier of the QAM channel.
Type	Primary or secondary session.
RF Channel	RF channel interface.
EQAM rf-port	The EQAM RF port used for the DEPI session.

Related Commands

Command	Description
depi-tunnel	Creates a template of DEPI tunnel configuration settings that can be inherited by different pseudowire classes.
rf-channel depi-tunnel	Binds the DEPI tunnel to an RF channel on a shared port adapter (SPA).
controller modular-cable	Enters controller configuration mode to configure the SPA controller.
show depi	Displays information about DEPI sessions and tunnels.
show depi tunnel	Displays information about DEPI tunnels.

show depi tunnel

To display information about Downstream External PHY Interface (DEPI) tunnels, use the **show depi tunnel** command in privileged EXEC mode.

show depi tunnel [*tunnel-id* **verbose** | **endpoints**]

Syntax Description

tunnel-id	(Optional) Name of the DEPI tunnel.
verbose	(Optional) Displays detailed DEPI tunnel or session information.
endpoints	(Optional) Specifies DEPI tunnel endpoints including tunnel ID and Edge Quadrature Amplitude Modulation (EQAM) RF port.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCE	This command was modified. Support for a new keyword, **endpoints**, was added to provide DEPI tunnel endpoint information.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a sample output of the **show depi tunnel** command for all the active control connections:

```
Router# show depi tunnel
LocTunID   RemTunID   Remote Name   State  Remote Address  Sessn L2TP Class
                                                          Count
555844637  4037701912 RFGW-10-1     est    11.30.14.100    4     test10
1486289361 1394811300 RFGW-10-1     est    12.30.14.100    4     test10
1688275168 1361251901 RFGW-10-1     est    24.30.14.100    4     test10
```

The following example shows a sample output of the **show depi tunnel** command for a specific active control connection identified by the DEPI tunnel name:

```
Router# show depi tunnel 1834727012 verbose
Tunnel id 1834727012 is up, remote id is 3849925733, 1 active sessions
  Locally initiated tunnel
  Tunnel state is established, time since change 04:10:38
  Remote tunnel name is RFGW-10
    Internet Address 1.3.4.155, port 0
  Local tunnel name is myankows_ubr10k
    Internet Address 1.3.4.103, port 0
  L2TP class for tunnel is rf6
  Counters, taking last clear into account:
    0 packets sent, 0 received
```

```
    0 bytes sent, 0 received
    Last clearing of counters never
  Counters, ignoring last clear:
    0 packets sent, 0 received
    0 bytes sent, 0 received
  Control Ns 255, Nr 254
  Local RWS 1024 (default), Remote RWS 8192
  Control channel Congestion Control is enabled
    Congestion Window size, Cwnd 256
    Slow Start threshold, Ssthresh 8192
    Mode of operation is Slow Start
  Retransmission time 1, max 1 seconds
  Unsent queuesize 0, max 0
  Resend queuesize 0, max 2
  Total resends 0, ZLB ACKs sent 252
  Total peer authentication failures 0
  Current no session pak queue check 0 of 5
  Retransmit time distribution: 0 0 0 0 0 0 0 0 0 0
  Control message authentication is disabled
```

The following is a sample output of the **show depi tunnel** command that shows DEPI tunnel endpoints in Cisco IOS Release 12.2(33)SCE and later:

```
Router# show depi tunnel endpoints
DEPI Tunnel               Modular Controller   State  Remote Address Sessn
                                                                     Count
depi_working_tunnel_8_0_4 Mod8/0/2             est    1.30.84.100     24
depi_protect_tunnel_5_1_0 Mod8/0/0:5/1/0       est    1.30.50.100     24
depi_protect_tunnel_5_1_4 Mod8/0/2:5/1/2       est    1.30.54.100     24
depi_working_tunnel_8_0_0 Mod8/0/0             est    1.30.3.100      24
```

Table 205: show depi Field Descriptions

Field	Description
LocTunID	Identifier of the local tunnel.
RemTunID	Identifier of the remote tunnel.
Remote Name	Name of the remote tunnel.
State	State of the tunnel.
Remote Address	IP address of the remote tunnel.
Session Count	Number of sessions.
L2TP Class	L2TP class name for the tunnel.
Modular Controller	Controller modular cable interface for primary and secondary DEPI tunnels.

Related Commands

Command	Description
depi-tunnel	Creates a template of DEPI tunnel configuration settings that can be inherited by different pseudowire classes.
rf-channel depi-tunnel	Binds the depi-tunnel to an rf-channel on a shared port adapter (SPA).

Command	Description
controller modular-cable	Enters controller configuration mode to configure the SPA controller.
show depi	Displays information about DEPI sessions and tunnels.
show depi session	Displays information about DEPI sessions.

show derived-config interface cable

To display the detailed configuration and channel list information of dynamic bonding group, use the **show derived-config interface cable** *(X/Y/Z)* command in privileged EXEC mode.

show derived-config interface cable*(X/Y/Z)*

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 16.10.1f	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Note

- For legacy DSG, you can see the DSG command by using **show derived-config interface** and **show interface Cable1/0/1** command.
- For OPS DSG, you can see the DSG command by using the **show derived-config interface** command, instead of the **show interface Cable1/0/1** command.

Examples

The following example shows a sample output when the legacy DSG is used:

```
Router# show running interface cable1/0/1
interface Cable1/0/1
cable downstream dsg chan-list 111
 cable downstream dsg timer 2
 cable downstream dsg vendor-param 2
 cable downstream dsg tg 4500 channel 1
 cable mac-domain-profile MD1
 cable bundle 255
 cable managed fiber-node 1
End
Router# show derived-config interface c1/0/
interface Cable1/0/1
......
 cable downstream dsg chan-list 111
 cable downstream dsg timer 2
 cable downstream dsg vendor-param 2
 cable downstream dsg tg 4500 channel 1
end
```

The following example shows a sample output when the OPS DSG command is used. This option hides the DSG configuration under MD when you run the show running command.

```
Router# show running interface cable 1/0/1
interface Cable1/0/1
 cable mac-domain-profile MD1
```

```
 cable bundle 255
 cable managed fiber-node 1
End
```

show derived-config interface wideband-Cable

To display the detailed channel list information of dynamic bonding group, use the **show derived-config interface wideband-Cable** command in privileged EXEC mode.

show derived-config interface wideband-Cable

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 16.7.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a sample output of the **show derived-config interface wideband-Cable** command for all the active control connections:

```
Router# show derived-config interface wideband-Cable 3/0/1:1
Building configuration...
Derived configuration: 113 bytes
!
interface Wideband-Cable3/0/1:1
 cable bundle 255
 cable rf-channels channel-list 0-7 bandwidth-percent 1
end
```

For a dynamically created bonding group, the **show derived-config interface wideband-Cable** shows the rf-channel list information as shown above while the **show run interface wideband-cable** does not show the show the rf-channel list details. A sample output for **show run interface wideband-cable** is shown below:

```
BXB-TB8#show run int wideband-Cable 1/0/0:10
Load for five secs: 9%/1%; one minute: 8%; five minutes: 9%
Time source is NTP, 10:46:09.783 EST Fri Dec 15 2017

Building configuration...

Current configuration : 117 bytes
!
interface Wideband-Cable1/0/0:10
cable bundle 1
end
```

Related Commands

Command	Description
show cable modem wideband channel	Displays the cable modem's primary wideband interface.
show cable modem verbose | in DS Tuner	Displays the cable modem's downstream tuner capability.

Command	Description
show cable mac-domain Cable *x/y/z***rcc**	Displays runtime receive channel configuration (RCC) on a cable line card interface.
show cable dynamic-bonding-group summary	Display the details of the dynamically created bonding groups.

show dhcp

To display the current Dynamic Host Configuration Protocol (DHCP) settings on point-to-point interfaces, use the **show dhcp** command in privileged EXEC mode.

Cisco uBR904, uBR905, uBR924, uBR925 cable access routers, Cisco CVA122 Cable Voice Adapter
show dhcp {**lease** | **server**}

Cisco cBR Series Converged Broadband Router
show dhcp {**lease** | **server**}

Syntax Description

lease	Displays DHCP addresses leased from a server.
server	Displays known DHCP servers.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3(4)NA	This command was introduced for the Cisco uBR904 cable access router.
12.0(4)XI1	Support was added for the Cisco uBR924 cable access router.
12.1(3)XL	Support was added for the Cisco uBR905 cable access router.
12.1(5)XU1	Support was added for the Cisco CVA122 Cable Voice Adapter.
12.2(2)XA	Support was added for the Cisco uBR925 cable access router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

You can use this command on any point-to-point type of interface that uses DHCP for temporary IP address allocation.

Examples

This example shows the output from the **show dhcp lease** command:

```
Router# show dhcp lease

Temp IP addr: 188.188.1.40  for peer on Interface: cable-modem0
Temp sub net mask: 0.0.0.0
   DHCP Lease server: 4.0.0.32, state: 3 Bound
   DHCP transaction id: 2431
   Lease: 3600 secs,  Renewal: 1800 secs,  Rebind: 3150 secs
Temp default-gateway addr: 188.188.1.1
   Next timer fires after: 00:58:01
   Retry count: 0   Client-ID: 0010.7b43.aa01
Router#
```

Table 206: show dhcp lease Field Descriptions

Field	Description
Temp IP addr	IP address leased from the DHCP server for the cable interface.
Temp subnet mask	Temporary subnet mask assigned to the cable interface.
DHCP Lease server	IP address of the DHCP server that assigned an IP address to this client.
state	Current state of this client (the cable interface). Possible states are Bound, Renew, or Rebinding. For descriptions of these states, see RFC 2131.
DHCP transaction id	Unique number established by the router before the first request message is sent to the DHCP server. The same transaction ID is used as long as the lease keeps getting renewed and is valid. If a new "discover" message is sent, a new transaction ID is used.
Lease	Time (in seconds) for which the leased IP address is valid; the duration of the lease.
Renewal	Time interval (in seconds) from address assignment until the client transitions to the renewing state. When the renewal (T1) time expires, the client sends a unicast dhcprequest message to the server to extends its lease. The default value of this timer is 0.5 times the duration of the lease.
Rebind	Time interval (in seconds) from address assignment until the client transitions to the rebinding state and sends a broadcast dhcprequest message to any DHCP server to extends its lease. The default value of this timer (T2) is 0.875 times the duration of the lease.
Temp default-gateway addr	IP address of the router closest to this client on the network.
Next timer fires after	Time in hours, minutes, and seconds until the next timer expires.
Retry count	Number of times the client has sent any message to the DHCP server—most likely a request message to extend its lease. When the lease is renewed, the Retry count is reset to 0.
Client-ID	MAC address (with optional media type code) that uniquely identifies the client on the subnet for binding lookups.

This example shows the output for the **show dhcp server** command:

```
Router# show dhcp server

   DHCP server: ANY (255.255.255.255)
    Leases:   1
    Offers:   1      Requests: 2     Acks: 1     Naks: 0
    Declines: 0      Releases: 0     Bad:  0
    TFTP Server Name: SOHOSERVER
    TIME0: 1.2.0.250,  TIME1: 0.0.0.0
    Subnet: 255.255.255.0
Router#
```

Table 207: show dhcp server Field Descriptions

Field	Description
DHCP server	MAC address used by the DHCP server.
Leases	Number of current leased IP addresses.
Offers	Number of offers for an IP address sent to a proxy client from the server.
Requests	Number of requests for an IP address to the server.
Acks	Number of acknowledge messages sent by the server to the proxy client.
Naks	Number of not acknowledge messages sent by the server to the proxy client.
Declines	Number of offers from the server that have been declined by the proxy client.
Releases	Number of times IP addresses have been relinquished gracefully by the client.
Bad	Number of bad packets received due to wrong length, wrong field type, or other causes.
TFTP Server Name	Name (if any) configured for the server providing TFTP downloads to the CM.
TIME0	IP address of the primary Time-of-Day (ToD) server.
TIME1	IP address of the secondary ToD server.
Subnet	Subnet containing the DHCP server.

Tip In Cisco IOS Release 12.2(8)T and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable-modem voip best-effort	Allows voice calls to be sent upstream over the cable interface using best effort.
show bridge cable-modem	Displays bridging information for the cable interface.
show interfaces cable-modem	Displays information about the cable interface.

show diag all eeprom detail | include MAC

To display the chassis MAC address information, use the **show diag all eeprom detail | include MAC** command in privileged EXEC mode.

show diag all eeprom detail | include MAC

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the chassis MAC address information.

Examples

The following sample output shows the chassis MAC address information:

```
Router# show diag all eeprom detail | include MAC
Chassis MAC Address      : c414.3c17.1c00
MAC Address block size   : 1024
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
mgmt-ip	Defines the local management IP address for a logical edge device.
mac-address	Defines the MAC address for a logical edge device.
vcg	Specifies the virtual carrier group assigned to the logical edge device.
virtual-edge-input-ip	Defines a virtual edge input.
show cable video logical-edge-device	Displays the logical edge device information.
show cable video gqi connections	Displays the GQI connection information of the logical edge device with the Session Resource Manager.

show diagnostic bootup level

To display the currently configured diagnostics level at bootup, use the **show diagnostic bootup** command in user EXEC or privileged EXEC mode.

show diagnostic bootup level

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	The command was introduced in this release to support Generic Online Diagnostics (GOLD) functionality for Cisco uBR10012 Universal Broadband Router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The level of diagnostic tests which run at bootup can be either configured as complete or minimal. To configure the bootup level, use the **diagnostic bootup level** command in global configuration mode. The **show diagnostic bootup level** command is used to display the currently configured bootup diagnostic level.

Examples

This example shows the output of the **show diagnostic bootup level** command on the Cisco uBR10012 Router:

```
Router# show diagnostic bootup level
Current bootup diagnostic level: complete
```

Related Commands

Command	Description
diagnostic bootup level	Configures the level of diagnostic tests which run at booup.

show diagnostic content

To display information about available tests, including test ID, test attributes, test schedule, and supported coverage test levels for each test and for each of the bays and line-cards, use the **show diagnostic content** command in user EXEC or privileged EXEC mode.

show diagnostic content[**all** | **bay** *slot/bay* | **slot** *slot-no* | **subslot** *slot/subslot*]

all	Displays information about available tests for all modules.
bay *slot/bay*	Indicates the card slot and bay number of the SPA for which the available test content details is displayed. The **bay** keyword is used to refer a SPA on the router. The valid range for the slot number is from 1 to 8 and 0 to 3 for the bay number.
slot *slot-no*	Indicates the slot number of the full-height line card for which the available test content details is displayed. The **slot** keyword is used to refer a full-height line card on the router. The valid range for slot is 1 to 8.
subslot *slot/subslot*	Indicates the slot and subslot number of half-height line card for which the available test content details has to be displayed. The **subslot** keyword is used to refer a half-height line card on Cisco uBR10012 Router. The valid range for the slot number is from 1 to 8 and 0 to 1 for the subslot number.

Command Default

None

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced for the Cisco uBR10012 Router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

For each available diagnostic test, a set of attributes is displayed as a series of characters in the Attributes field of the command output. An asterisk (*) in the character location indicates that the attribute is not applicable to the test. The following set of attribute s is displayed:

Attribute	Description
M	Test runs when the bootup diagnostic level is set to either Minimal or Complete.
C	Test runs when the bootup diagnostic level is set to Complete.
B	Test runs when the **diagnostic ondemand** command is executed. Indicates that the test is a basic ondemand test.
P	Test runs on a port, not the entire device (per-port test).
V	Test runs on the entire device (per-device test).

Attribute	Description
D	Test disrupts the network traffic (disruptive test).
N	Test runs when the system is online without disrupting the network traffic (non disruptive test).
S	If the card under test is a standby card, only the standby card runs the test. The test does not run from the active card. If the card under test is an active card, the active card runs the test on itself.
X	Test is not a health-monitoring test.
F	Monitoring interval of the test cannot be modified by the user (fixed monitoring test).
E	User cannot disable the test (always enabled test).
A	Monitoring is active for this test.
I	Monitoring is inactive for this test.

If a test is configured to run periodically, the interval will be displayed in the Test Interval field of the command output in the format dd hh:mm:ss.ms, indicating days, hours, minutes, seconds, and milliseconds. For example, the test interval of a test that runs every 15 minutes will be displayed as 000 00:15:00.00. The test interval of a test that runs every 14 days will be displayed as 014 00:00:00.00.

Examples

This example shows a sample output of the **show diagnostic content** command that displays the test suite, monitoring interval, and test attributes for bay 1/0 on the Cisco uBR10012 Universal Broadband Router.

```
Router# show diagnostic content bay 1/0
Bay 1/0: 2jacket-1
          Diagnostics test suite attributes:
            M/C/* - Minimal bootup level test / Complete bootup level test / NA
              B/* - Basic ondemand test / NA
            P/V/* - Per port test / Per device test / NA
            D/N/* - Disruptive test / Non-disruptive test / NA
              S/* - Only applicable to standby unit / NA
              X/* - Not a health monitoring test / NA
              F/* - Fixed monitoring interval test / NA
              E/* - Always enabled monitoring test / NA
              A/I - Monitoring is active / Monitoring is inactive
Test In terval
ID   Test Name                                      Attributes      day hh:mm:ss.
==== ========================================== ============    =============
1) TestModenaSample -------------------------> ***N****A       02010:10:10.10 99
2) TestModenaLLQDrops -----------------------> ***N****A       02010:10:10.10 99
```

Table 208: show diagnostic content bay Field Descriptions

Field	Description
ID	The identification number.
Test Name	The name of the test that is run on the specific bay.
Attributes	The test attribute for the specific bay.

Field	Description
Test In terval	The test interval in the dd hh:mm:ss.ms format, indicating days, hours, minutes, seconds, and milliseconds.

This example shows a sample output of the show diagnostic content subslot 8/0 command that displays the test suite, monitoring interval, and test attributes for subslot 8/0 on the Cisco uBR10012 Universal Broadband Router.

```
Router# show diagnostic content subslot 8/0
Subslot 8/0: 5cable-mc520u-d, 5 ports
  Diagnostics test suite attributes:
    M/C/* - Minimal bootup level test / Complete bootup level test / NA
      B/* - Basic ondemand test / NA
    P/V/* - Per port test / Per device test / NA
    D/N/* - Disruptive test / Non-disruptive test / NA
      S/* - Only applicable to standby unit / NA
      X/* - Not a health monitoring test / NA
      F/* - Fixed monitoring interval test / NA
      E/* - Always enabled monitoring test / NA
      A/I - Monitoring is active / Monitoring is inactive
                                                                    Test Interval
  ID   Test Name                                    Attributes      day hh:mm:ss
.
  ==== ========================================== ============    ============
1) TestSampleProxy ---------------------------> ***N****I       not configured  n/a
2) Test520LLQDrops ---------------------------> **PN****A       000 01:00:00.00 1
3) TestBlazeIndexLeak ------------------------> ***N****A       000 08:00:00.00 n/a
4) TestMemLeaks ------------------------------> ***N**F*A       000 02:00:00.00 n/a
```

Related Commands

Command	Description
diagnostic bootup level	Sets the bootup diagnostic level.
diagnostic monitor	Configures the health-monitoring diagnostic testing.
diagnostic ondemand	Configures the on-demand diagnostics.
diagnostic schedule test	Sets the scheduling of test-based diagnostic testing for a specific module or schedules a supervisor engine switchover.
show diagnostic description	Describes the diagnostic tests.
show diagnostic bootup	Displays the configured diagnostics level at bootup.
show diagnostic events	Displays the diagnostic event log.
show diagnostic ondemand settings	Displays the settings for the on-demand diagnostics.
show diagnostic result	Displays the diagnostic test results for a module.
show diagnostic schedule	Displays the current scheduled diagnostic tasks.
show diagnostic status	Displays the running diagnostics tests.
diagnostic ondemand	Configures the on-demand diagnostics.

Command	Description
diagnostic event-log size	Modifies the diagnostic event-log size dynamically.
diagnostic start	Runs the specified diagnostic test.
diagnostic stop	Stops the testing process.

show diagnostic ood-status

To display status information, such as the line card slot and name, Field Diagnostic image status, and overall results from previous diagnostic tests, enter the **show diagnostic ood-status** command.

show diagnostic ood-status [**slot** *slot-number* | **subslot** *slot-number*/*subslot-number*] [**detail**]

Syntax Description

slot	Specifies that the status information will be viewed for a line card in a full slot.
subslot	Specifies that the status information will be viewed for a line card in a subslot.
slot-number	Specifies the slot number of the line card whose status information will appear in the command output.
subslot-number	Specifies the subslot number of the line card whose status information will appear in the command output.
detail	Displays the status information and the detailed test results of the specified line card in the command output.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show diagnostic ood-status** output discloses if a line card supports Field Diagnostic testing and if the line card has already downloaded a Field Diagnostic image. Therefore, the **show diagnostic ood-status** command is useful as a reference before loading the Field Diagnostic image onto the line card.

It is important to note that the **show diag** and **show diagnostic** commands produce completely different outputs. Therefore, the **show diagnostic** output cannot be gathered using **show diag** because the autocomplete function will generate the **show diag**, not the **show diagnostic**, output. If you want to abbreviate the **show diagnostic** command, the shortest possible abbreviation is **show diagn**.

Examples

In the following example, the **show diagnostic ood-status** command is used to view status information of all the line card in the uBR10012 router.

```
Router# show diagnostic ood-status
Load for five secs: 0%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *05:56:50.835 EDT Thu Nov 5 2009
==== ======================== ======= ========== =========== ==============
                              FDiag   Loaded     Overall     Current
Slot Card Description         Support Image Type Diag Result Card State
---- ------------------------ ------- ---------- ----------- --------------
```

```
A    Active PRE2-RP           YES     IOS        N/A         ONLINE
B    Standby PRE2-RP          YES     N/A        N/A         OFFLINE
1    2jacket-1                YES     LCDOS      N/A         ONLINE
1    2cable-dtcc              NO      LCDOS      N/A         ONLINE
2/1  2cable-tccplus           NO      LCDOS      N/A         ONLINE
3/0  1gigethernet-hh-1        YES     LCDOS      N/A         ONLINE
3/1  1gigethernet-hh-1        YES     LCDOS      N/A         ONLINE
5/0  5cable-mc520h-d          YES     IOS        N/A         ONLINE
6/0  5cable-mc520h-d          YES     Field Diag N/A         DIAG READY
8/1  5cable-mc520u-d          YES     IOS        N/A         ONLINE
==== ======================== ======= ========== =========== ==============
```

Table 209: show diagnostic ood-status Field Descriptions

Field	Description
Slot	Identifies the slot on the router.
Card Description	A text explanation of the line card in the specified slot.
FDiag Support	Indicates whether the line card in the specific slot supports Field Diagnostic testing. • Yes—the line card in the slot supports Field Diagnostic testing. • No—the card in the slot does not support Field Diagnostic testing.
Loaded Image Type	Specifies the run-time image for each line card. • Field Diag—Indicates that the Field Diagnostic image is loaded on the line card. A line card will either have the Field Diagnostic or LCDOS image. • IOS—Specifies that the processor is running Cisco IOS. • LCDOS—Line card DOS. The LCDOS image is the image the line card is running during normal router operation. It is removed temporarily when a Field Diagnostic image is loaded onto the line card and loaded back onto a line card when a Field Diagnostic image is unloaded. **Note** The LCDOS image is not loaded on cable line cards.
Overall Diag Result	Displays the result of the last performed Field Diagnostic test, assuming the Field Diagnostic image has not been removed since the last test. • Pass—This line card passed the last diagnostic test. • Fail—At least one Field Diagnostic test failed during the last diagnostic test. • N/A—This line card has not been tested.
Current Card State	The current card state: • Diag Ready—A diagnostic image is loaded onto the line card and Field Diagnostic tests can be run. • Running Diag—A diagnostic image is loaded on to the line card and is currently being run. • Offline—The line card is not currently passing traffic and no Field Diagnostic image has been downloaded onto the line card. • Online—The line card is active and can pass traffic.

In the following sample output, the test results per line card is displayed when the **show diagnostic ood-status** command is used along with **subslot** and **detail** keywords. The output displays diagnostic status of the line card along with details of the tests being run and their status.

```
Router# show diagnostic ood-status subslot 6/0 detail
==== ======================== ======= ========== =========== ==============
                              FDiag   Loaded     Overall     Current
Slot Card Description         Support Image Type Diag Result Card State
---- ------------------------ ------- ---------- ----------- --------------
6/0  5cable-mc520h-d          YES     Field Diag N/A         RUNNING DIAG
==== ======================== ======= ========== =========== ==============
 Detail testing progress for card in slot 6/0:
 Current card state: RUNNING DIAG
                                                             Test
 ID   Test Name              [Selected To Run (Y/N)] Status
 ==== ================================================ =======
   1) Lookout2 RW test ..... [Y] Passed
   2) Lookout2 R/W Intr bits ..... [Y] Passed
   3) Lookout2 Reset test ..... [Y] Passed
   4) JIB2 PCI ID test ..... [Y] Passed
   5) JIB2 Register read/write test ..... [Y] Passed
   6) JIB2 R/W Intr bits ..... [Y] Passed
   7) JIB2 Reset test ..... [Y] Passed
   8) JIB2 ifa6 SDRAM Test ..... [Y] Running
   9) JIB2 ECC Disabled SDRAM Test ..... [Y] Not Run
  10) JIB2 Data Bus/Address SDRAM Test ..... [Y] Not Run
  11) JIB2 ifa6 SSRAM Test ..... [Y] Not Run
  12) JIB2 Data Bus/Address SSRAM Test ..... [Y] Not Run
  13) Mfpga R/W Intr bits ..... [Y] Not Run
  14) Mfpga Register read/write test ..... [Y] Not Run
  15) Mfpga Reset test ..... [Y] Not Run
  16) Internal Timer Test ..... [Y] Not Run
  17) Random Register Test ..... [Y] Not Run
  18) Processor Id Test ..... [Y] Not Run
  19) Ping Test ..... [Y] Not Run
  20) Core2 Memory Access Test ..... [Y] Not Run
  21) L1 Cache Test ..... [Y] Not Run
  22) core 2 L1 Cache Test ..... [Y] Not Run
  23) System DDR Test ..... [Y] Not Run
  24) Local UART Port 0 Internal Loopback Test . [Y] Not Run
  25) Local UART Port 1 Internal Loopback Test . [Y] Not Run
  26) PCI Bridge R/W Test ..... [Y] Not Run
  27) PCI Bridge ID Test ..... [Y] Not Run
  28) DM Channel Test ..... [Y] Not Run
  29) SMM665 Voltage Test ..... [Y] Not Run
  30) MarchingPattern_nvram ..... [Y] Not Run
  31) DataPins_nvram ..... [Y] Not Run

Router#
```

Table 210: show diagnostic ood-status subslot x/y detail Field Descriptions

Field	Description
Current card state	Specifies the card state.
ID	The test identification number.
Test Name	The name of the test.

Field	Description
Selected to Run	Specifies whether the test was specified to run. Y indicates the test will be run and N indicates the test will not be run.
Test Status	Provides the current test status.

Related Commands

Command	Description
diagnostic event-log size	Sets the size of the event table.
diagnostic load	Loads the Field Diagnostic image onto the line card.
diagnostic ondemand action-on-failure	Sets the number of errors allowed in the Field Diagnostic test before the Field Diagnostic test is stopped.
diagnostic ondemand iterations	Sets the number of times each specific Field Diagnostic test will be run when a Field Diagnostic test is initiated.
diagnostic start	Starts Field Diagnostic testing on the line card.
diagnostic stop	Stops an in-progress Field Diagnostic test.
diagnostic unload	Unloads the Field Diagnostic image from the line card and restores normal line card operation.
show diag	Shows information of all the line cards in the uBR10012 router, per slot, per subslot.
show diagnostic content	Shows the Field Diagnostic test list for a particular line card.
show diagnostic events	Displays the history of Field Diagnostic events since the last system reload.

show diagnostic result

To display the diagnostic test results for a module, use the **show diagnostic result** command in user EXEC or privileged EXEC mode.

show diagnostic result [[**bay** *slot/bay* | **slot** *slot-no* | **subslot** *slot/subslot*] | {**detail** | **test** {*test-idtest-id-range* | **all**}} | **all**]

Syntax Description

bay *slot/bay*	(Optional) Indicates the card slot and bay number for which the diagnostic test results are displayed. The **bay** keyword is used to refer a SPA on Cisco uBR10012 Universal Broadband Router. The valid range to specify slot is 1 to 8 and the valid range for bay is 0 to 3.
slot *slot-no*	(Optional) Indicates the slot number of the full-height line card for which the diagnostic test results have to be displayed. The **slot** keyword is used to refer a full-height line card on Cisco uBR10012 Universal Broadband Router. The valid range for the slot number is from 1 to 8.
subslot *slot/sub-slot*	(Optional) Indicates the slot and subslot number of the half-height line card for which the diagnostic test results have to be displayed. The **subslot** keyword is used to refer a half-height line card on Cisco uBR10012 Router. The valid range to specify slot is 1 to 8 and the valid range for sub-slot is 0 to 1.
all	(Optional) Displays diagnostic test results for all the SPAs, full-height line cards, and half-height line cards.
list	List of modules in the following format: • Entries separated by a comma, for example, 1,4,6-10. • Ranges specified with a hyphen, for example, 1-4,6-10.
slot	Single module by slot number.
slot/subslot	Single sub module by slot number and subslot or bay within the module.
detail	(Optional) Displays the detailed test results. The detail keyword is used along with the bay, slot, or subslot keywords to provide detailed test result information for a SPA, full-height line card, or half-height line card.
test *test-id*	(Optional) Displays test results only for the specified test-ids.
test *test-id-range*	(Optional) Displays test results for the specified range of test ids.
test *all*	(Optional) Displays the test results for all the tests running on the SPA, full-height line card, or half-height line card.

Command Default

None

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	The command was introduced in this release to support the Generic Online Diagnostics (GOLD) functionality on the Cisco uBR10012 Universal Broadband Router. The keywords **bay**, **slot**, and **subslot** were added for the Cisco uBR10012 Universal Broadband Router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

In the command output, the possible testing results are as follows:

- Passed (.)
- Failed (F)
- Untested (U)

To display the results of a specific diagnostic test, specify the *test-id* number using the **test** *test-id* keyword and argument. The *test-id* numbers for available diagnostic tests are displayed in the output of the **show diagnostic content** command.

You can use the **show diagnostic description** command to see a detailed description of a diagnostic test.

The command syntax to refer a line card or SPAs is different on Cisco uBR10012 Router. The keyword is **slot** *x* for a full-height line card, **slot** *x*/*y* for a half-height card, and **bay** *x*/*y* for a SPA.



Note To view the diagnostic test results for a SPA, full-height line card, or half-height line card use the **show diagnostic result** command along with the **bay**, **slot**, or **subslot** keywords respectively.

The GOLD test cases used to poll for system errors in Cisco IOS Software Release 12.2(33)SCC are Low Latency Queueing (LLQ) drop, Cable Line Card (CLC) memory leak, and Guardian index leak tests.

Examples

The following example shows a sample output of the **show diagnostic result all** command**.** The output displays a summary of test results on all the SPAs, full-height line cards, and half-height line cards on the Cisco uBR10012 Router:

```
Router# show diagnostic result all
Current bootup diagnostic level: minimal
Slot 1: 2jacket-1  SerialNo : CAT1146E05
Overall diagnostic result: UNTESTED
  Diagnostic level at card bootup: minimal
Test results: (. = Pass, F = Fail, U = Untested)
    1) TestJacketSample --------------------------> U
        Bay 1/0: 2jacket-1  SerialNo : N/A
          Overall diagnostic result: PASS
          Diagnostic level at card bootup: minimal
          Test results: (. = Pass, F = Fail, U = Untested)
            1) TestModenaSample --------------------------> U
            2) TestModenaLLQDrops ------------------------> .
Subslot 5/0: 5cable-mc520u-d, 5 ports  SerialNo : CAT10210T9
  Overall diagnostic result: PASS
  Diagnostic level at card bootup: minimal
  Test results: (. = Pass, F = Fail, U = Untested)
    1) TestSampleProxy ---------------------------> U
    2) Test520LLQDrops:
      Port  0  1  2  3  4
      -------------------
```

```
            .  .  .  .  .
3) TestBlazeIndexLeak ------------------------> U
    4) TestMemLeaks -----------------------------> .
Subslot 8/0: 5cable-mc520u-d, 5 ports  SerialNo : CAT08410SS
  Overall diagnostic result: PASS
  Diagnostic level at card bootup: minimal
  Test results: (. = Pass, F = Fail, U = Untested)
    1) TestSampleProxy --------------------------> U
    2) Test520LLQDrops:
      Port  0  1  2  3  4
      -------------------
            .  .  .  .  .
3) TestBlazeIndexLeak ------------------------> .
    4) TestMemLeaks -----------------------------> .
Subslot 8/1: 5cable-mc520u-d, 5 ports  SerialNo : CAT10251S2
  Overall diagnostic result: PASS
  Diagnostic level at card bootup: minimal
  Test results: (. = Pass, F = Fail, U = Untested)
    1) TestSampleProxy --------------------------> U
    2) Test520LLQDrops:
      Port  0  1  2  3  4
      -------------------
            .  .  .  .  .
3) TestBlazeIndexLeak ------------------------> U
    4) TestMemLeaks -----------------------------> .
```

The following example shows a sample output of the **show diagnostic result subslot** *5/0* **detail** command**.** The command output provides useful details such as overall diagnostic results and the time-related values of various important parameters, which help in identifying and resolving the issue:

```
Router# show diagnostic result subslot 5/0 detail
Current bootup diagnostic level: minimal
Subslot 5/0: 5cable-mc520u-d, 5 ports  SerialNo : CAT10210T9
  Overall diagnostic result: PASS
  Diagnostic level at card bootup: minimal
  Test results: (. = Pass, F = Fail, U = Untested)
_____________________________________________________________________________
    1) TestSampleProxy --------------------------> U
          Error code ----------------------------> 0 (DIAG_SUCCESS)
          Total run count -----------------------> 0
          Last test execution time --------------> n/a
          First test failure time ---------------> n/a
          Last test failure time ----------------> n/a
          Last test pass time -------------------> n/a
          Total failure count -------------------> 0
          Consecutive failure count -------------> 0
_____________________________________________________________________________
    2) Test520LLQDrops:
      Port  0  1  2  3  4
      -------------------
            .  .  .  .  .
          Error code ----------------------------> 0 (DIAG_SUCCESS)
          Total run count -----------------------> 17
          Last test execution time --------------> Aug 11 2009 09:42:22
          First test failure time ---------------> n/a
          Last test failure time ----------------> n/a
          Last test pass time -------------------> Aug 11 2009 09:42:22
          Total failure count -------------------> 0
          Consecutive failure count -------------> 0
_____________________________________________________________________________
    3) TestBlazeIndexLeak ------------------------> U
          Error code ----------------------------> 0 (DIAG_SUCCESS)
```

```
        Total run count -----------------------> 1
        Last test execution time --------------> Aug 11 2009 00:42:19
        First test failure time ---------------> n/a
        Last test failure time ----------------> n/a
        Last test pass time -------------------> Aug 11 2009 00:42:19
        Total failure count -------------------> 0
        Consecutive failure count -------------> 0
_____________________________________________________________________________
  4) TestMemLeaks ------------------------------> .
        Error code ----------------------------> 0 (DIAG_SUCCESS)
        Total run count -----------------------> 7
        Last test execution time --------------> Aug 11 2009 06:42:19
        First test failure time ---------------> n/a
        Last test failure time ----------------> n/a
        Last test pass time -------------------> Aug 11 2009 06:42:19
        Total failure count -------------------> 0
        Consecutive failure count -------------> 0
_____________________________________________________________________________
```

Related Commands

Command	Description
show diagnostic content	Displays the available diagnostic tests.
show diagnostic description	Describes the diagnostic tests.
show diagnostic bootup	Displays the configured diagnostics level at bootup.
show diagnostic events	Displays the diagnostic event log.
show diagnostic ondemand settings	Displays the settings for the on-demand diagnostics.
show diagnostic result	Displays the diagnostic test results for a module.
show diagnostic schedule	Displays the current scheduled diagnostic tasks.
show diagnostic status	Displays the running diagnostics tests.
diagnostic start	Runs the specified diagnostic test.
diagnostic stop	Stops the testing process.
show diagnostic content module	Displays the available diagnostic tests.
diagnostic bootup level	Configures the diagnostic bootup level.
diagnostic event-log size	Modifies the diagnostic event-log size dynamically.
diagnostic monitor	Configures the health-monitoring diagnostic testing.
diagnostic ondemand	Configures the on-demand diagnostics.
diagnostic schedule	Sets the scheduling of diagnostic testing for a specific bay, slot, or subslot.

show diagnostic schedule

To display the scheduled diagnostic tasks, use the **show diagnostic schedule** command in user EXEC or privileged EXEC mode.

show diagnostic schedule [**all** | **bay** *slot/bay* | **slot** *slot-no* | **subslot** *slot/subslot*]

Syntax Description

all	Displays the scheduled diagnostic tasks for all the installed SPAs, full-height line cards, and half-height line cards on the Cisco uBR10012 Universal Broadband Router.
bay *slot/bay*	(Optional) Indicates the card slot and bay number for which the scheduled diagnostic tasks is displayed. The **bay** keyword is used to refer a SPA on the router. The valid range for the slot number is from 1 to 8 and 0 to 3 for the bay number.
slot *slot-no*	(Optional) Indicates the slot number of the full-height line card for which the scheduled diagnostic tasks is displayed. The **slot** keyword is used to refer a full-height line card on the router. The valid range for slot is 1 to 8.
subslot *slot/sub-slot*	(Optional) Indicates the slot and subslot number of the half-height line card for which the scheduled diagnostic tasks have to be displayed. The **subslot** keyword is used to refer a half-height line card on the router. The valid range for the slot number is from 1 to 8 and 0 to 1 for the subslot.

Command Default

None

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	The command was introduced in this release to support Generic Online Diagnostics (GOLD) functionality for Cisco uBR10012 Universal Broadband Router. The keywords **bay**, **slot**, and **subslot** were added for the Cisco uBR10012 Universal Broadband Router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Diagnostic tests for a specific bay, slot, or subslot can be scheduled daily, weekly, or on specific dates and time using the **diagnostic schedule** command from global configuration mode. The **show diagnostic schedule** command output displays the diagnostic tests that have been scheduled for the bay, slot, or subslot using the command **diagnostic schedule**.

Examples

This example shows a sample output of the show diagnostic schedule slot 1 command that displays diagnostic tasks scheduled for slot 1 on the Cisco uBR10012 Universal Broadband Router:

```
Router# show diagnostic schedule slot 1
Current Time = 13:55:35 EST Tue Aug 11 2009
Diagnostic for Slot 1:
Schedule #1:
```

```
        To be run on September 1 2009 12:00
        Test ID(s) to be executed: 1.
```

This example shows a sample output of how to display the diagnostic tasks scheduled for all the bays, full-height line cards, and half-height line cards installed on the Cisco uBR10012 Universal Broadband Router:

```
Router# show diagnostic schedule all
Current Time = 14:05:41 EST Tue Aug 11 2009
Diagnostic for Slot 1:
Schedule #1:
        To be run on September 1 2009 12:00
        Test ID(s) to be executed: 1.
Diagnostic for Bay 1/0 is not scheduled.
Diagnostic for Subslot 5/0 is not scheduled.
Diagnostic for Subslot 8/0:
Schedule #1:
        To be run daily 12:00
        Test ID(s) to be executed: 2.
Diagnostic for Subslot 8/1:
Schedule #1:
        To be run weekly Sunday 12:00
        Test ID(s) to be executed: 3.
```

Related Commands

Command	Description
diagnostic schedule	Sets the diagnostic test schedule for a particular bay, slot, or subslot.
show diagnostic description	Provides the description for the diagnostic tests.
diagnostic start	Runs the specified diagnostic test.
diagnostic stop	Stops the testing process.
show diagnostic content module	Displays the available diagnostic tests.
diagnostic bootup level	Configures the diagnostic bootup level.
diagnostic event-log size	Modifies the diagnostic event-log size dynamically.
diagnostic monitor	Configures the health-monitoring diagnostic testing.
diagnostic ondemand	Configures the on-demand diagnostics.
show diagnostic bootup	Displays the configured diagnostics level at bootup.
show diagnostic events	Displays the diagnostic event log.
show diagnostic ondemand settings	Displays the settings for the on-demand diagnostics.
show diagnostic result	Displays the diagnostic test results for a module.
show diagnostic schedule	Displays the current scheduled diagnostic tasks.
show diagnostic status	Displays the running diagnostics tests.

show diagnostic status

This command is not supported in the cBR-8 router.

show facility-alarm status

To display the current temperature thresholds that will trigger a facility alarm, use the **show facility-alarm status** command in user EXEC or privileged EXEC mode.

show facility-alarm status [**critical** | **major** | **minor** | **info** | **phy-index**]

Syntax Description

critical	(Optional) Only critical alarms are shown.
major	(Optional) All major and critical facility alarms are shown.
minor	(Optional) All minor, major, and critical facility alarms are shown.
info	(Optional) All facility alarms are shown. The default severity level is info.
phy-index	(Optional) All facility alarms for the specified physical index entity are shown.

Command Default

All alarms are shown.

Command Modes

User EXEC, Privileged EXEC (#)

Command History

Release	Modification
12.2(1)XF1	This command was introduced for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCE4	This command was modified. The **phy-index** keyword was added to the command for the Cisco uBR7200 series and uBR10012 routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

When a severity level is identified, statuses of alarms at that level and higher are shown. For example, when you set a severity of major, all major and critical alarms are shown.

The **show facility-alarm status** command does not show the real status of the upstream channel connector when frequency stacking is configured on the upstream channel.

The **show facility-alarm status** command does not show the critical alarm temperature thresholds. You can display these values using the **show running-config | include facility** command. If this does not display any commands for critical alarms, then the temperature thresholds are set at their default values.

For additional information on Frequency Stacking feature, refer to the Virtual Interfaces and Frequency Stacking Configuration on MC5x20S and MC28U Linecards document on Cisco.com.

Starting from Cisco IOS XE Gibraltar 16.10.1g and 16.12.1w release, if the link redundancy is enabled, **show facility-alarm status** will not report physical port link down on the interface unless both ports assigned to this interface are down, and transceiver missing on either port, active or standby, will be a critical alarm.

Examples

The following example shows a typical display of the **show facility-alarm status** command:

```
Router# show facility-alarm status

Thresholds:
Intake minor 40 major 49 critical 72
Core   minor 45 major 53 critical 85
System Totals  Critical: 0  Major: 0  Minor: 77
Source              Severity      ACO         Description [Index]
------              --------      ---         -------------------
chassis                    MINOR          NORMAL     Core minor temperature limi]
Cable5/0-MAC0              INFO           NORMAL     Physical Port Administrativ]
Cable5/0-MAC1              INFO           NORMAL     Physical Port Administrativ]
Cable5/0-MAC2              INFO           NORMAL     Physical Port Administrativ]
Cable5/0-MAC3              INFO           NORMAL     Physical Port Administrativ]
Cable5/0-MAC4              INFO           NORMAL     Physical Port Administrativ]
Cable5/0-US0               MINOR          NORMAL     Physical Port Link Down [0]
Cable5/0-US1               MINOR          NORMAL     Physical Port Link Down [0]
Cable5/0-US2               MINOR          NORMAL     Physical Port Link Down [0]
Router#
```

The following example shows a typical display of the **show facility-alarm status phy-index** command:

```
Router# show facility-alarm status phy-index

Intake minor 40 major 49 critical 72
Core   minor 45 major 53 critical 85
System Totals  Critical: 4  Major: 1  Minor: 0
PhyIdx    Source                        Severity      ACO        Description [Index]
-----     ------                        --------      ---        -------------------
28        RP A                         MAJOR         NORMAL     Secondary failure [2]
46        GigE1H 3/0/0                 CRITICAL      NORMAL     Physical Port Link Down [0]
48        GigE1H 3/1/0                 CRITICAL      NORMAL     Physical Port Link Down [0]
5510      Cable5/1-US4                 INFO          NORMAL     Physical Port Administrative
 State Down [1]
5511      Cable5/1-US5                 INFO          NORMAL     Physical Port Administrative
 State Down [1]
Router#
```

Table 211: show facility-alarm status Field Descriptions

Field	Description
System Totals	Total number of alarms generated, identified by severity.
PhyIdx	The entity physical index for a specific alarm node.
Source	Interface from which the alarm was generated.
Severity	Severity level of the alarm generated.
ACO	Alarm cutoff. It could be “NORMAL” or “CLEARED”.
Description [Index]	Type of the alarm and the index of the alarm type. The index can be any number based on the number of alarm types that the device supports.

Related Commands

Command	Description
clear facility-alarm	Clears some or all of the facility alarms on the Cisco uBR10012 router.
facility-alarm	Sets the temperature thresholds at which the processor generates a critical, major, or minor alarm to warn of potential equipment damage.

show frame-clocks

To display information about the midplane time-division multiplexing (TDM) clock reference, use the **show frame-clocks** command in privileged EXEC mode.

show frame-clocks

Syntax Description

This command has no keywords or arguments.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(T)	This command was introduced.
12.1(1a)T1	This command was modified to include the cable clock card as the current clock source.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following sample output from the **show frame-clocks** command shows that there are no clock sources configured and the clock card is the default clock source:

```
Router# show frame-clocks

Priority 1 clock source:not configured input:none
Priority 2 clock source:not configured input:none
Priority 3 clock source:not configured input:none
Priority 4 clock source:not configured input:none
Current clock source:Clockcard, input:Primary, priority:5
```

Table 212: show frame-clocks Field Descriptions

Field	Description
Priority 1-4 clock source	The configuration of the four network clock sources.
Current clock source	The current clock source, its input, and priority. In this example, the clock card is providing the clock source.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show cable clock	Displays status information for the clock card.
show controllers clock-reference	Displays the clock card's hardware information.

show hardware pxf

In Cisco IOS Release 12.2(15)BC2 and later releases, all **show hardware pxf** commands were renamed as **show pxf**, as follows:

- **show pxf cable**
- **show pxf cable interface**
- **show pxf cpu**
- **show pxf dma**
- **show pxf microcode**
- **show pxf xcm**

The functionality of each command remains the same. See the above commands for more information.

In Cisco IOS-XE Release IOS-XE 3.15.0S, the **show hardware pxf** commands are not supported on the Cisco cBR Series Converged Broadband Routers.

show hccp

To display information about HCCP groups associated with cable interfaces, use the **show hccp** command in user EXEC or privileged EXEC mode.

show hccp [*group* | **brief** | **channel-switch** | **detail** | **event-history** | **interface** | **linecard**]

Syntax Description

group	(Optional) Specifies a group number to be displayed. The valid range is 1 to 255. It is a 1-based MAC domain number and hence on a: • Cisco uBR10-MC5X20 and Cisco UBR-MC20X20V line card, the group range is from 1 to 5. • Cisco uBR-MC3GX60V line card, the group range is from 1 to 15.
brief	(Optional) Displays a brief summary of the groups, configuration types, member numbers, and status for cable interfaces. You can also use this option when displaying information for a specific group.
channel-switch	(Optional) Displays information about the channel-switch configuration.
detail	(Optional) Displays a detailed summary of the groups, configuration types, member numbers, and status for cable interfaces, as well as the CLI commands that are being synchronized across interfaces.
event-history	(Optional) Displays information about switchover and sync events.
interface	(Optional) Displays a summary on each interface.
linecard	(Optional) Displays line card-level HCCP information.

Command Modes

User EXEC, Privileged EXEC (#)

Command History

Release	Modification
12.1(3a)EC	This command was introduced.
12.2(4)BC1	The **detail** option was added.
12.2(8)BC2	The current time to resync and current wait to restore values were added to the display for the **brief** option.
12.2(11)BC1	Support was added for the Cisco uBR-RFSW N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.2(15)BC2	The output of the **show hccp detail** command was changed to show separate lists of the critical and non-critical CLI commands that are being synchronized for each Working and Protect interface and subinterface.

Release	Modification
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB and the output of the **show hccp detail** command was changed to show CMTS interface pre-critical config information.
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC.
12.2(33)SCE	This command was modified. The **line card** keyword was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following examples are from the **show hccp** and **show hccp brief** commands for the entire chassis:

```
Router# show hccp

   Cable4/0 - Group 1 Protect, enabled, blocking
   authentication md5, key-chain "cisco1"
   hello time 2000 msec, hold time 6000 msec
   Member 1 standby
   ip addr: working 10.20.111.11, protect 10.20.111.10
   downstream wavecom (10.1.11.3/1, 10.1.11.3/2), upstream none
Router# show hccp brief

   Interface Config    Grp Mbr Status
   Ca5/0/0   Protect   1   3   standby
   Ca7/0/0   Working   1   3   active
```

In Cisco IOS Release 12.2(8)BC2 and later 12.2 BC releases, the **brief** option also shows the amount of time left before the next resynchronization and the time left before a restore:

```
Router# show hccp brief

   Interface Config    Grp Mbr Status          WaitToResync    WaitToRestore
   Ca5/0/0   Protect   1   3   standby                         00:01:50.892
   Ca7/0/0   Working   1   3   active          00:00:50.892    00:01:50.892
Router#
```

The following example shows a sample output for the **show hccp channel-switch** command, displaying the groups and module numbers for each configured member:

```
Router# show hccp channel-switch

Grp 1 Mbr 1 Working channel-switch:
        "uc" - enabled, frequency 555000000 Hz
        "rfswitch" - module 1, normal
        module 3, normal
        module 5, normal
        module 7, normal
        module 11, normal
Grp 2 Mbr 1 Working channel-switch:
        "uc" - enabled, frequency 555000000 Hz
        "rfswitch" - module 2, normal
        module 4, normal
        module 6, normal
        module 9, normal
        module 13, normal
```

```
Grp 1 Mbr 7 Protect channel-switch:
        "uc" - disabled, frequency 555000000 Hz
        "rfswitch" - module 1, normal
        module 3, normal
        module 5, normal
        module 7, normal
        module 11, normal
Grp 1 Mbr 5 Protect channel-switch:
        "uc" - disabled, frequency 555000000 Hz
        "rfswitch" - module 1, normal
        module 3, normal
        module 5, normal
        module 7, normal
        module 11, normal
Router#
```

The following example shows the first part of the display for the **detail** option of this command, which first displays chassis-wide configuration information. The command then displays the CLI configuration commands that are being synchronized for each subinterface.

```
Router# show hccp detail

HCCP software version 3.0
Cable3/0 - Group 1 Protect, enabled, blocking
  authentication none
  hello time 2000 msec, hold time 6000 msec, revertive
  track interfaces: Cable3/0
  sync time 1000 msec, suspend time 120000 msec
  local state is Learn, tran 54940
  last switch reason is internal
  last HELLO tran 54940, elapsed 672 msec, hello timer expires in 00:00:01.328
  switchover member 1, wait to restore in 00:01:24.580
  control plane relays sync packets
 Fast syncpulse detection is enabled
  statistics:
    standby_to_active 23, active_to_standby 23
    active_to_active 0, standby_to_standby 1
  Member 1 standby
    target ip address: protect 10.10.10.2, working 10.10.10.1
    channel-switch "uc" (wavecom-ma, 10.10.10.3/2, 10.10.10.3/1) enabled
    tran #: SYNC 17209, last SYNC_ACK 46592
    hold timer expires in 00:00:05.328
    interface config:
        mac-address 0000.0000.3030
    cmts config:
        bundle 1 master, resolve sid, dci-response success,
        downstream - frequency 555000000, channel id 0
        downstream - insertion_invl auto min = 60, max = 480
        upstream 0 - frequency 10000000, power level 0
        upstream 0 - modulation-profile 1, channel-width 3200000
        upstream 0 - cnr-profile1 25, cnr-profile2 15
                     corr-fec 1, uncorr-fec 1
        upstream 0 - hop-priority frequency modulation channel-width
        upstream 1 - frequency 12000000, power level 0
        upstream 1 - modulation-profile 1, channel-width 3200000
        upstream 1 - cnr-profile1 25, cnr-profile2 15
                     corr-fec 1, uncorr-fec 1
        upstream 1 - hop-priority frequency modulation channel-width
        upstream 2 - frequency 14000000, power level 0
        upstream 2 - modulation-profile 1, channel-width 3200000
        upstream 2 - cnr-profile1 25, cnr-profile2 15
                     corr-fec 1, uncorr-fec 1
        upstream 2 - hop-priority frequency modulation channel-width
```

```
        upstream 3 - frequency 16000000, power level 0
        upstream 3 - modulation-profile 1, channel-width 3200000
        upstream 3 - cnr-profile1 25, cnr-profile2 15
                     corr-fec 1, uncorr-fec 1
        upstream 3 - hop-priority frequency modulation channel-width
    sub-interface 200 config:
        ip address 10.23.240.1 255.255.255.0
        ip address 213.57.42.254 255.255.255.128 secondary
        ip helper-address 213.57.75.70
        ip helper-address 213.57.75.66, ip access-group 87 in, ip access-group 87 out
        cable helper-address 213.57.75.70
        cable helper-address 213.57.75.66
        cable arp, proxy-arp,
        cable ip-multicast-echo,
        cable dhcp-giaddr policy,
    sub-interface 8 config:
        ip address 10.23.128.1 255.255.240.0
        ip address 62.90.198.254 255.255.255.0 secondary
        ip helper-address 213.57.75.70
       ip helper-address 213.57.75.66, ip access-group BARAK in, ip access-group ANTI_TRACE
 out
        cable helper-address 213.57.75.70
        cable helper-address 213.57.75.66
        cable arp, proxy-arp,
        cable ip-multicast-echo,
        cable dhcp-giaddr policy,
    sub-interface 1 config:
        ip address 3.0.1.1 255.255.0.0
        ip address 99.99.1.1 255.255.255.0 secondary
        ip address 99.99.2.1 255.255.255.0 secondary
        ip address 99.99.3.1 255.255.255.0 secondary
        ip address 99.99.4.1 255.255.255.0 secondary
        ip helper-address 1.9.62.10
        ip helper-address 1.9.62.11, ip access-group no_netbios2 in, ip access-group
no_netbios2 out
        ip pim sparse-dense-mode
        cable arp,
        cable ip-multicast-echo
. . .
Router#
```

In Cisco IOS Release 12.2(15)BC2 and later releases, the **show hccp detail** command shows the critical and non-critical synchronized CLI commands in separate lists for each cable interface and subinterface:

```
Router# show hccp detail

HCCP software version 3.0
Cable5/0/0 - Group 1 Working, enabled, forwarding
  authentication none
  hello time 5000 msec, hold time 15000 msec, revert time 30 min
  track interfaces: Cable5/0/0
  sync time 1000 msec, suspend time 120000 msec
  switch time 240000 msec retries 5
  local state is Teach, tran 9
  in sync, out staticsync, start static sync in never
  last switch reason is internal
  data plane directly sends sync packets
  statistics:
    standby_to_active 2, active_to_standby 1
    active_to_active 0, standby_to_standby 0
  Member 5 active
    target ip address: protect 222.1.1.9, working 222.1.1.9
```

```
    channel-switch "uc" (wavecom-hd, 1.10.45.11/7, 1.10.45.11/4) enabled
    channel-switch "rfsw" (rfswitch-group, 1.10.52.33/0x40100000/8) enabled
    tran #: SYNC 9, last SYNC_ACK 0, last HELLO_ACK 54
    hold timer expires in 00:00:13.180
Cable6/0/0 - Group 1 Protect, enabled, blocking
  authentication none
  hello time 5000 msec, hold time 15000 msec, revertive
  track interfaces: Cable6/0/0
  sync time 1000 msec, suspend time 120000 msec
  local state is Learn, tran 54
  last switch reason is none
  last HELLO tran 54, elapsed 3928 msec, hello timer expires in 00:00:01.068
  data plane directly sends sync packets
  statistics:
    standby_to_active 0, active_to_standby 0
    active_to_active 0, standby_to_standby 4
  Member 6 standby
    target ip address: protect 222.1.1.9, working 222.1.1.9
    channel-switch "rfsw" (rfswitch-group, 1.10.52.33/0x40100000/7) enabled
    channel-switch "uc" (wavecom-hd, 1.10.45.11/7, 1.10.45.11/6) enabled
    tran #: SYNC 0, last SYNC_ACK 9
    hold timer expires in 00:00:11.068
    Interface Generic Critical Config
    ========================
int Cable6/0/0
 mac-address 00e0.6666.1288
end
    CMTS interface critical config
    ==============================
int Cable6/0/0
 cable downstream annex B
 cable downstream modulation 64qam
 cable downstream interleave-depth 32
 cable downstream frequency 441000000
 cable downstream channel-id 60
 cable upstream 0 frequency 11408000
 cable upstream 0 power-level 0
 cable upstream 0 channel-width 1600000
 cable upstream 0 minislot-size 4
 cable upstream 0 modulation-profile 1
 no cable upstream 0 shutdown
 cable upstream 1 power-level 0
 cable upstream 1 channel-width 1600000
 cable upstream 1 minislot-size 4
 cable upstream 1 modulation-profile 1
 cable upstream 1 shutdown
 cable upstream 2 power-level 0
 cable upstream 2 channel-width 1600000
 cable upstream 2 minislot-size 4
 cable upstream 2 modulation-profile 1
 cable upstream 2 shutdown
 cable upstream 3 power-level 0
 cable upstream 3 channel-width 1600000
 cable upstream 3 minislot-size 4
 cable upstream 3 modulation-profile 1
 cable upstream 3 shutdown
end
    Generic sub-interface master critical config
    ============================================
int Cable6/0/0
end
        CMTS subinterface critical config
        =================================
int Cable6/0/0
```

```
end
    Non Critical config
    ===================
int Cable6/0/0
!
 no ip address
 no keepalive
 cable bundle 1
end
  Member 5 standby
    target ip address: protect 222.1.1.9, working 222.1.1.9
    channel-switch "uc" (wavecom-hd, 1.10.45.11/7, 1.10.45.11/4) enabled
    channel-switch "rfsw" (rfswitch-group, 1.10.52.33/0x40100000/8) enabled
    tran #: SYNC 0, last SYNC_ACK 9
    hold timer expires in 00:00:13.756
    Interface Generic Critical Config
    =========================
int Cable6/0/0
 mac-address 00e0.6666.1270
end
    CMTS interface critical config
    ==============================
int Cable6/0/0
 cable bundle 1 master
 cable downstream annex B
 cable downstream modulation 64qam
 cable downstream interleave-depth 32
 cable downstream frequency 441000000
 cable downstream channel-id 60
 cable upstream 0 frequency 11408000
 cable upstream 0 power-level 0
 cable upstream 0 channel-width 1600000
 cable upstream 0 minislot-size 4
 cable upstream 0 modulation-profile 1
 no cable upstream 0 shutdown
 cable upstream 1 power-level 0
 cable upstream 1 channel-width 1600000
 cable upstream 1 minislot-size 4
 cable upstream 1 modulation-profile 1
 cable upstream 1 shutdown
 cable upstream 2 power-level 0
 cable upstream 2 channel-width 1600000
 cable upstream 2 minislot-size 4
 cable upstream 2 modulation-profile 1
 cable upstream 2 shutdown
 cable upstream 3 power-level 0
 cable upstream 3 channel-width 1600000
 cable upstream 3 minislot-size 4
 cable upstream 3 modulation-profile 1
 cable upstream 3 shutdown
end
    Generic sub-interface master critical config
    ============================================
int Cable6/0/0
 ip address 12.1.1.1 255.255.255.0 secondary
 ip address 1.6.1.65 255.255.255.0
end
        CMTS subinterface critical config
        =================================
int Cable6/0/0
end
    Non Critical config
    ===================
int Cable6/0/0
```

```
!
end
    Generic sub-interface master critical config
    ============================================
int Cable6/0/0
end
        CMTS subinterface critical config
        =================================
int Cable6/0/0
end
    Non Critical config
    ===================
int Cable6/0/0
!
 no ip address
 no keepalive
end
Router#
```

In Cisco IOS Release 12.2(33)SCB and later releases, the **show hccp detail** command shows CMTS interface pre-critical configuration information as part of the critical and non-critical synchronized CLI commands:

```
Router# show hccp detail

HCCP software version 3.0
Cable5/0/0 - Group 1 Working, enabled, forwarding
  authentication none
  hello time 5000 msec, hold time 15000 msec, revert time 30 min
  track interfaces: Cable5/0/0
  sync time 1000 msec, suspend time 120000 msec
  switch time 240000 msec retries 5
  local state is Teach, tran 9
  in sync, out staticsync, start static sync in never
  last switch reason is internal
  data plane directly sends sync packets
  statistics:
    standby_to_active 2, active_to_standby 1
    active_to_active 0, standby_to_standby 0
  Member 5 active
    target ip address: protect 222.1.1.9, working 222.1.1.9
    channel-switch "uc" (wavecom-hd, 1.10.45.11/7, 1.10.45.11/4) enabled
    channel-switch "rfsw" (rfswitch-group, 1.10.52.33/0x40100000/8) enabled
    tran #: SYNC 9, last SYNC_ACK 0, last HELLO_ACK 54
    hold timer expires in 00:00:13.180
Cable6/0/0 - Group 1 Protect, enabled, blocking
  authentication none
  hello time 5000 msec, hold time 15000 msec, revertive
  track interfaces: Cable6/0/0
  sync time 1000 msec, suspend time 120000 msec
  local state is Learn, tran 54
  last switch reason is none
  last HELLO tran 54, elapsed 3928 msec, hello timer expires in 00:00:01.068
  data plane directly sends sync packets
  statistics:
    standby_to_active 0, active_to_standby 0
    active_to_active 0, standby_to_standby 4
  Member 6 standby
    target ip address: protect 222.1.1.9, working 222.1.1.9
    channel-switch "rfsw" (rfswitch-group, 1.10.52.33/0x40100000/7) enabled
    channel-switch "uc" (wavecom-hd, 1.10.45.11/7, 1.10.45.11/6) enabled
    tran #: SYNC 0, last SYNC_ACK 9
    hold timer expires in 00:00:11.068
```

```
    Interface Generic Critical Config
    =================================
int Cable6/0/0
 mac-address 00e0.6666.1288
end
    CMTS interface pre-critical config
    ==================================
int Cable5/0/0
 cable downstream annex B
 cable downstream modulation 256qam
 cable downstream interleave-depth 32
end
    CMTS interface critical config
    ==============================
int Cable6/0/0
 cable downstream annex B
 cable downstream modulation 64qam
 cable downstream interleave-depth 32
 cable downstream frequency 441000000
 cable downstream channel-id 60
 cable upstream 0 frequency 11408000
 cable upstream 0 power-level 0
 cable upstream 0 channel-width 1600000
 cable upstream 0 minislot-size 4
 cable upstream 0 modulation-profile 1
 no cable upstream 0 shutdown
 cable upstream 1 power-level 0
 cable upstream 1 channel-width 1600000
 cable upstream 1 minislot-size 4
 cable upstream 1 modulation-profile 1
 cable upstream 1 shutdown
 cable upstream 2 power-level 0
 cable upstream 2 channel-width 1600000
 cable upstream 2 minislot-size 4
 cable upstream 2 modulation-profile 1
 cable upstream 2 shutdown
 cable upstream 3 power-level 0
 cable upstream 3 channel-width 1600000
 cable upstream 3 minislot-size 4
 cable upstream 3 modulation-profile 1
 cable upstream 3 shutdown
end
    Generic sub-interface master critical config
    ============================================
int Cable6/0/0
end
        CMTS subinterface critical config
        =================================
int Cable6/0/0
end
    Non Critical config
    ===================
int Cable6/0/0
!
 no ip address
 no keepalive
 cable bundle 1
end
  Member 5 standby
    target ip address: protect 222.1.1.9, working 222.1.1.9
    channel-switch "uc" (wavecom-hd, 1.10.45.11/7, 1.10.45.11/4) enabled
    channel-switch "rfsw" (rfswitch-group, 1.10.52.33/0x40100000/8) enabled
    tran #: SYNC 0, last SYNC_ACK 9
    hold timer expires in 00:00:13.756
```

```
    Interface Generic Critical Config
    =================================
int Cable6/0/0
 mac-address 00e0.6666.1270
end
    CMTS interface pre-critical config
    ==================================
int Cable5/0/0
 cable downstream annex B
 cable downstream modulation 256qam
 cable downstream interleave-depth 32
end
    CMTS interface critical config
    ==============================
int Cable6/0/0
 cable bundle 1 master
 cable downstream annex B
 cable downstream modulation 64qam
 cable downstream interleave-depth 32
 cable downstream frequency 441000000
 cable downstream channel-id 60
 cable upstream 0 frequency 11408000
 cable upstream 0 power-level 0
 cable upstream 0 channel-width 1600000
 cable upstream 0 minislot-size 4
 cable upstream 0 modulation-profile 1
 no cable upstream 0 shutdown
 cable upstream 1 power-level 0
 cable upstream 1 channel-width 1600000
 cable upstream 1 minislot-size 4
 cable upstream 1 modulation-profile 1
 cable upstream 1 shutdown
 cable upstream 2 power-level 0
 cable upstream 2 channel-width 1600000
 cable upstream 2 minislot-size 4
 cable upstream 2 modulation-profile 1
 cable upstream 2 shutdown
 cable upstream 3 power-level 0
 cable upstream 3 channel-width 1600000
 cable upstream 3 minislot-size 4
 cable upstream 3 modulation-profile 1
 cable upstream 3 shutdown
end
    Generic sub-interface master critical config
    ============================================
int Cable6/0/0
 ip address 12.1.1.1 255.255.255.0 secondary
 ip address 1.6.1.65 255.255.255.0
end
        CMTS subinterface critical config
        =================================
int Cable6/0/0
end
    Non Critical config
    ===================
int Cable6/0/0
!
end
    Generic sub-interface master critical config
    ============================================
int Cable6/0/0
end
        CMTS subinterface critical config
        =================================
```

```
int Cable6/0/0
end
    Non Critical config
    ====================
int Cable6/0/0
!
 no ip address
 no keepalive
end
Router#
```

In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

The following example shows a detailed display for the Cisco uBR10-MC5X20S cable interface line card:

```
Router# show hccp detail

    mac-address 0005.00e4.1236
cmts config:
    resolve sid, dci-response success,
    downstream - frequency 441000000, channel id 0
    downstream - insertion_invl auto min = 60, max = 480
    downstream - rf-shutdown, rf-power 48
    upstream 0 - frequency 11408000, power level 0
    upstream 0 - modulation-profile 1, channel-width 3200000
    upstream 0 - cnr-profile1 25, cnr-profile2 15
                 corr-fec 1, uncorr-fec 1
```

Note For cable interfaces with an integrated upconverter, the line showing the RF power will show **rf-shutdown** when the upconverter has been powered off.

Related Commands

Command	Description
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.
show hccp linecard	Displays line card-level HCCP information.
show hccp *group*	Displays group information.

show hccp channel-switch

To display channel-switch hccp information, use the **show hccp channel-switch** command in privileged EXEC mode.

show hccp channel-switch [**command-history local** | **counter** | **image** | **state** | **version**]

Syntax Description

command-history local	Displays the command history on the Cisco CMTS router.
counter	Displays the counters on the Cisco NGRFSW-ADV.
image	Displays the image list on the Cisco NGRFSW-ADV.
state	Displays the current state of the Cisco NGRFSW-ADV.
version	Displays the version of the Cisco NGRFSW-ADV.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example is a sample output of the **show hccp channel-switch command-history local** command showing the command history output.

```
Router# show hccp channel-switch command-history local
timestamp            state      command
2010-06-13 07:47:17  Succ       type:FILE_OPEN, slot:1, group:0x00
2010-06-13 07:47:27  Succ       type:FILE_CLOSE, slot:0, group:0x00
2010-06-13 07:48:11  Succ       type:FILE_OPEN, slot:2, group:0x00
2010-06-13 07:48:51  Fail       type:FILE_CLOSE, slot:0, group:0x00
2010-06-13 09:46:01  Succ       type:RESET_SLOT, slot:7, group:0x1F
2010-06-13 09:48:17  Succ       type:RESET_SLOT, slot:7, group:0x1F
2010-06-13 18:47:23  Succ       type:RESET_SLOT, slot:4, group:0x1F
```

The following example is a sample output of the **show hccp channel-switch counter** command showing the counter statistics.

```
Router# show hccp channel-switch counter
The counter of switchover for all slot/group in rf switch.
  slot id group 1 group 2 group 3 group 4 group 5
  0       16491   16491   16491   16491   16491
  1       2383    2383    2383    2383    2383
  2       2360    2360    2360    2360    2360
  3       2351    2351    2351    2351    2351
  4       2348    2348    2348    2348    2348
```

```
  5       2343    2343    2343    2343    2343
  6       2354    2354    2354    2354    2354
  7       2352    2352    2352    2352    2352
```

The following example is a sample output of the show hccp channel-switch image command showing the image information.

```
Router# show hccp channel-switch image
file size     file mode     file state       file name
   6402          Write                          asv3.0
   47246         Write                          acv3.0
   6406          Read          Active           gsv3.0
   47238         Read          Active           gcv3.0
```

The following example is a sample output of the show hccp channel-switch state command showing the state information.

```
Router# show hccp channel-switch state
Current State: RFSW Ready
Current Protected Slot: 7
The switchcard information in RFSW:
    Slot Id Module Id Type       HCCP Conf  State
    0       12        Upstream   Yes        Protecting
    0       11        Upstream   Yes        Protecting
    0       10        Downstream Yes        Protecting
    1       1         Upstream   Yes        Normal
    1       2         Upstream   Yes        Normal
    1       3         Downstream Yes        Normal
    2       4         Upstream   Yes        Normal
    2       5         Upstream   Yes        Normal
    2       6         Downstream Yes        Normal
    3       7         Upstream   Yes        Normal
    3       8         Upstream   Yes        Normal
    3       9         Downstream Yes        Normal
    4       13        Upstream   Yes        Normal
    4       14        Upstream   Yes        Normal
    4       15        Downstream Yes        Normal
    5       16        Upstream   Yes        Normal
    5       17        Upstream   Yes        Normal
    5       18        Downstream Yes        Normal
    6       19        Upstream   Yes        Normal
    6       20        Upstream   Yes        Normal
    6       21        Downstream Yes        Normal
    7       22        Upstream   Yes        In Protecting
    7       23        Upstream   Yes        In Protecting
    7       24        Downstream Yes        In Protecting
Failed Message Number: 21
Hello Message Interval: 3 seconds
AUXRFSW poll state: Succ
```

The following example is a sample output of the **show hccp channel-switch version** command showing the version information.

```
Router# show hccp channel-switch version
Controller:
 Controller Golden Firmware: gcv3.0, Controller Alternate Firmware:acv3.0
 Switch Golden Firmware: gsv3.0, Switch Alternate Firmware:asv3.0
  Ctrl    Switch  Bootload  Watchdog  Temperature Voltage    Uptime      Serial
  Version Version Version   Error                 Monitoring
  3.0     3.0     3.0       255       33          12.2V      46:21       AFL15448001

SwitchCards:
```

```
 Type Slot Bootload TotalPower Relay         Coil Fail   Tempe  TotalRelay Uptime Serial
      id   Version  Cycle      pos           Register    rature Cycle
U0    0    1.2      247        -----RSRRSR   -----PPPPPP 0      4457       0d0h   AFL15515020

U10   0    1.2      247        -----RSRRSR   -----PPPPPP 0      4420       0d0h   AFL15515013

DS    0    1.2      250        -----RRRSSR   -----PPPPPP 0      7533       0d0h   AFL15512017

U0    1    1.2      340        SSSSS-SSSSS   PPPPP-PPPPP 33     2472       0d0h   AFL15514160

U10   1    1.2      240        SSSSS-SSSSS   PPPPP-PPPPP 33     2352       0d0h   AFL15514163

DS    1    1.2      265        ------RRRRR   ------PPPPP 33     2382       0d0h   AFL15491025

U0    2    1.2      249        SSSSS-SSSSS   PPPPP-PPPPP 34     2339       0d0h   AFL15514236

U10   2    1.2      257        SSSSS-SSSSS   PPPPP-PPPPP 34     2340       0d0h   AFL15514223

DS    2    1.2      254        ------RRRRR   ------PPPPP 34     2361       0d0h   AFL15431001

U0    3    1.2      262        SSSSS-SSSSS   PPPPP-PPPPP 35     2315       0d0h   AFL15514214

U10   3    1.2      255        SSSSS-SSSSS   PPPPP-PPPPP 36     2316       0d0h   AFL15514215

DS    3    1.2      251        ------RRRRR   ------PPPPP 34     2313       0d0h   AFL15491078

U0    4    1.2      237        SSSSS-SSSSS   PPPPP-PPPPP 35     2324       0d0h   AFL15514213

U10   4    1.2      255        SSSSS-SSSSS   PPPPP-PPPPP 35     2314       0d0h   AFL15514221

DS    4    1.2      245        ------RRRRR   ------PPPPP 37     2326       0d0h   AFL15491092

U0    5    1.2      236        SSSSS-SSSSS   PPPPP-PPPPP 35     2281       0d0h   AFL15514212

U10   5    1.2      279        SSSSS-SSSSS   PPPPP-PPPPP 34     2333       0d0h   AFL15514228

DS    5    1.2      247        ------RRRRR   ------PPPPP 34     2315       0d0h   AFL15491064

U0    6    1.2      256        SSSSS-SSSSS   PPPPP-PPPPP 33     2333       0d0h   AFL15514224

U10   6    1.2      258        SSSSS-SSSSS   PPPPP-PPPPP 34     2314       0d0h   AFL15514230

DS    6    1.2      268        ------RRRRR   ------PPPPP 33     2310       0d0h   AFL15491044

U0    7    1.2      293        RRRRR-RRRRR   PPPPP-PPPPP 33     2369       0d0h   AFL15514227

U10   7    1.2      325        RRRRR-RRRRR   PPPPP-PPPPP 33     2403       0d0h   AFL15514235

DS    7    1.2      315        ------SSSSS   ------PPPPP 33     2383       0d0h   AFL15491108
```

Table 213: show hccp channel-switch Field Descriptions

Field	Description
timestamp	Time at which a command was executed.
State	State of the switch card.
command	List of commands executed on the Cisco CMTS router.
Module Id	Switchover module identifier in the Cisco NGRFSW-ADV.

Field	Description
Ctrl Version	Version of the Controller.
Switch Version	Version of the Switch.
Bootload Version	Version of the bootload in the Cisco NGRFSW-ADV.
Watchdog Error	Watchdog error number.
Temperature	Temperature of the switch card.
Voltage Monitoring	Voltage value.
Uptime	Uptime of the switch card.
Serial	Serial string for the controller and switchover cards.
Type	Type of the switch card (upstream or downstream).
Slot ID	Slot number of the switch card.
TotalPower Cycle	Power cycle number for the switchover card.
Relay pos	Relay position register. It is a 11-bit value, where ‘s’ represents a set bit, ‘R’ represents a reset bit, and ‘-’ is for an unused bit.
Coil Fail Register	Coil failure register in the switchover cards. It is a 11-bit value, where ‘P’ represents a normal bit, ‘F’ represents a failed bit and ‘-’ is for an unused bit.
TotalRelay Cycle	Relay cycle number for the switchover card.

Related Commands

Command	Description
show hccp	Displays Hot Standby Connection-to-Connection Protocol (HCCP) information.

show hccp group

To display information about groups associated with cable interfaces, use the **show hccp group** command in user EXEC or privileged EXEC mode.

show hccp group *member* {**CGD** | *mac-address* {**classifier** | **l2vpn**} | **channel-switch** | **detail** | **event-history** | **host** [**ipv6**] | **mcast sid** | **mlist** | **modem** [**ipv6**] | **multicast-session** | **qosparam** | **service-flow** [*sfid* [**classifier**]] | **sid**}

Syntax Description

group	(Optional) Specifies a group number to be displayed. The valid range is from 1 to 255.
member	(Optional, when displaying information for a particular group) Specifies the member ID of the Inter-database for the specified group. Each *member* denotes a working line card. For example, 50 is the member ID for slot 5/0, 51 is the member ID for slot 5/1, 81 is the member ID for slot 8/1. The valid range is from 1 to 255.
CGD	(Optional) Displays the channel group domain (CGD) information synchronized from the active line card to the standby line card. This information is saved in the Inter-database on the standby line card.
mac-address **classifier**	(Optional) Displays classifier information for the specified MAC address.
mac-address **l2vpn**	(Optional) Displays l2vpn information for the specified MAC address.
channel-switch	(Optional) Displays channel-switch information for this particular group and member.
detail	(Optional) Displays a detailed summary of the groups, configuration types, member numbers, and status for cable interfaces, as well as the CLI commands that are being synchronized across interfaces.
event-history	(Optional) Displays HCCP event history information.
host	(Optional) Displays host information for this particular group and member.
mcast sid	(Optional) Displays the modular or integrated cable interface multicast service ID (SID) information synchronized from the active line card to the standby line card. This information is saved in the Inter-database on the standby line card.
mlist	(Optional) Displays ACL-MSAID information.
modem	(Optional) Displays cable modem information for this particular group and member.
multicast-session	(Optional) Displays multicast session information.
qosparam	(Optional) Displays quality of service (QoS) parameter information for this particular group and member.

service-flow *sfid* **classifier**	(Optional) Displays service flow and classifier information for the specified service flow ID (SFID) for this particular group and member.
sid	(Optional) Displays service ID (SID) information for this particular group and member.

Command Modes

User EXEC, Privileged EXEC (#)

Command History

Release	Modification
12.1(3a)EC	This command was introduced.
12.2(4)BC1	The **detail** option was added.
12.2(8)BC2	The current time to resync and current wait to restore values were added to the display for the **brief** option.
12.2(11)BC1	Support was added for the Cisco uBR-RFSW N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
12.2(15)BC2	The output of the **show hccp detail** command was changed to show separate lists of the critical and non-critical CLI commands that are being synchronized for each Working and Protect interface and subinterface.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB and the output of the **show hccp detail** command was changed to show CMTS interface pre-critical config information.
12.2(33)SCC	This command was integrated into Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following shows an example of the show hccp command to display QoS parameters for a particular member of a particular group:

```
Router# show hccp 1 1 qosparam

Cable5/0/0:
Index Name              Dir   Sched  Prio MaxSusRate  MaxBurst    MinRsvRate
1                       US    BE     0    64000       0           0
2                       DS    BE     0    1000000     0           0
3                       US    BE     7    1024000     1522        0
4                       DS    BE     0    10000000    1522        0
Router#
```

In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

The following example shows the service flow information for a cable interface line card on group 2 member 50:

```
Router# show hccp 2 50 service-flow
Cable8/0/1[grp:2, mem:50, P]:[HCCP inter-db: service flow]
Sfid  Sid   Mac Address     QoS Param Index   Type    Dir    Curr
                          Prov  Adm  Act                  State
8     N/A   001a.c3ff.d198  6     6    6      P       DS     act
7     1     001a.c3ff.d198  4     4    4      P       US     act
16    9     001a.c3ff.d198  5     5    5      S(s)    US     act
10    N/A   001a.c3ff.d59e  6     6    6      P       DS     act
9     2     001a.c3ff.d59e  4     4    4      P       US     act
15    6     001a.c3ff.d59e  5     5    5      S(s)    US     act
14    N/A   001a.c3ff.d6a8  6     6    6      P       DS     act
13    4     001a.c3ff.d6a8  4     4    4      P       US     act
17    12    001a.c3ff.d6a8  5     5    5      S(s)    US     act
19    N/A   0019.474a.d592  6     6    6      P       DS     act
18    14    0019.474a.d592  4     4    4      P       US     act
20    15    0019.474a.d592  5     5    5      S(s)    US     act
12    N/A   001e.6bfa.f5bc  6     6    6      P       DS     act
11    3     001e.6bfa.f5bc  4     4    4      P       US     act
21    17    001e.6bfa.f5bc  5     5    5      S(s)    US     act
```

The following example shows the cable modem information for a cable interface line card on group 2 member 50:

```
Router# show hccp 2 50 modem
Cable8/0/1[grp:2, mem:50, P]:[HCCP inter-db: CM]
MAC Address    IP Address      MAC         Prim Timing Num  BPI   Prio
                               State         Sid  Offset CPEs Enbld
001a.c3ff.d198 10.10.2.1       w-online      1    1978   0    no    Data(0)
001a.c3ff.d59e 10.10.2.2       w-online      2    1978   0    no    Data(0)
001a.c3ff.d6a8 10.10.2.3       w-online      4    1978   0    no    Data(5)
0019.474a.d592 10.10.2.4       w-online      14   1576   0    no    Data(1)
001e.6bfa.f5bc 10.10.2.5       w-online      3    1976   0    no    Data(5)
```

Related Commands

Command	Description
show hccp	Displays HCCP group information for a specific cable interface.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

show hccp interface

To display information on all Hot Standby Connection-to-Connection Protocol (HCCP) groups associated with a specific cable interface, use the **show hccp interface** command in user EXEC or privileged EXEC mode.

show hccp interface *interface* [**brief** | **detail**]

Syntax Description

interface	The cable interface for which you want to display HCCP group information. The information presented includes HCCP groups, configuration types, member numbers, status, authentication algorithms, authentication key chains, HCCP timers, Ip address assignments, and downstream switch designations for the specified cable interface.
brief	(Option) Displays a brief summary of the HCCP groups, configuration types, member numbers, and status for a specified cable interface.
detail	(Option) Displays a detailed summary of the HCCP groups, configuration types, member numbers, and status for a specified cable interface.

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.1(3a)EC	This command was introduced.
12.2(4)BC1	The **detail** option was added.
12.2(8)BC2	The current time to resync and current wait to restore was added to the **brief** option.
12.2(11)BC1	Support was added for the N+1 (1:n) RF Switch with the Cisco uBR7246VXR router and Cisco uBR-MC16C, Cisco uBR-MC16S, and Cisco uBR-MC28C cards.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following examples are from the **show hccp interface cable 4/0** and **show hccp interface cable 4/0 brief** commands:

```
Router# show hccp interface cable 4/0

   Cable4/0 - Group 1 Protect, enabled, blocking
   authentication md5, key-chain "cisco1"
   hello time 2000 msec, hold time 6000 msec
   Member 1 standby
   ip addr: working 10.20.111.11, protect 10.20.111.10
   downstream wavecom (10.1.11.3/1, 10.1.11.3/2), upstream none
Router# show hccp interface cable 4/0 brief

   Interface Config    Grp Mbr Status
   Ca4/0     Protect   1   1   standby
Router#
```

In Cisco IOS Release 12.2(8)BC2 and later 12.2 BC releases, the **brief** option also shows the amount of time left before the next resynchronization and the time left before a restore:

```
Router# show hccp interface cable 4/0 brief

   Interface Config    Grp Mbr Status          WaitToResync    WaitToRestore
   Ca4/0     Protect   1   1   standby         00:00:50.892    00:01:50.892
Router#
```



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show hccp	Displays information for all cable interfaces on which one or more HCCP groups and authentication modes have been configured.

show hccp linecard

To display information about groups associated with cable interfaces, use the **show hccp linecard** command in user EXEC or privileged EXEC mode.

show hccp linecard {**brief** | **channel-switch** | **detail** | **fsm** | **nullfsm** | **subslot** *slot/subslot* {**channel-switch** | **detail** | **modem summary total**}}

Syntax Description

brief	(Optional) Displays a brief summary of HCCP for each line card.
channel-switch	(Optional) Displays channel-switch information for each line card.
detail	(Optional) Displays a detailed summary of HCCP for each line card.
fsm	(Optional) Displays the complete state transition flow. Each line card member in an HCCP group is controlled by a state machine, which controls the startup and switchover flow.
nullfsm	(Optional) Displays the HCCP members that received unused or nonmeaningful event. This is used only for debugging.
subslot *slot / subslot*	(Optional) Specifies the subslot for the line card.
channel-switch	(Optional) Displays line card-level channel switch summary.
detail	(Optional) Displays details of the line card-level HCCP.
modem summary total	(Optional) Displays modem information.

Command Default

None.

Command Modes

User EXEC, Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show hccp linecard subslot** *slot/subslot* **modem summary total** command is used to show the modem summary information in the peer Inter-database and to check if the modem has successfully synchronized with the standby.

Examples

This example shows the **brief** and **fsm** information for a cable interface line card:

```
Router# show hccp linecard brief
Card       Config    Mbr Role       State          WaitToResync    WaitToRestore
card 5/1   Protect   50  Standby    Standby Warm   never
card 5/0   Working   50  Active     Active Warm    never
```

```
Router# show hccp linecard fsm
Oct 26 2010 10:46:32 - Slot(5/0) Member(50): ( Active Sync  ) + < Staticsync Done  > --> (
 Active Warm  ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:46:32 - Slot(5/1) Member(50): ( Standby      ) + < Staticsync Done  > --> (
 Standby Warm ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:46:29 - Slot(5/0) Member(50): ( Active       ) + < Do Staticsync > --> (
Active Sync  ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:59 - Slot(5/1) Member(50): ( Standby      ) + < Data Plane Ready > --> (
 Standby      ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:59 - Slot(5/1) Member(50): ( Standby      ) + < Post Become Stdby> --> (
 Standby      ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:59 - Slot(5/0) Member(50): ( Active Crit  ) + < Data Plane Ready > --> (
 Active       ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:59 - Slot(5/1) Member(50): ( Standby Ready) + < Become Standby > --> (
Standby      ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:59 - Slot(5/1) Member(50): ( Standby Cold ) + < Prepare > --> ( Standby
Ready) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:57 - Slot(5/1) Member(50): ( Init         ) + < LC UP > --> ( Standby
Cold ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:57 - Slot(5/0) Member(50): ( Active Ready ) + < Become Active > --> (
Active Crit  ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:57 - Slot(5/0) Member(50): ( Active Cold  ) + < Prepare > --> ( Active
Ready ) : ( ACTIVE MD:0x7F )
Oct 26 2010 10:45:57 - Slot(5/0) Member(50): ( Init         ) + < LC UP > --> ( Active Cold
  ) : ( ACTIVE MD:0x7F )
```

Related Commands

Command	Description
show hccp	Displays HCCP group information for a specific cable interface.
show hccp interface	Displays group information for a specific cable interface on which one or more groups and authentication modes have been configured.

show hdd-devices summary

To view a summary of all the system HDD devices(SSD), use **show usb-devices summary** command in privileged Exec mode.

show hdd-devices summary

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged Exec (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to display a summary of all the system HDD devices(SSD) on an active SUP. An Active SUP shows both active SSDs and standby SSDs.

```
Router# show hdd-devices summary
Load for five secs: 3%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 21:37:16.729 EDT Mon Jun 26 2023

[Active Harddisk] Model:Micron P400m-MTFDDAK100MAN SN:MSA192505JN
[Standby Harddisk] Model:Micron_M500DC_MTFDDAK120MBB SN:MSA211203X3
```

Examples

The following example shows how to display a summary of all the system HDD devices(SSD) on a Standby SUP. A Standby SUP shows only local SSDs.

```
Router# show hdd-devices summary
Load for five secs: 3%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 22:38:16.729 EDT Mon Jun 26 2023

[Local Harddisk] Model:Micron_M500DC_MTFDDAK120MBB SN:MSA211203X3
```

Related Commands

Command	Description
show usb-devices summary	Displays a summary of all the system USB devices (eUSB Flash)

show hw-module bay

To display information about the wideband channels or RF channels on a Wideband SPA, use the **show hw-module bay** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show hw-module bay {*slot*/*subslot*/*bay* | **all**} *show-type* {**wideband-channel** | **rf-channel** | **modular-channel**} [*device-index*] [**verbose**]

Cisco IOS Release 12.2(33)SCB
show hw-module bay {*slot*/*bay*/*port* | **all**} *show-type* {**wideband-channel** | **rf-channel** | **modular-channel**} [*device-index*] [**verbose**]

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
all	Specifies that the displayed information will be for both bay 1 and bay 0 if Wideband SPAs are installed in both bays.
show-type	The type of information to display. Valid values are **association**, **config**, **counters**, and **mapping**. See the Usage Guidelines for more information on show types.
wideband-channel	Displays information for the wideband channel indicated by *device-index*.
rf-channel	Displays information for the RF channel indicated by *device-index*.
modular-channel	Displays information for the narrowband channel indicated by *device-index*.
device-index	(Optional) The wideband channel number or RF channel number or Baseline Privacy Interface (BPI) index number. • When the **wideband-channel** keyword is specified, valid values for *device-index* are 0 to 11. • When the **rf-channel** keyword is specified, valid values for *device-index* are 0 to 23 depending on how the Wideband SPA is configured with the **annex modulation** command.
verbose	(Optional) Used with the **config** keyword. Shows more configuration information on the wideband channel or RF channel.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.3(23)BC	The **modular-channel** keyword was added. MC BW % column was added to the rf-channel keyword output.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a SPA from *slot/subslot/bay* to *slot/bay/port*.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The type of information that **show hw-module** bay displays is determined by the value of the *show-type* argument. The table below describes the information shown for each *show-type*. In the table, the Allowed with Keyword column indicates whether the *show-type* can be used with the keyword wideband-channel, rf-channel or modular-channel.

If *device-index* is omitted from **show hw-module** bay, the command displays information for all wideband channels, RF channels, or BPI+ indexes depending on the keywords used.

The **association** *show-type* displays wideband-to-narrowband (traditional DOCSIS) channel association information only when the cable interface line card and Wideband SPA are physically present in the CMTS.

Note If you do not specify the **verbose** keyword, less detailed configuration information is displayed.

- Changes in Cisco IOS release 12.3(23)BC are not supported in Cisco IOS release 12.2(33)SCA.
- Effective with Cisco IOS Release 12.2(33)SCB, the **show hw-module** bay command displays an exclamation point (!) for the RF channels that are suspended by the Cisco CMTS. For more information on the suspended RF channels, see Wideband Modem Resiliency .

Table 214: Values for show-type

show-type	Allowed with Keyword	Description
association	**wideband-channel**	Displays wideband-to-narrowband (traditional DOCSIS) channel association information. The association of a wideband channel to a traditional DOCSIS downstream channel is made when a primary downstream channel for the fiber node is configured with the **downstream** command.
config	**wideband-channel** or **rf-channel**	Displays wideband channel or RF channel configuration information depending on the keyword specified.
counters	**wideband-channel** or **rf-channel**	Displays wideband channel or RF channel statistics depending on the keyword specified.

show-type	Allowed with Keyword	Description
mapping	**wideband-channel**, **rf-channel,** or **modular-channel**	Displays mapping of wideband channels to RF channels depending on the keyword specified.

For additional information, refer to the following documents on Cisco.com:

- *Cisco Cable Wideband Solution Design and Implementation Guide* , Release 1.0
- *Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide*
- *Cisco uBR10012 Universal Broadband Router SIP and SPA Hardware Installation Guide*

Examples

The following examples display sample output for the **show hw-module bay** command for wideband channel 0 on the Wideband SPA located in slot 1, subslot 0, bay 0:

```
Router# show hw-module bay 1/0/0 counters wideband-channel 0
SPA      WB channel   Tx packets              Tx octets
1/0/0    0            29069                   4032392
Router# show hw-module bay 1/0/0 mapping wideband-channel 0
SPA      WB       RF         BW %
         channel  channel
1/0/0    0        0          100
                  1          100
                  2          100
                  3          100
                  4          100
                  5          100
                  6          100
Router# show hw-module bay
 1/0/0 association wideband-channel 0
WB                      BG   Bundle  NB          NB chan  Reserved  Total
channel                 ID   num     channel     ID       CIR       CIR
Wideband-Cable1/0/0:0   1    1       Cable6/0/0  251      0         42064200
```

The following example shows sample output for the **show hw-module bay** command in Cisco IOS Release 12.3(21)BC:

```
Router# show hw-module bay 1/0/0 association wideband-channel 0
WB                      BG   Bundle  NB          NB chan  Reserved Avail
channel                 ID   num     channel     ID       CIR       CIR
Wideband-Cable1/0/0:0   1    1       Cable6/0/0  251      0           0
```

The following example shows sample output for the **show hw-module bay** command in Cisco IOS Release 12.3(23)BC:

```
Router# show hw-module bay 1/0/0 association wideband-channel 0
WB                      BG   Bundle  NB          NB chan  Reserved Total
channel                 ID   num     channel     ID       CIR       CIR
Wideband-Cable1/0/0:0   1    140     Cable6/0/0  30       0         42064200
Router# show hw-module bay 3/0/0 mapping rf-channel
SPA      RF         MC          WB          WB
            channel  BW %    channel    BW %
3/0/0     0            2            0              90
                                     1              2
3/0/0     1            2            0              90
                                     1              2
3/0/0     3            0            3              50
3/0/0     4            0            3              100
```

In the preceding example, the following information is displayed for each wideband channel when the **association** keyword is specified.

- WB channel—Wideband-cable interface (wideband channel).
- BG ID— Bonding Group ID for the wideband channel.
- MC BW %—Percentage of rf-channel bandwidth assigned to the corresponding modular-cable interface.
- Bundle num—The number of the virtual bundle interface in which the wideband channel is a member.
- NB channel—The slot/subslot/port of the primary downstream channel (narrowband channel or traditional DOCSIS channel) for the wideband channel.
- NB channel ID—Channel ID for the primary downstream channel.
- Reserved CIR—The reserved committed information rate (CIR).
- Total CIR—The total CIR that is available.

Note For Cisco IOS Release 12.3(21)BC, the descriptions for the Reserved CIR and Available CIR fields are as follows: Reserved CIR—The reserved committed information rate (CIR). Because QoS is currently best effort for wideband traffic, reserved CIR is always 0. Avail CIR—The part of the CIR that is available. Because QoS is currently best effort for wideband traffic, available CIR is always 0.

The following example shows a suspended RF channel in the output of the **show hw-module bay** command in Cisco IOS Release 12.2(33)SCB:

```
Router# show hw-module bay 1/0/0 mapping rf-channel
SPA      RF       MC         MC Rem.    WB         WB         WB Rem.
         channel  BW %       Ratio      channel    BW %       Ratio
1/0/0    0        20         1          3           10        1       4           10
  1
1/0/0    1        20         1          3           10        1       4           10
  1
1/0/0    2        20         1          3           10        1       4           10
  1
1/0/0    3        20         1          3           10        1       4           10
  1
1/0/0    4!       20         1          3           10        1
1/0/0    5        20         1          3           10        1
1/0/0    6        20         1          3           10        1
1/0/0    7        20         1          3           10        1
```

The following examples display **show hw-module bay** command output for wideband channels (0 to 11) on the Wideband SPA located in slot 1, subslot 0, bay 0:

```
Router# show hw-module bay 1/0/0 counters wideband-channel

SPA      WB channel   Tx packets        Tx octets
1/0/0    0            395               31590
1/0/0    1            0                 0
1/0/0    2            0                 0
1/0/0    3            0                 0
1/0/0    4            0                 0
1/0/0    5            0                 0
1/0/0    6            0                 0
1/0/0    7            0                 0
```

```
1/0/0    8            0                0
1/0/0    9            0                0
1/0/0    10           0                0
1/0/0    11           0                0
Router# show hw-module bay 1/0/0 config wideband-channel
WB                      BG    Bundle  WB Host       Primary
channel                 ID    num     Slot/Subslot  BG
Wideband-Cable1/0/0:0   24    123     5/0           Yes
Wideband-Cable1/0/0:1   25    123     5/0           Yes
Wideband-Cable1/0/0:2   26    123     5/0           Yes
Wideband-Cable1/0/0:3   27    123     5/0           Yes
Wideband-Cable1/0/0:4   28    123     5/0           Yes
Wideband-Cable1/0/0:5   29    123     5/0           Yes
Wideband-Cable1/0/0:6   30    123     5/0           Yes
Wideband-Cable1/0/0:7   31    123     5/0           Yes
Wideband-Cable1/0/0:8   32    0       5/0           Yes
Wideband-Cable1/0/0:9   33    0       5/0           Yes
Wideband-Cable1/0/0:10  34    0       5/0           Yes
```

In the preceding example, the following information is displayed for each wideband channel when the **config** keyword is specified.

- WB Channel—Specifies the wideband channel slot, sub-slot, bay and wideband channel number.
- BG ID—Bonding Group ID.
- Bundle num—The number of the virtual bundle interface to which the wideband channel is a member.
- WB Host Slot/Subslot—The cable interface line card that has been configured for Wideband protocol operations. See the command **modular-host**.
- Primary BG—Yes indicates that the wideband channel is a primary bonding group (primary wideband channel).

The following examples display **show hw-module bay** command output for RF channel 0 on the Wideband SPA located in slot 1, subslot 0, bay 0:

```
Router# show hw-module bay 1/0/0 config rf-channel 0
SPA    RF       Freq       Mod     Annex  IP Address       MAC Address     UDP
       channel                                                            port
1/0/0  0        699000000  64qam   B      192.168.200.30   0011.920e.a9ff  49152
```

In the preceding output, these fields provide information on the edge QAM device that is associated with the RF channel:

- IP Address—The IP address of the edge QAM device.
- MAC address—The MAC address of the next-hop device or edge QAM device.
- UDP port—The UDP port number for the edge QAM device that will be used for this RF channel.

```
Router# show hw-module bay 1/0/0 config rf-channel 0 verbose

SPA                                 : Wideband-Cable 1/0/0
RF channel number                   : 0
Frequency                           : 699000000 Hz
Modulation                          : 64qam
Annex                               : B
IP address of next hop              : 192.168.200.30
MAC address of EQAM                 : 000c.3033.2cbf
UDP port number                     : 49152
EQAM headroom                       : 0
```

The following example displays the **show hw-module bay counters rf-channel** command output for the RF channels of a Cisco Wideband SPA. Activity is seen on channels 1,2, and 3 as the MPEG Mbps field shows they are each transmitting at about 29 Mbps. Channel 1 is primary-capable as it is transmitting SYNC packets.

```
Router# show hw-module bay 3/3/0 counters rf-channel
SPA     RF    MPEG                  MPEG       MPEG    Sync          MAP
        Chan  Packets Tx            bps        Mbps    Packets Tx    Packets Tx
3/3/0   0     0                     0          0.000   0             0
3/3/0   1     4612111               29755888   29.755  32042         151486
3/3/0   2     4536949               29720243   29.720  0             154
3/3/0   3     4542709               29688759   29.688  0             154
3/3/0   4     0                     0          0.000   0             0
3/3/0   5     0                     0          0.000   0             0
3/3/0   6     0                     0          0.000   0             0
3/3/0   7     0                     0          0.000   0             0
3/3/0   8     0                     0          0.000   0             0
3/3/0   9     0                     0          0.000   0             0
3/3/0   10    0                     0          0.000   0             0
3/3/0   11    0                     0          0.000   0             0
3/3/0   12    0                     0          0.000   0             0
3/3/0   13    0                     0          0.000   0             0
3/3/0   14    0                     0          0.000   0             0
3/3/0   15    0                     0          0.000   0             0
3/3/0   16    0                     0          0.000   0             0
3/3/0   17    0                     0          0.000   0             0
3/3/0   18    0                     0          0.000   0             0
3/3/0   19    0                     0          0.000   0             0
3/3/0   20    0                     0          0.000   0             0
3/3/0   21    0                     0          0.000   0             0
3/3/0   22    0                     0          0.000   0             0
3/3/0   23    0                     0          0.000   0             0
Router# show hw-module bay 1/0/0 mapping rf-channel 0
SPA      RF       WB         BW %
         channel  channel
1/0/0    0        0          100
```

The following example displays **show hw-module bay** command output for RF channels on the Wideband SPA located at slot 1, subslot 0, bay 0. In the example, the output is for only RF channels 0 to 8 because only those RF channels have been associated with a wideband channel. The BW % column is the percent of the RF channel bandwidth that is assigned to the wideband channel with the **cable rf-channel** command.

```
Router# show hw-module bay 1/0/0 mapping rf-channel

SPA      RF       WB         BW %
         channel  channel
1/0/0    0        0          100
1/0/0    1        0          100
1/0/0    2        0          100
1/0/0    3        0          100
1/0/0    4        0          100
1/0/0    5        0          100
1/0/0    6        0          100
1/0/0    7        2          100
1/0/0    8        1          100
```

Related Commands

Command	Description
show hw-module bay oir	Displays the operational status of a Wideband SPA.

show hw-module bay oir

To display the operational status of a SPA, use the **show hw-module bay oir** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show hw-module bay {*slot*/*subslot*/*bay* | **all**} **oir** [**internal**]

Cisco IOS Release 12.2(33)SCB
show hw-module bay {*slot*/*bay*/*port* | **all**} **oir** [**internal**]

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for a SIP.
subslot	The subslot where the Wideband SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in the SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
all	Displays OIR status for all Wideband SPAs in the system.
internal	(Optional) Displays detailed diagnostic information. This option is intended for internal diagnostic use with Cisco technical support personnel.

Command Default

If you do not specify the **internal** keyword, detailed diagnostic information is not displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was modified to change the addressing format for a SPA from *slot/subslot/bay* to *slot/bay/port*.
IOS-XE 3.15.0S	This command was replaced by the **show hw-module subslot oir** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **show hw-module bay oir** command to obtain operational status information about a Wideband SPA. To display information for a specific SPA, specify *slot/subslot/bay* for the SPA. To display information for all SPAs in the router, use the **all** keyword.

The optional **internal** keyword displays detailed diagnostic information that is recommended only for use with Cisco technical support personnel.

Table 0-1 describes the possible values for the Operational Status field in the output.

Table 215: Operational Status Field Descriptions

Operational Status	Description
admin down	SPA is administratively disabled by the **hw-module bay shutdown** global configuration command.
booting	SPA is initializing.
missing	SPA is not present in the SIP bay.
ok	SPA is operational.
out of service (*reason*)	The SPA is out of service for one of the following reasons: **Note** The following reasons are not applicable to every SPA and can be platform-specific. • Analyze failed—Failed to create a SPA data structure, most likely due to a memory allocation problem. • Authentication failed—SPA has failed hardware validation. • Data structure create error—Failed to create a SPA data structure, most likely due to a memory allocation problem. • Event corrupt—A SPA online insertion and removal (OIR) event has been corrupted. This could be caused by a corrupted message between the SIP and the Route Processor (RP) or some other software or hardware problem. • Event sequence error—A SPA OIR event was received out of sequence. This could be caused by a corrupted message between the SIP and the Route Processor (RP) or some other software or hardware problem. • Fail code not set—Failure code could not be read from a SPA OIR event message. This could be caused by a corrupted message between the SIP and the RP or some other software or hardware problem. • Failed too many times—SPA is disabled because it has failed more than the allowable limit on the platform. • FPD upgrade failed—A field-programmable device (FPD), such as the Field-Programmable Gate Array (FPGA), failed to automatically upgrade. • H/W signal deasserted—The SPA_OK or PWR_OK hardware signal indicating that the SPA is accessible is no longer asserted. • Heartbeat failed—Occurs when intelligent SPAs encounter heartbeat failures. • Incompatible FPD—An FPGA version mismatch with the Cisco IOS software has been detected for the SPA.

Operational Status	Description
	• Init timeout—Time limit has been reached during initialization of a SPA. • Read SPA type failed—A read from the hardware for the SPA type failed. • Reload request—SPA reload is in progress from the **hw-module subslot reload** command. • SPA h/w error—The SPA software driver has detected a hardware error. • SPA ready timeout—A timeout occurred on the RP while waiting for the SPA to become operational. • SPA type mismatch—Occurs when you have pre-configured a SPA of one type, but have inserted a SPA of a different type. • SPA unrecognized—SPA is not supported by the Cisco IOS software release. • Start failed—Failed to start interfaces on SPA. • Unexpected inserted event—The SPA OIR software has received a SPA insertion event when the OIR software considered the SPA already present. • Wait h/w ok timeout—A timeout occurred while waiting for the SPA_OK and PWR_OK hardware signals to be asserted. • Wait start timeout—A timeout occurred on the SIP while waiting for permission from the RP to bring up the SPA.
stopped	SPA has been gracefully deactivated using the **hw-module subslot** stop privileged EXEC command.

Examples

The following example shows the operational status of a Wideband SPA:

```
Router# show hw-module bay 1/0/0 oir
Module        Model                Operational Status
------------- -------------------- ------------------------
bay 1/0/0     SPA-24XDS-SFP        ok
```

The following example shows the operational status of a Wideband SPA when the **internal** keyword is specified:

```
Router# show hw-module bay 1/0/0 oir  internal

WARNING: This command is not intended for production use
and should only be used under the supervision of
Cisco Systems technical support personnel.
sm(spa_oir_tsm bay 1/0/0 TSM), running yes, state ready
Admin Status: admin enabled,  Operational Status: ok(1)
Last reset Reason: audit failure
TSM Context:
    configured_spa_type 0x4AE
    soft remove fail code 0x0(none)
    last_fail_code 0x0(none)
    fail_count 0
    timed_fail_count 0, failed_spa_type 0x0
    recovery_action 0
    associated_fail_code 0x0(none)
    sequence numbers: next from tsm 1, last to tsm 1
    flags 0x0
Subslot:
    spa type 0x4AE, active spa type 0x4AE
```

```
    subslot flags 0x0, plugin flags 0x0
TSM Parameters:
    wait_psm_ready_timeout 180000 ms, init_timeout 120000 ms
    short_recovery_delay 5000 ms, long_recovery_delay 120000 ms
    ok_up_time 600000 ms, bad_fail_count 10
    fail_time_period 600000 ms, max_fail_count 5
    supports pre-configuration
sm(spa_oir_audit bay 1/0/1), running yes, state sleep
SPA OIR state machine audit statistics
               In-sync poll-count late-resp resp-fail restarts fail-count
bay 1/0/0           yes       2752         0         4        1          0
```

Related Commands

Command	Description
show hw-module bay	Displays information about the wideband channels or RF channels on a Wideband SPA.

show hw-module bay transceiver

To display information about the pluggable transceiver module, use the **show hw-module bay transceiver** command in privileged EXEC mode.

show hw-module bay *slot/subslot/* {*bayport*} **transceiver** *transceiver-port-number* [**idprom** | **status**]

Syntax Description

slot	Slot where a SIP or cable line card resides.
	• Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• Cisco uBR7225VXR router—The valid value is 1 or 2.
	• Cisco uBR10012 router—The valid range for:
	  • Cable line card is from 5 to 8
	  • SIPs is 1 and 3

subslot	Subslot where a SIP or cable line card resides.
	• Cisco uBR10012 router—The valid value for:
	  • Cable line card is 0 or 1
	  • SPAs in a SIP, prior to Cisco IOS Release 12.2(33)SCB is 0 or 1. For Cisco IOS Release 12.2(33)SCB and later releases, the value of subslot is not specified.

bay	Bay in a SIP where a SPA is located. The valid values are 0 (upper bay) and 1 (lower bay).

port	Port number.
	• Cisco uBR7246VXR router and Cisco uBR7225VXR router—The valid value is 0 or 1.
	• Cisco uBR10012 router—The valid value for:
	  • Slots 1 and 3 is 0
	  • Slots 5 to 8 is from 0 to 4

transceiver	Specifies the pluggable transceiver module installed in the *slot* /*subslot* /*bay* .
transceiver-port-number	Transceiver-port-number of the transceiver. The valid value is 0 or 1.
idprom	Displays information for the transceiver identification programmable read only memory (idprom).
status	Displays information for the transceiver initialization status.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example is a sample output of the **show hw-module bay transceiver** command for wideband channel 0 on the Wideband SPA located in slot 1, subslot 0, bay 0:

```
Router# show hw-module bay 1/0/0 transceiver 0 idprom
IDPROM for transceiver SPA_TYPE_ETHER_1x10GE_V2:
  Description                              = XFP optics (type 6)
  Transceiver Type:                        = DWDM XFP 1530.33 (138)
  Product Identifier (PID)                 = DWDM-XFP-30.33
  Vendor Revision                          = 04
  Serial Number (SN)                       = FLJ1212G578
  Vendor Name                              = CISCO
  Vendor OUI (IEEE company ID)             = 00.00.0E (14)
  CLEI code                                = IP9IAAZCAA
  Cisco part number                        = 10-2370-01
  Device State                             = Enabled.
  Date code (yy/mm/dd)                     = 08/03/25
  Connector type                           = LC.
  Encoding                                 = 64B/66B
                                             SONET Scrambled
                                             NRZ
  Minimum bit rate                         = 9900 Mbits/s
  Maximum bit rate                         = 11100 Mbits/s
```

Related Commands

Command	Description
show hw-module bay	Displays information about the wideband channels or RF channels on a Wideband SPA.
show hw-module bay oir	Displays the operational status of a Wideband SPA.

show hw-module subslot oir

To display the operational status of a SPA, use the **show hw-module subslot oir** command in privileged EXEC mode.

show hw-module subslot {*slot*/*subslot* | **all**} **oir** [**internal**]

Syntax Description

slot	The slot where a SIP resides. On the Cisco cBR-8 router, slots 0 to 9 can be used for a SIP.
subslot	The subslot where the Wideband SIP resides. On the Cisco cBR-8 router, subslot 1 is always specified.
all	Displays OIR status for all Wideband SPAs in the system.
internal	(Optional) Displays detailed diagnostic information. This option is intended for internal diagnostic use with Cisco technical support personnel.

Command Default

If you do not specify the **internal** keyword, detailed diagnostic information is not displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **show hw-module bay oir** command.

Usage Guidelines

Use the **show hw-module bay oir** command to obtain operational status information about a Wideband SPA. To display information for a specific SPA, specify *slot/subslot/bay* for the SPA. To display information for all SPAs in the router, use the **all** keyword.

The optional **internal** keyword displays detailed diagnostic information that is recommended only for use with Cisco technical support personnel.

Table 0-1 describes the possible values for the Operational Status field in the output.

Table 216: Operational Status Field Descriptions

Operational Status	Description
admin down	SPA is administratively disabled by the **hw-module bay shutdown** global configuration command.
booting	SPA is initializing.
missing	SPA is not present in the SIP bay.
ok	SPA is operational.

Operational Status	Description
out of service (*reason*)	The SPA is out of service for one of the following reasons: **Note** The following reasons are not applicable to every SPA and can be platform-specific. • Analyze failed—Failed to create a SPA data structure, most likely due to a memory allocation problem. • Authentication failed—SPA has failed hardware validation. • Data structure create error—Failed to create a SPA data structure, most likely due to a memory allocation problem. • Event corrupt—A SPA online insertion and removal (OIR) event has been corrupted. This could be caused by a corrupted message between the SIP and the Route Processor (RP) or some other software or hardware problem. • Event sequence error—A SPA OIR event was received out of sequence. This could be caused by a corrupted message between the SIP and the Route Processor (RP) or some other software or hardware problem. • Fail code not set—Failure code could not be read from a SPA OIR event message. This could be caused by a corrupted message between the SIP and the RP or some other software or hardware problem. • Failed too many times—SPA is disabled because it has failed more than the allowable limit on the platform. • FPD upgrade failed—A field-programmable device (FPD), such as the Field-Programmable Gate Array (FPGA), failed to automatically upgrade. • H/W signal deasserted—The SPA_OK or PWR_OK hardware signal indicating that the SPA is accessible is no longer asserted. • Heartbeat failed—Occurs when intelligent SPAs encounter heartbeat failures. • Incompatible FPD—An FPGA version mismatch with the Cisco IOS software has been detected for the SPA.
	• Init timeout—Time limit has been reached during initialization of a SPA. • Read SPA type failed—A read from the hardware for the SPA type failed. • Reload request—SPA reload is in progress from the **hw-module subslot reload** command. • SPA h/w error—The SPA software driver has detected a hardware error. • SPA ready timeout—A timeout occurred on the RP while waiting for the SPA to become operational. • SPA type mismatch—Occurs when you have pre-configured a SPA of one type, but have inserted a SPA of a different type. • SPA unrecognized—SPA is not supported by the Cisco IOS software release. • Start failed—Failed to start interfaces on SPA. • Unexpected inserted event—The SPA OIR software has received a SPA insertion event when the OIR software considered the SPA already present. • Wait h/w ok timeout—A timeout occurred while waiting for the SPA_OK and PWR_OK hardware signals to be asserted. • Wait start timeout—A timeout occurred on the SIP while waiting for permission from the RP to bring up the SPA.

Operational Status	Description
stopped	SPA has been gracefully deactivated using the **hw-module subslot** stop privileged EXEC command.

Examples

The following example shows the operational status of a Wideband SPA:

```
Router# show hw-module subslot 4/1 oir
Module        Model               Operational Status
------------- ------------------- ----------------------
subslot 4/1   CBR-SUP-8X10G-PIC    ok
```

The following example shows the operational status of a Wideband SPA when the **internal** keyword is specified:

```
Router# show hw-module subslot 4/1 oir internal

WARNING: This command is not intended for production use
and should only be used under the supervision of
Cisco Systems technical support personnel.

sm(spa_oir_tsm subslot 4/1 TSM), running yes, state ready
Admin Status: admin enabled, Operational Status: ok(1)
Last reset Reason: power up
TSM Context:
configured_spa_type 0xB82
soft remove fail code 0x0(none)
last_fail_code 0x0(none)
timed_fail_count 0, failed_spa_type 0x0
flags 0x10)
Subslot:
spa type 0xB82, active spa type 0xB82
subslot flags 0x0, plugin flags 0x0
TSM Parameters:
wait_psm_ready_timeout 360000 ms, init_timeout 300000 ms
remove_timeout 120000 ms, recovery_delay 5000 ms
fail_time_period 1200000 ms, max_fail_count 5
supports pre-configuration
```

Related Commands

Command	Description
show hw-module bay	Displays information about the wideband channels or RF channels on a Wideband SPA.

show ib statistic

To display the Ironbus statistics information on a SPA interface processor (SIP), use the **show ib statistic** command in privileged EXEC mode.

show ib statistic

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCI	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

The following is a sample output of the **show ib statistic** command:

```
Router# show ib statistic

1/0:
fib_pkts_rcvd 176652603       fib_byts_rcvd 14591185846
tib_pkts_sent 447859          tib_byts_sent 57548025
fib_throughput(DS) 1318481 b/s  tib_throughput(US) 7094 b/s
fib bandwidth usage(DS) < 1% tib bandwidth usage(US) < 1%
Current bandwidth threshold 90% message interval 2min
Default bandwidth threshold 90% message interval 2min

3/0:
fib_pkts_rcvd 44773           fib_byts_rcvd 4125566
tib_pkts_sent 3318            tib_byts_sent 388462
fib_throughput(DS) 0 b/s  tib_throughput(US) 0 b/s
fib bandwidth usage(DS) < 1% tib bandwidth usage(US) < 1%
Current bandwidth threshold 90% message interval 2min
Default bandwidth threshold 90% message interval 2min
```

Related Commands

Command	Description
cable sip ib-stats	Configures the Ironbus throughput warning message threshold.

show interface bundle

To display information about a specific virtual cable bundle, use the **show interface bundle** command in privileged EXEC mode.

Cisco uBR Series Router

show interface bundle *number* [**accounting** | **controller** | **counters protocol status** | **crb** | **description** | **fair-queue** | **intercept** | **irb** | **mac-accounting** | **monitor** *interval* | **mpls-exp** | **precedence** | **random-detect** | **stats** | **summary**]

Cisco cBR Series Router

show interface bundle *number* [**accounting** | **controller** | **counters protocol status** | **crb** | **description** | **intercept** | **irb** | **mac-accounting** | **monitor** *interval* | **mpls-exp** | **multicast-sessions** | **precedence** | **stats** | **summary**]

Syntax Description

number	Specific virtual bundle. The valid values range from 1 to 255.
accounting	Displays accounting information for the specified virtual interface bundle.
controller	Displays information about interface status, configuration, and controller status for the specified virtual interface bundle.
protocol	Displays information about interface protocol counters for the specified virtual interface bundle.
status	Displays information about the current status of enabled protocols.
crb	Displays the interface routing and bridging information.
description	Displays the specified virtual interface bundle description.
fair-queue	For uBR series routers, displays the interface bundle Weighted Fair Queueing (WFQ) information.
intercept	Displays the intercept streams information on the specified virtual interface bundle.
irb	Displays the interface bundle routing and bridging information.
mac-accounting	Displays the interface bundle MAC accounting information.
monitor *interval*	Monitors the specified interface bundle continuously at the specified interval.
mpls-exp	Displays the MPLS experimental accounting information on the specified interface bundle.
multicast-sessions	Displays the configuration parameters for multicast sessions on a specific bundle.
precedence	Displays the interface precedence accounting information.

random-detect	For uBR series routers, displays the interface Weighted Random Early Detection (WRED) information.
stats	Displays interface packets and octets, in and out, by the switching path.
summary	Displays the summary of activity on the specified interface bundle.

Command Default

No default behavior or values for this command.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCB	Support for the **multicast-sessions** keyword was removed. Running the command with the **multicast-sessions** keyword does not display an output.
12.2(33)SCE	The **multicast-sessions** keyword was removed.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The **fair-queue** and **random-detect** keywords are removed.
IOS-XE 3.15.0S	The **multicast-sessions** keyword was removed. It is not available on the Cisco cBR Series Converged Broadband Routers .

Examples

The following is an example of the **show interface bundle** command for bundle 1:

```
Router# show interface bundle 1
Load for five secs: 2%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:03:45.483 EDT Wed Oct 12 2011
Bundle1 is up, line protocol is up
  Hardware is Cable Virtual-bundle interface, address is 0013.5f03.a4e3 (bia 000
0.0000.0000)
  Internet address is 5.65.0.1/16
  MTU 1500 bytes, BW 26000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:25, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Interface Bundle1 queueing strategy: fifo
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     1676 packets input, 283993 bytes, 0 no buffer
     Received 601 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     51 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     4163 packets output, 379783 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

The following is an example of the **show interface bundle accounting** command for bundle 1:

```
Router# show interface bundle 1 accounting
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:04:41.271 EDT Wed Oct 12 2011
Bundle1
               Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                  Other       1678          0          0          0
                     IP       1406     270933       4209     384390
                    ARP        294      17640          0          0
```

The following is an example of the **show interface bundle controller** command for bundle 1:

```
Router# show interface bundle 1 controller
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:04:58.539 EDT Wed Oct 12 2011
Bundle1 is up, line protocol is up
  Hardware is Cable Virtual-bundle interface, address is 0013.5f03.a4e3 (bia 000
0.0000.0000)
  Internet address is 5.65.0.1/16
  MTU 1500 bytes, BW 26000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:17, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Interface Bundle1 queueing strategy: fifo
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 1000 bits/sec, 1 packets/sec
     1707 packets input, 289077 bytes, 0 no buffer
     Received 613 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     51 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     4224 packets output, 386306 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

The following is an example of the **show interface bundle counter protocol** command for bundle 1:

```
Router# show interface bundle 1 counters protocol status
Load for five secs: 0%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:05:30.695 EDT Wed Oct 12 2011
Protocols allocated:
 Bundle1: Other, IP, ARP
```

The following is an example of the **show interface bundle crb** command for bundle 1:

```
Router# show interface bundle 1 crb
Load for five secs: 2%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:05:57.267 EDT Wed Oct 12 2011
Bundle1
 Routed protocols on Bundle1:
  ip
```

The following is an example of the **show interface bundle description** command for bundle 1:

```
Router# show interface bundle 1 description
Load for five secs: 0%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:06:22.243 EDT Wed Oct 12 2011
```

```
Interface                      Status         Protocol Description
Bu1                            up             up
```

The following is an example of the **show interface bundle intercept** command for bundle 1:

```
Router# show interface bundle 1 intercept
Load for five secs: 2%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:06:56.763 EDT Wed Oct 12 2011
No interception active
```

The following is an example of the **show interface bundle multicast-sessions** command for bundle 1:

```
Router# show interface bundle 1 multicast-sessions
Multicast Sessions on Bundle1
 Group            Interface    GC  SAID SFID  GQC GEn RefCount GC-Interface State
 224.1.1.45       Bundle1.1    1   8193  ---   1   5   1        Bundle1     ACTIVE
 224.1.1.46       Bundle1.1    1   8193  ---   1   5   1        Bundle1     ACTIVE
 224.1.1.47       Bundle1.1    1   8193  ---   1   5   1        Bundle1     ACTIVE
Aggregate Multicast Sessions on Bundle1
 Aggregate Sessions for SAID 8193 GQC 1 CurrSess 3
 Group            Interface    GC  SAID SFID AggGQC GEn RefCount GC-Interface
 224.1.1.45       Bundle1.1    1   8193  ---   1      5   1        Bundle1
 224.1.1.46       Bundle1.1    1   8193  ---   1      5   1        Bundle1
 224.1.1.47       Bundle1.1    1   8193  ---   1      5   1        Bundle1
```

The following is an example of the **show interface bundle stats** command for bundle 1:

```
Router# show interface bundle 1 stats
Load for five secs: 0%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:10:18.775 EDT Wed Oct 12 2011
Bundle1
          Switching path    Pkts In   Chars In   Pkts Out  Chars Out
               Processor        661     179549          0          0
            Route cache       1175     130728       4512     414497
                  Total       1836     310277       4512     414497
```

The following is an example of the **show interface bundle summary** command for bundle 1:

```
Router# show interface bundle 1 summary
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *06:10:28.167 EDT Wed Oct 12 2011
 *: interface is up
 IHQ: pkts in input hold queue     IQD: pkts dropped from input queue
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue
 RXBS: rx rate (bits/sec)          RXPS: rx rate (pkts/sec)
 TXBS: tx rate (bits/sec)          TXPS: tx rate (pkts/sec)
 TRTL: throttle count
  Interface    IHQ     IQD     OHQ     OQD     RXBS    RXPS   TXBS   TXPS   TRTL
------------------------------------------------------------------------------
  *Bundle1     0         0       0       0        0       0      0      0      0
Router#
```

Related Commands

Command	Description
show interface cable	Displays configuration and status information for the cable interface.
show interface cable modem	Displays information about cable modems and associated customer premises equipment (CPE) devices connected to a particular cable interface.

show interface cable

To display the current configuration and status of a cable interface, use the show interface cable command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} [*options*]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} [*options*]

Cisco cBR Series Converged Broadband Router
show interface cable *slot*/*subslot*/*cable-interface-index* [*options*]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 15.

options	Cable-specific options are documented in their own command reference pages: • **show interface cable downstream** • **show interface cable intercept** • **show interface cable mac-scheduler** • **show interface cable monitor** • **show interface cable qos paramset** • **show interface cable service-flow** • **show interface cable sid** • **show interface cable signal-quality** • **show interface cable upstream** • **show interface cable** *slot/subslot/port* **mac-scheduler uschan-number-in-mac-domain** A number of non-cable-specific options are also supported (but not all are meaningful for cable interfaces): **accounting**—Displays the number of packets of each protocol type that was sent through the interface. **crb**—Displays routing and bridging information.**description**—Displays the description entered for the interface.**fair-queue**—Displays distributed weighted fair queuing (DWFQ) statistics. **irb**—Displays integrated routing bridge information. **mac-accounting**—Displays Ethernet MAC accounting information.**random-detect**—Displays weighted random early detection (WRED) information.**rate-limit**—Displays rate-limit information.**shape**—Displays Traffic Shape information.**stats**—Displays numbers of packets that were switched.



Note For information on the non-cable specific options, see the Cisco IOS Release 12.2 documentation on Cisco.com and the Customer Documentation CD-ROM.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.0(3)T	This command was ported to the mainline release.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Release	Modification
IOS XE 16.7.1	This command option was implemented on the Cisco cBR Series Converged Broadband Router: **show interface cable** *slot/subslot/port* **mac-scheduler uschan-number-in-mac-domain**

Examples

This example shows the output for the **show interface cable** command:

```
Router# show interface cable 1/0/0
Cable1/0 is up, line protocol is up
  Hardware is BCM3210 ASIC, address is 000a.13e8.1ca8 (bia 000a.13e8.1a60)
  Internet address is 10.1.1.3/24
  MTU 1500 bytes, BW 27000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation, loopback not set, keepalive not set
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 4d07h, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 1834000 bits/sec, 2385 packets/sec
  5 minute output rate 1982000 bits/sec, 2431 packets/sec
      24461542 packets input, 2348214388 bytes, 0 no buffer
      Received 1979 broadcasts, 0 runts, 0 giants, 0 throttles
      0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
      24854257 packets output, 2536222931 bytes, 0 underruns
      0 output errors, 0 collisions, 0 interface resets
      0 output buffer failures, 0 output buffers swapped out
```

Table 217: show interface cable Field Descriptions

Field	Description
Cable slot/cable-interface-index is up/...administratively down	Indicates whether the interface hardware is currently active or taken down by the administrator.
line protocol is up/...administratively down	Indicates whether the software processes that handle the line protocol believe the interface is usable or if it has been taken down by the administrator.
hardware	Hardware type and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit (MTU) of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255, calculated as an exponential average over 5 minutes. (For example, 255/255 is 100 percent reliability.)
load	Load on the interface as a fraction of 255, calculated as an exponential average over 5 minutes. (For example, 255/255 is complete saturation.)

Field	Description
Encapsulation	Encapsulation method assigned to this interface.
ARP type	Type of Address Resolution Protocol (ARP) and timeout value assigned.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface.
output	Number of hours, minutes, and seconds since the last packet was successfully sent by an interface.
Last clearing of "show interface" counters	Time at which the counters that measure cumulative statistics (such as number of bytes sent and received) were last reset to zero.
Queueing strategy	Displays the type of queueing configured for this interface. In the following example output, the type of queueing configured is first-in first-out (FIFO).
Output queue	Number of packets in the output queue. The format of this number is A/B, where A indicates the number of packets in the queue, and B indicates the maximum number of packets allowed in the queue.
drops	Indicates the number of packets dropped because of a full queue.
input queue/drops	Number of packets in the input queue. The format of this number is A/B, where A indicates the number of packets in the queue, and B indicates the maximum number of packets allowed in the queue.
drops	Indicates the number of packets dropped because of a full queue.
Five minute input rate Five minute output rate	Average number of bits and packets sent per second in the last five minutes. The five-minute interval is the default time period for statistics collection and can be changed for each individual cable interface using the **load-interval** command in interface configuration mode.
Note These statistics are calculated using a decayed averaging method, where only the average is stored over the interval period, not the individual samples. Every time a sample average is taken, a percentage of the sample and a percentage of the average are added together to create the new average. If traffic stops for a time period, these statistics do not immediately go to zero but drop with a decay rate of about 70 percent per time period. For example, if the interface is passing 1,000 packets per second (pps) before traffic stops, the **show interface cable** command shows the rate being 300 pps at the end of the first time interval. The rate then drops to 90 pps at the end of the second time interval, and so forth.	
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.

Field	Description
Note When using bundled cable interfaces on Cisco uBR7200 series routers, the input packet counters for the primary interface also include the packet counts for subordinate interfaces, except when using a Broadband Processing Engine (BPE) cable interface (such as the Cisco uBR-MC16U/X and Cisco uBR-MC28U/X). On BPE cards and on the Cisco uBR10012 router, the input counters for primary and subordinate cable interfaces are not combined.	
no buffer	Number of received packets discarded because there was no buffer space in the main system.
Received broadcast	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they are bigger than the standard Ethernet Maximum Transmission Unit (MTU) size. For Ethernet packets, RFC 1757 defines giants as "the total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed." **Note** In addition, to account for the different Ethernet and other packet encapsulations on the network, packets are considered giants when they exceed the configured MTU size plus 114 bytes.
input errors	Total number of errors received on the interface. This count includes runts and giants, which are shown above, as well as other errors, such as no buffers, and CRC, frame, overrun, and ignored counts. This count can also include DOCSIS protocol errors such as an invalid SID in the DOCSIS frame, a bad extended header length, corrupted concatenated packets, and invalid bandwidth requests.
CRC	Indicates the number of times the cyclic redundancy checksum (CRC) generated by the originating LAN station or far-end device does not match the checksum calculated from the data received.
frame	Number of packets received incorrectly having a CRC error and a non-integer number of octets.
overrun	Number of times the receiver hardware was unable to forward received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers.
packets output	Total number of messages sent by the system.
bytes	Total number of bytes, including data and MAC encapsulation, sent by the system.

Field	Description
underruns	Number of times the sender has been running faster than the receiving device can handle.
output errors	Sum of all errors that prevented the final transmission of packets out of the interface being examined.
collisions	Not applicable.
interface resets	Number of times an interface has been completely reset.
output buffer failures	Number of times the output buffer has failed.
output buffer swapped out	Number of times the output buffer has been swapped out.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output for the **show interface cable** command:

```
Router#show interface cable 1/0/0
Cable1/0/0 is up, line protocol is up
  Hardware is CMTS MD interface, address is c414.3c17.1dcb (bia c414.3c17.1dcb)
  MTU 1500 bytes, BW 26000 Kbit/sec, DLY 1000 usec,
     reliability 255/255, txload 22/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 19500 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 2281000 bits/sec, 2854 packets/sec
     27026 packets input, 2849227 bytes, 26 no buffer
     Received 0 broadcasts (0 multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     36755119 packets output, 3675867584 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out
```

Related Commands

Command	Description
show interface cable downstream	Displays information about the downstream on the cable interface.
show interface cable sid	Displays information by service identifier (SID) of each CM on the network.
show interface cable signal-quality	Displays information about the cable signal quality.
show interface cable upstream	Displays information about one or all upstreams on the cable interface.

show interface cable admission-control reservation

To display service flows, categorizations, and bandwidth consumption on the Cisco CMTS, for the specified interface, and the specified service flow direction, use the **show interface cable admission-control reservation** command in privileged EXEC mode.

show interface cable *slot/subslot/port* **admission-control reservation**[**downstream** | **upstream**]*port-no*

Cisco IOS Release 12.2(33)SCE and later
show | **interface** | **cable** | {*slot/cable-interface-indexslot/subslot/cable-interface-index*} | **admission-control** | **reservation** | [**downstream** | **upstream**]*port-no*

Cisco cBR Series Converged Broadband Router
show | **interface** | **cable** | {*slot/cable-interface-indexslot/subslot/cable-interface-index*} | **admission-control** | **reservation** | [**downstream** | **upstream** *port-no* | **us-bonding-group** *upstream -bonding-group-number*]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 15.
downstream	Displays downstream service flow information for the designated cable interface.
upstream *port-no*	Displays upstream service flow information for the designated cable interface. The port number may be optionally specified here for more limited display.

us-bonding-group *upstream -bonding-group-number*	Displays the upstream bonding group service flow information.

Command Default

No default behavior or values for this command. However, Cisco IOS Release 12.3(21)BC supports default operation and non-default configuration for feature on the Cisco CMTS.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router and the Cisco uBR7246VXR router.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **us-bonding-group** *upstream -bonding-group-number* keyword and variable was added.

Usage Guidelines

For additional information about using this command, refer to the following documents on Cisco.com:

- *Admission Control for the Cisco CMTS*
- *Service Flow Admission Control for the Cisco CMTS*

Use the **us-bonding-group** *upstream -bonding-group-number* keyword and variable to display the upstream bonding group service flow information.

Examples

This example shows the output and status of the Service Flow Admission Control feature, and the **show interface cable admission-control reservation** { **downstream | upstream** } *port-no* command.

```
Router# show interface cable 5/1/1 admission-control reservation downstream.
SfId   Mac Address       Bucket    Bucket Name         State    Current Reserv
4      0000.cad6.f052       8                         act       0
88     0000.cad6.f052       8                         act       2000
6      0000.cad6.eece       8                         act       0
21     0000.cad6.eece       8                         act       2000
8      0000.cad6.eebe       8                         act       0
24     0000.cad6.eebe       8                         act       2000
10     0000.cadb.30a6       8                         act       0
27     0000.cadb.30a6       8                         act       2000
```

This example illustrates further information for the Service Flow Admission Control feature with abbreviated command syntax. This example displays threshold levels and current reservation per bucket, and the oversubscribed bandwidth per bucket. Cisco IOS indicates implicitly calculated threshold with asterisk.

```
Router# sh cable admission-control interface ca 5/1/1 upstream 0
Interface  Cable5/1/1
Upstream Bit Rate (bits per second) = 4096000
```

```
Resource - Upstream Bandwidth
-----------------------------
Bucket Names  Minor # of  Major # of  Excls # of  Non-Ex Curr. Curr. Conf  # of
No            Level Times Level Times Level Times Level  Resv  Ovrsb Level Rejec
1             5     1312  7     1262  45    0     0      31    0     I    36
2             0     0     0     0     0     0     6*     0     0     I     0
3             0     0     0     0     0     0     6*     0     0     I     0
4             0     0     0     0     0     0     6*     0     0     I     0
5             0     0     0     0     0     0     6*     0     0     I     0
6             0     0     0     0     0     0     6*     0     0     I     0
7             0     0     0     0     0     0     6*     0     0     I     0
8             5     31    7     29    49    11    5      79    25    I     0
```

Examples for the Cisco cBR Series Converged Broadband Router

This example shows the output of the **show interface cable admission-control reservation** command with the **downstream** keyword on the Cisco cBR router:

```
Router#show interface cable 3/0/0 admission-control reservation downstream
SfId   Mac Address       Bucket    Bucket Name         State    Current Reserv
16     0025.2e2d.74f8       8                          Active       0
28     0025.2e2d.74f8       8                          Active       0
18     0025.2eaf.7f38       8                          Active       0
21     0025.2eaf.7f38       8                          Active       0
20     0025.2eaf.8302       8                          Active       0
22     0025.2eaf.8302       8                          Active       0
26     0025.2eaf.82f4       8                          Active       0
27     0025.2eaf.82f4       8                          Active       0
30     0025.2e2d.75be       8                          Active       0
32     0025.2e2d.75be       8                          Active       0

Router#
```

This example shows the output of the **show interface cable admission-control reservation** command with the **upstream** keyword on the Cisco cBR router:

```
Router#show interface cable 3/0/0 admission-control reservation upstream 0
Interface Cable3/0/0 Upstream Port 0
SfId   Mac Address       Bucket    Bucket Name         State    Current Reserv
15     0025.2e2d.74f8       8                          Active       0
19     0025.2eaf.8302       8                          Active       0
29     0025.2e2d.75be       8                          Active       0

Router#
```

This example shows the output of the **show interface cable admission-control reservation** command with the **us-bonding-group** keyword on the Cisco cBR router:

```
Router#show interface cable 3/0/0 admission-control reservation us-bonding-group 1
Interface Cable3/0/0 Upstream bonding group 1
SfId   Mac Address       Bucket    Bucket Name         State    Current Reserv

Router#
```

Related Commands

Command	Description
cable admission-control ds-bandwidth	Sets minor, major and exclusive thresholds for downstream voice or data bandwidth for each or all interfaces on the Cisco CMTS
cable admission-control preempt priority-voice	Changes the default PacketCable Emergency 911 call preemption functions on the Cisco CMTS, supporting throughput and bandwidth requirements for Emergency 911 calls above all other buckets on the Cisco CMTS.
cable admission-control us-bandwidth	Configures global or interface-level upstream bandwidth thresholds and exclusive or non-exclusive resources on the Cisco CMTS.
cable application-type include	Associates an application type with a specific and prioritized bucket on the Cisco CMTS.
cable application-type name	Assigns an alpha-numeric name for the specified bucket.
debug cable admission-control flow-categorization	Displays service flow categorization results, enabled when a service flow is classified.
show application-buckets	Displays rules for any or all buckets supporting Service Flow Admission Control on the Cisco CMTS.
show interface cable admission-control reservation	Displays service flows, categorizations, and bandwidth consumption on the Cisco CMTS, for the specified interface, and the specified service flow direction.

show interface cable cable-monitor

To display cable monitor flow information, use the **show interface cable cable-monitor** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **cable-monitor**

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **cable-monitor** [**cam** | **verbose**]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
cam	(Optional) Displays detailed content addressable memory (CAM) information.
verbose	(Optional) Displays detailed monitor flow information.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command is introduced.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.

Release	Modification
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output from the **show interface cable cable-monitor** command:

```
Router# show interface cable 5/0 cable-monitor
US/ Time Outbound  Flow     Flow Type      Flow  Packet MAC   MAC       Encap
DS  Stmp Interface Type     Identifier     Extn. Type   Extn. Type      Type
us   no    Et1/2   us-port  0              yes   data   no     -        docsis
all  no    Et1/2   acc-list 103            yes   data   no     -        docsis
all  yes   Et1/2   mac-addr 0050.0000.0000 yes   mac    no     -          -
```

The following is a sample output from the **show interface cable cable-monitor cam** command:

```
Router# show interface cable6/0/0 cable-monitor cam
Sniffer Wideband interface = Wi6/0/0:0
Sniff points 0x9
DS Unconditional sniffing for 0 flows. FlowIndex: Total: 0. Hits 0
DS HighPrio Unconditional sniffing for 0 flows. FlowIndex: Total: 0. Hits 0
US Packet Unconditional sniffing
US 0, 1 FlowIndex: 2 Total: 1. Hits 1035
US 1, 0 FlowIndex: Total: 0. Hits 0
US 2, 0 FlowIndex: Total: 0. Hits 0
US 3, 0 FlowIndex: Total: 0. Hits 0
US Frag Unconditional sniffing
US 0, 0 FlowIndex: Total: 0. Hits 0
US 1, 0 FlowIndex: Total: 0. Hits 0
US 2, 0 FlowIndex: Total: 0. Hits 0
US 3, 0 FlowIndex: Total: 0. Hits 0
MAC Address CAM :
Entry 0, MAC 7cb2.1b0f.ea7a Refcount 1 FlowIndex: 1 Total: 1 Hits 401
Entry 1, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 2, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 3, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 4, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 5, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 6, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 7, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 8, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 9, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 10, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 11, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 12, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 13, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 14, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 15, MAC 0000.0000.0000 Refcount 0 FlowIndex: Total: 0 Hits 0
Sid CAM :
Entry 0, Sid 1, US 1 Refcount 1 FlowIndex: 1 Total: 1 Hits 825
Entry 1, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 2, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 3, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 4, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 5, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 6, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 7, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 8, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 9, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 10, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 11, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
```

```
Entry 12, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 13, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 14, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
Entry 15, Sid 0, US 0 Refcount 0 FlowIndex: Total: 0 Hits 0
```

The following is a sample output from the **show interface cable cable-monitor verbose** command:

```
Router# show interface cable6/0/0 cable-monitor verbose
Sniffer Wideband interface = Wi6/0/0:0
Index 0, Direction all
  DS CAM Index 0 (MAC 7cb2.1b0f.ea74), Hits 10
  No US CAM Entry
  No US CAM Entry
  No US CAM Entry
  No US CAM Entry
  10 packets evaluated, 10 output, 0 No buffer
  0 NotData, 0 NotMac, 0 Extn not matched, 0 US MacAddress mismatch
  0 NotMap, 0 No sid in MAP, 0 not REQ, 0 not Grant
  0 Not DSA, 0 not DSC, 0 Not DSD
  0 Sid mismatch in DS Pkts, 0 ACL match failed
  In VCCI 0x5B, Out VCCI 0xFFFF

Index 1, Direction us
  No DS CAM Entry
  No US CAM Entry
  No US CAM Entry
  No US CAM Entry
  582 packets evaluated, 582 output, 0 No buffer
  0 NotData, 0 NotMac, 0 Extn not matched, 0 US MacAddress mismatch
  0 NotMap, 0 No sid in MAP, 0 not REQ, 0 not Grant
  0 Not DSA, 0 not DSC, 0 Not DSD
  0 Sid mismatch in DS Pkts, 0 ACL match failed
  In VCCI 0x5B, Out VCCI 0x56
```

Table 218: show interface cable monitor Field Descriptions

Field	Description
DS	Downstream. Indicates that only downstream flows are monitored.
UP	Upstream. Indicates that only upstream flows are monitored.
ALL	Indicates that all flows are monitored.
Time Stmp	“Yes” indicates that forwarded packets have been time-stamped, with appended 4 bytes. “No” indicates that forwarded packets have not been time-stamped.
Outbound Interface	Identifies the interfaces where the packets have been forwarded to (Ethernet or Fast Ethernet).
Flow Type	Identifies the selected flow type, MAC-address, access-list number, or upstream port number.
Flow Type Identifier	MAC address, access-list number, or service ID.
Flow Extn.	“Yes” indicates that extended filters are configured, and “no” indicates that no extended filters have been configured.
MAC Type	Not applicable.

Field	Description
Encap	DOCSIS encapsulation.
Type	Forwarded packets with Ethernet encapsulation.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable monitor	Enables the forwarding of selected packets on the cable interface to an external LAN analyzer.

show interface cable controller

To display the interface status, configuration and controller status, use the show interface cable controller command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show interface cable *slot/subslot/cable-interface-index* **controller**

Syntax Description

slot/subslot/cable-interface-index	Identifies the cable interface on the Cisco cBR Series Converged Broadband Router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.
IOS-XE 3.18.0SP	This command was modified on the Cisco cBR Series Converged Broadband Router. MD OCD and MD DPD statistics were added in the command output.

Examples

This example shows the output of the show interface cable controller command with the MD DPD statistics:

```
Router# show interface cable 3/0/0 controller | beg MD DPD
*** MD DPD Statistics ****

OFDM port/chan:      0/158

  Profile                     0
  DPD Cache RX good
           messages:          1     fragments:          1
  DPD TX fragments
    PLC:       good:       1159         error:          0
    Data Chan: good:        464         error:          0

  Profile                     1
  DPD Cache RX good
           messages:          1     fragments:          1
  DPD TX fragments
    Data Chan: good:        464         error:          0

  Profile                   255
  DPD Cache RX good
           messages:          1     fragments:          1
  DPD TX fragments
    PLC:       good:       1159         error:          0
    Data Chan: good:        464         error:          0

OFDM port/chan:      7/162

  Profile                     0
  DPD Cache RX good
           messages:          1     fragments:          1
```

```
  DPD TX fragments
    PLC:       good:        123         error:          0
    Data Chan: good:         50         error:          0

  Profile                     1
  DPD Cache RX good
           messages:          1     fragments:          1
  DPD TX fragments
    Data Chan: good:         50         error:          0

  Profile                   255
  DPD Cache RX good
           messages:          1     fragments:          1
  DPD TX fragments
    PLC:       good:        123         error:          0
    Data Chan: good:         50         error:          0

Totals
  DPD Cache RX good
           messages:          6     fragments:          6
  DPD TX fragments
    PLC:       good:       2564         error:          0
    Data Chan: good:       1542         error:          0
  DPD RX errors
           mpart err:          0     queue err:          0
         inv ccc err           0    oos ccc err          0
```

This example shows the output of the show interface cable controller command with the MD OCD statistics:

```
Router# show interface cable 3/0/0 controller | beg MD OCD
*** MD OCD Statistics ****

OFDM port/chan:      0/158
  OCD Cache RX good
           messages:          1     fragments:          1
  OCD TX fragments
    PLC:       good:        727         error:          0
    Data Chan: good:        291         error:          0

OFDM port/chan:      7/162
  OCD Cache RX good
           messages:          1     fragments:          1
  OCD TX fragments
    PLC:       good:         42         error:          0
    Data Chan: good:         17         error:          0

Totals
  OCD Cache RX good
           messages:          2     fragments:          2
  OCD TX fragments
    PLC:       good:        769         error:          0
    Data Chan: good:        308         error:          0
  OCD RX errors
           mpart err:          0     queue err:          0
         inv ccc err           0    oos ccc err          0
```

show interface cable downstream

To display information about the downstreams on a cable interface, use the **show interface cable downstream** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **downstream**

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **downstream**

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3 XA	This command was introduced.
12.0(3)T	Command ported to the mainline release.
12.1(4)CX	Output was expanded for **show interface cable downstream** command for DOCSIS 1.1 operation.
12.2(4)BC1	Support was added to the Release 12.2 BC train.

Release	Modification
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following example is sample output from the show interface cable downstream command for Cisco IOS releases that support only DOCSIS 1.0 or 1.0+ operation:

```
Router# show interface cable 6/0 downstream
Cable6/0: Downstream is up
     111947771 packets output, 1579682655 bytes, 0 discarded
     0 output errors
```

The following is sample output from the show interface cable downstream command for Cisco IOS releases that support only DOCSIS 1.1 operation:

```
Router# show interface cable 4/0 downstream

Cable4/0:Downstream is up
   54335436 packets output, 2854290447 bytes, 0 discarded
   0 output errors
  1 total active devices, 1 active modems
  Total downstream bandwidth: 27000000 bps
  Total downstream reserved bandwidth: 1000000 bps
  Worst case latency for low latency queue: 0 usecs
  Current Upper limit for worst case latency: 0 usecs
Router#
```

Table 219: show interface cable downstream Field Descriptions

Field	Description
Cable	Indicates the location of the downstream interface.
Downstream is up/...administratively down	Indicates the administrative state of the interface.
packets output	Total number of data packets that have been transmitted on this downstream cable interface.
bytes	The number of bytes for data packets that have been transmitted on this downstream cable interface.
discarded	Total number of packets that were not transmitted on the downstream, because of an error, such as a buffer overrun, the Cisco CMTS running out of memory, or the frame being larger than the cable interface's MTU value.
output errors	Total number of packets that could not be transmitted on this downstream cable interface because of all errors.
total active devices	Total number of active cable modems and customer premises equipment (CPE) devices that are connected to this downstream cable interface.

Field	Description
active modems	Total number of active cable modems that are connected to this downstream cable interface.
Total downstream bandwidth	Total bandwidth associated with this downstream cable interface, in bits per second.
Total downstream reserved bandwidth	Total bandwidth on this downstream cable interface that has been reserved by specifying a value for the Min Reserved Traffic Rate field for the downstream service flow in the cable modems' DOCSIS configuration files.
Worst case latency for low latency queue	Worst case latency value, in microseconds, that is allowed on this downstream cable interface, as determined by the Max DS Latency field for the downstream service flow in the cable modems' DOCSIS configuration files.
Current Upper limit for worst case latency	Lowest worst case latency value, in microseconds, that is allowed on this downstream cable interface. The Cisco CMTS uses the lowest specified Max DS Latency value that has been specified for a downstream service flow in any of the DOCSIS configuration files being used by cable modems on this downstream. If a cable modem tries to register a downstream service flow that uses a worst case latency that is greater than this value, the Cisco CMTS will refuse to admit that service flow.



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show interface cable	Displays configuration and status information for the cable interface.
show interface cable sid	Displays information by service identifier (SID) of each CM on the network.
show interface cable signal-quality	Displays information about the cable signal quality.
show interface cable upstream	Displays information about one or all upstreams on the cable interface.

show interface cable dsg downstream

To display interface configuration and status information for Advanced-mode DOCSIS Set-top Gateway (A-DSG) downstreams on a Cisco CMTS router, use the show interface cable dsg downstream command in privileged EXEC mode.

show interface cable {*slot*/*port*|*slot*/*subslot*/*port*} **dsg downstream** [**dcd**|**rule** *rule-id* [**cfr**|**clients**|**verbose**]|**tunnel** *tunnel-id*]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index*|*slot*/*subslot*/*cable-interface-index*} **dsg downstream** [**dcd**|**rule** *rule-id* [**cfr**|**clients**|**verbose**]|**tunnel** *tunnel-id*]

Cisco cBR Series Converged Broadband Router
show interface cable {*slot*/*subslot*/*cable-interface-index*} **dsg downstream** [**dcd**|**tunnel** *tunnel-id*]

Syntax Description

cable	*Specifies details of a cable interface line card:* • *slot*—Slot where the line card resides. • *subslot*—(Cisco uBR10012 only) Secondary slot number of the line card. • *port*—Downstream port number of the line card. • *cable-interface-index*—Downstream port or MAC domain index of the line card.
cable*slot/subslot/cable-interface-index*	For the Cisco cBR router— • The valid range for the *slot* is 0 to 3 and 6 to 9. • The valid value for the *subslot* is 0. • The valid range for *cable-interface-index*is 0 to 15.
dcd	(Optional) Displays downstream channel descriptor (DCD) messages for the A-DSG interface.
rule *rule-id*	(Optional) Displays interface-level information for A-DSG rules on the Cisco CMTS router, such as rule state, tunnels, classifiers, client information, upstream channel identifier, and the number of vendors associated to a rule on a given downstream.
cfr	(Optional) Displays the list of classifiers associated to the A-DSG rule, such as classifiers associated with the rule-id under the interface.
clients	(Optional) Displays clients associated with the rule-id under the interface.
verbose	(Optional) Displays A-DSG downstream rule detail information.
tunnel *tunnel-id*	(Optional) Displays interface-level A-DSG downstream tunnel information. The valid range is from 1 to 65535.

Command Default

Displays configuration information for all DSG downstream channels on a cable interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(13a)BC	This command was introduced to support A-DSG 1.1 on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.3(17a)BC	This command was modified to support A-DSG 1.2 with the following changes: • The **rule** keyword option is obsolete. • The tunnel group ID field ("TG id") was added to the **show interfaces cable dsg downstream tunnel** form of the command. • The output display column headings of the **show interfaces cable dsg downstream tunnel** form of the command were changed.
12.2SCA	This command was integrated into Cisco IOS Release 12.2SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB4	This command was modified. The show interface cable dsg downstream dcd command output is changed to display interface level DCD statistics for all interfaces in the mac-domain such as cable interfaces, modular cable interfaces, and IC interfaces. The field IF name is added to the output to indicate the interface.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
12.2(33)SCG	This command was modified. Support for the following keywords was removed: • **rule** *rule-id* • **cfr** • **clients** • **verbose**
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The following options were removed: • **rule** *rule-id* • **cfr** • **clients** • **verbose**

Usage Guidelines

To use the **show interface cable dsg downstream** command, the tunnel group must be configured globally and also at the cable interface.

Table 220: Interface Density Information

CMTS Router	Line Card	Slot	Subslot	Port	Cable Interface Index
Cisco uBR10012	Cisco uBR-MC3GX60V	5 to 8	0 or 1	0 to 4	0 to 14
	Cisco UBR-MC20X20V				0 to 4
	Cisco uBR10-MC5X20				
Cisco uBR7225VXR	All	1 or 2	—	0 or 1	—
Cisco uBR7246VXR	All	3 to 6	—	0 or 1	—

Examples

Example: Displaying Information for all A-DSG Downstreams on a Cable Interface

The following example illustrates A-DSG downstream configuration information and the number of DSG tunnels, classifiers, clients and vender specific parameters.

```
Router# show interface cable 6/0 dsg downstream
chan chFreq chan timer init    oper    twoWay oneWay num  num    num  num    num
list index  freq index timeout timeout timer  timer  rule tunnel cfr  client vsp
1    2      666  1     1       2       3      4      9    6      4    6      2
     3      500
```

Example: Displaying DCD Information for all A-DSG Downstreams on a Cable Interface

The following example illustrates the DCD statistics for the given downstream channel for A-DSG version 1.1. DCD TLV information displays if the debug cable dsg command is active. This output was changed in Cisco IOS Release 12.3(17a)BC for A-DSG version 1.2.

```
Router# show interface cable 6/0 dsg downstream dcd
dcd   num of dcd           num of dcd           num of dcd           num of
state sent                 fail                 change cnt           fragment
en    282                  0                    1                    1
```

The following example shows the output for A-DSG debugging while running the same command:

```
Router# debug cable dsg
Router# show interface cable 6/0 dsg downstream dcd
dcd   num of dcd           num of dcd           num of dcd           num of
state sent                 fail                 change cnt           fragment
en    2139                 0                    1                    1
Router#
00:35:58: DCD TLV last sent:
32390101 01020102 040E0302 09510100 02061111 11111111 05060100 5E010114
06020001 2B150803 12345612 3456789A BCDEF012 3456789A BCDEF032 26010102
02010104 0E030209 51010002 06111111 11111105 0601005E 01011E06 02000206
02000A32 18010103 02010104 04040200 01050601 005E0101 28060200 03321401
01040201 01040403 02070105 0601005E 01013232 14010105 02010104 04040200
02050601 005E0101 3C321401 01070201 01040404 02000605 0601005E 01011432
1E010108 02010104 0E030209 51010002 06111111 11111105 0601005E 01011432
35010114 02010104 0E030209 51010002 06111111 11111105 0601005E 0101142B
Router# 15080312 34561234 56789ABC DEF01234 56789ABC DEF01715 02020001 05010109
```

```
0C0504E6 6F6F6F03 046F6F6F 6F170F02 02000205 01010906 0504E601 0141170F
02020003 05010109 060504E6 01012817 0F020200 0A050101 09060504 E6010147
33230104 27B25A80 01041DCD 65000202 00010302 00020402 00030502 00042B05
08030022 22
```

Beginning in Cisco IOS Release 12.3(17a)BC, this output was modified to add the "dcd Tx" field in support of A-DSG version 1.2 as shown below:

```
Router# show interfaces cable 5/0 dsg downstream dcd
dcd   dcd
   num of dcd           num of dcd           num of dcd  num of
state Tx
    sent                 fail                 change cnt  fragment
en    on    6502                0                    28          1
```

The following output displays the DCD statistics on all the cable and modular interfaces. The "IF Name" field displays the interface type:

```
Router#show interface cable 5/1/0 dsg downstream dcd
IF         dcd   dcd   num of dcd      num of dcd     num of dcd  num of
Name       state Tx    sent           fail           change cnt  fragment
---------- ----- ----- -------------- -------------- ----------  --------
Ca5/1/0    en    on    70             0              2           1
Mo1/0/0:0  en    on    70             0              2           1
```

Example: Displaying Rule Information for all A-DSG Downstreams on a Cable Interface

Note This command is obsolete beginning in Cisco IOS Release 12.3(17a)BC.

```
Router# show interface cable 6/0 dsg downstream rule
rule rule  rule tunnel tunnel tunnel          cfr   cfr   cfrIn client vsp
id   state pri  id     state  mac-addr        id    state dcd   listId index
1    en    2    1      en     0100.5e01.0114  1     en    yes   2      1
                                              5     en    no
                                              11    en    no
                                              14    en    no
2    en    1    2      en     0100.5e01.011e  2     en    yes   2
                                              10    en    yes
3    en    1    3      en     0100.5e01.0128  3     en    yes   3
4    en    1    4      en     0100.5e01.0132  4     en    no    4
5    en    1    5      en     0100.5e01.013c  9     en    no    5
6    en    1    6      dis    0100.5e01.0146                    6      2
7    en    1    1      en     0100.5e01.0114  1     en    no    10
                                              5     en    no
                                              11    en    no
                                              14    en    no
8    en    1    1      en     0100.5e01.0114  1     en    no    2
                                              5     en    no
                                              11    en    no
                                              14    en    no
20   en    1    1      en     0100.5e01.0114  1     en    no    2      1
                                              5     en    no
                                              11    en    no
                                              14    en    no
                                        65535 dis   yes
```

The following example displays the same information as above for the given rule.

```
Router# show interface cable 6/0 dsg downstream rule 1

rule rule  rule tunnel tunnel tunnel          cfr   cfr   cfrIn client vsp
id   state pri  id     state  mac-addr        id    state dcd   listId index
1    en    2    1      en     0100.5e01.0114  1     en    yes   2      1
                                               5     en    no
                                               11    en    no
                                               14    en    no
Router# show interface cable 6/0 dsg downstream rule 1 cfr

rule cfr cfr   cfrIn cfr destination ip   source ip        srcPre d_port d_port
id   id  state dcd   pri address          address          length start  end
1    1   en    yes   1   230.111.111.111  111.111.111.111  32     0      65535
     5   en    no    1   230.1.1.60       0.0.0.0          32     0      65535
     11  en    no    1   224.25.25.134    0.0.0.0          32     0      65535
     14  en    no    0   230.1.1.20       0.0.0.0          32     1000   2000
Router# show interface cable 6/0 dsg downstream rule 1 clients

rule rule  rule client client client          client
id   state pri  listId id     id type         address
1    en    2    2      1      CA System ID    0951
                         3      Broadcast
                         8      MAC Addr        1111.1111.111
Router# show interface cable 6/0 dsg downstream rule 1 verbose

Rule ID                      : 1
State                        : enable
Priority                     : 2
Tunnel ID                    : 1
State                        : enable
MAC Addr                     : 0100.5e01.0114
Cfr Id                       : 1
State                        : enable
Priority                     : 1
Dest IP                      : 230.111.111.111
Src IP                       : 111.111.111.111
Src Prefix Length            : 32
Dest Port Start              : 0
Dest Port End                : 65535
Forwarded                    : 0
Received                     : 0
Cfr Id                       : 5
State                        : enable
Priority                     : 1
Dest IP                      : 230.1.1.60
Src IP                       : 0.0.0.0
Src Prefix Length            : 32
Dest Port Start              : 0
Dest Port End                : 65535
Forwarded                    : 0
Received                     : 0

Cfr Id                       : 11
State                        : enable
Priority                     : 1
Dest IP                      : 224.25.25.134
Src IP                       : 0.0.0.0
Src Prefix Length            : 32
Dest Port Start              : 0
Dest Port End                : 65535
Forwarded                    : 0
```

```
Received                        : 0
Cfr Id                          : 14
State                           : enable
Priority                        : 0
Dest IP                         : 230.1.1.20
Src IP                          : 0.0.0.0
Src Prefix Length               : 32
Dest Port Start                 : 1000
Dest Port End                   : 2000
Forwarded                       : 0
Received                        : 0
Client List Id                  : 2
Client Id                       : 1
Client Id Type                  : CA System ID    0951
Client Id                       : 3
Client Id Type                  : Broadcast
Client Id                       : 8
Client Id Type                  : MAC Addr        1111.1111.111
vsif index                      : 1
vsif oui                        : 0X123456
vsif value                      : 0X123456789ABCDEF0123456789ABCDEF0
```

Example: Displaying Tunnel Information for all A-DSG Downstream s on a Cable Interface

The following examples shows output for tunnels on A-DSG version 1.1 downstreams. This output was changed in Cisco IOS Release 12.3(17a)BC for A-DSG version 1.2.

```
Router# show interface cable 6/0 dsg downstream tunnel

tunnel tunnel tunnel          cfr  cfr   rule rule  client service
id     state  mac-addr        id   state id   state listId class
1      en     0100.5e01.0114  1    en    1    en    2      SI
                              5    en    7    en    10
                              11   en    8    en    2
                              14   en    20   en    2
2      en     0100.5e01.011e  2    en    2    en    2      NDS-CA
                              10   en
3      en     0100.5e01.0128  3    en    3    en    3      NDS-APP
4      en     0100.5e01.0132  4    en    4    en    4      MOTO-CA
5      en     0100.5e01.013c  9    en    5    en    5      MOTO-APP
6      dis    0100.5e01.0146             6    en    6      SA-CA
```

Beginning in Cisco IOS Release 12.3(17a)BC, this output was modified to add the “TG id” field in support of A-DSG version 1.2, and modifies the output column headings as shown below:

```
Router# show interfaces cable 5/0 dsg downstream tunnel
     tunnel              TG       cfr        rule
   client service
id  state mac-addr       id    id  state id state
 listId class
1      en 0100.5e01.0001 1     1      en 1     en 1      DSG-Rate1
                               6      en
                               7      en
                               8      en
2      en 0100.5e01.0002 1     2      en 2     en 2
3      en 0100.5e01.0003 1     3      en 3     en 3
4      en 0002.0002.0001 2     4      en 4     en 1
5      en 0002.0002.0002 2     5      en 5     en 2      DSG-Rate2
6      en 0002.0002.0003 2     9      en 6     en 21
```

Example: Displaying Information for a Specified Tunnel on A-DSG Downstream s on a Cable Interface

The following examples shows output for a specified tunnel on A-DSG version 1.1 downstreams. This output was changed in Cisco IOS Release 12.3(17a)BC for A-DSG version 1.2.

```
Router# show interface cable 6/0 dsg downstream tunnel 1

tunnel tunnel tunnel          cfr  cfr   rule rule  client service
id     state  mac-addr        id   state id   state listId class
1      en     0100.5e01.0114  1    en    1    en    2      SI
                              5    en    7    en    10
                              11   en    8    en    2
                              14   en    20   en    2
```

Beginning in Cisco IOS Release 12.3(17a)BC, this output was modified to add the “TG id” field in support of A-DSG version 1.2, and modifies the output column headings as shown below:

```
Router# show interfaces cable 5/0 dsg downstream tunnel 1
     tunnel              TG      cfr       rule
  client service
id  state mac-addr       id    id  state id state
 listId class
1      en 0100.5e01.0001 1     1      en 1     en 1      DSG-Rate1
                               6      en
                               7      en
                               8      en
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output for the **show interface cable dsg downstream** command:

```
Router#show interface cable 3/0/0 dsg downstream
chan  chan  chan timer init    oper    twoWay oneWay num  num    num  num    num
list  index freq index timeout timeout timer  timer  rule tunnel cfr  client vsp
----- ----- ---- ----- ------- ------- ------ ------ ---- ------ ---- ------ ---
                                                    0    0      0    0      0

Router#
```

This example shows the output for the **show interface cable dsg downstream dcd** command:

```
Router#show intwerface cable 3/0/0 dsg downstream dcd

IF          dcd   dcd   dsg  num of dcd      num of dcd     num of dcd  num of
Name        state Tx    fwd  sent           fail           change cnt  frag
----------- ----- ----- ---- -------------- -------------- ----------- ------
In3/0/0:8   dis   n/a   en   0              0              0           0
In3/0/0:16  dis   n/a   en   0              0              0           0
In3/0/0:24  dis   n/a   en   0              0              0           0
In3/0/0:32  dis   n/a   en   0              0              0           0
In3/0/0:33  dis   n/a   en   0              0              0           0
In3/0/0:40  dis   n/a   en   0              0              0           0

Router#
```

This example shows the output for the **show interface cable dsg downstream tunnel** command when a tunnel is not associated to an interface:

```
Router#show interface cable 3/0/0 dsg downstream tunnel 1
% DSG tunnel 1 not associated to interface.

Router#
```

Related Commands

Command	Description
debug cable dsg	Enables general, DCD or packet-related debugging.
show interface	Displays general interface information for the specified or all interfaces.
show interface cable dsg downstream tg	Displays information for A-DSG downstream tunnel groups on a Cisco CMTS router.

show interface cable dsg downstream tg

To display information for Advanced-mode DOCSIS Set-top Gateway (A-DSG) downstream tunnel groups on a Cisco CMTS router, use the show interface cable dsg downstream tg command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **dsg downstream tg** [**channel** *channel-id*]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **dsg downstream tg** [**channel** *channel-id*]

Cisco cBR Series Converged Broadband Router
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **dsg downstream tg** *tunnel-id*

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 15.
channel *channel-id*	(Optional) Specifies the downstream channel identifier as a number from 1–65535. This option is not supported on the Cisco cBR router.

tunnel-group id	(Optional Cisco cBR router) Specifies the DSG tunnel group identifier as a number from 1–65535.

Command Default

No default behaviors or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(17a)BC	This command was introduced to support A-DSG on the Cisco uBR10012 router and Cisco uBR7200 series routers.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD5	This command was modified. The output of the **show interface cable dsg downstream tg** command was changed.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **channel** keyword is removed.

Usage Guidelines

To use the **show interface cable dsg downstream tg** command, the tunnel group must be configured globally and also at the cable interface.

Examples

Example: Displaying Information for all A-DSG Downstream Tunnel Groups on a Cable Interface

The following example shows output for all A-DSG downstream tunnel groups:

```
Router# show interfaces cable 5/0 dsg downstream tg
TG: 1     Chan: 1     state: en pri: 16 Vendor: 1     UCID: 1 2 3 4
          rule        tunnel                    cfr                      client
 I/F    id state id state mac-addr       id  state dest-ip         In-DCD listId
 C5/0   1     en 1     en 0101.5e01.0001 1      en 230.1.0.1       yes    1
                                         6      en 231.1.1.6       no
                                         7      en 231.1.1.7       no
                                         8      en 231.1.1.8       no
        2     en 2     en 0101.5e01.0002 2      en 230.1.0.2       yes    2
        3     en 3     en 0101.5e01.0003 3      en 230.1.0.3       yes    3
TG: 2     Chan: 1     state: en pri: 11 Vendor: 2     UCID:
          rule        tunnel                    cfr                      client
 I/F    id state id state mac-addr       id  state dest-ip         In-DCD listId
 C5/0   4     en 4     en 0002.0002.0001 4      en 230.2.2.1       no     1
        5     en 5     en 0002.0002.0002 5      en 230.2.2.2       no     2
        6     en 6     en 0002.0002.0003 9      en 231.1.1.9       no     21
```

Example: Displaying Information for a Specified A-DSG Downstream Tunnel Group on a Cable Interface

The following example shows output for a specified A-DSG downstream tunnel group:

```
Router# show interfaces cable 5/0 dsg downstream tg 1 channel 1
TG: 1     Chan: 1     state: en pri: 16 Vendor: 1     UCID: 1 2 3 4
          rule        tunnel                    cfr                       client
 I/F    id state id state mac-addr       id  state dest-ip         In-DCD listId
 C5/0   1     en 1     en 0101.5e01.0001 1      en 230.1.0.1       yes    1
                                         6      en 231.1.1.6       no
                                         7      en 231.1.1.7       no
                                         8      en 231.1.1.8       no
        2     en 2     en 0101.5e01.0002 2      en 230.1.0.2       yes    2
        3     en 3     en 0101.5e01.0003 3      en 230.1.0.3       yes    3
```

Example: Displaying Information for a Specified A-DSG Downstream Tunnel Group on a Cable Interface for Cisco IOS Release 12.2(33)SCD5

The following example shows the output of the **show interfaces cable dsg downstream tg** command that displays the ignore option, introduced in Cisco IOS Release 12.2(33)SCD5, under the 'In DCD' column.

```
Router# show interfaces cable 7/0/0 dsg downstream tg
TG: 1     Chan: 1     State: en  Pri: 0   Vendor:       UCID:
   rule        tunnel                      cfr              In  clients
 id state id  state mac-addr       id  state dest-ip         DCD listId
 -------- ----------------------- ------------------------- --- -------
 1     en 1      en 0100.5e01.0101 1      en 230.1.1.1       ign  1
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output for the **show interface cable dsg downstream tg** command:

Related Commands

Command	Description
debug cable dsg	Enables general, DCD or packet-related debugging.
show interface	Displays general interface information for the specified or all interfaces.
show interface cable dsg downstream	Displays interface configuration and status information for A-DSG downstreams on a Cisco CMTS router.

show interface cable dynamic-service statistics

To display dynamic service statistics based on the cable interface, use the show interface cable dynamic-service statistics command in privileged EXEC mode.

show interface cable {*slot*/*cable-interface-index*|*slot*/*subslot*/*cable-interface-index*} **dynamic-service statistics**

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR router—The valid range is 0 to 15.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS Release 12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output of the **show interface cable dynamic-service statistics** command that shows dynamic service statistics based on the cable interface specified on the Cisco uBR10012 router in Cisco IOS Release 12.2(33)SCF:

```
Router# show interface cable 7/1/0 dynamic-service statistics
  Upstream        Downstream
```

```
DSA REQ      0               5
DSA RSP      5               0
DSA ACK      0               5
DSC REQ      0               5
DSC RSP      5               0
DSC ACK      0               5
DSD REQ      0               0
DSD RSP      0               0
Retransmission counts
             Upstream        Downstream
DSA REQ      0               0
DSA RSP      0               0
DSA ACK      0               0
DSC REQ      0               5
DSC RSP      5               0
DSC ACK      0               0
DSD REQ      0               0
DSD RSP      0               0
```

Table 221: show interface cable dynamic-service statistics Field Descriptions

Field	Description
Upstream	Dynamic service packets sent in the upstream direction.
Downstream	Dynamic service packets sent in the downstream direction.
DSA RSP	Dynamic service add response.
DSA ACK	Dynamic service add acknowledgement.
DSC REQ	Dynamic service change request.
DSC RSP	Dynamic service change response.
DSC ACK	Dynamic service change acknowledgement.
DSD REQ	Dynamic service delete request.
DSD RSP	Dynamic service delete response.

Examples for Cisco cBR Series Converged Broadband Router

Related Commands

Command	Description
show interface cable packetcable statistics	Displays PacketCable interprocess communication (IPC) statistics based on the specified cable interface.

show interface cable intercept

To display the cable modems for which traffic is currently being intercepted and forwarded to a data collector, use the **show interface cable intercept** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*portbundle*} **intercept**

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-indexbundle*} **intercept**

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
bundle	Identifies the bundle ID on the Cisco uBR7100 series, the Cisco uBR7200 series and the Cisco uBR10000 series routers where the interface has been configured to be a member of a virtual interface bundle. The valid range is 1 to 255.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(5)T1	This command was introduced.
12.0(6)SC	This command was introduced on the 12.0 SC train.

Release	Modification
12.1(2)EC	This command was introduced on 12.1 EC train.
12.2(4)BC1	This command was introduced on the 12.2 BC train.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following shows a display after a CM has been added to the intercept list:

```
router# configure terminal

router#(config) interface c6/0

router(config-if)# cable intercept 0080.fcaa.aabb 10.12.13.8 512
router(config-if)#  exit

router(config)# exit

router# show interface c6/0 intercept

                Destination   Destination
MAC Address     IP Address    UDP Port
0080.fcaa.aabb  3.12.13.8      512
```

The following shows a display when no CMs have been added to the intercept list:

```
router# show interface c6/0 intercept

No interception active
```



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable intercept	Specifies that a copy of all traffic for a particular CM should be forwarded to a data collector.

show interface cable mac-scheduler

To display the current time-slot scheduling state, statistics, and weighted fair queuing (WFQ) parameters, use the **show interface cable mac-scheduler** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **mac-scheduler** [*n*]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **mac-scheduler** [*n*]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **mac-scheduler** [*n*]

Cisco cBR Series Converged Broadband Router
show interface cable {*slot*/*subslot*/*cable-interface-index*} **mac-scheduler** [*n*]

Syntax Description

slot/port	Cable interface and downstream port on the Cisco uBR7200 series routers:
	• *slot*—Slot where the line card resides:
	  • Cisco uBR7246VXR router—The valid range is from 3 to 6.
	  • Cisco uBR7225VXR router—The valid value is 1 or 2.
	• *port*—Downstream port number:
	  • Cisco uBR7246VXR and Cisco uBR7225VXR routers— The valid value is 0 or 1.

slot/subslot/port	Cable interface on the Cisco uBR10012 router: • *slot* —Chassis slot number of the cable interface line card. The valid range is from 5 to 8. • *subslot* —Secondary slot number of the cable interface line card. The valid range is 0 or 1. • *port* —Downstream port number. The valid ports are from 0 to 4, depending on the cable interface line card.

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20U/H and Cisco uBR-MC28U line cards or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards.
	• Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid value is 0 or 1.
	• Cisco uBR10012 router:
	  • Cisco UBR-MC20X20V and Cisco uBR10-MC5X20U/H line cards—The valid range is from 0 to 4.
	  • Cisco uBR-MC3GX60V line card—The valid range is from 0 to 14.

slot/subslot/cable-interface-index	For the Cisco cBR router— • The valid range for the *slot* is 0 to 3 and 6 to 9. • The valid value for the *subslot* is 0. • The valid range for *cable-interface-index*is 0 to 15.
n	(Optional) Specific upstream to be displayed. The valid values start with 0 for the first upstream port on the cable interface line card. For the Cisco cBR router—The valid range is 0 to 7.

Command Default

If no upstream port is identified, the command displays information for all upstreams on the specified cable interface. If no logical-index is identified, the command displays all the logical channels under the physical port.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX	This command was introduced. (Much of the information shown in this command was previously shown by the **show interface cable** and **show interface cable upstream** commands.)
12.2(4)BC1	Support was added to the Cisco IOS Release 12.2 BC train.
12.2(15)CX	Support was added for the Cisco uBR-MC28U/X cable interface line card, including additional information about DOCSIS 2.0 A-TDMA and mixed modulation profiles.
12.2(15)BC2	Additional information was added to the display for DOCSIS 2.0 A-TDMA and mixed modulation profiles on the Cisco uBR10-MC5X20S cable interface line card.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCC	This command was modified. The command output was modified to show logical channels information when multiple logical channels are configured.
12.2(33)SCD2	This command was modified. The command output was modified to show weighted fair queuing (WFQ) parameters configured for upstream service flows.
12.2(33)SCE	This command was modified. The command output was modified to show the upstream scheduler output for a MAC domain configured with DPON. The port parameter was changed to *cable-interface-index* to indicate the MAC domain index for the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

In releases prior to Cisco IOS Release 12.2 BC, information for the MAC scheduler was displayed using the **show interface cable** and **show interface cable upstream** commands. In Cisco IOS Release 12.2 BC, the MAC scheduler information is moved to this command.

Example of the show interface cable mac-scheduler Command Output for the Cisco uBR7246VXR and Cisco uBR7225VXR Routers

This example shows theoutput of the **show interface cable mac-scheduler** command for the upstream port 0 on the indicated cable interface:

```
Router# show interface cable 3/0 mac-scheduler 0

    DOCSIS 1.1 MAC scheduler for Cable3/0/U0
     Queue[Rng Polls] 0/64, 0 drops
     Queue[CIR Grants] 0/64, 0 drops
     Queue[BE(7) Grants] 0/64, 0 drops
     Queue[BE(6) Grants] 0/64, 0 drops
     Queue[BE(5) Grants] 0/64, 0 drops
     Queue[BE(4) Grants] 0/64, 0 drops
     Queue[BE(3) Grants] 0/64, 2 drops
     Queue[BE(2) Grants] 0/64, 0 drops
     Queue[BE(1) Grants] 0/64, 0 drops
     Queue[BE(0) Grants] 0/64, 0 drops
     Req Slots 21992195, Req/Data Slots 0
     Init Mtn Slots 313764, Stn Mtn Slots 37638
     Short Grant Slots 3739132, Long Grant Slots 512
     Fragmentation count 5
     Fragmentation test disabled
     Avg upstream channel utilization : 2%
     Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
     Avg percent contention slots : 96%
     Avg percent initial ranging slots : 1%
     Avg percent minislots lost on late MAPs : 0%
     Sched Table Adm-State: Grants 1, Reqpolls 0, Util 2%
     UGS    : 1 SIDs, Reservation-level in bps 80000
     UGS-AD : 0 SIDs, Reservation-level in bps 0
     RTPS   : 0 SIDs, Reservation-level in bps 0
     NRTPS  : Not Supported
     BE     : 4 SIDs, Reservation-level in bps 0
Example of the show interface cable
 mac-scheduler
Command Output When Multiple Logical Channels are Configured for the Cisco uBR10012 Routers
```

OFDMA upstreams is calculated based on maximum single modem upstream performance. Actual performance can vary depending upon cable modem capabilities, possible congestion in the network, and other conditions.

This example shows the output of the **show interface cable mac-scheduler** command when multiple logical channels are configured on the indicated cable interface:

```
Router# show interface cable 7/1/0 mac-scheduler 0

 DOCSIS 1.1 MAC scheduler for Cable7/1/0/U0: rate 2560000
     wfq:None Fairness: Off
     Queue[Rng Polls] 0/128, 0 drops, flows 0 fs_demand_ms 0, max 1
     Queue[CIR Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
     Queue[BE(7) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
     Queue[BE(6) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
     Queue[BE(5) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
     Queue[BE(4) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
     Queue[BE(3) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
     Queue[BE(2) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
     Queue[BE(1) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
```

```
        Queue[BE(0) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Req Slots 10348117, Req/Data Slots 10072546
        Init Mtn Slots 298967, Stn Mtn Slots 21926
        Short Grant Slots 24, Long Grant Slots 16
        Adv Phy Short Grant Slots 0, Adv Phy Long Grant Slots 0
        Adv Phy UGS Grant Slots 0
        Awacs Slots 0
        Fragmentation count 0
        Fragmentation test disabled
        Avg upstream channel utilization : 0%
        Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
        Avg percent contention slots : 97%
        Avg percent initial ranging slots : 3%
        Avg percent minislots lost on late MAPs : 0%
        Sched Table Rsv-state: Grants 0, Reqpolls 0
        Sched Table Adm-State: Grants 0, Reqpolls 0, Util 0%
        UGS    : 0 SIDs, Reservation-level in bps 0
        UGS-AD : 0 SIDs, Reservation-level in bps 0
        RTPS   : 0 SIDs, Reservation-level in bps 0
        NRTPS  : 0 SIDs, Reservation-level in bps 0
        BE     : 4 SIDs, Reservation-level in bps 0
        MAP TSS: lch_state 11, init_retries 0
                 late_initial_maps 0, late_ucd_maps 0
                 mac-phy tss errors 0
        DOCSIS 1.1 MAC scheduler for Cable7/1/0/U8: rate 2560000
        wfq:None Fairness: Off
        Queue[Rng Polls] 0/128, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[CIR Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(7) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(6) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(5) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(4) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(3) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(2) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(1) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Queue[BE(0) Grants] 0/256, 0 drops, flows 0 fs_demand_ms 0, max 0
        Req Slots 0, Req/Data Slots 0
        Init Mtn Slots 0, Stn Mtn Slots 0
        Short Grant Slots 0, Long Grant Slots 0
        Adv Phy Short Grant Slots 0, Adv Phy Long Grant Slots 0
        Adv Phy UGS Grant Slots 0
        Awacs Slots 0
        Fragmentation count 0
        Fragmentation test disabled
        Avg upstream channel utilization : 0%
        Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
        Avg percent contention slots : 0%
        Avg percent initial ranging slots : 0%
        Avg percent minislots lost on late MAPs : 0%
        Sched Table Rsv-state: Grants 0, Reqpolls 0
        Sched Table Adm-State: Grants 0, Reqpolls 0, Util 0%
        UGS    : 0 SIDs, Reservation-level in bps 0
        UGS-AD : 0 SIDs, Reservation-level in bps 0
        RTPS   : 0 SIDs, Reservation-level in bps 0
        NRTPS  : 0 SIDs, Reservation-level in bps 0
        BE     : 0 SIDs, Reservation-level in bps 0
        MAP TSS: lch_state 1, init_retries 0
                 late_initial_maps 0, late_ucd_maps 0
                 mac-phy tss errors 0
```

Example of the **show interface cable mac-scheduler** Command Output That Displays WFQ Parameters in the Cisco uBR10012 Router

This example shows theoutput of the **show interface cable mac-scheduler command that displays** WFQ parameters configured for upstream service flows in slot 5, subslot 0, and port 1 on a Cisco uBR10012 router:

```
Router# show interface cable 5/0/2 mac-scheduler 0
DOCSIS 1.1 MAC scheduler for Cable5/0/2/U0: rate 10240000
wfq:Class,  weights: 1  2  3  4  5  6  7  8
Queue[Rng Polls] 0/128, 0 drops, flows 0 max 0
Queue[CIR Grants] 0/256, 0 drops, flows 0 max 0
Queue[BE(7) Grants] 0/32, 0 drops, flows 0 max 0
Queue[BE(6) Grants] 0/32, 0 drops, flows 0 max 0
Queue[BE(5) Grants] 0/32, 0 drops, flows 0 max 0
Queue[BE(4) Grants] 0/32, 0 drops, flows 0 max 0
Queue[BE(3) Grants] 0/32, 0 drops, flows 0 max 0
Queue[BE(2) Grants] 0/32, 0 drops, flows 0 max 0
Queue[BE(1) Grants] 0/32, 0 drops, flows 0 max 0
Queue[BE(0) Grants] 0/32, 0 drops, flows 0 max 0
Queue[LLQ Grants] 0/64, 0 drops, flows 0 max 0
BG pending grant list entries: 0
BG delay list entries: 0
Req Slots 265389868, Req/Data Slots 4
Init Mtn Slots 3798558, Stn Mtn Slots 0
Short Grant Slots 0, Long Grant Slots 0
Adv Phy Short Grant Slots 0, Adv Phy Long Grant Slots 0
Adv Phy UGS Grant Slots 0
Awacs Slots 0
Fragmentation count 0
Fragmentation test disabled
Avg upstream channel utilization : 0%
Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
Avg percent contention slots : 97%
Avg percent initial ranging slots : 3%
Avg percent minislots lost on late MAPs : 0%
Sched Table Rsv-state: Grants 0, Reqpolls 0
Sched Table Adm-State: Grants 0, Reqpolls 0, Util 0%
UGS    : 0 SIDs, Reservation-level in bps 0
UGS-AD : 0 SIDs, Reservation-level in bps 0
RTPS   : 0 SIDs, Reservation-level in bps 0
NRTPS  : 0 SIDs, Reservation-level in bps 0
BE     : 0 SIDs, Reservation-level in bps 0
MAP TSS: lch_state 11, init_retries 0
late_initial_maps 0, late_ucd_maps 0
mac-phy tss errors 0
r4k ticks in 1ms 800000
Total scheduling events 0
No search was needed 0
Previous entry free 0
Next entry free 0
Could not schedule 0
Recovery failed 0
Curr time 251 entry 251
Example of the show interface cable
 mac-scheduler
Command Output That Displays Upstream Scheduler Information for a MAC Domain Configured
with D-PON
```

This example shows theoutput of the **show interface cable mac-scheduler** command that displays upstream scheduler related information for a MAC domain configured with D-PON:

```
Router# show interface cable 7/0/2 mac-scheduler 1
```

```
      DOCSIS 1.1 MAC scheduler for Cable7/0/2/U1: rate 15360000
      wfq:None
      Req Slots 124, Req/Data Slots 13
      Init Mtn Slots 2243, Stn Mtn Slots 5
      Short Grant Slots 0, Long Grant Slots 0
      Adv Phy Short Grant Slots 1, Adv Phy Long Grant Slots 0
      Adv Phy UGS Grant Slots 0
      Awacs Slots 0
      Fragmentation count 0
      Fragmentation test disabled
      Avg upstream channel utilization : 0%
      Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
      Avg percent contention slots : 97%
      Avg percent initial ranging slots : 3%
      Avg percent minislots lost on late MAPs : 0%
      Sched Table Rsv-state: Grants 0, Reqpolls 0
      Sched Table Adm-State: Grants 0, Reqpolls 0, Util 0%
      UGS    : 0 SIDs, Reservation-level in bps 0
      UGS-AD : 0 SIDs, Reservation-level in bps 0
      RTPS   : 0 SIDs, Reservation-level in bps 0
      NRTPS  : 0 SIDs, Reservation-level in bps 0
      BE     : 0 SIDs, Reservation-level in bps 0
      MAP TSS: lch_state 13, init_retries 0
               late_initial_maps 0, late_ucd_maps 0
               mac-phy tss errors 0
! Only the DPON reference channel will display the following
Queue[Rng Polls] 0/128, 0 drops, flows 0 max 3
Queue[CIR Grants] 0/256, 0 drops, flows 0 max 1
Queue[BE(7) Grants] 0/64, 0 drops, flows 0 max 0
Queue[BE(6) Grants] 0/64, 0 drops, flows 0 max 0
Queue[BE(5) Grants] 0/64, 0 drops, flows 0 max 0
Queue[BE(4) Grants] 0/64, 0 drops, flows 0 max 0
Queue[BE(3) Grants] 0/64, 0 drops, flows 0 max 0
Queue[BE(2) Grants] 0/64, 0 drops, flows 0 max 2
Queue[BE(1) Grants] 0/64, 0 drops, flows 0 max 0
Queue[BE(0) Grants] 0/64, 0 drops, flows 0 max 1
BG pending grant list entries: 0
BG delay list entries: 0
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output for the **show interface cable mac-scheduler** command:

```
Router#show interface  c3/0/0 mac-scheduler

      DOCSIS 1.1 MAC scheduler for Cable3/0/0/U0 : rate 30720000
      wfq:None
      us_balance:OFF
      fairness:OFF
      Queue[Rng Polls] flows 0
      Queue[CIR Grants] flows 0
      Queue[BE(07) Grants] flows 0
      Queue[BE(06) Grants] flows 0
      Queue[BE(05) Grants] flows 0
      Queue[BE(04) Grants] flows 0
      Queue[BE(03) Grants] flows 0
      Queue[BE(02) Grants] flows 0
      Queue[BE(01) Grants] flows 0
      Queue[BE(00) Grants] flows 0
      Req Slots 985995867, Req/Data Slots 1543519
      Init Mtn Slots 14621488, Stn Mtn Slots 40946
      Short Grant Slots 0, Long Grant Slots 0
```

```
     Adv Phy Short Grant Slots 1732, Adv Phy Long Grant Slots 0
     Adv Phy UGS Grant Slots 0
     Avg upstream channel utilization : 0%
     Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
     Avg percent contention slots : 98%
     Avg percent initial ranging slots : 1%
     Avg percent minislots lost on late MAPs : 0%

     MAP TSS: lch_state 9, init_retries 0
              late_initial_maps 0, late_ucd_maps 0
              mac-phy tss errors 0, missed ccc 0
     DOCSIS 1.1 MAC scheduler for Cable3/0/0/U1 : rate 30720000
     wfq:None
     us_balance:OFF
     fairness:OFF
     Queue[Rng Polls] flows 0
     Queue[CIR Grants] flows 0
     Queue[BE(07) Grants] flows 0
     Queue[BE(06) Grants] flows 0
     Queue[BE(05) Grants] flows 0
     Queue[BE(04) Grants] flows 0
     Queue[BE(03) Grants] flows 0
     Queue[BE(02) Grants] flows 0
     Queue[BE(01) Grants] flows 0
     Queue[BE(00) Grants] flows 0
     Req Slots 985976158, Req/Data Slots 1548452
     Init Mtn Slots 14621526, Stn Mtn Slots 45933
     Short Grant Slots 0, Long Grant Slots 0
     Adv Phy Short Grant Slots 11243, Adv Phy Long Grant Slots 0
     Adv Phy UGS Grant Slots 0
     Avg upstream channel utilization : 0%
     Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
     Avg percent contention slots : 98%
     Avg percent initial ranging slots : 1%
     Avg percent minislots lost on late MAPs : 0%

     MAP TSS: lch_state 9, init_retries 0
              late_initial_maps 0, late_ucd_maps 0
              mac-phy tss errors 0, missed ccc 0
Router#
```

This example shows the output for the **show interface cable mac-scheduler** command for specific upstream port:

```
Router#show interface c3/0/0 mac-scheduler 0

     DOCSIS 1.1 MAC scheduler for Cable3/0/0/U0 : rate 30720000
     wfq:None
     us_balance:OFF
     fairness:OFF
     Queue[Rng Polls] flows 0
     Queue[CIR Grants] flows 0
     Queue[BE(07) Grants] flows 0
     Queue[BE(06) Grants] flows 0
     Queue[BE(05) Grants] flows 0
     Queue[BE(04) Grants] flows 0
     Queue[BE(03) Grants] flows 0
     Queue[BE(02) Grants] flows 0
     Queue[BE(01) Grants] flows 0
     Queue[BE(00) Grants] flows 0
     Req Slots 1358971798, Req/Data Slots 2127346
```

```
     Init Mtn Slots 20155580, Stn Mtn Slots 56513
     Short Grant Slots 0, Long Grant Slots 0
     Adv Phy Short Grant Slots 2331, Adv Phy Long Grant Slots 0
     Adv Phy UGS Grant Slots 0
     Avg upstream channel utilization : 0%
     Avg upstream channel utilization in 60 sec(SNMP, excl dps): 0%
     Avg percent contention slots : 98%
     Avg percent initial ranging slots : 1%
     Avg percent minislots lost on late MAPs : 0%

     MAP TSS: lch_state 9, init_retries 0
              late_initial_maps 0, late_ucd_maps 0
              mac-phy tss errors 0, missed ccc 0
Router#
```

This example shows the output for the **show interface cable mac-scheduler** command with **map-stats** keyword:

```
Router#show interface c3/0/0 mac-scheduler 0 map-stats


UBR MAP Proxy U0 for Cable3/0/0/U0:
     mslots_per_frame: 1        frame_in_nsecs: 50000
     Bktwidth:(2000 usecs, 20480 tstamps, 40 mslots) numbkts:150
     Tblwidth:(300000 usecs, 3072000 tstamps, 6000 mslots)
     Vacant bkt interval: 1200 mslots
     Bucket vacancy table (slot_count, used_ms, vacancy_ms)
     (  1,  0,  0) (  0,  4, 36) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  1,  0,  0) (  0,  4, 36) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  1,  0,  0) (  0,  4, 36) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  1,  0,  0) (  0,  4, 36) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39) (  0,  1, 39)
     ReqSlotSz:1  ReqSlotChunkSz:4  ImSlotSz:38   SmSlotsz:2
     MinFragSz:0  AdvMinFragSz:2 MaxUnFragSz:10 TolUfragJitt:0
     Current UCD count: 3
     UnfragSlotJittLimit: 0 usecs, CACEnf:0
     Force fragmentation: Threshold 2000
```

```
     fwd_tbl_sz:0 adv_fwd_tbl_sz:1630

UBR MAP Builder pch 12, lch 0 status 1
     MAP Calndr Variables: Numbkts:150
     Bktwidth:(2000 usecs, 20480 tstamps, 40 mslots)
     Tblwidth:(300000 usecs, 3072000 tstamps, 6000 mslots)
     Vacant bkt interval: 1200 mslots
     Bucket table (map_bkt_idx, total_rsvd_ms)
     (0  ,0  ) (1  ,0  ) (2  ,0  ) (3  ,0  ) (4  ,0  )
     (5  ,0  ) (6  ,0  ) (7  ,0  ) (8  ,0  ) (9  ,0  )
     (10 ,0  ) (11 ,0  ) (12 ,0  ) (13 ,0  ) (14 ,0  )
     (15 ,0  ) (16 ,0  ) (17 ,0  ) (18 ,0  ) (19 ,0  )
     (20 ,0  ) (21 ,0  ) (22 ,0  ) (23 ,0  ) (24 ,0  )
     (25 ,0  ) (26 ,0  ) (27 ,0  ) (28 ,0  ) (29 ,0  )
     (30 ,0  ) (31 ,0  ) (32 ,0  ) (33 ,0  ) (34 ,0  )
     (35 ,0  ) (36 ,0  ) (37 ,0  ) (38 ,0  ) (39 ,0  )
     (40 ,0  ) (41 ,0  ) (42 ,0  ) (43 ,0  ) (44 ,0  )
     (45 ,0  ) (46 ,0  ) (47 ,0  ) (48 ,0  ) (49 ,0  )
     (50 ,0  ) (51 ,0  ) (52 ,0  ) (53 ,0  ) (54 ,0  )
     (55 ,0  ) (56 ,0  ) (57 ,0  ) (58 ,0  ) (59 ,0  )
     (60 ,0  ) (61 ,0  ) (62 ,0  ) (63 ,0  ) (64 ,0  )
     (65 ,0  ) (66 ,0  ) (67 ,0  ) (68 ,0  ) (69 ,0  )
     (70 ,0  ) (71 ,0  ) (72 ,0  ) (73 ,0  ) (74 ,0  )
     (75 ,0  ) (76 ,0  ) (77 ,0  ) (78 ,0  ) (79 ,0  )
     (80 ,0  ) (81 ,0  ) (82 ,0  ) (83 ,0  ) (84 ,0  )
     (85 ,0  ) (86 ,0  ) (87 ,0  ) (88 ,0  ) (89 ,0  )
     (90 ,0  ) (91 ,0  ) (92 ,0  ) (93 ,0  ) (94 ,0  )
     (95 ,0  ) (96 ,0  ) (97 ,0  ) (98 ,0  ) (99 ,0  )
     (100,0  ) (101,0  ) (102,0  ) (103,0  ) (104,0  )
     (105,0  ) (106,0  ) (107,0  ) (108,0  ) (109,0  )
     (110,0  ) (111,0  ) (112,0  ) (113,0  ) (114,0  )
     (115,0  ) (116,0  ) (117,0  ) (118,0  ) (119,0  )
     (120,0  ) (121,0  ) (122,0  ) (123,0  ) (124,0  )
     (125,0  ) (126,0  ) (127,0  ) (128,0  ) (129,0  )
     (130,0  ) (131,0  ) (132,0  ) (133,0  ) (134,0  )
     (135,0  ) (136,0  ) (137,0  ) (138,0  ) (139,0  )
     (140,0  ) (141,0  ) (142,0  ) (143,0  ) (144,0  )
     (145,0  ) (146,0  ) (147,0  ) (148,0  ) (149,0  )
     ReqSlotSz:1  ReqSlotChunkSz:4  ImSlotSz:38   SmSlotsz:2
     MinFragMSlots:33 AdvMinFragMSlots: 2
     MaxUnFragSz:33  MaxUnFragSzNoJumbo:33, TolUfragJitt:0
     Current UCD count: 4
     UnfragSlotJittLimit: 0 usecs, CACEnf:1
     Force fragmentation: Threshold 2000
     MAP BD Varaibles
     last_sid 16383, last_iuc 1, next_ie_offset 0
     nonzero_len 0, zero_len 0
     map_cycle_usecs 2000, map_size_mslots 40
     sm_mslot_nopad 4, sm_mslot_pad 4 giant_map_check_mslot 80
     nom_map_adv_usecs 2757, max_map_adv_usecs 3880

     fwd_tbl_sz:0 adv_fwd_tbl_sz:1630

Router#
```

Table 222: show interface cable mac-scheduler Field Descriptions

Field	Description
wfq	WFQ parameters: class, activity, and custom weights for service flow priorities.

Field	Description

Queue...	State of the first-in, first-out (FIFO) priority queues for each scheduler. For each queue, the command displays the following:
	• Name of the queue. The following queues are available:
	  • Rng Polls—Queue used for ranging requests.
	  • CIR Grants—Queue used for committed information rate (CIR) grants, which is used for Unsolicited Grant Service (UGS) and UGS with Activity Detection (UGS-AD) service flows.
	  • BE(x) Grants—One of the eight queues used for Best-Effort(BE) service flows.
	• Number of currently occupied slots over the total number of slots available (which is hardcoded to 64 for each queue). For example, 3/64 indicates that the queue has a depth of 64 slots available and that 3 are currently in use.
	• Number of packets dropped because the queue already had 64 requests pending and a free slot was therefore not available.

Req Slots	Counter showing the number of slots advertised on this upstream port for bandwidth request opportunities since the last reset of the router or the counter.
Req/Data	Counter showing the number of slots advertised on this upstream port for request and data transmission opportunities since the last reset of the router or the counter.
Init Mtn Slots	Number of slots granted on this upstream port for initial maintenance requests (initial ranging) since the last reset of the router or the counter.
Stn Mtn Slots	Number of slots granted on this upstream port for station maintenance requests (unicast ranging) since the last reset of the router or the counter.
Short Grant Slots	Number of slots granted on this upstream port for short data requests since the last reset of the router or the counter.
Long Grant Slots	Number of slots granted on this upstream port for long data requests since the last reset of the router or the counter.
Adv Phy Short Grant Slots	Number of slots granted on this upstream port for short advanced physical data requests.
Adv Phy Long Grant Slots	Number of slots granted on this upstream port for long advanced physical data requests.
Adv Phy UGS Grant Slots	Number of UGS slots granted on this upstream port.
Awacs Slots	Number of awacs slots granted on this upstream port.
Fragmentation count	Number of frames received on this upstream port fragmented according to the DOCSIS 1.1 fragmentation technique.

Field	Description
Fragmentation test	Fragmentation statistics. If fragmentation is disabled, no statistics are available. If fragmentation is enabled, the fragmentation mode is displayed (multiple grant mode or piggyback mode), and the display shows the fragmentation threshold in the number of bytes and minislots.
Avg upstream channel utilization	Total upstream bandwidth currently used for upstream data traffic and DOCSIS management traffic, expressed as a short-term average percentage of total minislots used. **Note** See table below for the theoretical maximum possible bandwidth for an upstream, based on the channel width and modulation scheme.
Avg percent contention slots	Approximate average unused capacity in the network. This field shows the total upstream bandwidth that is currently dedicated to providing bandwidth request opportunities, expressed as an average percentage of total minislots used. This value is calculated by dividing the number of scheduled contention slots by the total number of minislots. **Note** This value is approximately 100 percent minus the percentage of slots being used for upstream data, management traffic, and initial ranging slots.
Avg percent initial ranging slots	Total upstream bandwidth currently used on an average for initial ranging requests for cable modems coming online, expressed as an average percentage of total minislots used.
Avg percent minislots lost on late MAPs	Total upstream bandwidth currently lost and unused because the bandwidth allocation MAP message was sent late. This field shows how often allocation gaps occur in the MAP scheduler, where the Cisco CMTS allows significant amounts of time to pass before it schedules a new MAP. Ideally, the CMTS should schedule MAPs consecutively, so that no gaps occur between the MAPs. However, when a large number of cable modems are using different service flow schedules, gaps can appear in the MAP scheduler, resulting in wasted scheduling time. **Tip** A typical value is only a few percentage points. If this field shows larger values than this, use the **debug cable startalloc** command to display the number of minislots that are skipped every time the Cisco CMTS has to adjust its MAP scheduler timer.
Sched Table Rsv-State	Current status of reserved service flows (which typically indicates the number of voice grants): • Grants—Number of admitted UGS style upstream service flows. • Reqpolls—Number of admitted Real Time Polling Service (RTPS) style upstream service flows.

Field	Description
Sched Table Adm-State	Current status of admitted service flows (which typically indicates the number of voice grants): • Grants—Number of admitted UGS style upstream service flows. • Reqpolls—Number of admitted RTPS style upstream service flows. • Percentage of channel utilization that is associated with these service flows.
UGS	Number of service IDs (SIDs) used for UGS service flows, and the current bandwidth reserved by these SIDs, in bits per second.
UGS-AD	Number of SIDs used for UGS with Activity Detection (UGS-AD) service flows, and the current bandwidth reserved by these SIDs, in bits per second.
RTPS	Number of SIDs used for RTPS service flows, and the current bandwidth reserved by these SIDs, in bits per second.
NRTPS	Number of SIDs used for non-RTPS (NRTPS) service flows, and the current bandwidth reserved by these SIDs, in bits per second.
BE	Number of SIDs used for best-effort (BE) service flows, and the current bandwidth reserved by these SIDs, in bits per second.
MAP TSS	MAP timestamp snapshot.



Note The sum of *Avg upstream channel utilization* and *Avg percent contention slots* need not be 100 percentage when rate-adapt is configured. These parameters may be in single digit when the remaining contention slots are assigned to other users and are not using any bandwidth.

The table below shows the maximum usable bandwidth (total bandwidth minus header and MAC-layer overhead) for an upstream that is using a specific channel width and modulation scheme combination.

Table 223: Maximum Potential Upstream Bandwidth

Channel Width (MHz)	Modulation Scheme	Raw Speed (Mbps)	Usable Bandwidth (Mbps)
1.6	QPSK	2.56	2.2
1.6	16 QAM	5.12	4.4
3.2	16 QAM	10.24	8.9
3.2	64 QAM	15.36	13.5
6.4	16 QAM	20.48	18
6.4	64 QAM	30.72	27.2

For example, if the upstream is configured for a 3.2 MHz channel width and is using 16 QAM modulation, its maximum usable bandwidth is 8.9 Mbps. If the average channel utilization field

shows that the upstream is at 50 percent, it indicates that cable modems on that upstream are currently using 0.5 * 8.9 Mbps or 4.45 Mbps.



Tip In Cisco IOS Release 12.1(12)EC, Cisco IOS Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in the line configuration mode.

Related Commands

Command	Description
show interface cable	Displays the configuration and status information for the cable interface.
show interface cable sid	Displays SID information of each CM on the network.
show interface cable signal-quality	Displays the cable signal quality information.
show interface cable upstream	Displays one or all of the cable interface upstream information.

show interface cable modem

To display information about cable modems (CMs) and customer premise equipment (CPE) behind a CM on a specified cable interface, use the **show interface cable modem** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **modem** [*sid* | **ipv6**]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **modem** [*sid* | **ipv6**]

Cisco cBR Series Converged Broadband Router
show interface cable {*slot*/*subslot*/*cable-interface-index*} **modem** [*sid* | **ipv6**]

Syntax Description

cable*slot*/*subslot*/*cable-interface-index*	*Specifies details of a cable interface line card:* • *slot*—Slot where the line card resides. • *subslot*—(Cisco uBR10012 and Cisco cBR-8) Secondary slot number of the line card. • *port*—Downstream port number of the line card. • *cable-interface-index*—Downstream port or MAC domain index of the line card. For the Cisco cBR series router: • *slot*—Slot where the card resides. The valid range is from 0 to 3 and 6 to 9 on the Cisco cBR-8 router. • *subslot*—Subslot where the card resides. The valid value is 0 on the Cisco cBR-8 router. • *cable-interface-index*—cable interface index number. The valid values are from 0 to 15 on the Cisco cBR-8 router.
sid	(Optional) Specifies the service ID (SID) to be displayed. The valid range is from 0 to 8176.
ipv6	(Optional) Specifies an IPv6 cable modem and connected host state.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(11)BC2	This command was introduced.

Release	Modification

12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes:
	• Support for the Cisco uBR7225VXR router was added.
	• The "Dual IP" output field was added to indicate support of both IPv4 and IPv6 addressing.
	• Multicast information was added to the output.
	• The following new initialization states were added to show initialization of CMs and CPEs supporting IPv6:
	  • init6(s)—CMTS router has seen SOLICIT message
	  • init6(a)—CMTS router has seen ADVERTISE message
	  • init6(r)—CMTS router has seen REQUEST message
	  • init6(i)—CMTS router has seen REPLY message
	  • init6(o)—CMTS router has seen version 6 TFTP request
	  • init6(t)—CMTS router has seen version 6 TOD request

12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
12.2(33)SCG	The **ipv6** keyword was added to this command.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show interface cable modem** command displays the cable modems that are known to be using or were last using the specified cable interface. When a cable modem goes offline, it remains associated with its last known cable interface and is shown as "offline" in the command's display for 24 hours.

The CPE devices associated with offline cable modems remain in the command's display either until their cable modem has been offline for 24 hours or until the device's Address Resolution Protocol (ARP) entry times out (the default value is 4 hours), whichever comes first.

The **show interface cable modem** command shows similar information to the **show cable modem** command, but adds information about the privacy bits and IP addressing method.

The **show interface cable modem** command with the **ipv6** keyword also displays the IPv4 CM in the output if an IPv6 or dual stack CPE is behind the IPv4-only cable modem. In all other cases, only IPv6 data of a CM or CPE is displayed.

The IPv6 output of the **show interface cable modem** command differs from the IPv4 command. The privacy bits and the dual IP flag of the IPv4 command output are not present in the output of the **show interface cable modem** command.

Table 224: Interface Density Information

CMTS Router	Line Card	Slot	Subslot	Port	Cable Interface Index
Cisco uBR10012	Cisco uBR-MC3GX60V	5 to 8	0 or 1	0 to 4	0 to 14
	Cisco UBR-MC20X20V				0 to 4
	Cisco uBR10-MC5X20				
Cisco uBR7225VXR	All	1 or 2	—	0 or 1	—
Cisco uBR7246VXR	All	3 to 6	—	0 or 1	—

Examples

This example shows output from the **show interface cable modem** command for all SIDs on a particular cable interface on a Cisco 7200 series router.

```
Router# show interface cable 6/0 modem
SID   Priv bits  Type      State       IP address      method    MAC address
1     11         modem     online(pt)  1.2.3.2         dhcp      0050.7366.1837
2     11         modem     online(pt)  1.2.3.3         dhcp      0010.7b6b.71fd
3     11         modem     online(pt)  1.2.3.4         dhcp      0010.7bb3.fc3d
4     00         modem     init(r1)    1.2.3.238       dhcp      0010.7b6b.71a9
5     11         modem     online(pt)  1.2.3.5         dhcp      0010.7bed.a731
6     11         modem     online(pt)  1.2.3.20        dhcp      0010.7bed.ab4b
7     11         modem     online(pt)  1.2.3.18        dhcp      0010.7b6b.71e3
8     11         modem     online(pt)  1.2.3.13        dhcp      0010.7bed.ab6f
9     11         modem     online(pt)  1.2.3.21        dhcp      0010.7bed.a52f
10    11         modem     online(pt)  1.2.3.14        dhcp      0010.7b6b.7191
11    11         modem     online(pt)  1.2.3.6         dhcp      0010.7bed.ab57
```

This example shows output from the **show interface cable modem** command for an individual SID on a particular cable interface on a Cisco 7200 series router.

```
Router# show interface cable 6/0 modem 9
SID   Priv bits  Type      State       IP address      method    MAC address
9     11         modem     online(pt)  1.2.3.21        dhcp      0010.7bed.a52f
```

This example shows output from the **show interface cable modem** command in Cisco IOS release 12.2(33)SCA on a particular cable interface on a Cisco uBR10012 router. None of the CMs or CPEs are supporting both IPv4 and IPv6 addressing, which is indicated by the “N” in the Dual IP output field.

```
Router# show interface cable 8/0/0 modem 0

SID   Priv Type      State          IP address      method  MAC address     Dual
      bits                                                                  IP
1     11   modem     online(pt)     10.3.134.12     dhcp    0008.0da6.1c47  N
1     11   host      unknown        10.3.134.74     static  000b.bf95.f555  N
2     00   modem     init(o)        10.3.225.26     dhcp    0007.0e07.27d7  N
3     00   modem     init(i)        10.3.225.19     dhcp    0007.0e06.c769  N
4     11   modem     online(pt)     10.3.134.3      dhcp    0008.0da6.3447  N
5     11   modem     online(pt)     10.3.134.38     dhcp    0011.8065.e78e  N
6     00   modem     init6(i)       unavailable             0018.6835.27dd  N
7     11   modem     online(pt)     10.3.134.10     dhcp    0011.8065.e7a6  N
8     00   modem     init(i)        10.3.134.9      dhcp    0006.53b6.57f5  N
9     11   modem     online(pt)     10.3.134.27     dhcp    0006.53b6.581d  N
10    11   modem     online(pt)     10.3.134.5      dhcp    0007.0e04.ebfd  N
```

This example shows the output from the **show interface cable modem** command that shows multicast information:

```
Router# show interface cable 6/1/0 modem
SID    Priv Type      State          IP address      method  MAC address     Dual
       bits                                                                  IP
9      11   modem     online(pt)     101.1.0.6       dhcp    0006.28f9.8c79   N
9      11   host      unknown        111.1.1.45      dhcp    0018.1952.a859   N
10     10   modem     online(pt)     101.1.0.5       dhcp    0006.5305.ac19   N
10     10   host      unknown        111.1.0.3       dhcp    0018.1952.a85a   N
13     10   modem     online(pt)     101.1.0.3       dhcp    0014.f8c1.fd1c   N
8195   10   multicast unknown        224.1.1.51      static  0000.0000.0000   N
8195   10   multicast unknown        224.1.1.49      static  0000.0000.0000   N
8195   10   multicast unknown        224.1.1.50      static  0000.0000.0000   N
```

This example shows the output of the **show interface cable modem** command with the **ipv6** keyword in Cisco IOS Release 12.2(33)SCG:

```
Router# show interface cable 7/0/0 modem ipv6
SID  Type State         IPv6 Address                              M MAC address
11   CM  online        2001:420:3800:809:3519:5F9C:B96A:D31      D 0025.2e2d.743a
11   CPE unknown       2001:420:3800:809:3DB2:8A6C:115F:41D8     D 0011.2544.f33b
```

This example shows the output of the **show interface cable modem** on the Cisco cBR-8 router:

```
Router#show interface cable 1/0/0 modem
                                                                          D
SID    Priv Type      State          IP address      method  MAC address      I
       bits                                                                  P
1      00   modem     online         10.10.20.8       dhcp    0025.2eaf.82e4  Y
2      00   modem     online         10.10.20.9       dhcp    0025.2eaf.82f4  Y
3      00   modem     online         10.10.20.110     dhcp    0025.2e2d.74f8  Y
4      00   modem     online         10.10.20.4       dhcp    0025.2e2d.75be  Y
5      00   modem     online         10.10.20.7       dhcp    0025.2eaf.7f38  Y
5      00   host      unknown        10.10.20.10      dhcp    b8c7.5dcd.04cd  N
6      00   modem     online         10.10.20.6       dhcp    0025.2eaf.8302  Y


Active modems        : 6
Total active devices : 7
```

Table 225: show interface cable modem Field Descriptions

Field	Description
SID	Identifies a SID currently defined and in use on this particular cable interface.

Field	Description
Priv bits	Identifies the current settings of the two privacy bits in the Extended Header (EH) that is used for BPI-encrypted packets. • First bit—Enable bit. Set to 1 when BPI or BPI+ is enabled. • Second bit—Toggle bit. Matches the least significant bit (LSB) of the Key Sequence Number (KSN) in the EH. For example, a value of "00" indicates that BPI is not enabled. A value of "10" indicates that BPI is enabled and that the KSN is an even number. A value of "11" indicates that BPI is enabled and that the KSN is an odd number. **Note** For more information on these bits, see the DOCSIS Baseline Privacy Interface Plus Interface Specification (SP-BPI+-I08-020301 or later).
Type	Identifies the use for this SID: • host—SID is used for a CPE device. • modem—SID is used for a CM. • multicast—SID is used for a multicast broadcast.
State	The current state of the MAC layer for this SID and CM. For hosts or multicast broadcasts, the state will always be unknown.
IP address	IP address for the CM using this SID.
IPv6 Address	IPv6 address of the CM or CPE.
method or m	Identifies the way that the IP address was assigned: • dhcp—The Cisco CMTS first learned of this IP address through a DHCP packet that assigned the address to this device. This IP address is therefore assumed to have been dynamically assigned to the cable modem or CPE device by a DHCP server. (Per the DOCSIS specifications, DHCP is the only valid method for cable modems.) • pppoe—(CPE device only) IP addressing for the CPE device was handled by the Point-to-Point Protocol over Ethernet (PPPoE) protocol. • static—(CPE device only) The Cisco CMTS first learned of this IP address from non-DHCP traffic sent to or from this CPE device. This IP address is therefore assumed to be statically assigned to this particular CPE device. **Note** The Cisco CMTS could identify a CPE device as having a static IP address, if the Cisco CMTS has been rebooted after the CPE device received its IP address from the DHCP server.
MAC address	Identifies the hardware (MAC) address for the CM using this SID.
Dual IP (On Cisco cBR series router) DIP	Identifies whether or not ("Y" or "N") the CM or CPE supports both IPv4 and IPv6 addressing.
Active modems	Total number of active cable modems that are connected to the cable interface.

Field	Description
Total active devices	Total number of active cable modems and customer premises equipment (CPE) devices that are connected to the cable interface.

Table 226: Descriptions for the MAC State Field The CM MAC state field can also be retrieved using SNMP by getting the value of the cdxCmtsCmStatusValue object in the CISCO-DOCS-EXT-MIB.

MAC State Value	Description
Registration and Provisioning Status Conditions for Devices Using IPv4 Addressing	
init(r1)	The CM sent initial ranging.
init(r2)	The CM is ranging. The CMTS received initial ranging from the Cm and has sent RF power, timing offset, and frequency adjustments to the CM.
init(rc)	Ranging has completed. **Note** If a CM appears to be stuck in this state, it could be that the CM is able to communicate successfully on the cable network, but that the upstream is at capacity and does not have any additional bandwidth to allow the CM to finish registration and come online. Either manually move one or more CMs to other upstreams, or enable load balancing on the upstream using the **cable load-balance group** commands.
init(d)	The DHCP request was received, as DHCPDISCOVER. This also indicates that the first IP broadcast packet has been received from the CM.
init(dr)	The DHCP request has been sent to the cable modem.
init(i)	The cable modem has received the DHCPOFFER reply (DHCPACK) from the DHCP server that has assigned an IP address to the modem, but the modem has not yet replied with a DHCPREQUEST message requesting that particular IP address, nor has it sent an IP packet with that IP address. **Note** If a CM appears to be stuck in this state, the CM has likely received the DHCPOFFER reply from the DHCP server, but this reply might have contained one or more invalid options for that particular CM.
init(io)	The Cisco CMTS has seen the DHCP offer as sent to the cable modem from the DHCP server that has assigned an IP address to the modem.
init(o)	The CM has begun to download the option file (DOCSIS configuration file) using the Trivial File Transfer Protocol (TFTP), as specified in the DHCP response. If the CM remains in this state, it indicates that the download has failed.
init(t)	Time-of-day (TOD) exchange has started.
resetting	The CM is being reset and will shortly restart the registration process.
Registration and Provisioning Status Conditions for Devices Using IPv6 Addressing	

MAC State Value	Description
init6(s)	The Cisco CMTS router has seen the DHCPv6 SOLICIT message from the CM.
init6(a)	The Cisco CMTS router has seen the ADVERTISE message from the DHCPv6 server to the CM.
init6(r)	The Cisco CMTS router has seen the REQUEST response from the CM to the DHCPv6 server.
init6(i)	The Cisco CMTS router has seen the REPLY message from the DHCPv6 server to the CM.
init6(o)	The Cisco CMTS router has seen the REQEST message from the CM to the TFTP server.
init6(t)	The Cisco CMTS router has seen the REQUEST message from the CM to the TOD server.
Non-error Status Conditions	
cc(r1)	The CM had registered and was online, but has received a Downstream Channel Change (DCC) or Upstream Channel Change (UCC) request message from the CMTS. The CM has begun moving to the new channel, and the CMTS has received the CM's initial ranging on the new downstream or upstream channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
cc(r2)	This state should normally follow cc(r1) and indicates that the CM has finished its initial ranging on the new channel, and is currently performing continuous ranging on the new channel. At the MAC layer, the CM is considered offline because it is not yet passing traffic on the new channel, but this state does not trigger the flap-list counters.
offline	The CM is considered offline (disconnected or powered down).
online	The CM has registered and is enabled to pass data on the network.
online(d)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. The CM does not forward traffic to or from the CPE devices, but the CMTS can continue to communicate with the CM using DOCSIS messages and IP traffic (such as SNMP commands). **Note** If BPI was enabled in the DOCSIS configuration file sent to the CM, assume that the CM is using BPI encryption, unless other messages show that the BPI negotiation and key assignments have failed.
online(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and KEK is assigned. **Note** This state is equivalent to the online(d) and online(pk) states.

MAC State Value	Description
online(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** This state is equivalent to the online(d) and online(pt) states.
online(pk)	The CM registered, BPI is enabled and KEK is assigned.
online(pt)	The CM registered, BPI is enabled and TEK is assigned. BPI encryption is now being performed. **Note** If network access was disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) instead of online(pt) even when BPI encryption is enabled and operational.
Note If an exclamation point (!) appears in front of one of the online states, it indicates that the **cable dynamic-secret** command has been used with either the **mark** or **reject** option, and that the cable modem has failed the dynamic secret authentication check.	
expire(pk)	The CM registered, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value.
expire(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, KEK was assigned, but the current KEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pk) states.
expire(pt)	The CM registered, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value.
expire(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI is enabled, TEK was assigned, but the current TEK expired before the CM could successfully renew a new KEK value. **Note** This state is equivalent to the online(d) and expire(pt) states.
Error Status Conditions	

MAC State Value	Description
reject(m)	The CM attempted to register but registration was refused due to a bad Message Integrity Check (MIC) value. This also could indicate that the shared secret in the DOCSIS configuration file does not match the value configured on the CMTS with the **cable shared-secret** command. In Cisco IOS Release 12.1(11b)EC1 and Cisco IOS Release 12.2(8)BC2 or later releases, this could also indicate that the **cable tftp-enforce** command has been used to require that a CM attempt a TFTP download of the DOCSIS configuration file before registering, but the CM did not do so.
reject(c)	The CM attempted to register, but registration was refused due to a a number of possible errors: • The CM attempted to register with a minimum guaranteed upstream bandwidth that would exceed the limits imposed by the **cable upstream admission-control** command. • The CM has been disabled because of a security violation. • A bad class of service (COS) value in the DOCSIS configuration file. • The CM attempted to create a new COS configuration but the CMTS is configured to not permit such changes. • The CM failed the timestamp check for its DOCSIS configuration file. (This could indicate a possible theft-of-service attempt, or a problem with the synchronization of the clocks on the CM and CMTS.)
reject(pk)	KEK key assignment is rejected, BPI encryption has not been established.
reject(pkd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because KEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pk) states.
reject(pt)	TEK key assignment is rejected, BPI encryption has not been established.
reject(ptd)	The CM registered, but network access for CPE devices using this CM has been disabled through the DOCSIS configuration file. In addition, BPI encryption was not established because TEK key assignment was rejected. **Note** This state is equivalent to the online(d) and reject(pt) states.
Note In Cisco IOS Release 12.1(20)EC, Cisco IOS Release 12.2(15)BC1, and earlier releases, when network access is disabled in the DOCSIS configuration file sent to the CM, the network disabled status takes precedence, and the MAC status field shows online(d) even if BPI encryption fails. Use the **show cable modem** *mac-address* command to confirm whether BPI is enabled or disabled for a particular cable modem.	
reject(ts)	The CM attempted to register, but registration failed because the TFTP server timestamp in the CM registration request did not match the timestamp maintained by the CMTS. This might indicate that the CM attempted to register by replaying an old DOCSIS configuration file used during a prior registration attempt.

MAC State Value	Description
reject(ip)	The CM attempted to register, but registration failed because the IP address in the CM request did not match the IP address that the TFTP server recorded when it sent the DOCSIS configuration file to the CM. IP spoofing could be occurring.
reject(na)	The CM attempted to register, but registration failed because the CM did not send a Registration-Acknowledgement (REG-ACK) message in reply to the Registration-Response (REG-RSP) message sent by the CMTS. A Registration-NonAcknowledgement (REG-NACK) is assumed.

Related Commands

Command	Description
show cable modem	Displays information for the registered and unregistered CMs.

show interface cable monitor



Note Effective with Cisco IOS Release 12.2(33)SCA the **show interface cable monitor** command is replaced by the **show interface cable cable-monitor** command.

To display cable monitor information, use the **show interface cable monitor** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **monitor**

Syntax Description

slot/port	Displays information for all CMs on the specified cable interface and downstream port on the Cisco uBR7100 series and Cisco uBR7200 series routers, where: • *slot*—Specifies the chassis slot number of the cable interface line card. • *port*—Specifies the downstream port number. Valid values for these arguments are dependent on your CMTS router and cable interface line card. Refer to the hardware documentation for your router chassis and cable interface line card for supported slot and port numbering.
slot/subslot/port	Displays information for all CMs on the specified cable interface on a Cisco uBR10012 router, where: • *slot* —Specifies the chassis slot number of the cable interface line card. Valid slots are 5 to 8. • *subslot* —Specifies the secondary slot number of the cable interface line card. Valid subslots are 0 or 1. • *port* —Specifies the downstream port number. Valid ports are 0 to 4, depending on the cable interface line card.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(3a)EC	This command was introduced.
12.2(4)XF	Support was added for the Cisco uBR10012 universal broadband router.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command is replaced by the **show interface cable-monitor** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface cable monitor** command:

```
Router# show interface cable 5/0 monitor
US/ Time Outbound  Flow     Flow Type      Flow  Packet MAC   MAC       Encap
DS  Stmp Interface Type     Identifier     Extn. Type   Extn. Type      Type
us   no    Et1/2   us-port  0              yes   data   no     -        docsis
all  no    Et1/2   acc-list 103            yes   data   no     -        docsis
all  yes   Et1/2   mac-addr 0050.0000.0000 yes   mac    no     -          -
```

Table 227: show interface cable monitor Field Descriptions

Field	Description
DS	Downstream. Indicates that only downstream flows are monitored.
UP	Upstream. Indicates that only upstream flows are monitored.
ALL	Indicates that all flows are monitored.
Time Stmp	“Yes” indicates that forwarded packets have been time-stamped, with appended 4 bytes. “No” indicates that forwarded packets have not been time-stamped.
Outbound Interface	Identifies the interfaces where the packets have been forwarded to (Ethernet or Fast Ethernet).
Flow Type	Identifies the selected flow type, MAC-address, access-list number, or upstream port number.
Flow Type Identifier	MAC address, access-list number, or service ID.
Flow Extn.	“Yes” indicates that extended filters are configured, and “no” indicates that no extended filters have been configured.
MAC Type	Not applicable.
Encap	DOCSIS encapsulation.
Type	Forwarded packets with Ethernet encapsulation.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
cable monitor	Enables the forwarding of selected packets on the cable interface to an external LAN analyzer.

show interface cable multicast-sessions

To display information about the multicast sessions on a specific cable interface, use the **show interface cable multicast-sessions** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **multicast-sessions**

Cisco IOS Release 12.2(33)SCE and later releases
show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **multicast-sessions** [**group** [*ipv4-MQoS-groupipv6-MQoS-group*] | **latency** | **sid** [*MQoS-sid*]]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot of the cable interface line card. The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
group [*ipv4-MQoS-group* | *ipv6-MQoS-group*]	Displays information about the specified IPv4 or IPv6 multicast quality of service (MQoS) group.
latency	Displays information about the multicast session latency.
sid [*MQoS-sid*]	Displays information about the MQoS service identifier (SID). The value of the SID ranges from 8192 to 12272.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the downstream port of the Cisco uBR10-MC5X20 or the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
12.2(33)SCF	This command was modified. The **latency** keyword was added.
IOS-XE 3.15.0S	This command was removed. It is not available on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example is a sample output from the **show interface cable multicast-sessions** command:

```
Router# show interface cable 7/0/0 multicast-sessions
Default Multicast Service Flow 3 on Cable7/0/0
Multicast Sessions on Cable7/0/0
 Group            Interface    GC  SAID SFID  GQC GEn RefCount GC-Interface State
 224.1.1.45       Bundle1.1    1   8193 24     1   5   1        Bundle1     ACTIVE
 224.1.1.46       Bundle1.1    1   8193 24     1   5   1        Bundle1     ACTIVE
 224.1.1.47       Bundle1.1    1   8193 24     1   5   1        Bundle1     ACTIVE
Aggregate Multicast Sessions on Cable7/0/0
 Aggregate Sessions for SAID 8193 SFID 24 GQC 1 CurrSess 3
 Group            Interface    GC  SAID SFID AggGQC GEn RefCount GC-Interface
 224.1.1.45       Bundle1.1    1   8193 24     1      5   1        Bundle1
 224.1.1.46       Bundle1.1    1   8193 24     1      5   1        Bundle1
 224.1.1.47       Bundle1.1    1   8193 24     1      5   1        Bundle1
```

The following example is a sample output from the **show interface cable multicast-sessions latency** command:

```
Router# show interface cable 5/0/0 multicast-sessions latency
Session (S,G) : (*,230.1.2.4)
Fwd Intfc     : Ca5/0/0
MQoS Entered at        MQoS Exit at
Mar 6 23:13:14.387     Mar 6 23:13:14.387
GC   SAID   SFID   SF req               SF rsp
1    8197   17     Mar 6 23:13:14.387  Mar 6 23:13:14.391
```

The following example is a sample output from the **show interface cable multicast-sessions group** command:

```
Router# show interface cable 5/0/0 multicast-sessions group 230.1.2.4
Multicast Group    : 230.1.2.4
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     1    8197    17      0     1      0
```

The following example is a sample output from the **show interface cable multicast-sessions sid** command:

```
Router# show interface cable 5/0/0 multicast-sessions sid 8197
Multicast Group    : 230.1.2.4
```

```
Source    : N/A
Act GCRs  : 1
Interface : Bu1                    State: A      GI: Bu1         RC: 0
GCR       : GC   SAID    SFID    Key   GQC    GEn
            1    8197    17      0     1      0
```

Related Commands

Command	Description
show interface cable	Displays configuration and status information for the cable interface.
show interface cable modem	Displays information about cable modems and associated customer premises equipment (CPE) devices connected to a particular cable interface.
show interface bundle multicast-sessions	Displays information about the multicast sessions on a specific virtual cable bundle.
show interface modular-cable multicast-sessions	Displays information about multicast sessions on a specific modular-cable interface.
show interface wideband-cable multicast-sessions	Displays information about the multicast sessions on a specific wideband-cable interface.

show interface cable packetcable statistics

To display PacketCable interprocess communication (IPC) statistics based on the cable interface, use the **show interface cable packetcable statistics** command in privileged EXEC mode.

show interface cable {*slot*/*cable-interface-index* | *slot*/*subslot*/*cable-interface-index*} **packetcable statistics**

Cisco cBR Series Converged Broadband Router
show interface cable *slot*/*subslot*/*cable-interface-index* **packetcable statistics**

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR router—The valid range is 0 to 15.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS Release 12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show interface cable packetcable statistics**command provides IPC statistics for the PacketCable module for debugging purpose.

Examples

The following is a sample output of the **show interface cable packetcable statistics** command that shows PacketCable IPC statistics based on the cable interface specified on the Cisco uBR10012 router in Cisco IOS Release 12.2(33)SCF:

```
Router# show interface cable 7/1/0 packetcable statistics
Packetcable IPC Statistics on RP
Msg   create     gate       gate       gate set   dsd
      gie        set        del        notify     notify
Sent  0          10         0          0          0
Rcvd  0          0          0          10         0
Packetcable IPC Statistics on LC
Msg   create     gate       gate       gate set   dsd
      gie        set        del        notify     notify
Sent  0          0          0          10         0
Rcvd  0          10         0          0          0
```

The table describes the significant fields shown in the show interface cable packetcable statistics command display.

Table 228: show interface cable packetcable statistics Field Descriptions

Field	Description
Msg	IPC messages sent and received.
create gie	Gate create request.
gate set	Gate set request.
gate del	Gate delete request.
gate set notify	Gate set notification.
dsd notify	Dynamic service delete notification.

Examples for the Cisco cBR Series Converged Broadband Router

This example shows the output of the **show interface cable packetcable statistics** command on the Cisco cBR router:

```
Router#show interface cable 1/0/0 packetcable statistics
Packetcable IPC Statistics on RP
Msg   create     gate       gate       gate set   dsd
      gie        set        del        notify     notify
Sent  0          0          0          0          0
Rcvd  0          0          0          0          0

Router#
```

Related Commands

Command	Description
show interface cable dynamic-qos statistics	Displays dynamic service statistics based on the specified cable interface.

show interface cable privacy

To display the baseline privacy information, use the show interface cable privacy command in privileged EXEC mode.

show interface cable {*slot/portslot/subslot/port*}**privacy** {**all** | **eae-policy** | **tek** | **kek** | **hotlist**}

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot/cable-interface-indexslot/subslot/cable-interface-index*}**privacy** {**all** | **eae-policy** | **tek** | **kek**}

Cisco cBR Series Converged Broadband Router
show interface cable {*slot/cable-interface-indexslot/subslot/cable-interface-index*}**privacy** {**all** | **eae-policy** | **tek** | **kek**}

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only—The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR router—The valid range is 0 to 15.
all	Displays all privacy configuration details.
eae-policy	Displays early authentication and encryption (EAE) configuration details.
tek	Displays the traffic encryption key (tek) values.
kek	Displays the key encryption key (kek) values.

hotlist	Displays a list of cable modems detected as clones.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
12.2(33)SCD	A new keyword, **hotlist**, was added to display the cable modems detected as clones.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards. The hotlist keyword was removed from this command and added to the **show cable privacy** command.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The show interface cable privacy command is available only in IOS images that support Baseline Privacy Interface (BPI) and BPI+ encryption.

Examples

This example shows the output of the show interface cable privacy command with the **tek** keyword:

```
Router#
 show interface cable 3/0 privacy tek
Configured TEK life-time value = 56000
```

This example shows the output of the show interface cable privacy command with the **kek** keyword:

```
Router#
 show interface cable 3/0 privacy kek
Configured KEK life-time value = 750000
```

This example shows the output of the show interface cable privacy command with the hotlist keyword:

```
Router#
 show interface cable 5/1/0 privacy hotlist
                        Last
MAC Address             Ranged On               Type
00a0.73b0.4c43          Oct 27 21:57:39         Permanent
001a.c3ff.d2d4          Oct 27 21:57:40         Permanent
0018.6852.7746          Never                   Permanent
000e.9bb3.b946          Never                   Permanent
```

This example shows the output of the show interface cable privacy command with the eae-policy keyword:

```
Router#
 show interface cable 5/1/0 privacy eae-policy
EAE Configuration
 Policy: EAE Ranging Enforcement
```

This example shows the output of the **show interface cable privacy** command with the **all** keyword:

```
Router#
 show interface cable 5/1/0 privacy all
EAE Configuration
 Policy: EAE Ranging Enforcement
KEK Configuration
 KEK lifetime: 604800
 Auth Infos: 0
 Auth Requests: 0, Auth Replies: 0
 Auth Rejects: 0, Auth Invalids: 0
 Packet Buffer Failures: 0
 Unrecoverable SPA Key Failures: 0
TEK Configuration
 TEK lifetime: 43200
 TEK Requests: 0, TEK Replies: 0
 TEK Rejects: 0, TEK Invalids: 0
 SAMap Requests: 0, SAMap Replies: 0
 SAMap Rejects: 0
Interface Configuration
 SelfSigned Trust: Untrusted
 Check Cert Validity Periods: True
```

Table 229: show interface cable privacy Command Field Description

Field	Description
Configured TEK life-time value =	Number of seconds defining the length of the traffic encryption key lifetime. The valid range is from 1,800 to 6,048,000 seconds. The default value is 43,200 seconds (12 hours).
Configured KEK life-time value =	Number of seconds defining the length of the key encryption key lifetime. The valid range is from 86,400 to 6,048,000 seconds. The default value is 604,800 seconds (7 days).
MAC Address	MAC address of the cloned cable modem.
Last Ranged On	Displays the time stamp when the cable modem last attempted registration on that interface. This value helps gauge the frequency with which the MAC address is attempting to be cloned, and manage the hotlist accordingly.
Type	• Permanent—The cable modem entry can be configured as a permanent clone from the CLI by executing the **cable privacy hotlist cable modem** command. A cable modem marked as a permanent clone can only be removed from the hotlist by executing the **no** form of the **cable privacy hotlist cable modem** command. • Temporary—The Cisco CMTS detects a duplicate cable modem MAC address. This duplicate MAC address is flagged as a clone and is prevented from coming online for 180 seconds.

This example shows the output of the **show interface cable privacy** command with the **all** keyword:

```
Router#show interface  cable 1/0/0 privacy all
EAE Configuration
 Policy: EAE Enforcement disabled

KEK Configuration
 KEK lifetime: 604800
 Auth Infos: 0
```

```
 Auth Requests: 0, Auth Replies: 0
 Auth Rejects: 0, Auth Invalids: 0

 Packet Buffer Failures: 0
 Unrecoverable Key Failures: 0

TEK Configuration
 TEK lifetime: 43200
 TEK Requests: 0, TEK Replies: 0
 TEK Rejects: 0, TEK Invalids: 0
 SAMap Requests: 0, SAMap Replies: 0
 SAMap Rejects: 0

Interface Configuration
 BPI Plus Policy: disabled
 Check Cert Validity Periods: True
 DSx Support: True
 OAEP Support: True
 Privacy Mandatory: False
 Retain Failed Certificate: False
 SelfSigned Trust: Trusted

LC Information
 Encryption Algorithm: aes128-des56-des40

Router#
```

Related Commands

Command	Description
cable privacy	Enables the operation of BPI/BPI+ encryption on the Cisco CMTS router.
cable privacy eae-exclude	Forces a cable modem to register without an early authentication and encryption (EAE) policy.
cable privacy eae-policy	Enables an early authentication and encryption policy for a cable modem registraion.
cable privacy hotlist	Marks a CA certificate or cable modem certificate of a manufacturer as untrusted and adds it to the Cisco CMTS hotlist of invalid certificates.
cable privacy kek	Sets the KEK lifetime values for baseline privacy.
cable privacy tek	Sets the TEK lifetime values for baseline privacy.
show cable privacy	Displays the BPI certificate information.

show interface cable qos paramset

To display the attributes of the service flow quality of service (QoS) parameter set, use the **show interface cable qos paramset** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **qos paramset** [*paramset-index*] [**verbose**]

Cisco IOS Release 12.2(33)SCE and later releases
show interface cable {*slot*/*cable-interface-index* | **slot**/**subslot**/**cable-interface-index**} **qos paramset** [**paramset-index** | **total**] [**verbose**]

Cisco cBR Series Converged Broadband Router
show interface cable slot/**subslot**/**cable-interface-index qos paramset** [**paramset-index** | **total**] [**verbose**]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 15.
paramset-index	(Optional) Service template index (1 to 255).
total	(Optional) Displays the total number of service flows per service template.
verbose	(Optional) Displays full details about the QoS parameter set.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX	This command replaces the **show cable qos profile** command for DOCSIS 1.1 operation.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
12.2(33)SCF	This command was modified. The total keyword was added to display the total number of service flows per service template.
12.2(33)SCG	The command output was modified to display the scheduling type as "N/A" for all downstream service flows.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show interface cable qos paramset** command displays the QoS parameter set for all the service flows on a particular cable interface.

Note Parameter sets that contain a service-class name string are not in an "expanded" state and serve as provisioning envelopes of class-based service flows. The actual attributes of such parameter sets depend on the service class that is referenced at the time the parameter sets are expanded.

Note Starting with Cisco IOS Release 12.2(33)SCG, the output of the **show interface cable qos paramset** command displays the scheduling type of all downstream service flows (DS-SF) as "N/A" to indicate that the DS-SFs do not have any scheduling type.

Examples

Example of the show interface cable qos paramset Command Output

The following is a sample output of the **show interface cable qos paramset** command:

```
Router# show interface c6/0 qos paramset

Index Name             Dir   Sched  Prio MaxSusRate  MaxBurst    MinRsvRate
1                      US    BE     0    64000       0           0
2                      DS    BE     0    1000000     0           0
3                      US    BE     7    1000000     1522        0
4                      DS    BE     0    10000000    3044        0
128                    US    BE     7    1000000     1522        0
129                    DS    BE     0    10000000    3044        0
```

Note In Cisco IOS Release 12.2(11)BC3 and later releases, the Cisco CMTS automatically maps the non-default DOCSIS 1.0 QoS profiles to profile numbers starting at 128, to facilitate their use in DOCSIS 1.1 networks.

Example of the show interface cable qos paramset verbose Command Output

The following is a sample output for the **verbose** form of the **show interface cable qos paramset** command:

```
Router# show interface c6/0 qos paramset 1 verbose


Index:                                  1
Name:
Direction:                              Upstream
Traffic Priority:                       0
Maximum Sustained Rate:                 64000 bits/sec
Max Burst:                              0 bytes
Minimum Reserved Rate:                  0 bits/sec
Minimum Packet Size                     0 bytes
Maximum Concatenated Burst:             1522
Scheduling Type:                        Best Effort
Request/Transmission Policy:            0x0
Nominal Polling Interval:               0
Tolerated Poll Jitter:                  0
Unsolicited Grant Size:                 0 bytes
Nominal Grant Interval:                 0 usecs
Tolerated Grant Jitter:                 0 usecs
Grants per Interval:                    0
IP ToS Overwrite [AND-mask,OR-mask]:    0x0,0x0
```

Example of the show interface cable qos paramset total Command in Cisco IOS Release 12.2(33)SCF

The following is a sample output for the **total** option of the **show interface cable qos paramset** command:

```
Router# show interfaces cable 6/1/0 qos paramset total
Index SrvClassName     Dir   Sched  MaxSusRate  MaxBurst    MinRsvRate  Total
1                      US    BE     64000       0           0           50669
2                      DS    BE     1000000     0           0           50669
3     def_sclass       DS    BE     10000000    3044        0           6
4     us_srvclass_ts1  US    BE     0           3044        0           4
5     us_srvclass_ts1  US    BE     0           3044        0           8
6     us_srvclass_ts2  US    BE     0           3044        0           4
7     us_srvclass_ts2  US    BE     0           3044        0           8
8     ds_srvclass_ts1  DS    BE     0           3044        0           12
9     ds_srvclass_ts2  DS    BE     0           3044        0           12
```

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Table 230: show interface cable qos paramset Field Descriptions

Field	Description
Dir	Downstream (DS) or upstream (US) service flow.
Sched	Identifies scheduling type of the service flow: • BE—Best-Effort • N/A—Scheduling type is not applicable to a service flow. • NRTPS—Non-Real-Time Polling Service • RTPS—Real-Time Polling Service • RSVD—Reserved but not yet in use • UGS_AD—Unsolicited Grant Service with Activity Detection • UGS—Unsolicited Grant Service • UNDEF—Not yet defined.
Prio	Traffic priority (0 to 7) given to this service flow.
MaxSusRate	Maximum sustained rate value, in bits per second.
MaxBrst	Maximum burst value, in bytes.
MinRsvRate	Minimum reserved rate, in bits per second.
SrvClassName	Service class name associated with the service flow.
Total	Total number of service flows per service template.

Examples for Cisco cBR Series Converged Broadband Router

Related Commands

show cable qos permission	Displays the status of permissions for changing QoS tables.
show cable modem qos	Displays quality of service (QoS) and service flow information for a particular CM.
show cable qos profile	Displays the QoS profiles that have been defined.

show interface cable service-flow

To display the attributes of DOCSIS service flows on a cable interface, use the **show interface cable service-flow** command in privileged EXEC mode.

show interface cable {*slot*/*port* | *slot*/*subslot*/*port*} **service-flow** [*sfid* [**queue** | **classifiers** | **counters** | **phs** | **qos** [**ds** | **us**]] [**verbose**]]

Cisco IOS Release 12.2(33)SCE and later releases
show interface cable {*slot*/*subslot*/*cable-interface-index*} **service-flow** [*sfid* [**qos** [**ds** | **service-class** | **us**] | [**zero-hwflow-index**]]]

Cisco cBR Series Converged Broadband Router
show interface cable *slot*/*subslot*/*cable-interface-index* **service-flow** [*sfid* [**classifiers** *classifier-id* | **counters** | **qos** | **verbose**][**qos** [**ds** | **service-class** | **us**]]] [**zero-hwflow-index**]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco UBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco UBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 15.
sfid	(Optional) Identifies the service flow index (1 to 65535).

queue	(Optional, Cisco 7100 and 7200 series routers only) Displays the downstream hierarchical queueing framework (HQF) queue information associated with this interface. To display detailed information of all the queues under this service flow, use the verbose option with this queue. This keyword is not supported on the Cisco cBR router.
classifiers *classifier-id*]	(Optional) Displays all classifiers associated with this service flow or optionally display information only for the specified classifier ID (*clid* , 1 to 65535).
counters	(Optional) Displays the real-time counters for the service flow for a specific SFID, to include the number of matches when used with the verbose keyword. This counter remains initialized for upstream service flows. The match count for upstream classifiers is not supported and is replaced with null value - in such cases.
phs	(Optional) Displays packet header suppression rules and packet counters for the service flow for a specific SFID. The PHS packet counters are not supported on the Cisco uBR10-MC5X20 card and always shows 0 or N/A, depending on the software release. This keyword is not supported on the Cisco cBR router.
qos	(Optional) Displays QoS information for the service flow for all service flows or for a specific SFID.
ds	(Optional) Displays QoS information for all the downstream service flows on the interface.
service-class	(Optional) Displays service class names, along with other QoS information, for all the service flows on the interface.
us	(Optional) Displays QoS information for all the upstream service flows on the interface.
verbose	(Optional) Displays detailed information on the service flow for a specific SFID.
zero-hwflow-index	Displays the service flows with zero hardware flow index.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.1(4)CX	This command was introduced.
12.2(4)BC1	The command was changed so that the optional keywords are supported only when displaying information for a specific service flow index.
12.2(8)BC1	The command was changed to remove the ability to display all service flows, and a service flow index must now be specified.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.

Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB	This command was modified to display either the downstream (DS) channel ID or the bonding group (BG) ID of the forwarding interface assigned to the downstream service flow.
12.2(33)SCC	This command was modified to display bonded service flow information.
12.2(33)SCD	This command was modified. The queue keyword was added to display downstream HQF queue information for the interface.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco UBR-MC20X20V, Cisco uBR-MC5X20 and Cisco uBR-MC3GX60V cable interface line cards.
12.2(33)SCF	This command was modified. The service-class keyword was added to display service class names for all the service flows on an interface.
12.2(33)SCG	The command output was modified to display the scheduling type as "N/A" for all downstream service flows.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The following keywords were removed: • **queue** • **phs**

Usage Guidelines

In Cisco IOS Release 12.2(4)BC1 and later, the optional keywords **classifiers**, **counters**, **phs**, **qos**, and **verbose** can be used only when requesting information for a specific service flow ID. When a service flow ID is specified, the **verbose** keyword can be used by itself or by any of the other optional keywords.

Note When using the **counters** keyword with the **verbose** keyword, this command displays the number of matches for the classifier match counter. However, this counter remains initialized for upstream service flows when using the **verbose** keyword. The match count for upstream classifiers is not supported and is replaced with null value - in such cases.

Note Starting with Cisco IOS Release 12.2(33)SCG, the output of the **show interface cable service-flow qos** command displays the scheduling type of all downstream service flows (DS-SF) as "N/A" to indicate that the DS-SFs do not have any scheduling type.

The following two **show** command examples illustrate counter information, with null value for the number of matches for the upstream service flow, when the **show interface cable service-flow** command is used with **verbose** keyword:

```
Router# show interface cable 6/0 service-flow 30191 verbose
```

```
Sfid : 30191
Mac Address : 000a.739e.140a
Type : Secondary(Dynamic)
Direction : Upstream
Current State : Active
Current QoS Indexes [Prov, Adm, Act] : [0, 24, 24]
Active Time : 00:55
Sid : 7140
Admitted QoS Timeout : 200 seconds
Active QoS Timeout : 0 seconds
Packets : 1824
Bytes : 466944
Rate Limit Delayed Grants : 0
Rate Limit Dropped Grants : 0
Current Throughput : 68356 bits/sec, 32 packets/sec
Classifiers:
Classifier Id : 41
Service Flow Id : 30191
CM Mac Address : 000a.739e.140a
Direction : upstream
Activation State : active
Classifier Matching Priority : 128
PHSI : 1
Number of matches : -
IP Classification Parameters:
 IP Source Address : 10.8.230.3
 Source IP Address Mask : 255.255.255.255
 Destination IP Address : 172.16.2.35
 Destination IP Address Mask : 255.255.255.255
 IP Protocol Type : 17
 Source Port Low : 53456
 Source Port High : 53456
 Destination Port Low : 7052
 Destination Port High : 7052
Router# show interface c6/0 service-flow 30191 phs verbose
Sfid : 30191
PHSI : 1
PHSS : 42
PHSV : Off
PHSM : FF FF FF FF FF C0
PHSF : 00 03 E3 31 65 A8 00 0A 73 9E 14 0C 08 00 45 A0 01 18 BE EF
 00 00 40 11 1C 07 0A 08 E6 03 AC 10 02 23 D0 D0 1B 8C 01 04
 00 00
Packet : 1844
```

Examples

This example shows the output of the **show interface cable service-flow** command.

```
Router# show interface c3/0 service-flow

Sfid  Sid   Mac Address     QoS Param Index Type  Dir  Curr  Active  BG / CH
                           Prov  Adm  Act             State Time
12    N/A   0014.0496.3f9e   4     4    4   prim  DS   act   3h17m   CH 1
11    5     0014.0496.3f9e   3     3    3   prim  US   act   3h17m
14    N/A   0014.0496.3f76   4     4    4   prim  DS   act   3h17m   BG 102
13    6     0014.0496.3f76   3     3    3   prim  US   act   3h17m
16    N/A   0007.0e07.24af   4     4    4   prim  DS   act   3h17m   CH 1
15    7     0007.0e07.24af   3     3    3   prim  US   act   3h17m
18    N/A   0007.0e06.e1b5   4     4    4   prim  DS   act   3h17m   CH 3
17    8     0007.0e06.e1b5   3     3    3   prim  US   act   3h17m
```

Per normal operation, the counter in the Number of Matches field is not initialized for working dynamic service flows. For upstream service flows, the classifier match count is not updated for upstream packet classifiers, and displays no results.

```
Router# show interface c6/0 service-flow 30191 verbose
Sfid : 30191
Mac Address : 000a.739e.140a
Type : Secondary(Dynamic)
Direction : Upstream
Current State : Active
Current QoS Indexes [Prov, Adm, Act] : [0, 24, 24]
Active Time : 00:55
Sid : 7140
Admitted QoS Timeout : 200 seconds
Active QoS Timeout : 0 seconds
Packets : 1824
Bytes : 466944
Rate Limit Delayed Grants : 0
Rate Limit Dropped Grants : 0
Current Throughput : 68356 bits/sec, 32 packets/sec
Classifiers:
Classifier Id : 41
Service Flow Id : 30191
CM Mac Address : 000a.739e.140a
Direction : upstream
Activation State : active
Classifier Matching Priority : 128
PHSI : 1
Number of matches : -
IP Classification Parameters:
 IP Source Address : 10.8.230.3
 Source IP Address Mask : 255.255.255.255
 Destination IP Address : 172.16.2.35
 Destination IP Address Mask : 255.255.255.255
 IP Protocol Type : 17
 Source Port Low : 53456
 Source Port High : 53456
 Destination Port Low : 7052
 Destination Port High : 7052
```



Note Per the DOCSIS 1.1 specification, the **show interface cable service-flow** command uses bytes allocated for a UGS service flow when calculating the throughput values for the service flow (see the Assumed Minimum Reserved Rate Packet Size parameter, TLV 11 in the upstream and downstream service flow configurations). Depending on the value of this parameter and the packet sizes of the actual traffic, this could result in throughput values that appear to be greater than the maximum sustained rate. You can use the **stats** option with the **show interface cable** command to display the actual byte counts.

Sample Downstream Flow

```
Router# show interface c4/0 service-flow 12 qos verbose

Sfid                                    : 12
Current State                           : Active
Sid                                     : N/A
```

```
Traffic Priority                        : 0
Maximum Sustained rate                  : 1000000 bits/sec
Maximum Burst                           : 0 bytes
Mimimum Reserved rate                   : 0 bits/sec
Minimum Packet Size                     : 0 bytes
Maximum Latency                         : 0 usecs
Current Throughput                      : 0 bits/sec, 0 packets/sec
```

Sample Upstream Flow

```
Router# show interface c4/0 service-flow 11 qos verbose

Sfid                                    : 11
Current State                           : Active
Sid                                     : 5
Traffic Priority                        : 0
Maximum Sustained rate                  : 64000 bits/sec
Maximum Burst                           : 0 bytes
Mimimum Reserved rate                   : 0 bits/sec
Minimum Packet Size                     : 0 bytes
Maximum Concatenated Burst              : 1522
Scheduling Type                         : Best Effort
Unsolicited Grant Size                  : 0 bytes
Nominal Grant Interval                  : 20000 usecs
Grants per interval                     : 0
Tolerated Grant Jitter                  : 0 usecs
Nominal Polling Interval                : 0 usecs
Tolerated Polling Jitter                : 0 usecs
Request/Transmission policy             : 0x0
IP ToS Overwrite[AND-mask, OR-mask]     : 0x0, 0x0
Current Throughput                      : 0 bits/sec, 0 packets/sec
```

Tip When PacketCable services are enabled to allow PacketCable-based Voice over IP (VoIP) traffic, the Nominal Grant Interval reflects the packetization interval that is configured on the VoIP call agent.

```
Router# show interface c4/0 service-flow counters

Sfid  Packets     Bytes       PacketDrops Bits/Sec    Packets/Sec
12    0           0           0           0           0
11    8           128         0           0           0
14    0           0           0           0           0
13    2           128         0           0           0
16    0           0           0           0           0
15    2           128         0           0           0
18    5           128         0           0           0
17    2           128         0           0           0
Router# show interface c4/0 service-flow 12 counters verbose

Sfid                   : 12
Packets                : 154
Octets                 : 51656
RateLimit Delayed Pkts : 0
RateLimit Dropped Pkts : 0
Bits/sec               : 0
Packets/Sec            : 0
Router# show interface c4/0 service-flow 14 classifiers
```

```
CfrId  SFID     cable modem Mac Address  Direction  State    Priority  Matches
2      14       00d0.bad3.c46b  upstream   active   8         0
1      14       00d0.bad3.c46b  upstream   inactive 5         0
Router# show interface c4/0 service-flow 14 classifiers verbose

Sfid                                : 14
Classifier Id                      : 2
Service Flow Id                    : 14
cable modem Mac Address                      : 00d0.bad3.c46b
Direction                          : upstream
Activation State                   : active
Classifier Matching Priority       : 8
PHSI                               : 0
Number of matches                  : 0
IP Classification Parameters:
        Destination Port Low       : 1024
        Destination Port High      : 65535
Router# show interface cable 3/0 service-flow 9 phs

Sfid  PHSI  PHSS  PHSM                    PHSF                      PHSV  Packet
20    1     22    00 00 FF                08 00 45 00 00 56 00 00  On    N/A
Router# show interface cable 3/0 service-flow 9 phs verbose

Sfid         : 20
PHSI         : 1
PHSS         : 22
PHSV         : On
PHSM         : 00 00 FF
PHSF         : 08 00 45 00 00 56 00 00 00 00 3C 00 67 A7 0B 00 00 01 0C 00
               00 01
Packet       : N/A
Router# show interface c6/0 service-flow 30191 phs verbose
Sfid : 30191
PHSI : 1
PHSS : 42
PHSV : Off
PHSM : FF FF FF FF FF C0
PHSF : 00 03 E3 31 65 A8 00 0A 73 9E 14 0C 08 00 45 A0 01 18 BE EF
 00 00 40 11 1C 07 0A 08 E6 03 AC 10 02 23 D0 D0 1B 8C 01 04
 00 00
Packet : 1844
```

Example of the show interface cable service-flow Command Output in Cisco IOS Release 12.2(33)SCD

The following example shows sample output for the **show interface cable service-flow** command.

```
Router# show interface c3/0 service-flow

Sfid  Sid   Mac Address     QoS  Param Index Type  Dir  Curr  Active  DS-ForwIf/
                           Prov Adm   Act             State Time    US-BG/CH
17    4     001c.ea37.9aac  3    3     3     P     US   act   13h21m  CH 3
18    N/A   001c.ea37.9aac  4    4     4     P     DS   act   13h21m  Wi3/0:0
21    6     001c.ea37.9b5a  3    3     3     P     US   act   13h21m  CH 4
22    N/A   001c.ea37.9b5a  4    4     4     P     DS   act   13h21m  Wi3/0:0
23    7     0016.925e.654c  3    3     3     P     US   act   13h21m  CH 3
24    N/A   0016.925e.654c  4    4     4     P     DS   act   13h21m  In3/0:0
```

Example of the show interface cable service-flow queue Command Output That Shows Downstream HQF Queue Information in Cisco IOS Release 12.2(33)SCD

```
The following example shows a sample output of the show interface cable service-flow queue
 command displaying downstream HQF queue information for an interface:
Router# show interface cable 3/0 service-flow 8 queue

*   idx/gqid   Len/Limit Deqs      Drops    CIR         MIR/PR
                 pkts    pkts      pkts     kbps         kbps
      0/53       0/128   0         0        100       15000/0
 I: Cable Interface Queue
 $: Low Latency Queue
 ~: Low Latency Policing Queue
```

Example of the show interface cable service flow queue verbose Command Output That Shows Detailed Downstream HQF Queue Information in Cisco IOS Release 12.2(33)SCD

```
The following example shows a sample output of the show interface cable service-flow queue
 verbose command displaying detailed downstream HQF queue information for an interface:
Router# show interfaces c3/0 service-flow 8 queue verbose
   blt (0x19FA93C0, index 6, qid 53, fast_if_number 20) layer CLASS_HIER0
   scheduling policy: FIFO (110)
   classification policy: NONE (120)
   drop policy: TAIL (141)
   packet size fixup policy: NONE (0)   no of global policers: 0
   D/Traffic Shaping enabled
   blt flags: 0x22A208C    scheduler: 0x1A015D80
   total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 9500 total
active 1
   D/Traffic Shaping enabled
   txcount 0 txqbytes 0 drops 0 qdrops 0 nobuffers 0 flowdrops 0
   qsize 0 aggregate limit/bytes 128/375000 availbuffers 128
   holdqueue_out 0 perc 0.00 remaining_ratio/perc 20
   visible_bw 100 max_rate 15000 allocated_bw 100 vc_encap 0 ecn_threshold NONE
   weight A 1 quantum A 1500 credit A 1500
   weight B 1 quantum B 1500 credit B 1500
   min-rate tokens: 1500, credit: 0, depth: 1500
   backpressure_policy 0 scheduler_flags C03F
   last_sortq[A/B] 0/0, remaining pak/particles 0/0
   leaf_blt[P1] 0x1A015D80 burst packets/bytes[P1] 0/0
   leaf_blt[P2] 0x1A015D80 burst packets/bytes[P2] 0/0
   leaf_blt[NOTP] 0x1A015D80 burst packets/bytes[NOTP] 0/0

   OUTPUT Shaping
     Bc internal 0 Be internal 0 Time interval 4
     increment 15000 increment_lower 0 increment_limit 15000
     last visit 0 credit 0 outstanding_tokens 0 maxtokens 32000000
     system timer delayed 0 restart timer 0
     timer set 0 hqf_shape_running 562
     nextexpire_system_time 0 nextexpire_time_qindex -1
```

Example of the show interface cable service-flow qos Command

The following is a sample output of the **show interface cable service-flow** qos command:

```
Router# show interfaces cable 6/1/0 service-flow qos
Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughput
          State       Type
```

```
5     DS  act   N/A   BE     0    10000000    3044        0           0
30    DS  act   N/A   BE     0    10000000    3044        0           0
31    US  act   12    BE     0    64000       0           0           0
32    DS  act   N/A   BE     0    1000000     0           0           0
33    US  act   13    BE     0    0           3044        0           0
35    US  act   14    BE     0    0           3044        0           0
34    DS  act   N/A   BE     0    0           3044        0           0
36    DS  act   N/A   BE     0    0           3044        0           0
37    US  act   15    BE     0    0           3044        0           0
45    US  act   19    BE     0    0           3044        0           0
38    DS  act   N/A   BE     0    0           3044        0           0
46    DS  act   N/A   BE     0    0           3044        0           0
39    US  act   16    BE     0    0           3044        0           0
47    US  act   20    BE     0    0           3044        0           0
40    DS  act   N/A   BE     0    0           3044        0           0
48    DS  act   N/A   BE     0    0           3044        0           0
41    US  act   17    BE     0    0           3044        0           0
43    US  act   18    BE     0    0           3044        0           0
42    DS  act   N/A   BE     0    0           3044        0           0
44    DS  act   N/A   BE     0    0           3044        0           0
```

Example of the show interface cable service-flow qos us Command Output

The following is a sample output for the us option of the **show interface cable service-flow** qos command:

```
Router# show interfaces cable 6/1/0 service-flow qos us
Sfid  Dir Curr   Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughput
          State       Type
31    US  act   12    BE     0    64000       0           0           0
33    US  act   13    BE     0    0           3044        0           0
35    US  act   14    BE     0    0           3044        0           0
37    US  act   15    BE     0    0           3044        0           0
45    US  act   19    BE     0    0           3044        0           0
39    US  act   16    BE     0    0           3044        0           0
47    US  act   20    BE     0    0           3044        0           0
41    US  act   17    BE     0    0           3044        0           0
43    US  act   18    BE     0    0           3044        0           0
```

Example of the show interface cable service-flow qos service-class Command in Cisco IOS Release 12.2(33)SCF

The following is a sample output for the service-class option of the **show interface cable service-flow** qos command:

```
Router# show interfaces cable 6/1/0 service-flow qos service-class
Sfid  Dir Sched  MaxSusRate  MaxBrst     MinRsvRate  SrvClassName
          Type
5     DS  BE     10000000    3044        0           def_sclass
30    DS  BE     10000000    3044        0           def_sclass
31    US  BE     64000       0           0
32    DS  BE     1000000     0           0
33    US  BE     0           3044        0           us_srvclass_ts1
35    US  BE     0           3044        0           us_srvclass_ts2
34    DS  BE     0           3044        0           ds_srvclass_ts1
36    DS  BE     0           3044        0           ds_srvclass_ts2
37    US  BE     0           3044        0           us_srvclass_ts1
45    US  BE     0           3044        0           us_srvclass_ts2
```

```
38     DS  BE      0           3044        0          ds_srvclass_ts1
46     DS  BE      0           3044        0          ds_srvclass_ts2
39     US  BE      0           3044        0          us_srvclass_ts1
47     US  BE      0           3044        0          us_srvclass_ts2
40     DS  BE      0           3044        0          ds_srvclass_ts1
48     DS  BE      0           3044        0          ds_srvclass_ts2
41     US  BE      0           3044        0          us_srvclass_ts1
43     US  BE      0           3044        0          us_srvclass_ts2
42     DS  BE      0           3044        0          ds_srvclass_ts1
44     DS  BE      0           3044        0          ds_srvclass_ts2
```

Table 231: show interface cable service-flow Field Descriptions

Field	Description
Sfid	Service flow identification number. **Note** Primary service flow IDs are displayed even for offline CMs because they are needed for modem re-registration.
Sid	Service identification number (upstream service flows only).
Mac Address	MAC address of the CM.
QoS Parameter Index Prov	QoS parameter index for the Provisioned state of this flow.
QoS Parameter Index Adm	QoS parameter index for the Admitted state of this flow.
QoS Parameter Index Act	QoS parameter index for the Active state of this flow.
Type	Indicates if the service flow is the primary flow or a secondary service flow. Secondary service flows are also identified by an “S” (created statically at the time of registration, using the DOCSIS configuration file) or “D” (created dynamically by the exchange of dynamic service messages between the CM and CMTS).
Dir	Downstream (DS) or upstream (US) service flow.
Curr State	Current run-time state of the service flow.
Active Time	Length of time this service flow has been active.
BG/CH	BGID or the DS channel ID of the forwarding interface assigned to the downstream service flow.
Len/Limit Pkts	Length or limit of the packets.
Deqs Pkts	Dequeue packets
Drops Pkts	Dropped packets.
CIR Kbps	Committed information rate.
MIR/PR Kbps	Maximum information and peak rate.
Forwint	Forwarding interface.

Field	Description
SFID	Service flow identifier.
Sched Type	Identifies scheduling type of this service flow: • BE—Best-Effort • N/A—Scheduling type is not applicable to a service-flow. • NRTPS—Non-Real-Time Polling Service • RTPS—Real-Time Polling Service • RSVD—Reserved but not yet in use • UGS_AD—Unsolicited Grant Service with Activity Detection • UGS—Unsolicited Grant Service • UNDEF—Not yet defined.
Prio	Traffic priority (0 to 7) given to this service flow.
MaxSusRate	Maximum sustained rate value, in bits per second.
MaxBrst	Maximum burst value, in bytes.
MinRsvRate	Minimum reserved rate, in bits per second.
Throughput	Current throughput for this service flow, in packets per second.
SrvClassName	Service class name associated with the service flow.

Note The PHS packet counters are not supported on the Cisco uBR10-MC5X20 card and always shows 0 or N/A, depending on the software release.

```
The following example shows upstream bonding information on a cable interface line card in
 Cisco IOS Release 12.2(33)SCC:
Routeru# show interface cable 5/0/1 service-flow 3070 verbose

Sfid                                  : 3070
Mac Address                           : 001a.c3ff.d59c
Type                                  : Secondary(Static)
Direction                             : Upstream
Current State                         : Active
Current QoS Indexes [Prov, Adm, Act]  : [6, 6, 6]
Active Time                           : 07:48
Required Attributes                   : 0x00000000
Forbidden Attributes                  : 0x00000000
Aggregate Attributes                  : 0x00000000
Sid                                   : 720
Traffic Priority                      : 0
Maximum Sustained rate                : 1000000 bits/sec
Maximum Burst                         : 1522 bytes
Minimum Reserved Rate                 : 0 bits/sec
Minimum Packet Size                   : 0 bytes
Admitted QoS Timeout                  : 200 seconds
Active QoS Timeout                    : 0 seconds
Packets                               : 58381
Bytes                                 : 29891072
```

```
Rate Limit Delayed Grants               : 63
Rate Limit Dropped Grants               : 29058
Current Throughput                      : 1108314 bits/sec, 270 packets/sec
Application Priority                    : 0
US Bonded                               : YES
Upstream Bonding Group                  : UBG-1
Transmit Channel Set                    : 0xF
Sid Cluster                             : SC-0, Sid [ 720 720 720 720 ]
Segments Valid                          : 24201
Segments Discarded                      : 0
Segments Lost                           : 0
SID Cluster Switching Information
Total Bytes Requested                   : 0
Total Time                              : 0
Outstanding Bytes                       : 0
Max Requests                            : 1
Classifiers:
Classifier Id                       : 1
Service Flow Id                     : 3070
CM Mac Address                      : 001a.c3ff.d59c
Direction                           : upstream
Activation State                    : active
Classifier Matching Priority        : 1
PHSI                                : 0
Number of matches                   : 58381
IP Classification Parameters:
        Destination IP Address      : 192.168.24.0
        Destination IP Address Mask : 255.255.255.0 Chicago10k#
```

The following example shows the output of the show interface cable service-flow counters command displaying the service flow counters on the cable interface at slot/subslot/port 7/1/0:

```
Router# show interface cable 7/1/0 service-flow 7 counters
Sfid  Packets              Bytes                PacketDrop Bits/Sec   Packet/Sec
7     16                   8384                 0          0          0
```

Table 232: show interface cable service-flow phs Field Descriptions

Field	Description
Sfid	Service flow identification number. **Note** Primary service flow IDs are displayed even for offline CMs because they are needed for modem re-registration.
PHSI	PHS Index. Number that uniquely references the PHS rule.
PHSS	PHS Size. 8-bit value specifying the number of header bytes to be suppressed.
PHSV	PHS Verify. Indicates whether PHS verification is enabled.
PHSM	PHS Mask. 5-bit PHS mask that defines the header bytes that should be suppressed.
PHSF	PHS Field. 8-bit values that defines the header bytes that should be suppressed.

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show interface cable service-flow** command.

```
Router#show interface cable 3/0/0 service-flow

Sfid  Sid   Mac Address     QoS Param Index Type  Dir Curr   Active  DS-ForwIf/
                           Prov  Adm  Act            State  Time    US-BG/CH
15    1     0025.2e2d.75be   3     3    3   P     US  act    1h34m   CH 1
16    N/A   0025.2e2d.75be   4     4    4   P     DS  act    1h34m   In3/0/0:32
35    N/A   0025.2e2d.75be   5     5    5   S(s)  DS  act    1h34m   In3/0/0:32
17    2     0025.2eaf.7f38   3     3    3   P     US  act    1d1h7m  CH 2
18    N/A   0025.2eaf.7f38   4     4    4   P     DS  act    1d1h7m  In3/0/0:33
19    N/A   0025.2eaf.7f38   5     5    5   S(s)  DS  act    1d1h7m  In3/0/0:33
21    3     0025.2eaf.82f4   3     3    3   P     US  act    1d1h7m  CH 2
22    N/A   0025.2eaf.82f4   4     4    4   P     DS  act    1d1h7m  In3/0/0:40
27    N/A   0025.2eaf.82f4   5     5    5   S(s)  DS  act    1d1h7m  In3/0/0:40
23    4     0025.2eaf.8302   3     3    3   P     US  act    1d1h7m  CH 1
24    N/A   0025.2eaf.8302   4     4    4   P     DS  act    1d1h7m  In3/0/0:33
29    N/A   0025.2eaf.8302   5     5    5   S(s)  DS  act    1d1h7m  In3/0/0:33
25    5     0025.2e2d.74f8   3     3    3   P     US  act    10:54   CH 2
26    N/A   0025.2e2d.74f8   4     4    4   P     DS  act    10:54   In3/0/0:32
36    N/A   0025.2e2d.74f8   5     5    5   S(s)  DS  act    10:54   In3/0/0:32
```

This example shows the output of the **show interface cable service-flow** command with the **zero-hwflow-index** keyword:

```
Router#show interface cable 3/0/0 service-flow zero-hwflow-index

Sfid  Sid   Mac Address     QoS Param Index Type  Dir Curr   Active  DS-ForwIf/
                           Prov  Adm  Act            State  Time    US-BG/CH
```

This example shows the output of the **show interface cable service-flow qos** command with the **ds** keyword:

```
Router#show interface cable 3/0/0 service-flow qos ds

Sfid  Dir Curr  Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughput
          State       Type
16    DS  act   N/A   N/A    2    2000000     3044        0           0
35    DS  act   N/A   N/A    3    3000000     3044        0           0
18    DS  act   N/A   N/A    2    2000000     3044        0           62
19    DS  act   N/A   N/A    3    3000000     3044        0           0
22    DS  act   N/A   N/A    2    2000000     3044        0           0
27    DS  act   N/A   N/A    3    3000000     3044        0           0
24    DS  act   N/A   N/A    2    2000000     3044        0           0
29    DS  act   N/A   N/A    3    3000000     3044        0           0
26    DS  act   N/A   N/A    2    2000000     3044        0           0
36    DS  act   N/A   N/A    3    3000000     3044        0           0
```

This example shows the output of the **show interface cable service-flow qos** command with the **us** keyword:

```
Router#show interface cable 3/0/0 service-flow qos us
```

```
Sfid  Dir Curr   Sid   Sched  Prio MaxSusRate  MaxBrst     MinRsvRate  Throughput
          State       Type
15    US  act    1     BE     1    1000000     1566        0           0
17    US  act    2     BE     1    1000000     1566        0           65
21    US  act    3     BE     1    1000000     1566        0           261
23    US  act    4     BE     1    1000000     1566        0           0
25    US  act    5     BE     1    1000000     1566        0           0
```

This example shows the output of the **show interface cable service-flow qos** command with the **service-class** keyword:

```
Router#show interface cable 1/0/0 service-flow qos service-class

Sfid  Dir Sched  MaxSusRate  MaxBrst     MinRsvRate  SrvClassName
          Type
15    US  BE     1000000     1566        0
16    DS  N/A    2000000     3044        0
35    DS  N/A    3000000     3044        0
17    US  BE     1000000     1566        0
18    DS  N/A    2000000     3044        0
19    DS  N/A    3000000     3044        0
21    US  BE     1000000     1566        0
22    DS  N/A    2000000     3044        0
27    DS  N/A    3000000     3044        0
23    US  BE     1000000     1566        0
24    DS  N/A    2000000     3044        0
29    DS  N/A    3000000     3044        0
25    US  BE     1000000     1566        0
26    DS  N/A    2000000     3044        0
36    DS  N/A    3000000     3044        0
```

Related Commands

Command	Description
cable service class	Sets the parameters for DOCSIS 1.1 cable service class.
cable service flow inactivity-threshold	Sets the inactivity threshold value for service flows using Unsolicited Grant Service with Activity Detection (UGS-AD).
cable service-flow inactivity-timeout	Sets the amount of time a dynamic service-flow can be present in the system without any activity.
show cable qos permission	Displays the status of permissions for changing QoS tables.
show cable qos profile	Displays the QoS profiles that have been defined.

show interface cable sid

To display the service identifier (SID) information for a cable modem (CM), use the **show interface cable sid** command in privileged EXEC mode.

show interface cable {*slot/portslot/subslot/port*}**sid id**[**association** | **connectivity** | **counters** | **qos** | **secondary-ip** | **rate-adapt**][**verbose**]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot/cable-interface-index slot/subslot/cable-interface-index* }**sid id**[**association** | **connectivity** | **counters** | **qos** | **secondary-ip** | **rate-adapt**][**verbose**]

Cisco cBR Series Converged Broadband Router
show interface cable *slot/subslot/cable-interface-index* **sid** *sid*[**association** | **counters** | **qos**][**verbose**]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 15.
sid	The service identification information number. The valid range is 1-8176.
association	Displays the virtual interfaces (VRF) or Interface Descriptor Blocks (IDBs).

connectivity	Displays the values of the per-SID connectivity statistics. (This option appears only in DOCSIS 1.0 and 1.0+ releases. Use the **show cable modem connectivity** command in DOCSIS 1.1 releases.) This keyword is not supported on the Cisco cBR router.
counters	Displays the values of the per-SID usage counters. Same as the keyword **stats** that appeared in Cisco IOS Release 11.3(5)NA and earlier releases.
qos	Displays the QoS characteristics received by each SID.
secondary-ip	Displays the secondary IP addresses associated with each SID. This keyword is not supported on the Cisco cBR router.
rate-adapt	(Cisco uBR7200 series and Cisco uBR10012 routers only) Displays the local or global upstream utilization optimization configuration parameters. This keyword is not supported on the Cisco cBR router.
verbose	Displays detailed information for the **counters** and **qos** options. **Note** The **verbose** option is supported by itself or with any of the other options, but it displays additional information only for the **counters** and **qos** options.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 XA	This command was introduced.
11.3(6)NA	The keyword **stats** was changed to **counters**.
12.0(4)XI	The primary SID information was added.
12.0(5)T	The command output was modified to identify secondary SIDs.
12.0(7)XR and 12.0(7)T	The **verbose** keyword was added to display additional information for the **counters** option.
12.1(4)CX, 12.2(1)XF, and 12.2(4)BC1	The **qos** keyword was added to display information on the QoS values received by the SID from the MAC scheduler. You an also use the **verbose** option with the **qos** keyword to display detailed information. Also, the **connectivity** option was removed and replaced by the **show cable modem connectivity** command.
12.1(11b)EC, 12.2(8)BC1	The **association** keyword was added.
12.2(8)BC2	An explicit error message was added if this command is used with a cable subinterface, instructing the user to use the main interface instead.
12.1(13)EC	The **secondary-ip** keyword was added for the Cisco uBR7100 series and Cisco uBR7200 series universal broadband routers.

Release	Modification
12.2(11)BC1	Support for the **secondary-ip** keyword was added for the Cisco uBR10012 universal broadband router.
12.2(11)CY, 12.2(11)BC3	Three codeword fields were added to the **verbose** counters display to support the Cisco uBR10-MC5X20S cable interface line card. These fields always display zero for the other cable interface line cards.
12.2(11)BC3	The **counters** option now displays the following counters: • Concatenated headers received • Fragmentation headers received • Fragmentation headers discarded **Note** The Cisco uBR10-MC5X20S cable interface line card does not currently support these particular counters.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA, with the following changes: • Support for the Cisco uBR7225VXR router was added. • The "Dual IP" output field was added to indicate support of both IPv4 and IPv6 addressing.
12.3(23)BC2	This command was modified to add two rate-adapt output fields to the **counters verbose** form of the command.
12.2(33)SCB	The two rate-adapt output fields in the **counters verbose** form of the command were integrated into Cisco IOS Release 12.2(33)SCB.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The following keywords were removed: • **connectivity** • **secondary-ip** • **rate-adapt**

Usage Guidelines

Data transport over the radio frequency (RF) link uses the registered SID address rather than the Ethernet address. This allows multiple hosts to access the network via a single CM.

The **verbose** keyword can be used with any of the other options or by itself, but it displays additional information only when used with the **counters**, **qos**, and **rate-adapt** options.

Note You can specify only a main interface with this command, not a subinterface.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

This section shows the output from the different forms of the **show interface cable sid** command.

This example shows the the error message that is displayed when you attempt to use this command on a subinterface:

```
Router# show interface cable 6/0.1 sid
Command not allowed on sub-interface
Please use main interface C6/0
```

show interface cable sid Examples

```
Router# show interface cable 4/0 sid

Sid  Prim  MAC Address    IP Address        Type Age      Admin   Sched  Sfid
                                                          State   Type
5          0010.7b6b.58c1 10.20.114.34      stat 2d1h36m  enable  BE     1
6          0010.7bed.9dc9 10.20.114.37      stat 2d1h36m  enable  BE     13
7          0010.7bed.9dbb 10.20.114.38      stat 2d1h36m  enable  BE     15
8          0010.7b6b.58bb 10.20.114.112     stat 2d1h34m  enable  BE     17
9          0010.7b6b.58bb 10.20.114.112     dyna 2d1h34m  enable  BE     19
```

This example shows the output from the **show interface cable modem** command in Cisco IOS Release 12.2(33)SCA for all SIDs on a particular cable interface on a Cisco uBR10012 router. None of the CMs or CPEs are supporting both IPv4 and IPv6 addressing, which is indicated by the "N" in the Dual IP output field.:

```
Router# show interface cable 8/0/0 sid
Sid  Prim  MAC Address    IP Address      Type Age      Admin   Sched  Sfid  Dual
                                                       State   Type         IP
1          0008.0da6.1c47 50.3.134.12     stat 41:58    enable  BE     3     N
2          0008.0da5.6e48 50.3.134.2      stat 41:58    enable  BE     5     N
3          0008.0da6.0447 50.3.134.13     stat 41:55    enable  BE     7     N
4          0008.0da6.3447 50.3.134.3      stat 41:56    enable  BE     9     N
5          0011.8065.e78e 50.3.134.38     stat 40:52    enable  BE     11    N
6          0000.cab7.8620 50.3.134.8      stat 41:25    enable  BE     13    N
7          0011.8065.e7a6 50.3.134.10     stat 40:52    enable  BE     15    N
8          0006.53b6.57f5 50.3.134.9      stat 41:34    enable  BE     17    N
9          0006.53b6.581d 50.3.134.27     stat 41:08    enable  BE     19    N
10         0007.0e04.ebfd 50.3.134.5      stat 41:04    enable  BE     21    N
```

Table 233: show interface cable sid Field Descriptions

Field	Description
Sid	Service identification number.
Prim	The primary service identifier (SID) assigned to the modem.
MAC address	MAC address of the modem owning this SID.

Field	Description
IP address	IP address of the modem owning this SID.
Type	Indicates whether this SID was created statically (“stat”) at the time of registration, or dynamically (“dyna”) by the exchange of dynamic service messages between the CM and CMTS.
Age	Length of time that the SID has been enabled.
Admin State	Adminstrative state of the SID, where “Disable” means that the SID has been turned off. “Enable” is the normal state.
Sched Type	The service class schedule type, where: 2–Best-Effort Schedule Type 3–Non-Real-Time Polling Service Schedule Type 4–Real-Time Polling Service Schedule Type 5–Unsolicited Grant Service with Activity Detection Schedule Type 6–Unsolicited Grant Service Schedule Type
Sfid	Service flow identifier.
Dual IP	Identifies whether or not (“Y” or “N”) the CM or CPE supports both IPv4 and IPv6 addressing.

show interface cable sid qos Examples

```
Router# show interface cable 4/0 sid qos

Sid  Pr MaxSusRate MinRsvRate Sched  Grant Grant  GPI Poll   Thrput
                              Type   Size  Intvl      Intvl
5    0  64000      0          BE     0     0      0   0      0
6    0  64000      0          BE     0     0      0   0      0
7    0  64000      0          BE     0     0      0   0      0
8    0  64000      0          BE     0     0      0   0      0
Router# show interface cable 4/0 sid 5 qos

Sid  Pr MaxSusRate MinRsvRate Sched  Grant Grant  GPI Poll   Thrput
                              Type   Size  Intvl      Intvl
5    0  64000      0          BE     0     0      0   0      0
```

show interface cable sid qos verbose Examples

```
Router# show interface cable 4/0 sid 5 qos verbose

Sid                                  : 5
Traffic Priority                     : 0
Maximum Sustained Rate               : 64000
Maximum Burst                        : 0
Minimum Reserved Rate                : 0
Minimum Packet Size                  : 0
Maximum Concatenated Burst           : 1522
Scheduling Type                      : Best Effort
Nominal Grant Interval               : 0
Tolerated Grant Jitter               : 0
Nominal Polling Interval             : 0
```

```
Tolerated Polling Jitter                : 0
Unsolicited Grant Size                  : 0
Grants per Interval                     : 0
Request/Transmission Policy             : 0x0
IP ToS Overwrite [AND-mask, OR-mask]    : 0x0, 0x0
Current Throughput                      : 0 bits/sec, 0 packets/sec
```

show interface cable sid counter Examples

When using DOCSIS 1.1 software, such as Cisco IOS Release 12.2 BC, the **show interface sid counter** command provides the following display:

```
Router# show interface cable 5/0 sid counter

Sid  Req-polls  BW-reqs    Grants     Packets    Frag       Concatpkts
     issued     received   issued     received   complete   received
1    0          22         22         22         0          0
2    0          3          3          2          0          0
3    0          0          0          0          0          0
```

When using DOCSIS 1.0 software, such as Cisco IOS Release 12.1 EC, the **show interface sid counter** command provides the following display:

```
Router# show interface cable 5/0 sid counter

Sid   Inpackets  Inoctets   Outpackets Outoctets  Ratelimit  Ratelimit
                                                  BWReqDrop  DSPktDrop
6     51         6559       42         3580       0          0
7     47         5993       40         3428       0          0
8     47         6136       36         3122       0          0
9     0          0          0          0          0          0
```

show interface cable sid counter verbose Examples

This example shows the typical verbose output for the SID counters on a Cisco uBR-MCxxC cable interface line card:

```
Router# show interface cable 4/0 sid 3 counter verbose

Sid                           : 3
Request polls issued          : 0
BW requests received          : 1
No grant buf BW request drops  : 0
Rate exceeded BW request drops : 0
Grants issued                 : 1
Packets received              : 0
Bytes received                : 0
Fragment reassembly completed  : 0
Fragment reassembly incomplete : 0
Concatenated packets received  : 0
Queue-indicator bit statistics : 0 set, 0 granted
Good Codewords rx             : 0
Corrected Codewords rx        : 0
Uncorrectable Codewords rx    : 0
Concatenated headers received  : 0
Fragmentation headers received : 0
Fragmentation headers discarded: 0
```

This example shows the typical verbose output for the SID counters on the Cisco uBR10-MC5X20S cable interface line card:

```
Router# show interface cable 4/0 sid 3 counters verbose

Sid                             : 1
Request polls issued            : 0
BWReqs {Cont,Pigg,RPoll,Other} : 0, 1052, 1052, 0
No grant buf BW request drops  : 0
Rate exceeded BW request drops : 0
Grants issued                   : 1052
Packets received                : 0
Bytes received                  : 0
Fragment reassembly completed  : N/A
Fragment reassembly incomplete : N/A
Concatenated packets received  : N/A
Queue-indicator bit statistics : 0 set, 0 granted
Good Codewords rx               : 53
Corrected Codewords rx          : 6110
Uncorrectable Codewords rx      : 8540896
Concatenated headers received  : 235
Fragmentation headers received : 0
Fragmentation headers discarded: 0
```

Note Because the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR10-MC5X20S/U/H cable interface line cards do not support the fragmentation and concatenation packet counters, these counters always show zero for these particular cable interfaces. However, these interfaces do accurately count the number of concatenation headers, as shown above.

show interface cable sid association Example

This example shows the typical output for the **association** keyword:

```
Router# show interface cable 5/0 sid association

Sid  Prim Online     IP Address      MAC Address    Interface     VRF Name
1          online     192.168.129.20  0003.e38f.e993 Ca5/0.50      green
2          online     192.168.129.17  0003.e38f.e89d Ca5/0.50      green
3          init(t)    192.168.129.12  00d0.baa2.fb93 Ca5/0.50      green
```

Note The output of the **show interface cable sid association** command output will not display the updated interface name immediately after deleting a VRF. This is because the SID is not re-mapped automatically to the interface on which the CM comes online. If you want to view the updated interface name, reset the cable modem to re-map the interface name and then execute this show command.

This example shows the sample output for the **secondary-ip** keyword:

```
Router# show interface cable 5/0 sid secondary-ip

For sid 1 secondary ip list contains 2 address(es)
```

```
        192.168.129.20
        192.168.81.123
For sid 2 secondary ip list contains 2 address(es)
        192.168.129.17
        10.10.11.3
```



Tip One possible situation that might occur is if a CM first assigns a secondary IP address to one CPE device, but later that same IP address is assigned to another CPE device behind a different CM. If this happens, the IP address will continue to show up as a secondary IP address for the original CM until that CM renews its public keys. This will not affect network connectivity for either CPE or CM. You can, however, clear the unneeded secondary IP address from the CMTS database using the **clear cable secondary-ip** command.

Table 234: show interface cable sid Field Descriptions

Field	Description
Sid	Service identification number.
Prim Sid	The primary service identifier (SID) assigned to the modem.
Type	Indicates that this SID was created statically at the time of registration or dynamically by the exchange of dynamic service messages between the CM and CMTS.
Online State Offline State	“Online” means that the modem owning this SID is processing traffic. “Offline” means that the modem owning this SID is not processing traffic.
Admin Status	“Disable” means that the SID has been turned off. “Enable” is the normal state.
QoS	Quality of service.
Create time	When the SID was created, number of seconds since the system booted.
Input octets (In octets)	Number of octets received by using this SID.
Input packets (In packets)	Number of packets received by using this SID.
Output octets (Out octets)	Number of octets sent from this SID.
Output packets (Out packets)	Number of packets sent from this SID.
IP address	IP address of the modem owning this SID.
MAC address	MAC address of the modem owning this SID.
BW requests received	Number of bandwidth requests received by this SID.
Grants issued	Number of bandwidth requests granted by this SID.
Rate exceeded BW request drops	Number of bandwidth requests not granted by this SID.
Rate exceeded DS packet drops	Number of downstream packets lost by this SID.

Field	Description
Ratelimit BWReqDrop	Number of bandwidth requests not granted by this SID.
Ratelimit DSPktDrop	Number of downstream packets lost by this SID.
1st time online	Time at which the modem with this SID connected.
Times online	Number of times the modem with this SID connected.
% online	Percentage of time the modem with this SID has been connected.
Online time	The minimum, average, and maximum number of hours and minutes the modem with this SID has been connected. **Note** A CM is considered online when it has completed the registration process and has communicated with the DHCP, TFTP, and TOD servers.
Offline time	The minimum, average, and maximum number of hours and minutes the modem with this SID has been disconnected. **Note** A CM is considered offline after it has missed 16 consecutive station maintenance messages.
MaxSusRate	The maximum rate (0 to 4,294,967,295 bps).
MinRsvRate	The minimum guaranteed rate (0 to 4,294,967,295 bps).
Sched Type	The service class schedule type: 2–Best-Effort Schedule Type 3–Non-Real-Time Polling Service Schedule Type 4–Real-Time Polling Service Schedule Type 5–Unsolicited Grant Service with Activity Detection Schedule Type 6–Unsolicited Grant Service Schedule Type
Grant Size	The grant size (0 to 65535 bytes).
Grant Interval	The grant interval (0 to 4294967295 microseconds).
GPI	The grants per interval (0 to 127 grants).
Poll Interval	The poll interval (0 to 4294967295 microseconds).
Throughput	The overall throughput for this SID.
VRF Name	Name of the virtual interface that has been configured for Multiprotocol Label Switching (MPLS) Virtual Private Network (VPN) operation.
Fragment reassembly completed	Number of packets that were subject to DOCSIS fragmentation that were successfully reassembled. **Note** This counter is not supported on the Cisco uBR10-MC5X20 card and always shows 0 or N/A, depending on the software release.

Field	Description
Fragment reassembly incomplete	Number of packets that were subject to DOCSIS fragmentation that have not yet been successfully reassembled. **Note** This counter is not supported on the Cisco uBR10-MC5X20 card and always shows 0 or N/A, depending on the software release.
Concatenated packets received	Number of packets that were subject to DOCSIS concatenation that were successfully received. **Note** This counter is not supported on the Cisco uBR10-MC5X20 card and always shows 0 or N/A, depending on the software release.
Good Codewords rx	Number of FEC codewords received without error.
Corrected Codewords rx	Number of FEC codewords received with errors that could be corrected.
Uncorrectable Codewords rx	Number of FEC codewords received with errors that could not be corrected.
Concatenated packets received	Number of concatenation headers received on an upstream service flow. (This field always shows 0 for the Cisco uBR10012 router, but you can use the docsQosUpstreamConcatBursts attribute in DOCS-QOS-MIB to get a current count.)
Fragmentation headers received	Number of fragmentation headers received on an upstream service flow, regardless of whether the fragment was correctly reassembled into a valid packet. (See docsQosUpstreamFragments in DOCS-QOS-MIB.)
Fragmentation headers discarded	Number of upstream fragments discarded and not assembled into a valid upstream packet. (See docsQosUpstreamFragDiscards in DOCS-QOS-MIB.)

Examples for the Cisco cBR Series Converged Broadband Router

This example shows the output of the **show interface cable sid** command on the Cisco cBR router:

```
Router#show interface cable 1/0/0 sid
Sid  Prim  MAC Address    IP Address      Type Age      Admin   Sched  Sfid Dual
                                                       State   Type        IP
1          0025.2e2d.74f8 10.1.2.110      BE   8h55m    enable  BE     15    Y
2          0025.2eaf.7f38 10.1.2.7        BE   20h26m   enable  BE     17    Y
3          0025.2eaf.8302 10.1.2.6        BE   20h26m   enable  BE     19    Y
4          0025.2eaf.82f4 10.1.2.9        BE   20h18m   enable  BE     25    Y
5          0025.2e2d.75be 10.1.2.4        BE   10h13m   enable  BE     29    Y

Router#
```

This example shows the output of the **show interface cable sid** command with the **association** on the Cisco cBR router:

```
Router#show interface cable 1/0/0 sid association
Sid  Prim Online        IP Address      MAC Address    Interface        VRF Name       MPLS
 TC
1         online        10.1.2.4        0025.2e2d.75be Bu1                             N/A
2         online        10.1.2.110      0025.2e2d.74f8 Bu1                             N/A
3         online        10.1.2.7        0025.2eaf.7f38 Bu1                             N/A
4         online        10.1.2.6        0025.2eaf.8302 Bu1                             N/A
5         online        10.1.2.9        0025.2eaf.82f4 Bu1                             N/A

Router#
```

This example shows the output of the **show interface cable sid** command with the **counters** on the Cisco cBR router:

```
Router#show interface cable 1/0/0 sid counters
Sid  Req-polls  BW-reqs    Grants     Packets        Frag       Concatpkts
     issued     received   issued     received       complete   received
1    0          18         18         29             0          1
2    0          14         14         26             0          1
3    0          103        103        125            0          11
4    0          23         23         37             0          1
5    0          25         25         39             0          0

Router#
```

This example shows the output of the **show interface cable sid** command with the **qos** on the Cisco cBR router:

```
Router#show interface cable 1/0/0 sid qos
Sid  Pr MaxSusRate MinRsvRate Sched  Grant Grant  GPI Poll   Thrput
                              Type   Size  Intvl      Intvl
1    1  1000000    0          BE     N/A   N/A    N/A N/A    0
2    1  1000000    0          BE     N/A   N/A    N/A N/A    0
3    1  1000000    0          BE     N/A   N/A    N/A N/A    0
4    1  1000000    0          BE     N/A   N/A    N/A N/A    0
5    1  1000000    0          BE     N/A   N/A    N/A N/A    261

Router#
```

This example shows the output of the **show interface cable sid** command with the **verbose** on the Cisco cBR router:

```
Router#show interface cable 1/0/0 sid verbose
Sid  Prim  MAC Address    IP Address      Type Age      Admin   Sched  Sfid Dual
                                                       State   Type        IP
1          0025.2e2d.75be 100.1.2.4       BE   12:36    enable  BE     15    Y
2          0025.2e2d.74f8 100.1.2.110     BE   12:11    enable  BE     17    Y
3          0025.2eaf.7f38 100.1.2.7       BE   11:26    enable  BE     19    Y
4          0025.2eaf.8302 100.1.2.6       BE   13:20    enable  BE     21    Y
5          0025.2eaf.82f4 100.1.2.9       BE   11:33    enable  BE     28    Y

Router#
```

Related Commands

Command	Description
clear cable secondary-ip	Clears the router's table that links secondary IP addresses to the devices that use them.
show cable modem connectivity	Displays connectivity statistics for one or more CMs.
show interface cable signal-quality	Displays information about the cable signal quality.

show interface cable signal-quality

To display information about the signal quality of a downstream port on a cable interface line card in a Cisco CMTS, use the **show interface cable signal-quality** command in privileged EXEC mode.

show interface cable {*slot* */port* | *slot* */subslot* */port*} **signal-quality** [*n*]

Cisco IOS Release 12.2(33)SCE and later
show interface cable {*slot* */cable-interface-index* | *slot* */subslot* */cable-interface-index*} **signal-quality** [*n*]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 only —The valid subslots are 0 or 1.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14.
n	(Optional) Identifies a particular upstream on the selected interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
11.3 XA	This command was introduced.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.

Release	Modification
IOS-XE 3.15.0S	This command is not supported on Cisco cBR Series Converged Broadband Router.

Examples

This example shows the output from the **show interface cable signal-quality** command:

```
Router# show interface cable 6/0 signal-quality
Cable6/0: Upstream 0 is up includes contention intervals: TRUE
```

This table describes the fields shown in the **show interface cable signal-quality** display.

Table 235: show interface cable signal-quality Field Descriptions

Field	Description
Cable	Interface name.
Upstream is up includes contention intervals	States whether this statement is true.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Related Commands

Command	Description
show interface cable downstream	Displays cable interface information.
show interface cable sid	Displays information by SID of each cable access router on the network.

show interface cable upstream

To display information about an upstream on a cable interface, use the **show interface cable upstream** command in privileged EXEC mode.

show interface cable {*slot/port slot/subslot/port*}**upstream** [*n*][**ugs statistics** | **rate-adapt**]
show interface cable {*slot/port slot/subslot/port*}**upstream** [**bonding-group**]

Cisco IOS Release 12.2(33)SCE and later releases
show interface cable {*slot/cable-interface-indexslot/subslot/cable-interface-index*}**upstream** [*n*][**ugs statistics** | **rate-adapt**]
show interface cable {*slot/cable-interface-indexslot/subslot/cable-interface-index*}**upstream** [**bonding-group**]

Cisco cBR Series Converged Broadband Router
show interface cable *slot/subslot/cable-interface-index***upstream** [*n*][**ugs statistics**]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. • Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. • Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. • Cisco cBR router—The valid range is 0 to 15.
n	(Optional) Specific upstream to be displayed. Valid values start with 0 for the first upstream port on the cable interface line card.
ugs statistics	(Optional) Displays statistics related to Unsolicited Grant Service (UGS) flows on the upstream.

rate-adapt	(Optional) Displays whether a specific upstream is enabled or disabled for upstream utilization optimization. This keyword is not supported on the Cisco cBR router
bonding-group	(Optional) Displays the bonding groups configured on an upstream port. This keyword is not supported on the Cisco cBR router
index	(Optional) Bonding group index value. Valid values are from 1 to 65535. This variable is not supported on the Cisco cBR router

Command Default

If no upstream is specified, all upstreams on the given cable interface are shown.

Command Modes

Privileged EXEC (#)

Command History

BC Release	Modification
12.2(4)BC1	The MAC-related information in this command was moved to the **show interface cable mac-scheduler** command for DOCSIS 1.1 operations.
12.2(15)BC1a	The **ugs statistics** keywords were added to Cisco IOS Release 12.2BC.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.3(23)BC2	The **rate-adapt** keyword was added.
C Release	Modification
12.1(4)CX1	The MAC-related information in this command was moved to the **show interface cable mac-scheduler** command for DOCSIS 1.1 operations.
SC Release	Modification
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCB	The **rate-adapt** keyword was integrated into Cisco IOS Release 12.2(33)SCB.
12.2(33)SCC	This command was modified. The **bonding-group** keyword was added in Cisco IOS Release 12.2(33)SCC.
12.2(33)SCD2	This command was modified. The command output was modified to display the multiple transmit channel (MTC) mode cable modems that share a particular upstream channel in their transmit channel set (TCS).
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
12.2(33)SCE5	This command was modified. The show interface cable upstream command output was modified to display a warning message when no ports are configured on an upstream.

BC Release	Modification
12.2(33)SCG	This command was modified. The *index* argument was added to the **bonding-group** keyword.
T Release	Modification
12.0(3)T	This command was integrated into Cisco IOS Release 12.0(3)T.
X Release	Modification
11.3XA	This command was introduced.
12.0(7)XR	The output was expanded.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **rate-adapt**and the **bonding-group** keywords were removed.

Examples

This example shows the output of the **show interface cable upstream** command (DOCSIS 1.0 Cisco IOS software releases) for the upstream cable interface located in slot 6 and port 0:

```
Router# show interface cable 6/0 upstream 0
Cable6/0: Upstream 0 is up
Received 855 broadcasts, 147 multicasts, 408833 unicasts
0 discards, 925 errors, 0 unknown protocol
409835 packets input, 20 uncorrectable
884 noise, 0 microreflections
Total Modems On This Upstream Channel : 51 (51 active)
Default MAC scheduler
Queue[Rng Polls]  0/64, fifo queueing, 0 drops
Queue[Cont Mslots]  0/52, fifo queueing, 1 drops
Queue[CIR Grants]  0/64, fair queueing, 0 drops
Queue[BE Grants]  0/64, fair queueing, 0 drops
Queue[Grant Shpr]   0/64, calendar queueing, 0 drops
Reserved slot table currently has 0 CBR entries
Req IEs 8296144, Req/Data IEs 0
Init Mtn IEs 57962, Stn Mtn IEs 14413
Long Grant IEs 133168, Short Grant IEs 67845
Avg upstream channel utilization : 6%
Avg percent contention slots : 89%
Avg percent initial ranging slots : 2%
Avg percent minislots lost on late MAPs : 0%
Total channel bw reserved 0 bps
CIR admission control not enforced
Admission requests rejected 0
Current minislot count   : 6788097    Flag: 0
Scheduled minislot count : 6788190    Flag: 0
```

This example shows the output of the **show interface cable upstream** command (DOCSIS 1.1 Cisco IOS software releases) for the upstream cable interface located in slot 6 and port 0:

```
Router# show interface cable 6/0 upstream 0

Upstream 0 is up
     Received 38085 broadcasts, 5758 multicasts, 17257229 unicasts
     0 discards, 1451132592 errors, 0 unknown protocol
     17301072 packets input, 48239157 uncorrectable
```

```
     1071719720 noise, 0 microreflections
     Total Modems On This Upstream Channel : 147 (142 active)
```

This example shows the output for the upstream cable interface located for the Cisco uBR10-MC5X20S and Cisco uBR-MC28U/X line cards, which provides information about the error counters maintained by the card onboard MAC controller for each upstream interface:

```
Router# show interface cable 6/1/0 upstream 0

Cable6/1/0: Upstream 3 is up
    Received 140 broadcasts, 2075 multicasts, 134502 unicasts
    0 discards, 144954 errors, 0 unknown protocol
    136717 packets input, 0 uncorrectable
    0 noise, 0 microreflections
    Total Modems On This Upstream Channel : 37 (35 active)
  JIB counters for ifInErrors:
      us_error_frame_drop 72477
      us_crc_error 4
      us_hcs_error 72473
      us_cont_collision 0
      us_uncorr_cw_rcvd 14
```

The following shows the sample output for the **ugs statistics** option:

```
Router# show interface cable 6/1/0 upstream 3 ugs statistics

UGS Statistics for Upstream 3
# of Active UGS on the Upstream : 4
                      UGS Allocation Statistics
                     max         min         avg
Last 1 Hour          14          3           4
Last 5 Min           12          5           5
```

The following shows the sample output for the **rate-adapt** option:

```
Router# show interface cable 6/1/0 upstream 0 rate-adapt

Global:Enabled US[0]:Enabled rate-adapt_total: 0
local:maps 500 pri 6, rate 150000 bcs 10 (10) fcms Off
```

The following example shows the segment information for upstream ports on cable interface 7/0/1:

```
Router#show interface cable 7/1/0 upstream
Cable7/1/0: Upstream 0 is up
     Received 1236 broadcasts, 0 multicasts, 312274 unicasts
     0 discards, 37623 errors, 0 unknown protocol
     313510 packets input
     Codewords: 315034 good 82 corrected 1 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 3 (3 active)
     Segments: 0 valid, 0 discarded
Cable7/1/0: Upstream 1 is up
     Received 0 broadcasts, 0 multicasts, 0 unicasts
     0 discards, 0 errors, 0 unknown protocol
     0 packets input
     Codewords: 0 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
```

Beginning in Cisco IOS Release 12.2(33)SCD2, the output of the **show interface cable upstream** command was modified to display the MTC mode cable modems that share a particular upstream channel in their TCS as shown in the following example:

```
Router# show interface cable 7/1/0 upstream 1
Cable7/1/0: Upstream 1 is up
     Received 1236 broadcasts, 0 multicasts, 312274 unicasts
     0 discards, 37623 errors, 0 unknown protocol
     313510 packets input
     Codewords: 315034 good 82 corrected 1 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0(0 active)
  Total MTC Modems On This Upstream Channel : 3 (3 active)
     Segments: 0 valid, 0 discarded
```

The following example shows the bonding groups configured for upstream ports on the cable interface 7/0/1:

```
Router# show interface cable 7/1/0 upstream bonding-group
Cable7/1/0: Upstream Bonding Group 2
     0 packets input, 0 octets input
     Segments: 0 valid, 0 discarded, 0 lost
     Reserved Bandwidth Max : 0 bits/sec
     Reserved Bandwidth     : 0 bits/sec
     Available Bandwidth    : 2560000 bits/sec
     Total Service Flows On This Bonding Group: 0
Cable7/1/0: Upstream Bonding Group 12
     0 packets input, 0 octets input
     Segments: 0 valid, 0 discarded, 0 lost
     Reserved Bandwidth Max : 0 bits/sec
     Reserved Bandwidth     : 0 bits/sec
     Available Bandwidth    : 2560000 bits/sec
     Total Service Flows On This Bonding Group: 0
Cable7/1/0: Upstream Bonding Group 235
     0 packets input, 0 octets input
     Segments: 0 valid, 0 discarded, 0 lost
     Reserved Bandwidth Max : 0 bits/sec
     Reserved Bandwidth     : 0 bits/sec
     Available Bandwidth    : 15360000 bits/sec
     Total Service Flows On This Bonding Group: 0
```

Example of show interface cable upstream Command for Cisco IOS Release 12.2(33)SCE5

Starting with Cisco IOS Release 12.2(33)SCE5, the show interface cable upstream command output is modified to display a warning message when no ports are configured on an upstream.

The following example displays the output of the show interface cable upstream command for upstream 0:

```
Router# show interface cable 7/0/0 upstream 0
No upstream configured on mac-domain Cable7/0/0
```

The following example displays the output of the show interface cable upstream command with ugs statistics option:

```
Router# show interface cable 7/0/0 upstream 0 ugs statistics
No upstream configured on mac-domain Cable7/0/0
```

The following example displays the output of the show interface cable upstream command with rate-adapt option:

```
Router# show interface cable 7/0/0 upstream 0 rate-adapt
No upstream configured on mac-domain Cable7/0/0
```

Table 236: show interface cable upstream Field Descriptions

Field	Description
Cable	Location of the upstream interface.
Upstream is up/ ...administratively down	Administrative state of the upstream interface.
Received broadcasts	Number of broadcast packets received through this upstream interface.
multicasts	Number of multicast packets received through this upstream interface.
unicasts	Number of unicast packets received through this interface.
discards	Number of packets discarded by this interface, typically because of buffer overruns.
errors	Total of all packets with errors that prevented the transmission of the packets through this upstream interface. This figure could include the following error packets: • Collisions of request and request/data packets • Damaged frames received during request and request data requests or slots, typically because they had bad forward error correction (FEC) header checksums (HCS) • Damaged frames received from ranging requests • Data packets with unique word, collision, or no energy • Number of upstream bursts whose preamble or unique word could not be correctly received • Packets with at least one frame with an uncorrectable error On Broadband Processing Engine (BPE) cable interface line cards, such as the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR10-MC5X20S/U line cards, this counter also counts conditions such as HCS/CRC errors and collisions that occur during initial ranging requests and bandwidth requests. Compare this counter with the uncorrectable error counter from the **show cable hop** command to determine whether a problem with noise exists, or whether the counter is high only because a large number of CMs are trying to register.
unknown protocol	Number of packets received that were using an unknown protocol (the packet was not an IP, ARP, or PPPoE packet). This counter also includes DOCSIS frames that could not be identified as DOCSIS frames because of malformed headers or invalid header options.
packets input	Number of frames received (broadcast, multicast, and unicast) through this upstream interface that were free from errors.

Field	Description
corrected	Number of frames received through this upstream interface that had errors that were corrected.
uncorrectable	Number of frames received through this upstream interface that had errors that could not be corrected. This means the frame had at least one uncorrectable FEC block, making the whole frame uncorrectable. Nominally, you should expect at most 1 uncorrectable error per 10,000 packets, and typically, the uncorrectable error rate is much less in good environments. **Note** This counter is not supported on Broadband Processing Engine (BPE) cable interface line cards, such as the Cisco uBR-MC16U/X, Cisco uBR-MC28U/X, and Cisco uBR10-MC5X20S/U/H line cards, because these line cards count only uncorrectable codewords, not frames. As a result, this field always shows 0 or N/A for these line cards, depending on the software release. Instead of this field, use the **show cable hop** command to display the number of uncorrectable errors per codeword.
noise	Number of upstream packets of any type that were corrupted by line noise.
microreflections	Approximate number of upstream packets corrupted by microreflections. Microreflections are a type of impairment that is caused by impedance mismatches between amplifiers, couples, cables, and other equipment in the cable plant. Microreflections create copies of a signal that arrive at the receiver with different amounts of delay and attenuation, generating intersymbol interference (ISI) that can cause the receiver to improperly detect the amplitude and phase of the incoming signal. **Note** This value is not exact but provides an approximate indication of the microreflections that have been received.
Guaranteed-rate service queue depth	Number of bandwidth requests queued up in the Guarantee-rate queue. This queue is available only to CMs that have a reserved minimum upstream rate in their class of service (CoS).
Best-effort service queue depth	Number of bandwidth requests queued up in the Best-effort queue. This queue is available to all CMs that do not have any reserved rate on the upstream.
Total Modems On This Upstream Channel	Number of CMs currently sharing this upstream channel. This field also shows how many of these CMs are active.
Total NON-MTC Modems On This Upstream Channel	Number of non-MTC cable modems currently sharing this upstream channel. This field also shows how many of these CMs are active.
Total MTC Modems On This Upstream Channel	Number of MTC cable modems currently sharing this upstream channel. This field also shows how many of these CMs are active.
Segments	Valid segments and discarded segments transmitted on a logical channel interface will be added.

Field	Description
JIB counters for ifInErrors	Error counters for the upstream interface that are maintained by the MAC controller that is onboard certain cable interface line cards (such as the Cisco uBR10-MC5X20S and Cisco uBR-MC28U/X line cards): • us_error_frame_drop = Number of frames dropped from the upstream frame queue because the queue was already full with packets with various errors, such as cyclic redundancy check (CRC), header checksum (HCS), fragmentation, concatenation, and unrecognized frame errors. • us_crc_error = Number of packets with CRC errors that were received on the upstream. • us_hcs_error = Number of packets with HCS errors that were received on the upstream. • us_cont_collision = Number of packets that were received with a collision detected during contention transmit opportunity. • us_uncorr_cw_rcvd = Number of packets with uncorrectable codewords that were received on the upstream.
Rng Polls	MAC scheduler queue showing number of ranging polls.
Cont Mslots	MAC scheduler queue showing number of forced contention request slots in MAP.
CIR Grants	MAC scheduler queue showing number of CIR grants pending.
BE Grants	MAC scheduler queue showing number of Best-Effort grants pending.
Grant Shpr	MAC scheduler queue showing number of grants buffered for traffic shaping.
Reserved slot table	Number of slots that the MAC scheduler has placed in the reserved slot table at the time that the command was made.
Req IEs	Counter of Request IEs sent in MAP.
Req/Data IEs	Counter of Request/Data IEs sent in MAP.
Init Mtn IEs	Counter of Initial Maintenance IEs.
Stn Mtn IEs	Number of station maintenance (ranging poll) IEs.
Long Grant IEs	Number of long grant IEs.
ShortGrmg IEs	Number of short grant IEs.
Avg upstream channel utilization	Average percent of the upstream channel bandwidth being used for user (Ethernet) traffic. This does not include DOCSIS MAC-layer packets.
Avg percent contention slots	Average percent of slots available for CMs to request bandwidth using contention mechanisms. Also indicates the amount of unused capacity in the network.
Avg percent initial ranging slots	Average percent of slots in the initial ranging state.

Field	Description
Avg percent minislots lost on late MAP	Average percent of slots that were lost because a MAP interrupt was too late.
Current Total Bandwidth Reserved	Total amount of bandwidth reserved by all CMs sharing this upstream channel that require bandwidth reservation. The CoS for these CMs specifies some nonzero value for the guaranteed-upstream rate. When one of these CMs is admitted on the upstream, this field value is incremented by this guaranteed-upstream rate value.
CIR admission control	Status of admission control on the upstream channel. ENFORCED status allows users to enable admission control on a per-port basis. This controls how limited bandwidth is allocated. NOT ENFORCED status indicates that there is no admission control. Every modem that registers with a class of service (COS) specifying a minimum upstream rate is admitted by the CMTS, regardless of how much aggregate bandwidth is actually available. Users enable admission control via the admission control command-line interface (CLI).
Subscription Level	Amount of oversubscription to allow on this upstream channel, as configured with the **cable upstream admission-control** command. Oversubscription is expressed as a percentage of the raw capacity of the channel.
Reservation Limit (with Oversubscription)	Maximum cumulative bandwidth reservation allowable before rejecting new CMs.
Admission requests rejected	Number of CMs that attempted to register on this interface but were rejected because of the admission control policy that has been configured with the **cable upstream admission-control** command.
Virtual channel bw	Maximum virtual bandwidth of this capacity, in bits per second (b/s), when admission control is enabled.
Last Minislot Stamp (current_time_base)	Current minislot count at the CMTS. FLAG indicates the timebase reference. This field is used only by developers.
Last Minislot Stamp (scheduler_time_base)	Furthest minislot count allocated at the indicated time. FLAG indicates the timebase reference. This field is used by developers.
# of Active UGS on the Upstream	Number of Unsolicited Grant Service (UGS) flows that are currently active on the upstream.
UGS Allocation Statistics (max, min, avg)	Maximum number of UGS service flows, minimum number of UGS service flows, and average number of UGS service flows that have been allocated on the upstream over the last hour and last five minute period.

Field	Description
Rate-adapt	Rate-adapt is enabled and any local upstream (US) configuration information: • global–Rate-adapt is enabled globally. • US–Rate-adapt is enabled locally on a specific US. • pri–Indicates the priority setting for the local US. • rate–Indicates the minimum max-rate setting for the local US. • bcs–Indicates the number of broadcast contention minislots.

Table 237: show interface cable upstream bonding-group Field Descriptions

Field	Description
packets input	Number of drops, errors, and total number of packets received on each upstream.
octets input	Number of octets received on the upstream.
Segments	Number of valid segments, discarded segments and lost segments transmitted on a bonding group.
Reserved Bandwidth Max	Maximum amount of bandwidth reserved for a bonding group.
Reserved Bandwidth	Amount of bandwidth reserved by all CMs sharing this upstream channel.
Available Bandwidth	Amount of bandwidth available on a bonding group.
Total Service Flows on this Bonding Group	Number of service flows assigned to a particular bonding group.

Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a time stamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

This example shows the output of the **show interface cable upstream bonding-group** command showing bonding group 2 configuration on the cable interface 7/0/1 in Cisco IOS Release 12.2(33)SCG:

```
Router# show interface cable 7/1/0 upstream bonding-group 2
30 seconds input rate 515470 bits/sec, 1000 packets/sec.
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show interface cable upstream** command on the Cisco cBR router:

```
Router#show interface cable 1/0/0 upstream

MAC domain upstream impairment report: 0x0
```

```
Cable1/0/0: Upstream 0  is up
     Description: UC3/0/0:U0
     Received 20 broadcasts, 1710 multicasts, 10882 unicasts
     0 discards, 0 errors, 0 unknown protocol
     12612 packets input
     Codewords: 15234 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 3 (3 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Cable1/0/0: Upstream 1  is up
     Description: UC3/0/0:U1
     Received 28 broadcasts, 3916 multicasts, 12806 unicasts
     0 discards, 0 errors, 0 unknown protocol
     16750 packets input
     Codewords: 30419 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 2 (2 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Cable1/0/0: Upstream 2  is down
     Received 0 broadcasts, 0 multicasts, 0 unicasts
     0 discards, 0 errors, 0 unknown protocol
     0 packets input
     Codewords: 0 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0 (0 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Cable1/0/0: Upstream 3  is down
     Received 0 broadcasts, 0 multicasts, 0 unicasts
     0 discards, 0 errors, 0 unknown protocol
     0 packets input
     Codewords: 0 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0 (0 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Cable1/0/0: Upstream 4  is down
     Received 0 broadcasts, 0 multicasts, 0 unicasts
     0 discards, 0 errors, 0 unknown protocol
     0 packets input
     Codewords: 0 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0 (0 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Cable1/0/0: Upstream 5  is down
     Received 0 broadcasts, 0 multicasts, 0 unicasts
     0 discards, 0 errors, 0 unknown protocol
     0 packets input
     Codewords: 0 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0 (0 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Cable1/0/0: Upstream 6  is down
     Received 0 broadcasts, 0 multicasts, 0 unicasts
     0 discards, 0 errors, 0 unknown protocol
     0 packets input
     Codewords: 0 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0 (0 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
```

```
     Segments: 0 valid, 0 discarded
Cable1/0/0: Upstream 7  is down
     Received 0 broadcasts, 0 multicasts, 0 unicasts
     0 discards, 0 errors, 0 unknown protocol
     0 packets input
     Codewords: 0 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 0 (0 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Router#
```

This example shows the output of the **show interface cable upstream** command for a specific upstream port on the Cisco cBR router:

```
Router#show interface cable 1/0/0 upstream 1

MAC domain upstream impairment report: 0x0
Cable1/0/0: Upstream 1  is up
     Description: UC1/0/0:U1
     Received 28 broadcasts, 3949 multicasts, 12906 unicasts
     0 discards, 0 errors, 0 unknown protocol
     16883 packets input
     Codewords: 30658 good 0 corrected 0 uncorrectable
     0 noise, 0 microreflections
     Total NON-MTC Modems On This Upstream Channel : 2 (2 active)
     Total MTC Modems On This Upstream Channel : 0 (0 active)
     Segments: 0 valid, 0 discarded
Router#
```

This example also shows the output of the **show interface cable upstream** command for a specific upstream port on the Cisco cBR router:

```
Router#show interfaces cable1/0/0 upstream 0

MAC domain upstream impairment report: 0x0
Cable1/0/0: Upstream 0 is up
Description: UC1/0/0:U0
Received 3807 broadcasts, 0 multicasts, 750999 unicasts
0 discards, 0 errors, 0 unknown protocol
754806 packets input
Codewords: 1394549 good 0 corrected 0 uncorrectable
0 noise, 0 microreflections
Total NON-MTC Modems On This Upstream Channel : 14 (14 active)
Total MTC Modems On This Upstream Channel : 52 (52 active)
Segments: 199946 valid, 0 discarded
```

This example shows the output of the **show interface cable upstream** command with the **ugs statistics** keyword on the Cisco cBR router:

```
Router#show interface cable 1/0/0 upstream 1 ugs statistics

UGS Statistics for Upstream 1
# of Active UGS on the Upstream : 0

                     UGS Allocation Statistics
                    max         min         avg
Last 1 Hour         0           0           0
Last 5 Min          0           0           0
```

```
Router#
```

Related Commands

Command	Description
show interface cable	Displays configuration and status information for the cable interface.
show interface cable downstream	Displays information about the downstream cable interface.
show interface cable sid	Displays information by service identifier (SID) of each cable modem on the network.
show interface cable signal-quality	Displays information about the cable signal quality.

show interface cable upstream debug

To display information about the Service ID (SID) tracking on a cable interface, use the **show interface cable upstream debug** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router

On the Cisco cBR router, use the **show interface cable upstream debug** command with the **sf-tracking** keyword on the Cisco line card to display the Service Flow (SF) tracking information.

show interface cable {*slot/port slot/subslot/port*} **upstream debug sid-tracking** *sid-value* **start-index** *count-number* {**summary** | **verbose**}
show interface cable {*slot/port slot/subslot/port*} **upstream debug sid-tracking** *sid-value* **clear**

Cisco IOS Release 12.2(33)SCE and later

show interface cable {*slot/subslot/cable-interface-index*} **upstream debug sid-tracking** *sid-value* **start-index** *count-number* {**summary** | **verbose**}
show interface cable {*slot/subslot/cable-interface-index*} **upstream debug sid-tracking** *sid-value* **clear**

Cisco cBR Series Converged Broadband Router

show interface cable {*slot/subslot/cable-interface-index*} **upstream debug sf-tracking** *sfid-value* **start-index** *count-number* [**summary** | **verbose**]
show interface cable {*slot/subslot/cable-interface-index*} **upstream debug sid-tracking** *sfid-value* **clear**

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the cable interface line card. Cisco uBR10012 —The valid subslots are 0 or 1. Cisco cBR router—The valid value is 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).

cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 15.
sid-tracking *sid-value*	Specifies the SID number for which SID tracking details are displayed. The valid range is from 1 to 8191.
sf-tracking *sfid-value*	On the Cisco cBR router— Specifies the SFID number for which the tracking details are required to be displayed. The valid range is from 1 to 65536.
start-index	First event you want to display. Cisco uBR10012 router—The valid range is from 0 to 40000 Cisco cBR router—Valid values are from 0 to 4294967295.
count-number	Total number of events you want to display. Cisco uBR10012 router—The valid range is from 0 to 40000 Cisco cBR router—Valid values are from 0 to 4294967295.
summary	(Optional) Displays the summary of events.
verbose	(Optional) Displays queuing and token bucket information for bandwidth requests.
clear	Clears the SID tracking data.

Command Modes

Privileged EXEC (#)

Line card slot (Slot-x-0#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show interface cable upstream debug** command with the **sf-tracking** keyword must be used on the Cisco cBR line card. To enter the line card mode, do the following:

In the Privileged EXEC (#) mode, use the **request platform software console attach** *slot/subslot* command. This example displays how to go to the line card Slot mode:

```
Router#request platform software console attach 1/0

#
# Connecting to the CLC console on 1/0.
# Enter Control-C to exit the console connection.
#
Slot-1-0> en
Slot-1-0#
```

See the examples for information on how to use the **show interface cable upstream debug sf-tracking** command in the line card Slot mode.

Examples

The following is a sample output of the show interface cable upstream debug command on a cable interface line card in slot 5, subslot 0, and port 1:

```
Router# show cable 5/0/1 upstream debug sid-tracking 35 0 40000 [19   ]:BWREQ_2
  2662273505  4594-usecs bytes:2987       req_id:0          sid:35
[63   ]:BWREQ_2  2662361817  4905-usecs bytes:2987       req_id:0          sid:35
[108  ]:BWREQ_2  2662450105  5190-usecs bytes:2987       req_id:0          sid:35
[151  ]:BWREQ_2  2662535807  4893-usecs bytes:2987       req_id:0          sid:35
[196  ]:BWREQ_2  2662624956  4043-usecs bytes:2987       req_id:0          sid:35
[240  ]:BWREQ_2  2662713320  4407-usecs bytes:2987       req_id:0          sid:35
[284  ]:BWREQ_2  2662801603  4682-usecs bytes:2987       req_id:0          sid:35
[328  ]:BWREQ_2  2662889928  5006-usecs bytes:2987       req_id:0          sid:35
[373  ]:BWREQ_2  2662978229  5304-usecs bytes:2987       req_id:0          sid:35
[417  ]:BWREQ_2  2663067305  4381-usecs bytes:2987       req_id:0          sid:35
[461  ]:BWREQ_2  2663155618  4694-usecs bytes:2987       req_id:0          sid:35
[505  ]:BWREQ_2  2663243945  5020-usecs bytes:2987       req_id:0          sid:35
```

Examples for the Cisco cBR Series Converged Broadband Router

This example shows the output of the **show interface cable upstream debug sf-tracking** command with the **summary** keyword on the Cisco cBR line card:

```
Slot-1-0#show interface cable 1/0/0 upstream debug sf-tracking 1 1 10 summary
Show tracking (1 .. 11) for SFID 1 in Cable1/0/0
cmts_mac_sched_sfid_track_show: md 0 sfid 1 start 1 count 10, tx-status 1
Slot-1-0#
```

This example shows the output of the **show interface cable upstream debug sf-tracking** command with the **verbose** keyword on the Cisco cBR line card:

```
Slot-1-0#show interface cable 1/0/0 upstream debug sf-tracking 1 1 10 verbose
Show tracking (1 .. 11) for SFID 1 in Cable1/0/0
cmts_mac_sched_sfid_track_show: md 0 sfid 1 start 1 count 10, tx-status 1
Slot-1-0#
```

Related Commands

Command	Description
debug cable interface	Displays debugging messages for a specific cable interface, or for traffic related to a specific MAC address or Service ID on that cable interface.
show interface cable	Displays configuration and status information for the cable interface.

show interface gigabitethernet

To display status of the gigabitethernet interface, its MAC and IP address details, and information about the Downstream External PHY Interface (DEPI) traffic, use the **show interface gigabitethernet** command in privilege EXEC mode.

show interface gigabitethernet *slot/subslot/* {*bayport*}

Syntax Description

slot	The slot where a SIP or cable line card resides.
	• Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• Cisco uBR7225VXR router—The valid range is from 1 to 2.
	• Cisco uBR10012 router—The valid range for:
	  • Cable line card is from 5 to 8
	  • SIP is 1 and 3

subslot	The subslot where a SIP or cable line card resides.
	• Cisco uBR10012 router—The valid value for:
	  • Cable line card in slot 5 to 8 is 0 or 1
	  • SPAs in a SIP in slot 1 or 3, prior to Cisco IOS Release 12.2(33)SCB is 0 or 1. For Cisco IOS Release 12.2(33)SCB and later, subslot is not specified.

bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).

port	Specifies the port number.
	• Cisco uBR7246VXR router and Cisco uBR7225VXR router—The valid range is from 0 to 1.
	• Cisco uBR10012 router—The valid value for:
	  • Slot 1 and 3 is 0
	  • Slot 5 to 8 is from 0 to 4

Command Default

None

Command Modes

Privilege EXEC

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
12.2(33)SCG	This command was modified. The status of the output flow-control and input flow-control in the output is displayed as on or off.

Examples

This is a sample output for the **show interface gigabitethernet** command:

```
Router# show interface gigabitethernet 6/1/0
GigabitEthernet6/1/0 is up, line protocol is up
Hardware is Gigabit Ethernet MAC Controller, address is 0013.5f06.7f74 (bia 0013.5f06.7f74)
Internet address is 56.1.1.1/24
MTU 1500 bytes, BW 10000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Full Duplex, 1000Mbps, link type is auto, media type is SX
  output flow-control is unsupported, input flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:01, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 8
  Interface GigabitEthernet6/1/0 queueing strategy: PXF Class-based
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     2557 packets input, 541995 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     723 packets output, 52113 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
Router#
```

Effective with Cisco IOS Release 12.2(33)SCG, the **show interface gigabitethernet** command was modified to display the correct status of the output and input flow-control parameters as on or off. This change is applicable only to Cisco SPA-5X1G and Cisco SPA-1X10G shared port adapters.

The following example shows the changed output of the **show interface gigabitethernet** command:

```
Router# show interface gigabitethernet1/2/3
Load for five secs: 5%/0%; one minute: 8%; five minutes: 8%
Time source is NTP, 14:25:51.761 CST Wed Feb 20 2013
GigabitEthernet1/2/3 is down, line protocol is down
Hardware is GigEther SPA, address is 649e.f366.b71d (bia 649e.f366.b71d)
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
 reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive set (10 sec)
Full Duplex, 1000Mbps, link type is auto, media type is LX
output flow-control is on, input flow-control is on
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Interface GigabitEthernet1/2/3 queueing strategy: PXF Class-based
30 second input rate 0 bits/sec, 0 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicasts)
0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 0 multicast, 0 pause input
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
```

```
0 output buffer failures, 0 output buffers swapped out
Router#
```

Related Commands

Command	Description
show controller gigabitethernet	Displays information about the Gigabit Ethernet interface used by the DEPI.

show interface integrated-cable

To display the current configuration and status for an integrated channel, use the **show interface integrated-cable** command in privileged EXEC mode.

Cisco uBR10012 Router
show integrated interface-cable *slot/subslot/port: interface-number*[*options*]

Cisco uBR7246VXR and Cisco uBR7225VXR Routers
show integrated interface-cable *slot/port: interface-number*[*options*]

Cisco cBR Series Converged Broadband Router
show integrated interface-cable *slot/subslot/port: integrated-Cable-interface-number*[*options*]

Syntax Description

slot/subslot/port	• *slot*—Slot where the line card resides. The valid range is from 5 to 8. • *subslot*—Subslot where the line card resides. The available slots are 0 or 1. • *port*—Downstream controller number on the line card. The valid *port* values are 0 to 4. Cisco cBR router— • *slot*—The valid range is 0 to 3 and 6 to 9. • *subslot*—Subslot where the line card resides. The valid value is 0. • *port*—Downstream controller number on the line card. The valid range is from 0 to 7.

slot/port	On the Cisco uBR7225VXR or Cisco uBR7246VXR routers:
	• *slot*—Slot where the line card resides.
	  • Cisco uBR7225VXR router—The valid range is from 1 to 2.
	  • Cisco uBR7246VXR router—The valid range is from 3 to 6.
	• *port*—Downstream controller number on the line card. The valid values are 0 or 1.

integrated-Cable-interface-number	Integrated cable interface number. The valid range is from 0 to 3. Cisco cBR router—The valid range is from 0 to 162.

options	The following non-cable specific options generate information for integrated cable interfaces: • **accounting**—Displays the number of packets of each protocol type that is sent through the interface. • **controller**—Displays the status of the interface, configuration, and controller. • **counters**—Displays the integrated cable interface counters. • **crb**—Displays the interface routing and bridging information. • dbs—Displays the Dynamic Bandwidth Sharing (DBS) scheduler information. • **description**—Displays the description entered for the interface. • **dlm**—Displays the DEPI Latency Measurement (DLM) statistics. This keyword is not supported on the Cisco cBR router. • **downstream**—Displays the downstream information. • **history**—Displays the interface history on the Cisco cBR router. • **human-readable**—Displays the interfaces output with larger numbers separated by comma(s) on the Cisco cBR router. • **fair-queue**—Displays the integrated cable interface Weighted Fair Queuing (WFQ) information. This keyword is not supported on the Cisco cBR router. • **irb**—Displays the interface routing and bridging information. • **mac-accounting**—Displays the interface MAC accounting information. • **monitor**—Displays the status of the interface continuously. • **mpls-exp**—Displays the interface Multiprotocol Label Switching (MPLS) experimental accounting information. • **multicast-gcr**—Displays the multicast QoS (MQoS) GCR details. • **multicast-sessions**—Displays information about the multicast sessions on the integrated-cable interface. • **precedence**—Displays interface precedence accounting information. • **privacy**—Displays privacy group information. This keyword is not supported on the Cisco cBR router. • **random-detect**—Displays the interface Weighted Random Early Detection (WRED) information. This keyword is not supported on the Cisco cBR router. • **stats—**Displays packets that are switched. • **summary**—Displays interface summary information. • **switching**—Displays interface switching information. This keyword is not supported on the Cisco cBR router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced on the Cisco uBR10012 router.

Release	Modification
12.2(33)SCD	This command was integrated on the Cisco uBR7246VXR and Cisco uBR7225VXR routers.
12.2(33)SCF	This command was modified. The downstream keyword was enhanced to capture fairness across DOCSIS interfaces related information.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The following keywords were removed: • **dlm** • **fair-queue** • **privacy** • **random-detect** • **switching** The following keywords were added: • **history** • **human-readable**

Usage Guidelines

Some other non-cable specific options do not generate any meaningful information for integrated-cable interfaces. For information on the non-cable specific options, see the Cisco IOS Release 12.3 documentation on Cisco.com .

In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to the **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

This example shows the output of the **show interface integrated-cable accounting** command:

```
Router# showshow interface integrated-cable 7/0/0:0 accounting
Protocol    Pkts In   Chars In   Pkts Out  Chars Out
IP          0          0        280      41606
```

This example shows the output of the **show interface integrated-cable dbs** command:

```
Router# show interface integrated-cable 3/0:0 dbs
Dynamic Bandwidth Sharing is enabled
active 0
RF 0: tokens 23342, active 0, policer 4687 KB/s, max_tokens 23435
      deficit counter 0, quantum 6000
      ticks_limit: 62500, max_ticks:625000, policer(ticks): 312
```

The following is the sample output of the **show interface integrated-cable description** command:

```
Router# show interface integrated-cable 7/0/0:0 description
Interface                      Status         Protocol Description
In7/0/0:0                      up             up
tfchan_ubr10k_1#show interface integrated-cable 7/0/0:0  downstream
In7/0/0:0: Downstream is up
 Total Modems 5 (5 active), Total Flows 6
 Total downstream bandwidth: 18750 Kbps
 Total downstream reserved/reservable bandwidth: 2002/15000 Kbps
```

The following is the sample output of the **show interface integrated-cable downstream** command:

```
Router# show interface integrated-cable 7/0/0:0 downstream
In7/0/0:0: Downstream is up
 Total Modems 5 (5 active), Total Flows 6
 Total downstream bandwidth: 18750 Kbps
 Total downstream reserved/reservable bandwidth: 2002/15000 Kbps
```

The following is the sample output of the **show interface integrated-cable irb** command:

```
Router# show interface integrated-cable 7/0/0:0 irb
Integrated-Cable7/0/0:0
tfchan_ubr10k_1#show interface integrated-cable 7/0/0:0  multicast-gcr
Group Classifier Rules on Integrated-Cable7/0/0:0:
Classifier_id  Group_id  Group_Qos_id  Sid   SFID   ref_count  Key
1              1         1             8196  16     1          0
```

This example shows the output of the **show interface integrated-cable multicast-gcr** command:

```
Router# show interface integrated-cable 5/1/2:0 multicast-gcr
Group Classifier Rules on Integrated-Cable7/0/0:0:
Classifier_id  Group_id  Group_Qos_id  Sid   SFID   ref_count  Key
1              1         1             8196  16     1          0
```

This example shows the output of the **show interface integrated-cable multicast-sessions** command:

```
Router# show interface integrated-cable 5/1/2:0 multicast-sessions
Default Multicast Service Flow 53 on Integrated-Cable 5/1/2:0
Multicast Group    : 230.1.2.3
         Source    : N/A
         Act GCRs  : 2
         Interface : Bu123                State: A      GI: Bu123       RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     2    8252    64      31    2      1
                     1    8253    65      32    1      1
```

Example of the Updated show interface integrated-cable downstream Command Output in Cisco IOS Release 12.2(33)SCF

This example shows the output of the **show interface integrated-cable downstream** command:

```
Router# show interface integrated-cable 6/1/0:0 downstream
In6/1/0:0: Downstream is up
 Total Modems 1 (1 active), Total Flows 2
 Total downstream bandwidth: 375 Kbps
 Total downstream reserved/reservable bandwidth: 0/300 Kbps
 Total downstream guaranteed/non-guaranteed bonus bandwidth: 20025/10012 Kbps
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show interface integrated-cable accounting** command:

```
Router#show interface integrated-Cable 1/0/0:0 accounting
Integrated-Cable1/0/0:0
               Protocol    Pkts In   Chars In   Pkts Out  Chars Out
No traffic sent or received on this interface.
```

```
Router#
```

This example shows the output of the **show interface integrated-cable controller** command:

```
Router#show interface integrated-Cable 1/0/0:0 controller
Integrated-Cable1/0/0:0 is down, line protocol is down
  Hardware is CMTS IC interface, address is c414.3c17.1dcb (bia c414.3c17.1dcb)
  MTU 1500 bytes, BW 37500 Kbit/sec, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 28125 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out


IC controller details
In1/0/0:0 RFID: 12288
Inject header:
    DOCSIS DATA HDR Byte dump:
00 00 00 03
00 14 64 00
00 00 00 00
00 00 00 00


---------------------------------------
DOCSIS DATA HDR Decode, hdr Size: 16
---------------------------------------
HEADER FIELDS
---------------------------------------
Pkt-Len             : 0 (0x0)
Jib-hdr-ver         : 0 (0x0)
pkt-type            : 0 (0x0)
pkt-subtype         : 0 (0x0)
Dest                : 3 (0x3)
Src                 : 0 (0x0)
ilk                 : 0 (0x0)
sf-idx              : 1305 (0x519)
Qos                 : 0 (0x0)
Control             : 0 (0x0)
dbg_control         : 0 (0x0)
bpi_idx             : 0 (0x0)
timestamp           : 0 (0x0)
---------------------------------------

Flow control Id: 0x3000 [slot: 3 (0x3), JIB chan no: 0 (0x0)]
```

```
---------------------------------------------
State info (DSNB if and its underlying states)
---------------------------------------------
DSNB IF state                          : DOWN
RF Chan state                          : UP
RF Chan Mod Type                       : SC-QAM
RF Chan frequency                      : 93000000
Bandwidth configured on DSNB IF        : YES
Inject Header/HW flow creation status  : DSNB_IF_SM_UP
MD state                               : DSNB i/f is NOT part of a MD
*DSNB i/f Line State                   : DOWN
---------------------------------------------
Router#
```

This example shows the output of the **show interface integrated-cable counters protocol status** command:

```
Router#show interface integrated-Cable 1/0/0:0 counters protocol status
Protocols allocated:
 Integrated-Cable1/0/0:0: Other, IP
Router#
```

This example shows the output of the **show interface integrated-cable crb** command:

```
Router#show interface integrated-Cable 1/0/0:0 crb

Integrated-Cable1/0/0:0

 Routed protocols on Integrated-Cable1/0/0:0:
  ipv6
Router#
```

This example shows the output of the **show interface integrated-cable human-readable** command:

```
Router#show interface integrated-Cable 1/0/0:0 human-readable
Integrated-Cable1/0/0:0 is down, line protocol is down
  Hardware is CMTS IC interface, address is c414.3c17.1dcb (bia c414.3c17.1dcb)
  MTU 1500 bytes, BW 37500 Kbit/sec, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 28125 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
```

```
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out
Router#
```

Related Commands

Command	Description
show interface integrated-cable queue	Displays the downstream hierarchical queueing framework (HQF) queue information for an integrated cable interface.

show interface integrated-cable queue

To display the downstream hierarchical queuing framework (HQF) queue information for an integrated cable interface, use the **show interface integrated-cable queue** command in privileged EXEC mode.

show interface integrated-cable *slot/port:sub-interface* **queue** [**verbose** | **cblt** [*cblt_indexpriority*] | **pblt**]

Syntax Description

slot/port	• *slot*—Slot where the line card resides. • Cisco uBR7225VXR router—The valid range is from 1 to 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • *port*—Downstream controller number on the line card. The valid *port* values are 0 or 1.
verbose	(Optional) Displays detailed information for all queues
cblt	(Optional) Displays detailed class layer bandwidth limited traffic (CBLT) stream information for normal downstream HQF queues.
cblt_index	CBLT index information.
priority	Displays CBLT information for priority HQF queues. Priority queues do not have any indexes.
pblt	(Optional) Displays detailed physical layer bandwidth limited traffic (PBLT) stream information for this interface.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCD	This command was introduced for the Cisco uBR7246VXR and Cisco uBR7225VXR routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output of the **show interface integrated-cable queue** command:

```
Router> show interface integrated-cable 3/0:0 queue

*   idx/gqid   Len/Limit     Deqs      Drops    CIR         MIR/PR    SFID         ForwInt
                    pkts           pkts      pkts     kbps         kbps
BE Queues:
I     0/1          0/128          700       0        0              0/0          C5/0:11
     In5/0:0
      1/44        0/128              0         0        0            10000/0    C5/0:11
   In5/0:0

CIR Queues:
     33/97       0/128   1      14374    0        100       15000/0      C5/0:15
In5/0:0
```

```
Low Latency Queues:
~     51/124     0/128   1      14374    0        100        100/0       C5/0:15
In5/0:0
$     0/0          0/128   1      14374    0        100        100/0          -
    In5/0:0
 I: Cable Interface Queue
 $: Low Latency Queue
 ~: Low Latency Policing Queue
Router>
```

The following is a sample output of the **show interface integrated-cable queue verbose** command:

```
Router> show interface integrated-cable 3/0:0 queue verbose
Interface Number 5 (type 25) Integrated Cable 3/0:0
 OUTPUT FEATURES
   blt (0x63D90FA0, index 0, qid 0, fast_if_number 5) layer PHYSICAL
   scheduling policy: WFQ (111)
   classification policy: CLASS_BASED (122)
   drop policy: TAIL (141)
   packet size fixup policy: NONE (0)   no of global policers: 0
   blt flags: 0x220000    scheduler: 0x63DFDBE0
  total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 0 total active
 0
   txcount 26131 txqbytes 2030784 drops 0 qdrops 0 nobuffers 0 flowdrops 0
   qsize 0 aggregate limit/bytes 1000/0 availbuffers 1000
   holdqueue_out 1000 perc 0.00 remaining_ratio/perc 0
   visible_bw 37500 max_rate 37500 allocated_bw 37500 vc_encap 0 ecn_threshold NONE
   weight A 1 quantum A 1500 credit A 1500
   weight B 1 quantum B 1500 credit B 1500
   min-rate tokens: 13000, credit: 0, depth: 13000
   backpressure_policy 0 scheduler_flags C03B
   last_sortq[A/B] 0/0, remaining pak/particles 0/0
   leaf_blt[P1] 0x63DFDBE0 burst packets/bytes[P1] 0/0
   leaf_blt[P2] 0x63DFDBE0 burst packets/bytes[P2] 0/0
   leaf_blt[NOTP] 0x63DFDBE0 burst packets/bytes[NOTP] 0/0
 (max entries 1000)
     next layer HQFLAYER_CLASS_HIER0 (max entries 1000)
     blt (0x63D90EE0, index 0, qid 1, fast_if_number 5) layer CLASS_HIER0
     scheduling policy: FIFO (110)
     classification policy: NONE (120)
     drop policy: TAIL (141)
     packet size fixup policy: NONE (0)   no of global policers: 0
     blt flags: 0x220000    scheduler: 0x63DFDB20
     total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 0 total
active 1
     txcount 167 txqbytes 12912 drops 0 qdrops 0 nobuffers 0 flowdrops 0
     qsize 0 aggregate limit/bytes 1000/0 availbuffers 1000
     holdqueue_out 0 perc 100.00 remaining_ratio/perc 0
     visible_bw 37500 max_rate 37500 allocated_bw 37500 vc_encap 0 ecn_threshold NONE
     weight A 1 quantum A 1500 credit A 1500
     weight B 1 quantum B 1500 credit B 1500
     min-rate tokens: 18750, credit: 0, depth: 18750
     backpressure_policy 0 scheduler_flags C03B
     last_sortq[A/B] 55/11, remaining pak/particles 0/0
     leaf_blt[P1] 0x63DFDB20 burst packets/bytes[P1] 0/0
     leaf_blt[P2] 0x63DFDB20 burst packets/bytes[P2] 0/0
     leaf_blt[NOTP] 0x63DFDB20 burst packets/bytes[NOTP] 1/80
Router>
```

The following is a sample output of the **show interface integrated-cable queue cblt** *cblt_index* command:

```
Router> show interface integrated-cable 3/0:0 queue cblt 1
```

```
    blt (0x65CE3EA0, index 1, qid 45, fast_if_number 19) layer CLASS_HIER0
    scheduling policy: FIFO (110)
    classification policy: NONE (120)
    drop policy: TAIL (141)
    packet size fixup policy: NONE (0)   no of global policers: 0
    D/Traffic Shaping enabled
    blt flags: 0x22A208C    scheduler: 0x65D504C0
    total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 1000 total
active 1
    D/Traffic Shaping enabled
    txcount 890 txqbytes 63900 drops 0 qdrops 0 nobuffers 0 flowdrops 0
    qsize 0 aggregate limit/bytes 128/100000 availbuffers 128
    holdqueue_out 0 perc 0.00 remaining_ratio/perc 11
    visible_bw 0 max_rate 4000 allocated_bw 0 vc_encap 0 ecn_threshold NONE
    weight A 1 quantum A 1500 credit A 1500
    weight B 1 quantum B 1500 credit B 1500
    min-rate tokens: 1500, credit: 0, depth: 1500
    backpressure_policy 0 scheduler_flags C03F
    last_sortq[A/B] 0/0, remaining pak/particles 0/0
    leaf_blt[P1] 0x65D504C0 burst packets/bytes[P1] 0/0
    leaf_blt[P2] 0x65D504C0 burst packets/bytes[P2] 0/0
    leaf_blt[NOTP] 0x65D504C0 burst packets/bytes[NOTP] 0/0
    OUTPUT Shaping
      Bc internal 0 Be internal 0 Time interval 4
      increment 4000 increment_lower 0 increment_limit 4000
      last visit 87456736 credit 0 outstanding_tokens 23760 maxtokens 24352
      peak_rate_credit 0 peak_rate_tokens 0 peak_rate_increment 0
      system timer delayed 0 restart timer 0
      timer set 0 hqf_shape_running 17254
      nextexpire_system_time 0 nextexpire_time_qindex -1
Router>
```

The following is a sample output of the **show interface integrated-cable queue cblt** *priority* command:

```
Router# show interface integrated-cable 3/0:0 queue cblt priority
    blt (0x19FA9300, index 0, qid 52, fast_if_number 20) layer CLASS_HIER0
    scheduling policy: FIFO (110)
    classification policy: NONE (120)
    drop policy: TAIL (141)
    packet size fixup policy: NONE (0)   no of global policers: 0
    blt flags: 0x200800    scheduler: 0x1A015CC0
    total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 9500 total
active 1

    txcount 114 txqbytes 12864 drops 0 qdrops 0 nobuffers 0 flowdrops 0
    qsize 0 aggregate limit/bytes 128/0 availbuffers 128
    holdqueue_out 0 perc 0.00 remaining_ratio/perc 0
    visible_bw 0 max_rate 37500 allocated_bw 0 vc_encap 0 ecn_threshold NONE
    weight A 1 quantum A 1500 credit A 1500
    weight B 1 quantum B 1500 credit B 1500
    min-rate tokens: 1500, credit: 0, depth: 1500
    backpressure_policy 0 scheduler_flags C83F
    last_sortq[A/B] 0/0, remaining pak/particles 0/0
    leaf_blt[P1] 0x1A015CC0 burst packets/bytes[P1] 0/0
    leaf_blt[P2] 0x1A015CC0 burst packets/bytes[P2] 0/0
    leaf_blt[NOTP] 0x1A015CC0 burst packets/bytes[NOTP] 0/0
PRIORITY LEVEL 1: total bandwidth 500 kbps, total percent 0%
Router#
```

The following is a sample output of the **show interface integrated-cable queue pblt** command:

```
Router# show interface integrated-cable 3/0:0 queue pblt
```

```
   blt (0x19FB4700, index 0, qid 0, fast_if_number 20) layer PHYSICAL
   scheduling policy: WFQ (111)
   classification policy: CLASS_BASED (122)
   drop policy: TAIL (141)
   packet size fixup policy: NONE (0)   no of global policers: 0
   blt flags: 0x220000    scheduler: 0x1A0210C0
  total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 0 total active
 0
   txcount 67743 txqbytes 6281007 drops 2 qdrops 0 nobuffers 0 flowdrops 0
   qsize 0 aggregate limit/bytes 8000/0 availbuffers 8000
   holdqueue_out 1000 perc 0.00 remaining_ratio/perc 0
   visible_bw 37500 max_rate 37500 allocated_bw 18000 vc_encap 0 ecn_threshold NONE
   weight A 1 quantum A 1500 credit A 1500
   weight B 1 quantum B 1500 credit B 1500
   min-rate tokens: 13000, credit: 0, depth: 13000
   backpressure_policy 1 scheduler_flags C03F
   last_sortq[A/B] 0/0, remaining pak/particles 0/0
   leaf_blt[P1] 0x1A0210C0 burst packets/bytes[P1] 0/0
   leaf_blt[P2] 0x1A0210C0 burst packets/bytes[P2] 0/0
   leaf_blt[NOTP] 0x1A0210C0 burst packets/bytes[NOTP] 0/0
Router#
```

Table 238: show interface integrated-cable – Field Description

Field	Description
Len/Limit Pkts	Queue length and limit in packets.
Deqs Pkts	Dequeue packets
Drops Pkts	Dropped packets.
CIR Kbps	Committed information rate, in kilobytes per second.
MIR/PR Kbps	Maximum information and peak rate, in kilobytes per second.
Forwint	Forwarding interface.
BE Queues	Best effort queues.
CIR Queues	Committed information rate queues.
Low Latency Queues	Low latency queues.
sfid	Service flow identification number.

Related Commands

Command	Description
show interface cable downstream	Displays information about the downstream on the cable interface.
show interface cable sid	Displays the service identifier (SID) information of each CM on the network.
show interface cable signal-quality	Displays information about the cable signal quality.
show interface cable upstream	Displays information about one or all upstreams on the cable interface.

Command	Description
show interface wideband-cable	Displays information about wideband channels.

show interface modular-cable

To display the current configuration and status of a modular cable interface, use the **show interface modular-cable** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable *slot/subslot/bay:nb-channel-number*

Cisco IOS Release 12.2(33)SCB
show interface modular-cable *slot/bay/port:nb-channel-number*

Cisco IOS Release 12.2(33)SCF
show interface modular-cable *slot/subslot/port:nb-channel-number*

Syntax Description

slot	Slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	Subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	Bay in a SIP where a SPA is located. The valid values are 0 (upper bay) and 1 (lower bay).
port	Interface number on the SPA.
unit	Controller unit number.
nb-channel-number	Narrowband channel number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port.*
12.2(33)SCF	This command was modified. The downstream keyword was enhanced to capture fairness across DOCSIS interfaces related information.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output of the **show interface modular-cable** command:

```
Router# show interface modular-cable 1/0/0:0
Modular-Cable3/0/0:0 is up, line protocol is up
  Hardware is CMTS MC interface, address is 0011.9221.84be (bia 0011.9221.84be)
```

```
MTU 1500 bytes, BW 539 Kbit, DLY 1000 usec,
   reliability 255/255, txload 1/255, rxload 1/255
Encapsulation MCNS, loopback not set
Keepalive set (10 sec)
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output 00:09:57, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: PXF First-In-First-Out
Output queue 0/64, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
   0 packets input, 0 bytes, 0 no buffer
   Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
   0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
   107 packets output, 16302 bytes, 0 underruns
   0 output errors, 0 collisions, 0 interface resets
   0 output buffer failures, 0 output buffers swapped out
```

The following is sample output of the **show interface modular-cable** command with downstream keyword:

```
Router# show interface modular-cable 1/0/0:1 downstream
Mo1/0/0:1: Downstream is up
 Total Modems 0 (0 active), Total Flows 1
 Total downstream bandwidth: 3750 Kbps
 Total downstream reserved/reservable bandwidth: 0/3000 Kbps
 Total downstream guaranteed/non-guaranteed bonus bandwidth: 10644/10643 Kbps
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface accounting information.
show interface modular-cable description	Displays a description for the interface.
show interface modular-cable downstream	Displays downstream information for the narrowband channel.
show interface modular-cable dsg	Displays DOCSIS Set-Top Gateway (DSG) information per interface.
show interface modular-cable intercept	Displays intercept stream information.
show interface modular-cable stats	Displays interface packets and octets that were switched.
show interface modular-cable summary	Displays interface summary information.
show interface modular-cable switching	Displays interface switching information.

show interface modular-cable accounting

To display interface accounting information, use the **show interface modular-cable accounting** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable {*slot/subslot/bay:nb-channel-number* } **accounting**

Cisco IOS Release 12.2(33)SCB
show interface modular-cable {*slot/bay/port:nb-channel-number* } **accounting**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

No default values or behavior

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port.*
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface modular-cable accounting** command for the modular-cable interface in slot 1, subslot 0, bay 0, and narrowband channel number 0:

```
Router# show interface modular-cable 1/0/0:0 accounting
Modular-Cable1/0/0:0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                      IP          0          0       1286     131092
```

Related Commands

Command	Description
show interface modular-cable description	Displays a description for the interface.
show interface modular-cable downstream	Displays downstream information for the narrowband channel.
show interface modular-cable dsg downstream	Displays DOCSIS Set-Top Gateway (DSG) information.
show interface modular-cable intercept	Displays intercept stream information.
show interface modular-cable stats	Displays interface packets and octets that were switched.
show interface modular-cable summary	Displays interface summary information.
show interface modular-cable switching	Displays interface switching information.

show interface modular-cable description

To display a description for the interface, use the **show interface modular-cable description** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable *slot/subslot/bay:nb-channel-number* **description**

Cisco IOS Release 12.2(33)SCB
show interface modular-cable *slot/subslot/port:nb-channel-number* **description**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port.*
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface modular-cable description** command for the modular cable interface in slot 1, subslot 0, bay 0 and narrowband channel number 0:

```
Router# show interface modular-cable 1/0/0:0 description
Interface                      Status         Protocol Description
Mo1/0/0:0                      up             up
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface accounting information.

Command	Description
show interface modular-cable downstream	Displays dowstream information for the narrowband channel.
show interface modular-cable dsg downstream	Displays DOCSIS Set-Top Gateway (DSG) information.
show interface modular-cable intercept	Displays intercept stream information.
show interface modular-cable summary	Displays interface summary information.
show interface modular-cable stats	Displays interface packets and octets that were switched.
show interface modular-cable switching	Displays interface switching information.

show interface modular-cable dlm

To display DEPI Latency Measurement (DLM) information, use the **show interface modular-cable dlm** command in privileged EXEC mode.

show interface modular-cable *slot/bay/port:interface-number* **dlm**

Syntax Description

slot	Slot where a SIP resides. On the Cisco uBR10012 universal broadband router, slots 1 and 3 can be used for SIPs.
bay	Bay in a SIP where a SPA is located. The valid values are 0 (upper bay) and 1 (lower bay).
port	Interface number on the SPA.
interface-number	Modular-cable interface number.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output of the **show interface modular-cable dlm** command for the modular cable interface in slot 1, bay 0, port 0, and modular-cable interface number 6:

```
Router# show interface Modular-Cable 1/0/0:6 dlm
DEPI Latency Measurements for Modular-Cable1/0/0:6
Current CIN Delay: 146 usecs
Current DLM: 4566
Average DLM (last 10): 1514
Max DLM: 5115
Min DLM: 913
Ingress DLM
#           SysUpTime           Delay (Ticks)
x-----------x-------------------x------------
0           831149              949
1           831159              1168
2           831170              4566
3           831076              1005
4           831087              983
5           831097              1185
6           831108              1139
7           831118              1144
8           831128              2013
9           831139              996
```

Table 239: show interface modular-cable Field Descriptions

Field	Description
Current CIN Delay	Current CIN delay value.
Current DLM	Current DLM value.
Average DLM (last 10)	Average DLM value.
Max DLM	Maximum DLM .
Min DLM	Minimum DLM.
SysUpTime	The system up or active time.
Delay (Ticks)	The delay measured as number of ticks.

Related Commands

Command	Description
show interface modular-cable downstream	Displays downstream information for the narrowband channel.
show interface modular-cable summary	Displays interface summary information.
rf-channel network-delay	Configures the network delay for an RF channel on a Wideband SPA.

show interface modular-cable downstream

To display downstream information for the narrowband channel, use the show interface modular-cable downstream command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable *slot/subslot/bay:nb-channel-number* **downstream**

Cisco IOS Release 12.2(33)SCB
show interface modular-cable *slot/subslot/port:nb-channel-number* **downstream**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port.*
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface modular-cable downstream** command for the modular cable interface in slot 1, subslot 0, bay 0, and narrowband channel number 0:

```
Router# show interface modular-cable 1/0/0:0 downstream
Mo1/0/0:0: Downstream is up
 Total Modems 5 (5 active), Total Flows 6
 Total downstream bandwidth: 1940 Kbps
 Total downstream reserved bandwidth: 200 Kbps
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface accounting information.
show interface modular-cable description	Displays a description for the interface.
show interface modular-cable dsg downstream	Displays DOCSIS Set-Top Gateway (DSG) information.
show interface modular-cable intercept	Displays intercept stream information.
show interface modular-cable stats	Displays interface packets and octets that were switched.
show interface modular-cable summary	Displays interface summary information.
show interface modular-cable switching	Displays interface switching information.

show interface modular-cable intercept

To display intercept stream information, use the **show interface modular-cable intercept** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable *slot/subslot/bay:nb-channel-number* **intercept**

Cisco IOS Release 12.2(33)SCB
show interface modular-cable *slot/subslot/port:nb-channel-number* **intercept**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port.*
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface modular-cable intercept** command for the modular cable interface in slot 1, subslot 0, bay 0, and narrowband channel number 0:

```
Router# show interface modular-cable 1/0/0:0 intercept
Interface Modular-Cable1/0/0:0 is a member of bundle 2. Reenter the command on t
he virtual bundle interface.
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface accounting information.

Command	Description
show interface modular-cable description	Displays a description for the interface.
show interface modular-cable downstream	Displays downstream information for the narrowband channel.
show interface modular-cable dsg downstream	Displays DOCSIS Set-Top Gateway (DSG) information.
show interface modular-cable stats	Displays interface packets and octets that were switched.
show interface modular-cable summary	Displays interface summary information.
show interface modular-cable switching	Displays interface switching information.

show interface modular-cable multicast-sessions

To display information about multicast sessions on a specific modular-cable interface, use the **show interface modular-cable multicast-sessions** command in privileged EXEC mode.

show interface modular-cable *slot/ {subslot bay}/port:wideband-channel* [**group** | [*ipv4-MQoS-group ipv6-MQoS-group*] | **latency** | **sid** [*MQoS-sid*]]

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8.
subslot	(Cisco uBR10012 only) Secondary slot of the cable interface line card. The valid subslots are 0 or 1.
bay	Bay where the Cisco Wideband SPA is located. The valid range is from 0 to 3.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
interface-number	Modular-cable interface number. The valid range is from 0 to 23.
group [*ipv4-MQoS-group* | *ipv6-MQoS-group*]	Displays information about the specified IPv4 or IPv6 multicast quality of service (MQoS) group.
latency	Displays information about the multicast session latency.
sid [*MQoS-sid*]	Displays information about the MQoS service identifier (SID). The value of the SID ranges from 8192 to 12272.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port* .
12.2(33)SCF	This command was modified. The **latency** keyword was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output from the **show interface modular-cable multicast-sessions** command:

```
Router# show interface modular-cable 1/1/0:0 multicast-sessions
Default Multicast Service Flow 7 on Modular-Cable1/1/0:0
Multicast Group    : 230.1.2.5
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     1    8198    18      0     1      0
```

The following is a sample output from the **show interface modular-cable multicast-sessions group** command:

```
Router# show interface modular-cable 1/1/0:0 multicast-sessions group 230.1.2.5
Multicast Group    : 230.1.2.5
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     1    8198    18      0     1      0
```

The following is a sample output from the **show interface modular-cable multicast-sessions latency** command:

```
Router# show interface modular-cable 1/1/0:0 multicast-sessions latency
Session (S,G) : (*,230.1.2.5)
Fwd Intfc     : Mo1/1/0:0
MQoS Entered at        MQoS Exit at
Mar 6 23:13:16.223     Mar 6 23:13:16.223
GC   SAID   SFID   SF req               SF rsp
1    8198   18     Mar 6 23:13:16.223  Mar 6 23:13:16.283
```

The following is a sample output from the **show interface modular-cable multicast-sessions sid** command:

```
Router# show interface modular-cable 1/1/0:0 multicast-sessions sid 8198
Multicast Group    : 230.1.2.5
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     1    8198    18      0     1      0
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface modular-cable accounting information.
show interface modular-cable description	Displays the description of the modular-cable interface.
show interface modular-cable downstream	Displays the downstream information for the narrowband channel.
show interface modular-cable dsg	Displays the DOCSIS Set-Top Gateway (DSG) information per modular-cable interface.

Command	Description
show interface modular-cable intercept	Displays the intercept stream information of the interface modular-cable.
show interface modular-cable stats	Displays the interface modular-cable packets and octets that were switched.
show interface modular-cable summary	Displays the interface modular-cable summary information.
show interface modular-cable switching	Displays the interface modular-cable switching information.
show interface wideband-cable multicast-sessions	Displays the information about multicast sessions on a specific wideband-cable interface.
show interface cable multicast-sessions	Displays the information about the multicast sessions on a specific cable interface.

show interface modular-cable stats

To display interface packets and octets that were switched, use the **show interface modular-cable stats** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable *slot/subslot/bay:nb-channel-number* **stats**

Cisco IOS Release 12.2(33)SCB
show interface modular-cable *slot/bay/port:nb-channel-number* **stats**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port*.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface modular-cable stats** command for the modular cable interface in slot 1, subslot 0, bay 0, and narrowband channel number 0:

```
Router# show interface modular-cable 1/0/0:0 stats
Modular-Cable1/0/0:0
          Switching path    Pkts In   Chars In   Pkts Out  Chars Out
               Processor          0          0          0          0
            Route cache           0          0        509      41582
                  Total           0          0        509      41582
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface accounting information.
show interface modular-cable description	Displays a description for the interface.
show interface modular-cable downstream	Displays downstream information for the narrowband channel.
show interface modular-cable dsg downstream	Displays DOCSIS Set-Top Gateway (DSG) information.
show interface modular-cable intercept	Displays intercept stream information.
show interface modular-cable switching	Displays interface switching information.
show interface modular-cable summary	Displays interface summary information.

show interface modular-cable summary

To display interface summary information, use the **show interface modular-cable summary** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable *slot/subslot/bay:nb-channel-number* **summary**

Cisco IOS Release 12.2(33)SCB
show interface modular-cable *slot/subslot/port:nb-channel-number* **summary**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

No default values or behavior

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced in the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port.*
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface modular-cable summary** command for the modular cable interface in slot 1, subslot 0, bay 0, and narrowband channel number 0:

```
Router# show interface modular-cable 1/0/0:0 summary
 *: interface is up
 IHQ: pkts in input hold queue     IQD: pkts dropped from input queue
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue
 RXBS: rx rate (bits/sec)          RXPS: rx rate (pkts/sec)
 TXBS: tx rate (bits/sec)          TXPS: tx rate (pkts/sec)
 TRTL: throttle count
  Interface              IHQ   IQD  OHQ   OQD  RXBS RXPS  TXBS TXPS TRTL
```

```
--------------------------------------------------------------------------
* Modular-Cable1/0/0:0     0     0    0     2     0    0     0    0    0
NOTE:No separate counters are maintained for subinterfaces
     Hence Details of subinterface are not shown
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface accounting information.
show interface modular-cable description	Displays a description for the interface.
show interface modular-cable downstream	Displays downstream information for the narrowband channel.
show interface modular-cable dsg downstream	Displays DOCSIS Set-Top Gateway (DSG) information.
show interface modular-cable intercept	Displays intercept stream information.
show interface modular-cable stats	Displays interface packets and octets that were switched.
show interface modular-cable switching	Displays interface switching information.

show interface modular-cable switching

To display interface switching information, use the **show interface modular-cable switching** command in privileged EXEC mode.

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA
show interface modular-cable *slot/subslot/bay:nb-channel-number* **switching**

Cisco IOS Release 12.2(33)SCB
show interface modular-cable *slot/subslot/port:nb-channel-number* **switching**

Syntax Description

slot	The slot where a SIP resides. On the Cisco uBR10012 router, slots 1 and 3 can be used for SIPs.
subslot	The subslot where a SIP resides. On the Cisco uBR10012 router, subslot 0 is always specified.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the interface number on the SPA.
nb-channel-number	Represents the narrowband channel number.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a modular cable interface from *slot/subslot/bay* to *slot/bay/port*.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show interface modular-cable switching** command for the modular cable interface in slot 1, subslot 0, bay 0, and narrowband channel number 0:

```
Router# show interface modular-cable 1/0/0:0 switching
Modular-Cable1/0/0:0
    Protocol  IP
          Switching path    Pkts In   Chars In   Pkts Out  Chars Out
                 Process          0          0          0          0
           Cache misses           0          -          -          -
                   Fast           0          0        457      37670
```

```
            Auton/SSE          0          0          0          0
NOTE: all counts are cumulative and reset only after a reload.
```

Related Commands

Command	Description
show interface modular-cable accounting	Displays interface accounting information.
show interface modular-cable description	Displays a description for the interface.
show interface modular-cable downstream	Displays downstream information for the narrowband channel.
show interface modular-cable dsg downstream	Displays DOCSIS Set-Top Gateway (DSG) information.
show interface modular-cable intercept	Displays intercept stream information.
show interface modular-cable stats	Displays interface packets and octets that were switched.
show interface modular-cable summary	Displays interface summary information.

show interface multicast-gcr

To display the details of the Group Classifier Rule, use the **show interface multicast-gcr** command in privileged EXEC mode.

show interface {**cable** *slot/subslot/port* | **modular-cable** *slot/bay/port:channel* | **wideband-cable** *slot/bay/port:channel* } **multicast-gcr**

Cisco cBR Series Converged Broadband Router
show interface {**cable** *slot/subslot/cable-interface-index* | **wideband-cable** *slot/bay/port:channel* } **multicast-gcr**

Syntax Description

cable *slot/subslot/port*	Identifies the cable interface for which information should be displayed, where: • slot—0 to 8 • subslot—0 or 1 • port—0 to 4
cable *slot/subslot/cable-interface-index*	On the Cisco cBR Series Converged Broadband Router: • *slot*—0 to 3, and 6 to 9. • *subslot*—0 • *cable-interface-index*—0 to 15.
modular-cable *slot/bay/port:channel*	Identifies the cable interface for which information should be displayed, where: • slot—0 to 8 • bay—0 or 1 • port—0 • channel—0
wideband-cable *slot/bay/port:channel*	Identifies the wideband cable interface for which information should be displayed, where: • slot—0 to 8 • bay—0 or 1 • port—0 • channel—0

Command Default

No default behavior or values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **modular-cable** keyword was removed.

Usage Guidelines

Use this command to display the details of the Group Classifier Rule.

Examples

The following example shows a sample output for the **show interface multicast-gcr** command:

```
Router# show interface wideband-cable 1/1/0:0 multicast-gcr
Group Classifier Rules on Wideband-Cable1/1/0:0:
Classifier_id  Group_id  Group_Qos_id  Sid   SFID   ref_count
7              1         1             8196  10     1
8              2         1             8197  11     1
```

Table 240: show interface multicast-gcr Field Descriptions

Field	Description
Classifier_id	Displays group classifier ID.
Group_id	Displays group ID number of the Group Classifier Rules.
Group_Qos_id	Displays group QoS ID number of the Group Classifier Rules.
Sid	Displays information for the service identifier on the cable interface.
SFID	Displays service flow identifier (SFID).
ref_count	Displays the reference count.

Related Commands

Command	Description
show interface cable service-flow	Displays the attributes of DOCSIS service flows on a given cable interface.
show cable multicast db	Displays the contents of multicast explicit tracking database.
show cable multicast qos	Displays the configuration information for MQoS, (Group-Config, Group-QoS-Config, and Group-Encryption-Config).

show interface port-channel

To display the EtherChannel interfaces and channel identifiers, with their mode and operational status, use the **show interface port-channel** command in privileged EXEC mode.

show interface port-channel *number*

Syntax Description

number	Optional value enables the display of information for one port channel interface number. The range is from 1 to 64.

Command Default

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(11)BC3	This command was introduced on the Cisco uBR7246VXR router.
12.2(9a)BC	This command was introduced on the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

The following example illustrates Gigabit EtherChannel (GEC) information for the port-channel interface of 2 as configured on a Cisco uBR10012 router with the PRE2 performance routing engine model.

This configuration is comprised of three GEC port channels as follows:

Member 0 is the GEC interface bundle primary.

Member 2 is the final subordinate interface in this GEC group.

These three port-channel interfaces (members) comprise one GEC group that is set up with a GEC peer on the network.

```
Router# show interface port-channel 2
Port-channel2 is up, line protocol is up
  Hardware is GEChannel, address is 8888.8888.8888 (bia 0000.0000.0000)
  Internet address is 101.101.101.1/16
  MTU 1500 bytes, BW 3000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
    No. of members in this channel: 3
    No. of configured  members in this channel: 3
    No. of passive members in this channel: 0
    No. of active members in this channel: 3
        Member 0 : GigabitEthernet1/0/0 , Full-duplex, 1000Mb/s
        Member 1 : GigabitEthernet3/0/0 , Full-duplex, 1000Mb/s
        Member 2 : GigabitEthernet2/0/0 , Full-duplex, 1000Mb/s
    No. of Non-active members in this channel: 0
```

```
  Last input 00:00:02, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/225/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/120 (size/max)
  30 second input rate 17292000 bits/sec, 9948 packets/sec
  30 second output rate 17315000 bits/sec, 9935 packets/sec
     866398790 packets input, 3324942446 bytes, 0 no buffer
     Received 2 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     866394055 packets output, 3323914794 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

The following example illustrates GEC information for the port-channel interface of 2 as configured on a Cisco uBR7246VXR router.

This configuration is comprised of three port-channel interfaces (members) as follows:

Member 0 is the GEC interface bundle primary.

Member 2 is the final subordinate interface in this GEC group.

These three port-channel interfaces (members) comprise one GEC group that is set up with a GEC peer on the network.

```
Router# show interfaces port-channel 2
Port-channel2 is up, line protocol is up
  Hardware is GEChannel, address is 000b.bf7d.9c01 (bia 000b.bf7d.9c00)
  Internet address is 101.101.101.2/16
  MTU 1500 bytes, BW 3000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
    No. of members in this channel: 3
    No. of configured  members in this channel: 3
    No. of passive members in this channel: 0
    No. of active members in this channel: 3
        Member 0 : GigabitEthernet0/3 , Full-duplex, 1000Mb/s
        Member 1 : GigabitEthernet0/2 , Full-duplex, 1000Mb/s
        Member 2 : GigabitEthernet0/1 , Full-duplex, 1000Mb/s
    No. of Non-active members in this channel: 0
  Last input 00:13:48, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/225/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/120 (size/max)
  30 second input rate 17358000 bits/sec, 9999 packets/sec
  30 second output rate 17359000 bits/sec, 10000 packets/sec
     868633935 packets input, 3809968911 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     868642883 packets output, 3811242413 bytes, 0 underruns
     2 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     2 lost carrier, 0 no carrier, 0 pause output
```

```
     0 output buffer failures, 0 output buffers swapped out
```

The following example illustrates FastEtherChannel (FEC) information for the specified port channel interface as configured on a Cisco uBR7246VXR router.

This configuration is comprised of four port channel interfaces (members) as follows:

Member 0

Member 0 is the GEC interface bundle primary.

Member 3 is the final subordinate interface in this FEC group.

These four port-channel interfaces (members) comprise one FEC group that is set up with an FEC peer on the network.

```
Router# show interfaces port-channel 1
Port-channel1 is up, line protocol is up
  Hardware is FEChannel, address is 000b.bf7d.9c1c (bia 000b.bf7d.9c00)
  Description: test
  Internet address is 100.100.100.1/24
  MTU 1500 bytes, BW 400000 Kbit, DLY 100 usec,
     reliability 255/255, txload 11/255, rxload 11/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
    No. of members in this channel: 4
    No. of configured  members in this channel: 4
    No. of passive members in this channel: 0
    No. of active members in this channel: 4
        Member 0 : FastEthernet2/1 , Full-duplex, 100Mb/s
        Member 1 : FastEthernet2/0 , Full-duplex, 100Mb/s
        Member 2 : FastEthernet1/1 , Full-duplex, 100Mb/s
        Member 3 : FastEthernet1/0 , Full-duplex, 100Mb/s
    No. of Non-active members in this channel: 0
  Last input 00:14:48, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/300/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/160 (size/max)
  30 second input rate 17358000 bits/sec, 9998 packets/sec
  30 second output rate 17357000 bits/sec, 9998 packets/sec
     869366601 packets input, 3968956491 bytes
     Received 3 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog
     0 input packets with dribble condition detected
     868944538 packets output, 3876736548 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

show interface rf-status

To display the logical UP and DOWN state for each of the configured RF channels for a wideband interface, use the **show interface rf-status** command in privileged EXEC mode.

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers
show interface wideband-cable *slot/port:wideband-channel* **rf-status**

Cisco uBR10012 Universal Broadband Router
show interface wideband-cable *slot/bay/port:wideband-channel* **rf-status**

Syntax Description

slot	Slot where the line card resides. Cisco uBR7246VXR router—The valid range is from 3 to 6. Cisco uBR7225VXR router—The valid range is from 1 to 2. Cisco uBR10012 router—The valid range is from 5 to 8. Slots 1 and 3 can be used for SIPs.
bay	The bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the downstream port number.
wideband-channel	Represents the wideband channel number.

Command Default

The default logical state of each channel is UP.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCD	This command was modified. Support was added for Cisco uBR7225VXR and Cisco uBR7246VXR routers.
IOS-XE 3.15.0S	This command was replaced by the **show interfaces resil-rf-status** command on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The default logical state of each channel is UP. The state is set to DOWN when the threshold configured using **cable rf-change-trigger** command is reached.

Examples

The following is a sample output of the **show interface rf-status** command on a wideband cable interface on a Cisco uBR10012 router:

```
Router# show interface wideband-cable 1/0/0:3 rf-status
 Logical
```

```
RF  Status
--  ------
17  UP
18  UP
19  UP
```

The following is a sample output of the **show interface rf-status** command on a wideband cable interface on a Cisco uBR7225VXR router:

```
Router# show interface Wideband-Cable 5/1:0 rf-status
               Logical
Resource    RF  Status
----------------------
5/1         0   UP
            1   UP
            2   UP
```

Table 241: show interface rf-status Field Descriptions

Field	Description
Resource	The interface information.
RF	Cable interface line card or SPA downstream channel number.
Logical Status	The logical status of the RF channel. Default is UP.

Related Commands

Command	Description
show cable rf-status	Displays the logical state of all RF channels.

show interface resil-rf-status

To display the logical UP and DOWN state for each of the configured RF channels for a wideband interface, use the **show interface resil-rf-status** command in privileged EXEC mode.

show interface wideband-cable *slot/bay/port:wideband-channel* **resil-rf-status**

Syntax Description

slot	Slot where the line card resides. The valid range is 0 to 3 and 6 to 9.
bay	The bay in a SIP where a SPA is located. Valid value is 0.
port	Specifies the downstream port number. Valid range is 0 to 7
wideband-channel	Represents the wideband channel number. The valid range is 0-63.

Command Default

The default logical state of each channel is UP.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Router. This command replaces the **show interface rf-status** command.

Usage Guidelines

The default logical state of each channel is UP. The state is set to DOWN when the threshold configured using **cable rf-change-trigger** command is reached.

Examples

This example show the output of the **show interface rf-status** command on a wideband cable interface on Cisco cBR-8 router:

```
Router# show interfaces Wideband-Cable 1/0/0:0 resil-rf-status
 Load for five secs: 1%/0%; one minute: 3%; five minutes: 2%
Time source is user configuration, 04:21:17.800 EDT Wed May 20 2015

                Logical
Resource    RF  Resil Status
-----------------------
3/0/0       0   UP
            1   UP
            2   UP
            3   UP
            4   UP
            5   UP
            6   UP
            7   UP
```

Table 242: show interface rf-status Field Descriptions

Field	Description
Resource	The interface information.
RF	Cable interface line card or SPA downstream channel number.
Logical Status	The logical status of the RF channel. Default is UP.

show interfaces tengigabitethernet

To display the ten gigabit ethernet interface information, use the **show interface tengigabitethernet** command in privileged EXEC mode.

show interface tengigabitethernet *interface/port/-adapter/interface*
[**accounting** | **controller** | **counters protocol status** | **crb** | **dampening** | **description** | **etherchannel** | **history** [**60min** | **60sec** | **72hour** | **all** | **both** | **input** | **output**] | **human-readable** | **irb** | **mac-accounting** | **monitor interval** *seconds* | **mpls-exp** | **plim qos** | **precedence** | **stats** | **summary**]

Syntax Description

slot/port/interface	Slot where the line card resides. *slot*—The valid range is from 0 to 9. *port*—The valid range is from 0 to 1. *interface*—The valid range is from 0 to 63.
accounting	Displays the interface accounting.
controller	Displays the interface status, configuration and controller status.
counters protocol status	Displays the interface counters.
crb	Displays the interface routing or bridging information.
dampening	Displays the interface dampening information.
description	Displays the interface description.
etherchannel	Displays the interface etherchannel information.
history	Displays the interface history.
human-readable	Displays the output interfaces information.
irb	Displays the interface routing/bridging information.
mac-accounting	Displays the interface MAC accounting information.
monitor interval *seconds*	Displays the interfaces with the specified interval.
mpls-exp	Displays the interface MPLS experimental accounting information.
plim qos	Displays the tenGiga eth module plim commands.
precedence	Displays the interface precedence accounting information.
stats	Displays the interface packets and octets by switching path.
summary	Displays the interface summary.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the ten gigabit ethernet interface information.

Examples

The following is a sample output of the**show interface tengigabitethernet** command on a Cisco cBR-8 router:

```
Router# show interfaces tengigabitethernet 4/1/0 accounting
TenGigabitEthernet 4/1/0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                   Other         15       1155       1814     109078
                      IP 8038262210 9404766785700       0          0
                 DEC MOP         15       1155         14       1078
                     ARP          0          0          1         60
```

Related Commands

Command	Description
logical-edge-device	Define a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
vei-bundle	Bundles the virtual edge inputs for a particular LED.
vcg	Specifies the virtual carrier group assigned to the logical edge device

show interfaces video accounting

To display the video service interface information, use the **show interface video accounting** command in privileged EXEC mode.

show interface video *slot/port/interface* **accounting**

Syntax Description

slot	Slot where the line card resides. The valid range is from 0 to 15.
port	The bay in a SIP where a SPA is located. The valid values are 0 and 1.
interface	Specifies the video interface number. The valid range is from 0 to 63.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command displays the video service interface information.

Examples

The following is a sample output of the**show interface video accounting** command on a Cisco cBR-8 router:

```
Router# show interface video 3/0/0 accounting
Video3/0/0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                      IP          0          0       8849     857276
                 DEC MOP          0          0        269      16947
                     ARP          0          0          4        112
```

Related Commands

Command	Description
logical-edge-device	Define a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
vei-bundle	Bundles the virtual edge inputs for a particular LED.

show interfaces VirtualPortGroup

To verify the VirtualPortGroup interface state, use the **show interfaces VirtualPortGroup** command in privileged EXEC mode.

show interfaces VirtualPortGroup *number*

Syntax Description

number	Displays the information of the VirtualPortGroup with this number.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to verify the VirtualPortGroup interface state.

The following sample output shows the VirtualPortGroup interface state:

```
show interfaces VirtualPortGroup0
VirtualPortGroup0 is up, line protocol is up
Hardware is Virtual Port Group, address is badb.ad09.7077 (bia badb.ad09.7077)
Internet address is 1.22.2.1/24
MTU 1500 bytes, BW 2500000 Kbit/sec, DLY 1000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not supported
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output 00:24:14, output hang never
Last clearing of "show interface" counters never
Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicasts)
0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 input packets with dribble condition detected
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 0 interface resets
0 unknown protocol drops
Cisco Converged Broadband Routers Software Configuration Guide For Video
42
How to Configure the Management IP Interface
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out
```

Related Commands

Command	Description
interface	Defines a VirtualPortGroup interface.
show run interface VirtualPortGroup	Displays the VirtualPortGroup interface configuration.
show run | include mgmt-intf	Displays the cable video management interface configuration.
mgmt-intf	Defines a cable video management interface.

show interface wideband-cable

To display the current configuration and status for a wideband channel, use the **show interface wideband-cable** command in privileged EXEC mode.

Cisco uBR10012 Universal Broadband Router

Cisco IOS Releases 12.3(23)BC and 12.2(33)SCA

show interface wideband-cable *slot/subslot/bay:wideband_channel*[*options*]
Cisco IOS Release 12.2(33)SCB

show interface wideband-cable *slot/bay/port:wideband_channel* [*options*]
Cisco IOS Release 12.2(33)SCC

show interface wideband-cable *slot/subslot/port:wideband_channel* [*options*]

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers

Cisco IOS Release 12.2(33)SCD

show interface wideband-cable *slot/port:wideband_channel* [*options*]

Cisco cBR Series Converged Broadband Router
show integrated wideband-cable *slot/subslot/port: wideband-Cable-interface-number*[*options*]

Syntax Description

slot	Slot where a SIP or line card resides. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR7225VXR router—The valid range is from 1 to 2. • Cisco uBR10012 router—The valid range is from 5 to 8, and slots 1 and 3 can be used for SIP. • Cisco cBR router—The valid range is 0 to 3 and 6 to 9.
subslot	Secondary slot number of the SIP or a cable interface line card. Cisco uBR10012 —The valid subslots is 0. Cisco cBR router—The valid value is 0.
bay	Bay in a SIP where a SPA is located. Valid values are 0 (upper bay) and 1 (lower bay).
port	Specifies the port number. • Cisco uBR7246VXR router and Cisco uBR7225VXR router—The valid range is from 0 to 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface). • Cisco cBR router—The valid range is 0 to 15.
wideband-channel	Represents the wideband channel number. Valid values are from 0 to 31. On the Cisco uBR7246VXR and Cisco uBR7225VXR routers, the valid values are from 0 to 5.

options	The following non-cable specific options generate information for wideband cable interfaces: • **accounting**—Displays the number of packets of each protocol type that was sent through the interface. • **description**—Displays the description entered for the interface. • dbs—Displays DBS scheduler information. The dbs option is available only on the Cisco uBR7225VXR and Cisco uBR7246VXR routers. • **downstream**—Displays the downstream information. • **multicast-sessions**—Displays information about the multicast sessions on a specific wideband-cable interface. • **privacy**—Displays privacy group information. • service-flow—Displays the attribute-based assignment of service flows on a cable interface. • **stats**—Displays packets that were switched. • **summary**—Displays interface summary information. The following additional non-cable specific options generate information for wideband cable interfaces on the Cisco cBR router: • **controller**—Displays the status of the interface, configuration, and controller. • **counters**—Displays the wideband cable interface counters. • **crb**—Displays the interface routing and bridging information. • dbs—Displays the Dynamic Bandwidth Sharing (DBS) scheduler information. • **history**—Displays the interface history on the Cisco cBR router. • **human-readable**—Displays the interfaces output with larger numbers separated by comma(s) on the Cisco cBR router. • **irb**—Displays the interface routing and bridging information. • **mac-accounting**—Displays the interface MAC accounting information. • **monitor**—Displays the status of the interface continuously. • **mpls-exp**—Displays the interface Multiprotocol Label Switching (MPLS) experimental accounting information. • **multicast-gcr**—Displays the multicast QoS (MQoS) GCR details. • **precedence**—Displays interface precedence accounting information. • **stats—**Displays packets that are switched. • **summary**—Displays interface summary information.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(21)BC	This command was introduced on the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCB	This command was modified to change the addressing format for a wideband cable interface from *slot/subslot/bay* to *slot/bay/port*.

Release	Modification
12.2(33)SCD	This command was modified. Support was added for Cisco uBR7225VXR and Cisco uBR7246VXR routers. The dbs, and service-flow keywords were added.
12.2(33)SCF	This command was modified. The downstream keyword was enhanced to capture fairness across DOCSIS interfaces related information.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The following keywords were added: • **controller** • **counters** • **crb** • **history** • **human-readable** • **irb** • **mac-accounting** • **monitor** • **mpls-exp** • **multicast-gcr** • **precedence** • **stats—** • **summary**

Usage Guidelines

Some of the non-cable specific options do not generate any meaningful information for wideband cable interfaces. For information on the non-cable specific options, see the Cisco IOS Release 12.3 documentation on Cisco.com .

In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

Examples

This example shows the output for the **show interface wideband-cable** command:

```
Router# show interface wideband-cable 1/0/0:1

Wideband-Cable1/0/0:1 is up, line protocol is up
  Hardware is Wideband CMTS Cable interface, address is 0012.001a.8897 (bia 0012.001a.8897)

  MTU 1500 bytes, BW 74730 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 00:00:09, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
```

```
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     24224 packets output, 1222002 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

This example shows the output for the **show interface wideband-cable accounting** command:

```
Router# show interface wideband-cable 1/0/0:0 accounting
Wideband-Cable1/0/0:1
               Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                     IP          0          0   56493807 7909133546
```

This example shows the output for the **show interface wideband-cable description** command:

```
Router# show interface wideband-cable 1/0/0:0 description
Interface                      Status         Protocol Description
Wi1/0/0:1                      up             up
```

This example shows the output for the **show interface wideband-cable dbs** command:

```
Router# show interface wideband-cable 3/0:0 dbs
Dynamic Bandwith Sharing is enabled
bg_rf_channel_bitmap_local B, active 0
RF 0: tokens 23254, active 0, policer 4687 KB/s, max_tokens 23435
      deficit counter 0, quantum 2000
      ticks_limit: 62500, max_ticks:625000, policer(ticks): 312
RF 1: tokens 23249, active 0, policer 4687 KB/s, max_tokens 23435
      deficit counter 0, quantum 5000
      ticks_limit: 62500, max_ticks:625000, policer(ticks): 312
RF 3: tokens 23249, active 0, policer 4687 KB/s, max_tokens 23435
      deficit counter 0, quantum 10000
```

This example shows the output for the **show interface wideband-cable service-flow** command:

```
Router# show interface wideband-cable 3/0:0 service-flow
Sfid  Sid   Mac Address     QoS Param Index Type  Dir Curr   Active  DS-ForwIf/
                           Prov  Adm  Act            State  Time    US-BG/CH
3     8193  ffff.ffff.ffff   3     3    3   S(s)  DS  act    2h06m   Wi5/1:0
```

This example shows the output for the **show interface wideband-cable privacy** command:

```
Router# show interface wideband-cable 1/0/0:1 privacy all
EAE Configuration
 Policy: EAE Enforcement disabled
KEK Configuration
 KEK lifetime: 604800
 Auth Infos: 0
 Auth Requests: 0, Auth Replies: 0
 Auth Rejects: 0, Auth Invalids: 0
 Packet Buffer Failures: 0
TEK Configuration
 TEK lifetime: 43200
 TEK Requests: 0, TEK Replies: 0
 TEK Rejects: 0, TEK Invalids: 0
 SAMap Requests: 0, SAMap Replies: 0
 SAMap Rejects: 0
Interface Configuration
 SelfSigned Trust: Untrusted
 Check Cert Validity Periods: True
```

This example shows the output for the **show interface wideband-cable stats** command:

```
Router# show interface wideband-cable 1/0/0:1 stats
Wideband-Cable1/0/0:1
          Switching path    Pkts In   Chars In   Pkts Out  Chars Out
               Processor          0          0          0          0
            Route cache           0          0   56493807 7909133546
                  Total           0          0   56493807 7909133546
```

This example shows the output for the **show interface wideband-cable summary** command:

```
Router# show interface wideband-cable 1/0/0:1 summary
*: interface is up
 IHQ: pkts in input hold queue     IQD: pkts dropped from input queue
 OHQ: pkts in output hold queue    OQD: pkts dropped from output queue
 RXBS: rx rate (bits/sec)          RXPS: rx rate (pkts/sec)
 TXBS: tx rate (bits/sec)          TXPS: tx rate (pkts/sec)
 TRTL: throttle count
  Interface                   IHQ       IQD       OHQ       OQD      RXBS      R
XPS      TXBS      TXPS      TRTL
------------------------------------------------------------------------------
---------------------------------
*Wideband-Cable1/0/0:1          0         0         0         0         0
  0         0         0         0
```

This example shows the output for the **show interface wideband-cable multicast-sessions** command:

```
Router# show interface wideband-cable 7/0/0:0 multicast-sessions
Default Multicast Service Flow 3 on Wideband-Cable7/0/0:0
Multicast Group    : 230.1.1.1
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     1    8200    4       30    1      1
```

Table 243: show interface wideband-cable Field Descriptions

Field	Description
Wideband-Cable slot/subslot/bay:wb-channel is up/...administratively down	Indicates whether the interface hardware is currently active or taken down by the administrator.
line protocol is up/...administratively down	Indicates whether the software processes that handle the line protocol believe the interface is usable or if it has been taken down by the administrator.
hardware	Hardware type and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit (MTU) of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.

Field	Description
rely	Reliability of the interface as a fraction of 255, calculated as an exponential average over 5 minutes. (For example, 255/255 is 100 percent reliability.)
load	Load on the interface as a fraction of 255, calculated as an exponential average over 5 minutes. (For example, 255/255 is complete saturation.)
Encapsulation	Encapsulation method assigned to this interface.
Keepalive set	Keepalive time interval.
ARP type	Type of Address Resolution Protocol (ARP) and timeout value assigned.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface.
output	Number of hours, minutes, and seconds since the last packet was successfully sent by an interface.
Last clearing of "show interface" counters	Time at which the counters that measure cumulative statistics (such as number of bytes sent and received) were last reset to zero.
Queueing strategy	Displays the type of queueing configured for this interface. In the following example output, the type of queueing configured is first-in first-out (FIFO).
Output queue	Number of packets in the output queue. The format of this number is A/B, where A indicates the number of packets in the queue, and B indicates the maximum number of packets allowed in the queue.
drops	Indicates the number of packets dropped because of a full queue.
input queue/drops	Number of packets in the input queue. The format of this number is A/B, where A indicates the number of packets in the queue, and B indicates the maximum number of packets allowed in the queue.
drops	Indicates the number of packets dropped because of a full queue.
Five minute input rate Five minute output rate	Average number of bits and packets sent per second in the last five minutes. The five-minute interval is the default time period for statistics collection and can be changed for each individual cable interface using the **load-interval** command in interface configuration mode.

Field	Description
Note These statistics are calculated using a decayed averaging method, where only the average is stored over the interval period, not the individual samples. Every time a sample average is taken, a percentage of the sample and a percentage of the average are added together to create the new average. If traffic stops for a time period, these statistics do not immediately go to zero but drop with a decay rate of about 70 percent per time period. For example, if the interface is passing 1,000 packets per second (pps) before traffic stops, the **show interface cable** command shows the rate being 300 pps at the end of the first time interval. The rate then drops to 90 pps at the end of the second time interval, and so forth.	
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system.
Received broadcast	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they are bigger than the standard Ethernet Maximum Transmission Unit (MTU) size. For Ethernet packets, RFC 1757 defines giants as "the total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed." **Note** In addition, to account for the different Ethernet and other packet encapsulations on the network, packets are considered giants when they exceed the configured MTU size plus 114 bytes.

Field	Description
input errors	Total number of errors received on the interface. This count includes runts and giants, which are shown above, as well as other errors, such as no buffers, and CRC, frame, overrun, and ignored counts. This count can also include DOCSIS protocol errors such as an invalid SID in the DOCSIS frame, a bad extended header length, corrupted concatenated packets, and invalid bandwidth requests.
CRC	Indicates the number of times the cyclic redundancy checksum (CRC) generated by the originating LAN station or far-end device does not match the checksum calculated from the data received.
frame	Number of packets received incorrectly having a CRC error and a non-integer number of octets.
overrun	Number of times the receiver hardware was unable to forward received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers.
packets output	Total number of messages sent by the system.
bytes	Total number of bytes, including data and MAC encapsulation, sent by the system.
underruns	Number of times the sender has been running faster than the receiving device can handle.
output errors	Sum of all errors that prevented the final transmission of packets out of the interface being examined.
collisions	Not applicable.
interface resets	Number of times an interface has been completely reset.
output buffer failures	Number of times the output buffer has failed.
output buffer swapped out	Number of times the output buffer has been swapped out.
sfid	Service flow identification number.
sid	Service identification number (upstream service flows only).
QoS Prov	QoS parameter index for the provisioned state of this flow.
Param Adm	QoS parameter index for the Admitted state of this flow.
Index Act	QoS parameter index for the Active state of this flow.

Field	Description
Type	Indicates if the service flow is the primary flow or a secondary service flow. Secondary service flows are identified by an "S" (created statically at the time of registration, using the DOCSIS configuration file) or "D" (created dynamically by the exchange of dynamic service messages between the CM and CMTS).
Dir	Indicates if this service flow is downstream (DS) or upstream (US).
Curr State	Current run-time state of the service flow.
Active Time	Length of time this service flow has been active.
DS-ForwIf/US-BG/CH	Bonding group ID or the downstream RFID of the forwarding interface assigned to the downstream service flow.

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output for the **show interface wideband-cable human-readable** command:

```
Router#show interface wideband-cable 3/0/0:0 human-readable
Wideband-Cable3/0/0:0 is up, line protocol is up
  Hardware is CMTS WB interface, address is c414.3c17.1dcb (bia c414.3c17.1dcb)
  MTU 1500 bytes, BW 150000 Kbit/sec, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 112500 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts (0 multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 unknown protocol drops
     0 output buffer failures, 0 output buffers swapped out
Router#
```

Related Commands

Command	Description
show interface cable downstream	Displays information about the downstream on the cable interface.

Command	Description
show interface cable sid	Displays information by service identifier (SID) of each CM on the network.
show interface cable signal-quality	Displays information about the cable signal quality.
show interface cable upstream	Displays information about one or all upstreams on the cable interface.

show interface wideband-cable multicast-sessions

To display information about multicast sessions on a specific wideband-cable interface, use the **show interface wideband-cable multicast-sessions** command in privileged EXEC mode.

show interface wideband-cable *slot/* {*subslot bay*}*/port:wideband-channel* [**group** | [*ipv4-MQoS-group ipv6-MQoS-group*] | **latency** | **sid** [*MQoS-sid*]]

Cisco cBR Series Converged Broadband Router
show interface wideband-cable *slot/* {*subslot bay*}*/port:wideband-channel*

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3, and 6 to 9.
subslot	Subslot where a SIP resides. On the Cisco uBR10012 router, the subslot 0 is always specified. On the Cisco cBR router, the subslot is always 0.
bay	Bay in a SIP where a SPA is located. The valid values are 0 (upper bay) and 1 (lower bay).
port	Downstream port number. • Cisco uBR7246VXR router and Cisco uBR7225VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface). • Cisco cBR router—The valid range is 0 to 7.
wideband-channel	Wideband channel number. The valid range is from 0 to 11. On the Cisco uBR7246VXR and Cisco uBR7225VXR routers, the valid range is from 0 to 5.
wideband-cable-interface	Wideband cable interface On the Cisco cBR router, the valid range is 0 to 63.
group [*ipv4-MQoS-group* | *ipv6-MQoS-group*]	Displays information about the specified IPv4 or IPv6 multicast quality of service (MQoS) group.
latency	Displays information about the multicast session latency.
sid [*MQoS-sid*]	Displays information about the MQoS service identifier (SID). The value of the SID ranges from 8192 to 12272.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. This command was modified to change the addressing format for a wideband cable interface from *slot/subslot/bay* to *slot/bay/port* .
12.2(33)SCF	This command was modified. The **latency** keyword was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The *wideband-channel* variable was removed and the *wideband-cable-interface* was added. The **group** , **latency** and **sid** keywords was also removed.

Examples

The following is a sample output from the **show interface wideband-cable multicast-sessions** command:

```
Router# show interface wideband-cable 1/0/0:0 multicast-sessions
Default Multicast Service Flow 3 on Wideband-Cable1/1/0:0
Multicast Group    : 230.1.2.3
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     1    8196    4       0     1      0
```

The following is a sample output from the **show interface wideband-cable multicast-sessions group** command:

```
Router# show interface wideband-cable 1/0/0:0 multicast-sessions group 230.1.2.3
Multicast Group    : 230.1.2.3
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
                     1    8196    4       0     1      0
```

The following is a sample output from the **show interface wideband-cable multicast-sessions latency** command:

```
Router# show interface wideband-cable 1/0/0:0 multicast-sessions latency
Session (S,G) : (*,230.1.2.3)
Fwd Intfc     : Wi1/1/0:0
MQoS Entered at        MQoS Exit at
Mar 6 23:13:12.383     Mar 6 23:13:12.383
GC   SAID   SFID   SF req               SF rsp
1    8196   4      Mar 6 23:13:12.383  Mar 6 23:13:12.387
```

The following is a sample output from the **show interface wideband-cable multicast-sessions sid** command:

```
Router# show interface wideband-cable 1/0/0:0 multicast-sessions sid 8196
Multicast Group    : 230.1.2.3
         Source    : N/A
         Act GCRs  : 1
         Interface : Bu1                   State: A      GI: Bu1         RC: 0
         GCR       : GC   SAID    SFID    Key   GQC    GEn
```

```
1     8196    4       0     1       0
```

Related Commands

Command	Description
show interface modular-cable multicast-sessions	Displays the information about multicast sessions on a specific modular-cable interface.
show interface cable multicast-sessions	Displays the information about the multicast sessions on a specific cable interface.
show interface wideband-cable	Displays the current configuration and status for a wideband channel.

show interface wideband-cable queue

To display the downstream hierarchical queueing framework (HQF) queue information for a wideband channel, use the **show interface wideband-cable queue** command in privileged EXEC mode.

show interface wideband-cable *slot/port:wideband-channel* [**queue** | [**cblt** | {*cblt-index* | **priority** } | **pblt** | **verbose**]]

Syntax Description

slot/port	• Slot on the Cisco uBR7246VXR router. The valid values are:
	  • slot—3 to 6
	  • port—0 or 1 (depending on the cable interface)
	• Slot on the Cisco uBR7225VXR router. The valid values are:
	  • slot—1 and 2
	  • port—0 or 1 (depending on the cable interface)

wideband-channel	Wideband channel number. Valid values range from 0 to 7.
queue	(Optional) Displays downstream HQF queue information.
cblt	(Optional) Displays detailed class layer bandwidth limited traffic (CBLT) stream information for normal downstream HQF queues.
cblt-index	CBLT index information.
priority	Displays CBLT information for priority HQF queues. Priority queues do not have any indexes.
pblt	(Optional) Displays detailed physical layer bandwidth limited traffic (PBLT) stream information for normal HQF queues.
verbose	(Optional) Displays detailed information for all queues.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCD	This command was introduced for the Cisco uBR7246VXR and Cisco uBR7225VXR routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output of the **show interface wideband-cable queue** command:

```
Router# show interface wideband-cable 3/0:0 queue
*   idx/gqid   Len/Limit     Deqs      Drops    CIR       MIR/PR    SFID        ForwInt
               pkts           pkts      pkts     kbps       kbps
```

```
BE Queues:
I     0/1      0/128          700       0        0           0/0    C5/0:11     In5/0:0
      1/44     0/128            0       0        0       10000/0    C5/0:11     In5/0:0

CIR Queues:
     33/97     0/128   1      14374     0        100     15000/0    C5/0:15     In5/0:0

Low Latency Queues:
~     51/124   0/128   1      14374     0        100       100/0    C5/0:15     In5/0:0
$     0/0      0/128   1      14374     0        100       100/0          -     In5/0:0
```

The following is a sample output of the **show interface wideband-cable queue verbose** command:

```
Router# show interface wideband-cable 3/0:0 queue verbose
Interface Number 5 (type 25) Integrated Cable 3/0:0
 OUTPUT FEATURES
   blt (0x63D90FA0, index 0, qid 0, fast_if_number 5) layer PHYSICAL
   scheduling policy: WFQ (111)
   classification policy: CLASS_BASED (122)
   drop policy: TAIL (141)
   packet size fixup policy: NONE (0)   no of global policers: 0
   blt flags: 0x220000    scheduler: 0x63DFDBE0
  total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 0 total active
 0
   txcount 26131 txqbytes 2030784 drops 0 qdrops 0 nobuffers 0 flowdrops 0
   qsize 0 aggregate limit/bytes 1000/0 availbuffers 1000
   holdqueue_out 1000 perc 0.00 remaining_ratio/perc 0
   visible_bw 37500 max_rate 37500 allocated_bw 37500 vc_encap 0 ecn_threshold NONE
   weight A 1 quantum A 1500 credit A 1500
   weight B 1 quantum B 1500 credit B 1500
   min-rate tokens: 13000, credit: 0, depth: 13000
   backpressure_policy 0 scheduler_flags C03B
   last_sortq[A/B] 0/0, remaining pak/particles 0/0
   leaf_blt[P1] 0x63DFDBE0 burst packets/bytes[P1] 0/0
   leaf_blt[P2] 0x63DFDBE0 burst packets/bytes[P2] 0/0
   leaf_blt[NOTP] 0x63DFDBE0 burst packets/bytes[NOTP] 0/0
 (max entries 1000)
     next layer HQFLAYER_CLASS_HIER0 (max entries 1000)
     blt (0x63D90EE0, index 0, qid 1, fast_if_number 5) layer CLASS_HIER0
     scheduling policy: FIFO (110)
     classification policy: NONE (120)
     drop policy: TAIL (141)
     packet size fixup policy: NONE (0)   no of global policers: 0
     blt flags: 0x220000    scheduler: 0x63DFDB20
     total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 0 total
active 1
     txcount 167 txqbytes 12912 drops 0 qdrops 0 nobuffers 0 flowdrops 0
     qsize 0 aggregate limit/bytes 1000/0 availbuffers 1000
     holdqueue_out 0 perc 100.00 remaining_ratio/perc 0
     visible_bw 37500 max_rate 37500 allocated_bw 37500 vc_encap 0 ecn_threshold NONE
     weight A 1 quantum A 1500 credit A 1500
     weight B 1 quantum B 1500 credit B 1500
     min-rate tokens: 18750, credit: 0, depth: 18750
     backpressure_policy 0 scheduler_flags C03B
     last_sortq[A/B] 55/11, remaining pak/particles 0/0
     leaf_blt[P1] 0x63DFDB20 burst packets/bytes[P1] 0/0
     leaf_blt[P2] 0x63DFDB20 burst packets/bytes[P2] 0/0
     leaf_blt[NOTP] 0x63DFDB20 burst packets/bytes[NOTP] 1/80
```

The following is a sample output of the **show interface wideband-cable queue cblt cblt-index** command:

```
Router# show interface wideband-cable 3/0:0 queue cblt 1
```

```
    blt (0x65CE3EA0, index 1, qid 45, fast_if_number 19) layer CLASS_HIER0
    scheduling policy: FIFO (110)
    classification policy: NONE (120)
    drop policy: TAIL (141)
    packet size fixup policy: NONE (0)   no of global policers: 0
    D/Traffic Shaping enabled
    blt flags: 0x22A208C    scheduler: 0x65D504C0
    total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 1000 total
active 1
    D/Traffic Shaping enabled
    txcount 890 txqbytes 63900 drops 0 qdrops 0 nobuffers 0 flowdrops 0
    qsize 0 aggregate limit/bytes 128/100000 availbuffers 128
    holdqueue_out 0 perc 0.00 remaining_ratio/perc 11
    visible_bw 0 max_rate 4000 allocated_bw 0 vc_encap 0 ecn_threshold NONE
    weight A 1 quantum A 1500 credit A 1500
    weight B 1 quantum B 1500 credit B 1500
    min-rate tokens: 1500, credit: 0, depth: 1500
    backpressure_policy 0 scheduler_flags C03F
    last_sortq[A/B] 0/0, remaining pak/particles 0/0
    leaf_blt[P1] 0x65D504C0 burst packets/bytes[P1] 0/0
    leaf_blt[P2] 0x65D504C0 burst packets/bytes[P2] 0/0
    leaf_blt[NOTP] 0x65D504C0 burst packets/bytes[NOTP] 0/0
    OUTPUT Shaping
      Bc internal 0 Be internal 0 Time interval 4
      increment 4000 increment_lower 0 increment_limit 4000
      last visit 87456736 credit 0 outstanding_tokens 23760 maxtokens 24352
      peak_rate_credit 0 peak_rate_tokens 0 peak_rate_increment 0
      system timer delayed 0 restart timer 0
      timer set 0 hqf_shape_running 17254
      nextexpire_system_time 0 nextexpire_time_qindex -1
```

The following is a sample output of the **show interface wideband-cable queue cblt priority** command:

```
Router# show interface wideband-cable 3/0:0 queue cblt priority
    blt (0x19FA9300, index 0, qid 52, fast_if_number 20) layer CLASS_HIER0
    scheduling policy: FIFO (110)
    classification policy: NONE (120)
    drop policy: TAIL (141)
    packet size fixup policy: NONE (0)   no of global policers: 0
    blt flags: 0x200800    scheduler: 0x1A015CC0
    total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 9500 total
active 1

    txcount 114 txqbytes 12864 drops 0 qdrops 0 nobuffers 0 flowdrops 0
    qsize 0 aggregate limit/bytes 128/0 availbuffers 128
    holdqueue_out 0 perc 0.00 remaining_ratio/perc 0
    visible_bw 0 max_rate 37500 allocated_bw 0 vc_encap 0 ecn_threshold NONE
    weight A 1 quantum A 1500 credit A 1500
    weight B 1 quantum B 1500 credit B 1500
    min-rate tokens: 1500, credit: 0, depth: 1500
    backpressure_policy 0 scheduler_flags C83F
    last_sortq[A/B] 0/0, remaining pak/particles 0/0
    leaf_blt[P1] 0x1A015CC0 burst packets/bytes[P1] 0/0
    leaf_blt[P2] 0x1A015CC0 burst packets/bytes[P2] 0/0
    leaf_blt[NOTP] 0x1A015CC0 burst packets/bytes[NOTP] 0/0
PRIORITY LEVEL 1: total bandwidth 500 kbps, total percent 0%
```

The following is a sample output of the **show interface wideband-cable queue pblt** command:

```
Router# show interface wideband-cable 3/0:0 queue pblt
   blt (0x19FB4700, index 0, qid 0, fast_if_number 20) layer PHYSICAL
   scheduling policy: WFQ (111)
```

```
  classification policy: CLASS_BASED (122)
  drop policy: TAIL (141)
  packet size fixup policy: NONE (0)   no of global policers: 0
  blt flags: 0x220000    scheduler: 0x1A0210C0
 total guarantee percent 0 total remaining perc 0 total bandwidth guarantee 0 total active
0
  txcount 67743 txqbytes 6281007 drops 2 qdrops 0 nobuffers 0 flowdrops 0
  qsize 0 aggregate limit/bytes 8000/0 availbuffers 8000
  holdqueue_out 1000 perc 0.00 remaining_ratio/perc 0
  visible_bw 37500 max_rate 37500 allocated_bw 18000 vc_encap 0 ecn_threshold NONE
  weight A 1 quantum A 1500 credit A 1500
  weight B 1 quantum B 1500 credit B 1500
  min-rate tokens: 13000, credit: 0, depth: 13000
  backpressure_policy 1 scheduler_flags C03F
  last_sortq[A/B] 0/0, remaining pak/particles 0/0
  leaf_blt[P1] 0x1A0210C0 burst packets/bytes[P1] 0/0
  leaf_blt[P2] 0x1A0210C0 burst packets/bytes[P2] 0/0
  leaf_blt[NOTP] 0x1A0210C0 burst packets/bytes[NOTP] 0/0
```

The table below describes the fields shown in the **show interface wideband-cable queue command** display.

Table 244: show interface wideband-cable queue Field Descriptions

Field	Description
Len/Limit Pkts	Queue length and limit in packets.
Deqs Pkts	Dequeue packets
Drops Pkts	Dropped packets.
CIR Kbps	Committed information rate.
MIR/PR Kbps	Maximum information and peak rate.
Forwint	Forwarding interface.
BE Queues	Best effort queues.
CIR Queues	Committed information rate queues.
Low Latency Queues	Low latency queues.

Related Commands

Command	Description
show interface cable	Displays the configuration and status of a cable interface.
show interface modular-cable	Displays the configuration and status of a modular cable interface.
show interface wideband-cable	Displays the configuration and status of a wideband channel.

show ip arp vrf

To view which virtual routing and forwarding (VRF) instance contains a specific cable modem in the Address Resolution Protocol (ARP) cache table, use the **show ip arp vrf** command in privileged EXEC mode.

show ip arp vrf WORD

Syntax Description

WORD	VRF name.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

The following is sample output from the **show ip arp vrf** command:

```
Router # show ip arp vrf vrfa

Protocol  Address             Age (min)  Hardware Addr   Type   Interface
Internet  203.0.113.1               0   0018.742c.6e00  ARPA   FastEthernet0/0/0
Internet  203.0.113.2               -   0014.f1e4.fb58  ARPA   FastEthernet0/0/0
Internet  198.51.100.1              -   0014.f1e4.fc31  ARPA   Bundle1.2
Internet  198.51.100.2              0   001e.6bfb.34e8  ARPA   Bundle1.2
Internet  198.51.100.3              0   0007.0e07.9f1f  ARPA   Bundle1.2
Internet  198.51.100.5              0   0025.2eaf.6bea  ARPA   Bundle1.2
Internet  198.51.100.6              0   001a.c3ff.d1a4  ARPA   Bundle1.2
Internet  198.51.100.7              0   001e.6bfb.1c7e  ARPA   Bundle1.2
```

The table describes the significant fields shown in the display.

Table 245: show ip arp vrf Field Descriptions

Field	Description
Protocol	Protocol for network address in the Address field.
Address	The network address that corresponds to the IPv4 address.
Age (min)	Age of the cache entry (in minutes). A hyphen (-) means the address is local.
Hardware Addr	LAN hardware address of a MAC address that corresponds to the network address.

Field	Description
Type	Encapsulation type for the network address. The valid values include: • ARPA • SNAP • SAP
Interface	Interface associated with the specified network address.

This example shows the output of the **show ip arp vrf** command for the Cisco cBR router.

```
Router#show ip arp vrf Tennis 112.59.130.96
Load for five secs: 13%/3%; one minute: 18%; five minutes: 18%
Time source is NTP, 13:42:16.864 CST Tue May 12 2015

Protocol  Address          Age (min)  Hardware Addr   Type   Interface
Internet  112.59.130.96           1   c0c6.872f.a512  ARPA   Bundle255.5

interface Bundle255.5
vrf forwarding Tennis
ip dhcp relay information option-insert
 ip address 112.61.0.1 255.255.0.0 secondary
ip address 112.60.0.1 255.255.0.0 secondary
ip address 112.59.0.1 255.255.0.0
ip pim sparse-mode
ip rip authentication mode md5
ip rip authentication key-chain ubr-rip
ip verify unicast reverse-path allow-self-ping
ip access-group HSI-RCM-OUT in
ip access-group HSI-RCM-OUT out
ip policy route-map RouteISP
no cable nd
no cable arp
cable ipv6 source-verify dhcp
cable source-verify dhcp
cable dhcp-insert hostname
cable dhcp-insert upstream-description
cable dhcp-insert downstream-description
cable dhcp-giaddr policy
cable dhcp-giaddr policy mta 112.61.0.1
cable helper-address 20.11.0.62 cable-modem
cable helper-address 20.11.0.62 host
cable helper-address 20.11.0.62 stb
cable helper-address 20.11.0.62 ps
cable helper-address 20.1.0.5 mta
cable helper-address 20.11.0.162
ipv6 address 2001:100:112:B009::1/64
```

Related Commands

Command	Description
cable source-route	Configures the VRF source route on the cable modem in subinterface configuration mode.
cable vrf-steering cable-modem	Steers or directs the cable modems to the specified VRF.
ip vrf	Defines a VRF instance and enters the interface configuration mode.

show ip interface brief

To display a brief summary of an interface's IP information and status, to include virtual interface bundle information, use the **show ip interface brief** command in privileged EXEC mode.

show ip interface brief

Syntax Description

This command has no additional keywords or arguments.

Command Default

Virtual Interface Bundling is enabled by default in Cisco IOS Release 12.3(21)BC and later releases.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(21)BC	Support was added for virtual interface bundling configured with upgrade to Cisco IOS Release 12.3(21)BC and later releases.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

Refer to the following document on Cisco.com for additional information about cable interface bundling and virtual interface bundling on the Cisco CMTS:

- *Cable Interface Bundling and Virtual Interface Bundling on the Cisco CMTS*

Examples

The following example illustrates a virtual interface bundle with the **show ip interface brief** command:

```
Router# show ip interface brief
Interface                  IP-Address        OK? Method Status                Protocol
FastEthernet0/0/0          209.165.200.225   YES NVRAM  up                    up
POS1/0/0                   unassigned        YES NVRAM  up                    up
GigabitEthernet2/0/0       209.165.201.1     YES NVRAM  up                    up
GigabitEthernet1/0/0       209.165.201.2     YES NVRAM  up                    up
GigabitEthernet4/0/0       209.165.201.6     YES NVRAM  down                  down
Cable8/1/0                 unassigned        YES NVRAM  up                    up
Cable8/1/1                 unassigned        YES NVRAM  up                    up
Cable8/1/2                 unassigned        YES NVRAM  up                    up
Cable8/1/3                 unassigned        YES NVRAM  up                    up
Cable8/1/4                 unassigned        YES NVRAM  up                    up
Bundle1                    209.165.202.129   YES TFTP   up                    up
Router#
```

This example shows the output of the **show ip interface brief** command on the Cisco cBR Series Converged Broadband Router:

```
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
Cable1/0/0             unassigned      YES unset  initializing          down
Video1/0/0             unassigned      YES unset  up                    up
Cable1/0/1             unassigned      YES unset  initializing          down
Cable1/0/2             unassigned      YES unset  initializing          down
Cable1/0/3             unassigned      YES unset  initializing          down
```

```
Cable1/0/4             unassigned      YES unset  initializing          down
Cable1/0/5             unassigned      YES unset  initializing          down
Cable1/0/6             unassigned      YES unset  initializing          down
Cable1/0/7             unassigned      YES unset  initializing          down
Cable1/0/8             unassigned      YES unset  initializing          down
Cable1/0/9             unassigned      YES unset  initializing          down
Cable1/0/10            unassigned      YES unset  initializing          down
Cable1/0/11            unassigned      YES unset  initializing          down
Cable1/0/12            unassigned      YES unset  initializing          down
Cable1/0/13            unassigned      YES unset  initializing          down
Cable1/0/14            unassigned      YES unset  initializing          down
Cable1/0/15            unassigned      YES unset  initializing          down
Te4/1/0                209.165.202.129 YES NVRAM  up                    up
Te4/1/1                unassigned      YES unset  administratively down down
Te4/1/2                unassigned      YES unset  administratively down down
Te4/1/3                unassigned      YES unset  administratively down down
Te4/1/4                unassigned      YES unset  administratively down down
Te4/1/5                unassigned      YES unset  administratively down down
Te4/1/6                unassigned      YES unset  administratively down down
Te4/1/7                unassigned      YES unset  administratively down down
Te5/1/0                unassigned      YES unset  administratively down down
Te5/1/1                unassigned      YES unset  administratively down down
```

Related Commands

Command	Description
cable bundle	Configures a cable interface to belong to an interface bundle or virtual interface bundle.
show arp	Displays the entries in the router's ARP table.
show cable bundle number forwarding-table	Displays the MAC forwarding table for the specified bundle, showing the MAC addresses of each cable modem in a bundle and the physical cable interface that it is currently using.
show cable modem	Displays the cable modems that are online both before and after cable interface bundling has been configured.
show running-config interface cable	Displays the configuration for the specified cable interface.

show ipdr collector

To display the list of sessions that the Collector is associated, use the show ipdr collector command in the privileged EXEC mode.

show ipdr collector collector_name

Syntax Description

collector_name	The name of the Collector.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show ipdr collector** command displays the collector information, message statistics and event for all the sessions that are associated with the collector .

Examples

The following example shows the sample output for the **show ipdr collector** command.

```
Router#show ipdr collector federal
Collector Name: federal, IP: 192.0.2.0, Port: 0
2001-07-05T19:28:22 Collector in session 1 Statistics:
 Transmitted 12658 Acknowledged 12658 Enqueued 12658 Lost 0
 Last Event: Event Id 1 IPDR_EVENT_SERVER_CONNECTED - INCOMING
Router(config)#
```

This example shows the output of the **show ipdr collector** command for the Cisco cBR router.

```
Router#show ipdr collector doc_test
Collector Name: doc_test, IP: 209.165.202.129, Port: 1
2012-01-13T21:08:27 Collector in session 1 Statistics:
 Transmitted 0 Acknowledged 0 Enqueued 0 Lost 0
 Last Event: N/A
Router#
```

Related Commands

Command	Description
show ipdr exporter	Displays information about the IPDR Exporter state.
ipdr collector	Configures the Internet Protocol Detail Record (IPDR) Collector details.

show ipdr exporter

To display information about the state of the IPDR Exporter, use the **show ipdr exporter** command in the privileged EXEC mode.

show ipdr exporter

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.
IOS XE Gibraltar 16.12.1	The output of this command was update to indicate the active or passive mode.

Usage Guidelines

The **show ipdr exporter** command displays information about the IPDR Exporter state. The information displayed indicates the Exporter states that are listed below.

- started
- not started
- not initialized

Starting from Cisco IOS XE Gibraltar 16.12.1, the output of this command is updated to include active and passive mode for IPDR exporter.

Examples

The following example shows the sample output for the **show ipdr exporter**command.

```
Router#show ipdr exporter
IPDR exporter is started.
```

This example shows the sample output for the **show ipdr exporter**command on the Cisco cBR router:

```
Router#show ipdr exporter
IPDR exporter is not started.
```

This example shows the sample output for the show ipdr exporter command on the Cisco cBR router starting from Cisco IOS XE Gibraltar 16.12.1:

```
Router# show ipdr exporter
Load for five secs: 7%/0%; one minute: 7%; five minutes:
7%
No time source, *15:52:25.468 CST Thu May 23 2019
IPDR exporter is started in passive
mode. Current parameters:
KeepAliveInterval :300
AckTimeInterval 60
AckSequenceInterval :200
```

Related Commands

Command	Description
show ipdr collector	Displays the collector information, message statistics and event for all the sessions that are associated with the collector.
ipdr exporter start	Starts the IPDR Exporter and connects to the collector.

show ipdr session

To display the list of sessions and session details, use the show ipdr session command in the privileged EXEC mode.

show ipdr session {**all***session_id*}

Syntax Description

all	Displays all the associated sessions and session details such as the session ID, description, and the session state.
session_id	Displays session details for a specific session ID. The valid range is 1 to 255.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show ipdr session** command displays the session details such as the session ID, description, and the session state for all sessions as well as for a specific session.

Examples

The following example shows the sample output for the all option for the **show ipdr session** command.

```
Router#show ipdr session all
Session ID: 1, Name: utilsta, Descr: test, Started: False
```

The following example shows the sample output for the *session_id* option for the **show ipdr session** command.

```
Router#show ipdr session 1
Session ID: 1, Name: utilsta, Descr: test, Started: False
2001-07-05T19:36:28 Statistics:
Transmitted 0 Acknowledged 0 Enqueued 0 Lost 0
queuedOutstanding 0 queuedUnacknowledged 0
1 Collectors in the session:
Name: federal, IPAddr: 192.0.2.0, Port: 0, Priority: 1
```

This example shows the sample output for the **show ipdr session** command on the Cisco cBR router:

```
Router#show ipdr session 1
Session ID: 1, Name: doc_test, Descr: DOC TEST, Started: False

Session Type: Ad-hoc.
```

```
Session Wrapper PID: N/A. Exporting not started.

2012-01-13T21:13:34 Statistics:
Transmitted 0 Acknowledged 0 Enqueued 0 Lost 0
queuedOutstanding 0 queuedUnacknowledged 0

1 Collectors in the session:
Name: doc_test, IPAddr: 10.12.0.210, Port: 1, Priority: 1[DISCONNECTED]


Router#show ipdr session all
Session ID: 1, Name: doc_test, Descr: DOC TEST, Started: False
Router#
```

Related Commands

Command	Description
show ipdr exporter	Displays information about the IPDR Exporter state.
ipdr collector	Configures the Internet Protocol Detail Record (IPDR) Collector details.
ipdr session	Adds a session to the IPDR Exporter.
ipdr exporter start	Starts the IPDR Exporter and connects to the collector.

show ipdr session collector

To display the details of a collector that is associated with a specific session, use the show ipdr session collector command in the privileged EXEC mode.

show ipdr session *session_id* **collector** *collector_name*

Syntax Description

session_id	The IPDR session ID. The valid range is 1 to 255.
collector_name	The name of the Collector.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show ipdr session collector** command displays the details of a collector that is associated with a specific session. Since there can be multiple collectors associated to a session, this command is used to show a specific session-collector pair.

Examples

This example shows the output for the **show ipdr session collector** command.

```
Router#show ipdr session 1 collector federal
Session ID: 1, Name: utilsta, Descr: test, Started: False
Collecotr Name: federal, IP: 192.0.2.0, Port: 0
2001-07-05T19:38:02 Collector in session 1 Statistics:
 Transmitted 0 Acknowledged 0 Enqueued 0 Lost 0
 Last Event: Event Id 0 WRONG_EVENT_ID
```

This example shows the output for the **show ipdr session collector** command on the Cisco cBR router:

```
Router#show ipdr session 1 collector collector 1
Session ID: 1, Name: TI-CM-STATUS, Descr: TI-CM-STATUS, Started: True
Collector Name: collector1, IP: 20.1.0.6, Port: 4737

2015-05-23T01:22:38 Collector in session 1 Statistics:
 Transmitted 0 Acknowledged 0 Enqueued 0 Lost 0
 Last Event: N/A
```

Related Commands

Command	Description
show ipdr session	Displays the list of sessions and session details.
show ipdr collector	Displays the list of sessions that the Collector is associated.
ipdr session	Adds a session to the IPDR Exporter.

show ipdr session template

To display the list of all active templates supported by a specific session, use the **show ipdr session template** command in the privileged EXEC mode.

show ipdr session *session_id* **template**

Syntax Description

session_id	The IPDR session ID. The valid range is 1 to 255.

Command Default

None

Command Modes

Privileged EXEC mode

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show ipdr session template** command displays the list of all active templates supported by a specific session.

Examples

This example shows the output for the **show ipdr session template** command.

```
Router#show ipdr session 1 template
Template ID: 2, Name: , Type: DOCSIS-Type, KeyNumber: 22
Session 1 has totally 1 templates.
```

This example shows the output for the **show ipdr session template** command on the Cisco cBR router:

```
Router#show ipdr session 1 template
Template ID: 8, Name:
http://www.cablelabs.com/namespaces/DOCSIS/3.0/xsd/ipdr/DOCSIS-CMTS-CM-REG-STATUS-TYPE/DOCSIS-CMTS-CM-REG-STATUS-TYPE_3.5.1-A.1.xsd,

Type: CMTS-CM-REG-STATUS-TYPE, KeyNumber: 18
Session 1 has a total of 1 templates.
```

Related Commands

Command	Description
show ipdr session	Displays the list of sessions and session details.
ipdr template	Adds an IPDR template to the IPDR Session.
ipdr session	Adds a session to the IPDR Exporter.



Cable Commands: show l through show z

- show lacp, on page 2959
- show lcha logging , on page 2964
- show lcha rfsw , on page 2966
- show license summary, on page 2967
- show logging onboard , on page 2969
- show nls, on page 2973
- show nls ag-id, on page 2975
- show nls flow, on page 2976
- show cable oudp-leak-detect, on page 2977
- show packetcable cms, on page 2979
- show packetcable event, on page 2983
- show packetcable gate, on page 2986
- show packetcable gate counter commit, on page 2990
- show packetcable gate ipv6, on page 2992
- show packetcable gate multimedia, on page 2995
- show packetcable global, on page 2999
- show platform hardware diagnostic status, on page 3003
- show platform hardware dpic, on page 3004
- show platform hardware qfp active cable dpic-lcha if-name, on page 3006
- show platform hardware qfp active cable us-mpls-tc, on page 3008
- show platform hardware qfp active feature docsis bf , on page 3010
- show platform hardware qfp active feature docsis cbl-vrf-steering, on page 3012
- show platform hardware qfp active feature docsis mpls_tc-precfy db, on page 3013
- show platform hardware qfp active infrastructure punt sbrl, on page 3014
- show platform hardware qfp active infrastructure punt summary , on page 3016
- show platform integrity, on page 3018
- show platform software cable, on page 3022
- show platform software iomd, on page 3024
- show platform software ios/cdman ipccl , on page 3026
- show platform software ios ipccl , on page 3029
- show platform software ios socket statistics 0, on page 3032
- show platform software patch, on page 3033
- show platform software ptpd stat stream , on page 3035

- show platform software punt-policer, on page 3037
- show platform software restart info, on page 3041
- show platform software trace message lc-veman LC slot number/0, on page 3043
- show ptp clock, on page 3044
- show pxf cable, on page 3047
- show pxf cable controller, on page 3053
- show pxf cable feature, on page 3055
- show pxf cable interface, on page 3057
- show pxf cable multicast, on page 3060
- show pxf cpu, on page 3061
- show pxf cpu drl-trusted-sites, on page 3078
- show pxf cpu queue wb-spa, on page 3080
- show pxf cpu statistics drl ipv4, on page 3083
- show pxf cpu statistics drl ipv6, on page 3085
- show pxf cpu statistics drl max-rate us-cable, on page 3087
- show pxf cpu statistics drl max-rate wan , on page 3088
- show pxf cpu statistics drl us-cable, on page 3089
- show redundancy , on page 3091
- show redundancy config-sync, on page 3103
- show redundancy linecard , on page 3105
- show redundancy platform, on page 3107
- show running-config interface cable, on page 3109
- show run interface VirtualPortGroup, on page 3113
- show run | se ptp , on page 3114
- show snmp | i queue, on page 3115
- show tech-support, on page 3116
- show usb-devices summary , on page 3121

show lacp

To display Link Aggregation Control Protocol (LACP) information, use the **show lacp** command in either user EXEC or privileged EXEC mode.

show lacp {*channel-group-number* {**counters** | **internal** [**detail**] | **neighbor** [**detail**] | **sys-id**}}

Syntax Description

channel-group- number	Number of the channel group. The range is from 1 to 128.
counters	Displays information about the LACP traffic statistics.
internal	Displays LACP internal information.
neighbor	Displays information about the LACP neighbor.
detail	(Optional) Displays detailed internal information when used with the **internal** keyword and detailed LACP neighbor information when used with the **neighbor** keyword.
sys-id	Displays the LACP system identification. It is a combination of the port priority and the MAC address of the device

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS 12.2(33)SCJ	This command was introduced.

Usage Guidelines

Use the **show lacp** command to troubleshoot problems related to LACP in a network.

If you do not specify a value for the argument *channel-group-number*, all channel groups are displayed.

show lacp sys-id Example

This example shows how to display the LACP system identification using the **show lacp sys-id**command:

```
Device> show lacp sys-id

8000,AC-12-34-56-78-90
```

The system identification is made up of the system priority and the system MAC address. The first two bytes are the system priority, and the last six bytes are the globally administered individual MAC address that is associated to the system.

LACP Statistics for a Specific Channel Group Examples

This example shows how to display the LACP statistics for a specific channel group:

```
Device# show lacp 1 counters

              LACPDUs         Marker       LACPDUs
Port        Sent   Recv     Sent   Recv     Pkts Err
---------------------------------------------------
Channel group: 1
  Fa4/1     8      15       0      0         3    0
  Fa4/2     14     18       0      0         3    0
  Fa4/3     14     18       0      0         0
  Fa4/4     13     18       0      0         0
```

The output displays the following information:

- The LACPDUs Sent and Recv columns display the LACPDUs that are sent and received on each specific interface.
- The LACPDUs Pkts and Err columns display the marker-protocol packets.

The following example shows output from a **show lacp***channel-group-number***counters**command:

```
Device1# show lacp 5 counters

             LACPDUs         Marker      Marker Response    LACPDUs
Port        Sent   Recv     Sent   Recv     Sent   Recv      Pkts Err
---------------------------------------------------------------------
Channel group: 5
Gi5/0/0     21     18       0      0        0      0         0
```

The following table describes the significant fields shown in the display.

Table 246: show lacp channel-group-number counters Field Descriptions

Field	Description
LACPDUs Sent Recv	Number of LACP PDUs sent and received.
Marker Sent Recv	Attempts to avoid data loss when a member link is removed from an LACP bundle.
Marker Response Sent Recv	Cisco IOS response to the Marker protocol.
LACPDUs Pkts Err	Number of LACP PDU packets transmitted and the number of packet errors.

The following example shows output from a **show lacp internal**command:

```
Device1# show lacp 5 internal

Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode       P - Device is in Passive mode
Channel group 5
                            LACP port     Admin     Oper    Port        Port
Port      Flags   State     Priority      Key       Key     Number      State
Gi5/0/0   SA      bndl      32768         0x5       0x5     0x42        0x3D
```

The following table describes the significant fields shown in the display.

Table 247: show lacp internal Field Descriptions

Field	Description
Flags	Meanings of each flag value, which indicates a device activity.
Port	Port on which link bundling is configured.
Flags	Indicators of device activity.
State	Activity state of the port. States can be any of the following: • Bndl--Port is attached to an aggregator and bundled with other ports. • Susp--Port is in suspended state, so it is not attached to any aggregator. • Indep--Port is in independent state (not bundled but able to switch data traffic). This condition differs from the previous state because in this case LACP is not running on the partner port. • Hot-sby--Port is in hot standby state. • Down--Port is down.
LACP port Priority	Priority assigned to the port.
Admin Key	Defines the ability of a port to aggregate with other ports.
Oper Key	Determines the aggregation capability of the link.
Port Number	Number of the port.
Port State	State variables for the port that are encoded as individual bits within a single octet with the following meaning: • bit0: LACP_Activity • bit1: LACP_Timeout • bit2: Aggregation • bit3: Synchronization • bit4: Collecting • bit5: Distributing • bit6: Defaulted • bit7: Expired

Internal Information About a Specific Channel Group Example

This example shows how to display internal information for the interfaces that belong to a specific channel:

```
Device# show lacp 1 internal

Flags:  S - Device sends PDUs at slow rate. F - Device sends PDUs at fast rate.
        A - Device is in Active mode.       P - Device is in Passive mode.
Channel group 1
                            LACPDUs     LACP Port    Admin   Oper    Port     Port
Port      Flags    State    Interval    Priority     Key     Key     Number   State
Fa4/1     saC      bndl     30s         32768        100     100     0xc1     0x75
Fa4/2     saC      bndl     30s         32768        100     100     0xc2     0x75
Fa4/3     saC      bndl     30s         32768        100     100     0xc3     0x75
Fa4/4     saC      bndl     30s         32768        100     100     0xc4     0x75
Device#
```

The following table describes the significant fields shown in the display.

Table 248: show lacp internal Field Descriptions

Field	Description
State	Current state of the port; allowed values are as follows: • bndl--Port is attached to an aggregator and bundled with other ports. • susp--Port is in a suspended state; it is not attached to any aggregator. • indep--Port is in an independent state (not bundled but able to switch data traffic. In this case, LACP is not running on the partner port). • hot-sby--Port is in a hot-standby state. • down--Port is down.
LACPDUs Interval	Interval setting.
LACP Port Priority	Port-priority setting.
Admin Key	Defines the ability of a port to aggregate with other ports.
Oper Key	Determines the aggregation capability of the link.
Port Number	Port number.
Port State	Activity state of the port. • See the Port State description in the show lacp internal Field Descriptions table for state variables.

Information About LACP Neighbors for a Specific Port Example

This example shows how to display the information about the LACP neighbors for a specific port channel:

```
Device# show lacp 1 neighbors

Flags:  S - Device sends PDUs at slow rate. F - Device sends PDUs at fast rate.
        A - Device is in Active mode.       P - Device is in Passive mode.
```

```
Channel group 1 neighbors
          Partner                 Partner
Port      System ID               Port Number     Age      Flags
Fa4/1     8000,00b0.c23e.d84e     0x81            29s      P
Fa4/2     8000,00b0.c23e.d84e     0x82            0s       P
Fa4/3     8000,00b0.c23e.d84e     0x83            0s       P
Fa4/4     8000,00b0.c23e.d84e     0x84            0s       P
          Port          Admin     Oper      Port
          Priority      Key       Key       State
Fa4/1     32768         200       200       0x81
Fa4/2     32768         200       200       0x81
Fa4/3     32768         200       200       0x81
Fa4/4     32768         200       200       0x81
Device#
```

The following table describes the significant fields shown in the display.

Table 249: show lacp neighbors Field Descriptions

Field	Description
Port	Port on which link bundling is configured.
Partner System ID	Peer's LACP system identification (sys-id). It is a combination of the system priority and the MAC address of the peer device.
Partner Port Number	Port number on the peer device
Age	Number of seconds since the last LACP PDU was received on the port.
Flags	Indicators of device activity.
Port Priority	Port priority setting.
Admin Key	Defines the ability of a port to aggregate with other ports.
Oper Key	Determines the aggregation capability of the link.
Port State	Activity state of the port. See the Port State description in the show lacp internal Field Descriptions table for state variables.

If no PDUs have been received, the default administrative information is displayed in braces.

Related Commands

Command	Description
clear lacp counters	Clears the statistics for all interfaces belonging to a specific channel group.
lacp port-priority	Sets the priority for the physical interfaces.
lacp system-priority	Sets the priority of the system.

show lcha logging

To display the information about the cable line card switchover event and state logs, use **show lcha logging** command in privileged EXEC mode.

show lcha logging level { **error** [{ **sort using** { { **slot** *slot number* } | {**transaction** *transaction number* } } }] } | {**info** [{ **sort using** { { **slot** *slot number* } | {**transaction** *transaction number* } } }] } | {**noise** [{ **sort using** { { **slot** *slot number* } | {**transaction** *transaction number* } } }] } | {**notice** [{ **sort using** { { **slot** *slot number* } | {**transaction** *transaction number* } } }] } | {**warning** [{ **sort using** { { **slot** *slot number* } | {**transaction** *transaction number* } } }] }

Syntax Description

error	Displays all error logs.
sort using	Sorts the records.
slot *slot number*	The line card slot number. Valid range is from 0 to 13.
transaction *transaction number*	The line card transaction number. Valid range is from 0 to 65535.
info	Displays information, notice, warning and error logs.
noise	Displays noise and other related error logs.
notice	Displays notice and other related error logs.
warning	Displays all warning and error logs.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to display the cable modem line card logs.

```
Router# show lcha logging level noise
11:02:03.313 CST Tue Nov 18 2014 [error] [slot=3] [txn=229] Peer-Up Message [tag=1011]
to slot 3 complete [36144 ms]; status=nak response
11:02:03.313 CST Tue Nov 18 2014 [error] [slot=0] [txn=229] Slot 0 downloaded
configuration for slot 3; result=peer-up notification failed
11:02:03.316 CST Tue Nov 18 2014 [noise] [slot=0] [txn=none]
lcha_plfm_get_max_port_count_for_slot: slot 0 maximum port count is 1794
11:02:03.316 CST Tue Nov 18 2014 [noise] [slot=0] [txn=none]
lcha_plfm_get_starting_port_index: slot 0 starting port count is 0
11:02:03.331 CST Tue Nov 18 2014 [note] [slot=0] [txn=none] Slot 0 is being reset
11:02:04.352 CST Tue Nov 18 2014 [note] [slot=0] [txn=none] slot 0 removed
```

Related Commands

Command	Description
show lcha rfsw	Displays the internal RF switch PIC state information.

show lcha rfsw

To display the internal RF switch PIC state information, use **show lcha rfsw** command in privileged Exec mode.

show lcha rfsw

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged Exec (#)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to display the internal RF switch PIC state information:

```
Router# show lcha rfsw
Slot 0 ====================================
Type : Secondary PIC State: normal
Slot 1 ====================================
Type : Primary PIC State: normal
```

Related Commands

Command	Description
show lcha logging	Displays information about the cable line card switchover event and state logs.

show license summary

To display the 10G and 100G WAN license information summary.

show license summary

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Privileged EXEC (#)

Release	Modification
IOS-XE 16.8.1	This command was introduced.

The command displays the following information, depending on the **cable license 100G-conversion** configuration.

- With the **cable license 100G-conversion**, the **show license summary** would display:

```
Router(config)# show license summary
-----------------------------------------
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: CBR8_DEV_1
  Virtual Account: cbr8-dev-test
  Export-Controlled Functionality: Allowed
  Last Renewal Attempt: None
  Next Renewal Attempt: Jun 13 00:47:13 2018 CST

License Authorization:
  Status: AUTHORIZED
  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Jan 14 11:25:01 2018 CST

License Usage:
  License                Entitlement tag               Count Status
  -----------------------------------------------------------------------------
  regid.2014-11.com.ci... (WAN_License)                   20 AUTHORIZED
```

- With the **no cable license 100G-conversion**, the **show license summary** would display:

```
Router(config)# show license summary
-----------------------------------------
Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: CBR8_DEV_1
  Virtual Account: cbr8-dev-test
  Export-Controlled Functionality: Allowed
  Last Renewal Attempt: None
  Next Renewal Attempt: Jun 13 00:47:13 2018 CST
```

```
License Authorization:
  Status: AUTHORIZED
  Last Communication Attempt: SUCCEEDED
  Next Communication Attempt: Jan 14 11:34:13 2018 CST

License Usage:
  License                 Entitlement tag               Count Status
  -----------------------------------------------------------------------------
  regid.2017-09.com.ci... (WAN_100G_License)                2 AUTHORIZED
```

show logging onboard

To view the OBFL logging information, use the **show logging onboard** command in privileged EXEC mode. To clear the OBFL logging information, use the **clear logging onboard** command.

show logging onboard {`slot|module|bay`} {*slotnumbersubslotnumbermodulenumber*} {`dram|message|serdes|status|temperature|uptime|voltage|firmware`}

clear logging onboard {`slot|module|bay`} {*slotnumbersubslotnumbermodulenumber*} {`dram|message|serdes|status|temperature|uptime|voltage|firmware`}

Syntax Description

slotnumber	Displays the slot information.
subslotnumber	Displays the sub slot information.
modulenumber	Displays the module information.
dram	Displays slot information.
message	Displays or clears the DRAM ECC error log.
serdes	Displays or clears the onboard serdes log.
status	Displays whether onboard logging is enabled or disabled.
uptime	Displays information such as the time when you powered on the card, the number of times the card was reset, the number of times you moved a card from one slot to another, the reason why a card was reset, the current slot in which you installed the card, and the last time when you powered on the card.
temperature	Displays the onboard temperature information.
voltage	Displays the onboard voltage information.
firmware	Displays firmware versions of slot cards such as SUP and LC and PIC cards such as SUP-PIC, RF-PIC, D-PIC and so on.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 16.8.1	The **firmware** keyword was added.Using the **uptime** keyword, you can view additional information such as: • the time when you powered on the card • the number of times the card was reset • the number of times you moved a card from one slot to another • the reason why a card was reset • the current slot in which you installed the card • the last time when you powered on the card
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use **show logging onboard slot** *slot* **message** to check OBFL messages. Use this command to identify the hardware or software-related failures.

Examples

The following is a sample output of the **show logging onboard slot** *slot* **message** command:

```
Router#  show logging onboard slot 8 message
 timestamp message

------------------------------------------------------------------------------------------------------------------------

03/09/15 18:35:29    US-PHY    1    SN Unknown Mg0 TGC-verify not sampled at frame-sync
pulse 0x4a900046, 520 times
03/09/15 18:35:29    US-PHY    1    SN Unknown Mg1 TGC-verify not sampled at frame-sync
pulse 0x4a900046, 520 times
03/09/15 18:35:29    US-PHY    1    SN Unknown Mg3 TGC-verify not sampled at frame-sync
pulse 0x4a900046, 520 times
03/09/15 18:35:29    US-PHY    1    SN Unknown Mg2 TGC-verify not sampled at frame-sync
pulse 0x4a900046, 520 times
03/09/15 18:41:59    US-PHY    1    SN Unknown Mg2 TGC-verify not sampled at frame-sync
pulse 0x389a0047, 540 times
03/09/15 18:41:59    US-PHY    1    SN Unknown Mg1 TGC-verify not sampled at frame-sync
pulse 0x389a0047, 540 times
```

The following is a sample output of the **show logging onboard slot** *slot* **voltage** command:

```
Router#show logging onboard slot R1 voltage
Name              Id    Data (mV)  Poll      Last Update
-------------------------------------------------------------------------
PSOC-MB2_20: VO   40         1791  1         01/01/12 17:03:03
PSOC-MB2_21: VO   41         3290  1         01/01/12 17:03:03
PSOC-MB2_22: VO   42         3293  1         01/01/12 17:03:03
PSOC-MB2_23: VO   43         3299  1         01/01/12 17:03:03
PSOC-MB2_24: VO   44         4958  1         01/01/12 17:03:03
PSOC-MB2_25: VO   45         4508  1         01/01/12 17:03:03
PSOC-MB3_0: VOU   46         4999  1         01/01/12 17:03:03
PSOC-MB3_1: VOU   47         4982  1         01/01/12 17:03:03
PSOC-MB3_2: VOU   48         1499  1         01/01/12 17:03:03
PSOC-MB3_3: VOU   49         1193  1         01/01/12 17:03:03
PSOC-MB3_4: VOU   50          708  1         01/01/12 17:03:03
```

```
PSOC-MB3_5: VOU   51          757  1         01/01/12 17:03:03
PSOC-MB3_6: VOU   52          585  1         01/01/12 17:03:03
PSOC-MB3_7: VOU   53         1501  1         01/01/12 17:03:03
```

The following is a sample output of the **show logging onboard slot** *slot* **temperature** command:

```
Router#show logging onboard slot R1 temperature
Name               Id     Data (C)  Poll      Last Update
-------------------------------------------------------------------
Temp: BB_DIE       159          25  1         01/02/12 23:04:19
Temp: VP_DIE       160          21  1         01/02/12 23:04:19
Temp: RT-E_DIE     161          29  1         01/02/12 23:04:19
Temp: INLET_1      162          20  1         01/02/12 23:04:19
Temp: INLET_2      163          18  1         01/02/12 23:04:19
Temp: OUTLET_1     164          22  1         01/02/12 23:04:19
Temp: 3882_1       165          44  1         01/02/12 23:04:19
Temp: 3882_1A      166          38  1         01/02/12 23:04:19
Temp: 3882_1B      167          36  1         01/02/12 23:04:19
Temp: 3882_2       168          38  1         01/02/12 23:04:19
Temp: 3882_2A      169          37  1         01/02/12 23:04:19
Temp: 3882_2B      170          35  1         01/02/12 23:04:19
Temp: 3882_3       171          38  1         01/02/12 23:04:19
```

The following is a sample output of the **show logging onboard slot** *slot* **uptime latest** command:

```
Router#show logging onboard slot R1 uptime latest
 Slot              Reset reason  Power On
-----------------------------------------------------
    1      reset local software  01/02/12 23:02:46
```

The following is a sample output of the **show logging onboard slot** *slot* **uptime** command:

```
Router#show logging onboard slot R1 uptime
 Slot              Reset reason  Power On
-----------------------------------------------------
    0      reset local software  01/06/12 01:52:26
    4      reset local software  01/06/12 01:52:42
    0      reset local software  01/06/12 01:52:45
    0      reset local software  01/06/12 02:20:27
    4      reset local software  01/06/12 02:20:43
    0      reset local software  01/06/12 02:20:46
    0      reset local software  01/06/12 05:12:02
    4      reset local software  01/06/12 05:12:19
    0      reset local software  01/06/12 05:12:22
    0      reset local software  01/06/12 05:17:31
    4      reset local software  01/06/12 05:17:48
    0      reset local software  01/06/12 05:17:51
    0            reset power on  01/01/12 08:56:44
    4            reset power on  01/01/12 08:57:00
```

The following is a sample output of the **show logging onboard slot** *slot* **firmware** command:

```
Router# show logging onboard slot R0 firmware
slot     timestamp                                  firmware       version
-------------------------------------------------------------------------------
0         2018-01-16T00:00:00.000  09:36:38.000   CPLD           16052011
0         2018-01-16T00:00:00.000  09:36:38.000   ViperSO CPLD   14091201
0         2018-01-16T00:00:00.000  09:36:38.000   ViperSIO CPLD  14092901
0         2018-01-16T00:00:00.000  09:36:39.000   Rommon         16.6(1r)S
0         2018-01-16T00:00:00.000  09:36:39.000   SUP-DC CPLD    ffffffff
0         2018-01-16T00:00:00.000  09:36:39.000   SUP PSOC       v4.1.0_i2c1
0         2018-01-16T00:00:00.000  09:36:39.000   SUP PSOC 1     v4.0.8_i2c1
0         2018-01-16T00:00:00.000  09:36:39.000   SUP PSOC 2     v4.1.1_IVB"
0         2018-01-16T00:00:00.000  09:36:39.000   SUP PSOC 3     v4.0.6_i2c1
0         2018-01-16T00:00:00.000  09:36:39.000   SUP-DC PSOC 0  N/A
```

```
0         2018-01-16T00:00:00.000  09:36:39.000   SUP-DC PSOC 1  N/A
0         2018-01-16T00:00:00.000  09:36:39.000   SUP-PIC PSOC 0 V2.0.6
0         2018-01-16T00:00:00.000  09:36:39.000   SUP-PIC PSOC 1 V2.0.6
0         2018-01-16T00:00:00.000  09:36:39.000   Blackbird      00000112
```

The following is a sample output of the **show logging onboard slot** *slot* **firmware reverse** command:

```
Router# show logging onboard slot R0 firmware reverse
slot       timestamp            firmware          version
-------------------------------------------------------------------
0       01/16/18 09:38:12       Raptor ESI        0001003b
0       01/16/18 09:36:39       Blackbird         00000112
0       01/16/18 09:36:39       SUP-PIC PSOC 1    V2.0.6
0       01/16/18 09:36:39       SUP-PIC PSOC 0    V2.0.6
0       01/16/18 09:36:39       SUP-DC PSOC 1     N/A
0       01/16/18 09:36:39       SUP-DC PSOC 0     N/A
0       01/16/18 09:36:39       SUP PSOC 3        v4.0.6_i2c1
0       01/16/18 09:36:39       SUP PSOC 2        v4.1.1_IVB
0       01/16/18 09:36:39       SUP PSOC 1        v4.0.8_i2c1
0       01/16/18 09:36:39       SUP PSOC 0        v4.1.0_i2c1
0       01/16/18 09:36:39       SUP-DC CPLD       ffffffff
0       01/16/18 09:36:39       Rommon            16.6(1r)S
0       01/16/18 09:36:38       ViperSIO CPLD     14092901
0       01/16/18 09:36:38       ViperSO CPLD      14091201
0       01/16/18 09:36:38       CPLD              16052011
```

Examples

The following is a sample output of the **show logging onboard slot** *slot* **firmware backup** command:

```
Router#show logging onboard bay 4/4 firmware backup
slot timestamp        firmware          version
-------------------------------------------------------------------------------------
4 01/16/18 09:40:20   SUP-PIC CPLD      14071504
4 01/16/18 09:40:20   DTI Client FPGA   00000005
4 01/16/18 09:40:20   DTI Firmware      00000a03
4 01/16/18 09:40:20   Raptor MAC        00010031
4 01/16/18 09:40:20   Cortina PHY       201402061607
…
4 01/17/18 08:38:22   SUP-PIC CPLD      14071504
4 01/17/18 08:38:22   DTI Client FPGA   00000005
4 01/17/18 08:38:22   DTI Firmware      00000a03
```

The following is a sample output of the **show logging onboard slot** *slot* **backup reverse** command:

```
Router# show logging onboard bay 4/4 firmware backup reverse
slot timestamp           firmware          version
4    01/17/18 08:38:22   Cortina PHY       201402061607
4    01/17/18 08:38:22   Raptor MAC        00010031
4    01/17/18 08:38:22   DTI Firmware      00000a03
4    01/17/18 08:38:22   DTI Client FPGA   00000005
4    01/17/18 08:38:22   SUP-PIC CPLD      14071504
4    01/16/18 09:40:20   Cortina PHY       201402061607
4    01/16/18 09:40:20   Raptor MAC        00010031
4    01/16/18 09:40:20   DTI Firmware      00000a03
4    01/16/18 09:40:20   DTI Client FPGA   00000005
4    01/16/18 09:40:20   SUP-PIC CPLD      14071504
```

show nls

To display the Network Layer Signalling (NLS) functionality state, use the **show nls** command in privileged EXEC mode.

show nls[**ag-id** | **flow**]

Command Default

Information for the NLS state is displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows the output of the **show nls** command:

```
Router# show nls
NLS enabled
NLS Authentication enabled
NLS resp-timeout 45
```

Examples

The following example shows the output of the **show nls ag-id**command:

```
Router# show nls ag-id
Auth Group Id
12345
```

The following example shows the output of the **show nls flow** command:

```
Router# show nls flow
NLS flowid CPE IP CR Type CR ID NLS State
4294967295 16.16.1.1 1 1 PEND_B_RESP
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show nls** command:

```
Router# show nls
NLS Enabled
NLS Authentication Enabled
NLS resp-timeout 20
```

This example shows the output of the **show nls ag-id** command for the Cisco cBR Series Converged Broadband Router:

```
Router#show nls ag-id
Auth Group Id
100

Router#
```

This example shows the output of the **show nls flow** command for the Cisco cBR Series Converged Broadband Router:

```
Router# show nls flow
NLS flowid CPE IP CR Type CR ID NLS State
4294967295 16.16.1.1 1 1 PEND_B_RESP
```

Related Commands

Command	Description
cpd	Enables CPD.
nls	Enables NLS.

show nls ag-id

To display authorization group ID information, use the **show nls ag-id** command in privileged EXEC mode.

show nls ag-id

Command Default

Authorization group ID information is displayed. The authentication key is saved encrypted and is not displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.

Examples

The following example shows the output of the **show nls-sg-id**command:

```
Router# show nls ag-id
Auth Group Id
12345
```

Related Commands

Command	Description
cpd	Enables CPD.

show nls flow

To display NLS active flow information, use the **show nls flow** command in privileged EXEC mode.

show nls flow

Command Default

Information for NLS active flows are displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(21a)BC3	This command was introduced.

Examples

The following example shows the output of the show cpd command:

```
Router# show nls flow
NLS flowid CPE IP CR Type CR ID NLS State
4294967295 16.16.1.1 1 1 PEND_B_RESP
```

Related Commands

Command	Description
cpd	Enables CPD.

show cable oudp-leak-detect

See the OFDMA OUDP Leak Detection Configuration section in the configuration guide for the EXEC, Global configuration, Configuration and Show commands.

To display information related to OUDP leakage detection test sessions, use the **show cable oudp-leak-detect** command.

show cable oudp-leak-detect { **settings** | **test-sessions** }

show cable oudp-leak-detect session-id *OUDP parent test session id* { **detail** | **cm-stats** }

show cable oudp-leak-detect { **system-boot-holdoff** | **burst-profiles** | **schedules** | **rf-detector** | **docsis-clock slot** *CLC slot* }

Syntax Description

settings	Displays the values of OUDP global configuration parameters and the CBR-8 capabilities (specifically the OSSI SupportsNumBurstsNotReceived—We support RxNoEnergy stat.)
test-sessions	Displays summary of the test session that includes parent/child IDs, start/stop times, interfaces, and status.
detail	Displays the parent or child test session details. Includes OSSI information pertaining to: • LeakageDetectionTestSessionStatus • LeakageDetectionTestChannelStatus
cm-stats	Displays the child test session CM stats for BurstGrants, BurstRx, BurstNoEnergyRx, and BytesRx. Includes OSSI information pertaining to: • LeakageDetectionTestSessionStats All child session CM stats are displayed when the parent session-id is entered.
system-boot-holdoff	Time delay during system boot to allow OFDMA channels to reach up state and CMs to reach online. After this holdoff time expires, OUDP test sessions will begin.
burst-profiles	Displays persistent OUDP burst profiles configured in NVRAM (startup-config).
schedules	Displays persistent OUDP schedules configured in NVRAM (startup-config).
rf-detector	Displays currently available OFDMA channels and frequencies in the system. Useful for identifying OFDMA channel participation for a given OUDP frequency range.
docsis-clock slot*CLC slot*	Displays the timing reference information of the SUP and selected CLC slot.

Command Modes

Privileged EXEC (#)

Release	Modification
17.6.1z	This command was introduced.

show packetcable cms

To display all gate controllers that are connected to the PacketCable client, use the **show packetcable cms** command in privileged EXEC mode.

show packetcable cms [**all** | **verbose**]

Syntax Description

all	(Optional) Specifies all gate controllers including the Common Open Policy Service (COPS) servers for which the PacketCable connection is gone down.
verbose	(Optional) Provides detailed output with statistics for all gate controllers that are connected to the PacketCable client.

Command Default

All gate controllers currently connected to the PacketCable client are displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS Release 12.2(33)SCF	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

The **show packetcable cms** command displays various PacketCable counters including message exchanges and error frequency details to help detect any PacketCable errors. This command output can be periodically monitored to validate the overall health of a PacketCable solution.

In normal circumstances, the output of the **show packetcable cms all** command is not different from the output of the **show packetcable cms** command (default form of the command). However, the **show packetcable cms** command with the all keyword is used to capture all COPS servers including the servers for which the PacketCable connection is gone down.

Examples

The following is a sample output of the **show packetcable cms** command that shows all gate controllers that are currently connected to the PacketCable client in Cisco IOS Release 12.2(33)SCF:

```
Router# show packetcable cms
GC-Addr         GC-Port  Client-Addr    COPS-handle  Version PSID Key PDD-Cfg
1.100.30.2      47236    2.39.34.1      0x2FF9E268/1    4.0   0    0   0
2.39.26.19      55390    2.39.34.1      0x2FF9D890/1    1.0   0    0   2
```

The following is a sample output of the **show packetcable cms** command with the all keyword in Cisco IOS Release 12.2(33)SCF:

```
Router# show packetcable cms all
GC-Addr         GC-Port  Client-Addr    COPS-handle  Version PSID Key PDD-Cfg
1.100.30.2      47236    2.39.34.1      0x2FF9E268/1    4.0   0    0   0
2.39.26.19      55390    2.39.34.1      0x2FF9D890/1    1.0   0    0   2
1.10.30.22      42307    2.39.34.1      0x0       /0    4.0   0    0   0
```

The following is a sample output of the **show packetcable cms** command with the **verbose** keyword. This output provides additional information with statistics for all gate controllers that are connected to the PacketCable client.

```
Router# show packetcable cms verbose
Gate Controller
     Addr         :     1.100.30.2
     Port         :     47236
     Client Addr  :     2.39.34.1
     COPS Handle  :     0x2FF9E268
     Version      :     4.0
     Statistics   :
        gate del =  0  gate del ack =  0   gate del err = 0
        gate info = 0  gate info ack = 0  gate info err = 0
        gate open =  0  gate report state = 0
        gate set =  0  gate set ack =  0   gate set err = 0
        gate alloc = 0 gate alloc ack = 0  gate alloc err = 0
        gate close =  0
Gate Controller
     Addr         :     2.39.26.19
     Port         :     55390
     Client Addr  :     2.39.34.1
     COPS Handle  :     0x2FF9D890
     Version      :     1.0
     Statistics   :
        gate del =  0  gate del ack =  0   gate del err = 0
        gate info = 0  gate info ack = 0  gate info err = 0
        gate open =  0  gate report state = 0
        gate set =  2  gate set ack =  2   gate set err = 0
        PCMM Timers Expired
        Timer T1 =  0  Timer T2 =  0 Timer T3 = 0 Timer T4 = 0
GC-Addr        GC-Port  Client-Addr    COPS-handle  Version PSID Key PDD-Cfg
1.100.30.2     47236    2.39.34.1      0x2FF9E268/1    4.0   0    0   0
2.39.26.19     55390    2.39.34.1      0x2FF9D890/1    1.0   0    0   2
```

Table below describes the significant fields shown in the **show packetcable cms** command display.

Table 250: show packetcable cms Field Descriptions

Field	Description
GC-Addr	Gate controller IP address.
GC-Port	Port number of the gate controller.
Client-Addr	PacketCable client IP address.
COPS-handle	Unique value to identify a Common Open Policy Service (COPS) connection.
PSID	Policy server ID.

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show packetcable cms** command with the **all** keyword:

```
Router#show packetcable cms all
GC-Addr        GC-Port  Client-Addr    COPS-handle        Version PSID Key PDD-Cfg
```

```
1.100.30.2      45140    2.39.23.23      0x7F07E87170D0/1   4.0      0    0   0
1.100.30.2      45143    2.38.40.14      0x7F07E8717000/1   4.0      0    0   0
2.39.26.19      34934    2.39.23.23      0x7F079F594380/1   4.0      0    0   0
2.39.23.117     44902    2.38.40.14      0x7F079F594318/1   4.0      0    0   2
```

This example shows the output of the **show packetcable cms** command with the **verbose** keyword:

```
Router#show packetcable cms verbose
Gate Controller
     Addr         :     1.100.30.2
     Port         :     50406
     Client Addr  :     2.38.40.14
     COPS Handle  :     0x7FD926EEAC08
     Version      :     4.0
     Statistics   :
        gate del =  0  gate del ack =  0  gate del err = 0
        gate info = 0  gate info ack = 0  gate info err = 0
        gate open = 0  gate report state = 0
        gate set =  0  gate set ack =  0  gate set err = 0
        gate alloc = 0 gate alloc ack = 0  gate alloc err = 0
        gate close =  0

Gate Controller
     Addr         :     1.100.30.2
     Port         :     50408
     Client Addr  :     2.39.23.23
     COPS Handle  :     0x7FD926EEABA0
     Version      :     4.0
     Statistics   :
        gate del =  4  gate del ack =  0  gate del err = 4
        gate info = 0  gate info ack = 0  gate info err = 0
        gate open = 0  gate report state = 0
        gate set =  0  gate set ack =  0  gate set err = 0
        gate alloc = 0 gate alloc ack = 0  gate alloc err = 0
        gate close =  0

Gate Controller
     Addr         :     2.39.23.117
     Port         :     50874
     Client Addr  :     2.38.40.14
     COPS Handle  :     0x7FD92801E148
     Version      :     4.0
     Statistics   :
        gate del =  0  gate del ack =  0  gate del err = 0
        gate info = 0  gate info ack = 0  gate info err = 0
        gate open = 0  gate report state = 0
        gate set =  6  gate set ack =  0  gate set err = 6
        gate error statistics:
          Invalid subscriber = 6
        PCMM Timers Expired
        Timer T1 =  0  Timer T2 =  0 Timer T3 = 0 Timer T4 = 0

Gate Controller
     Addr         :     2.39.26.19
     Port         :     33525
     Client Addr  :     2.39.23.23
     COPS Handle  :     0x7FD92801DB30
     Version      :     4.0
     Statistics   :
        gate del =  0  gate del ack =  0  gate del err = 0
        gate info = 0  gate info ack = 0  gate info err = 0
```

```
gate open = 0  gate report state = 0
gate set =  0  gate set ack =  0  gate set err = 0
PCMM Timers Expired
Timer T1 =  0  Timer T2 =  0 Timer T3 = 0 Timer T4 = 0
```

Related Commands

Command	Description
cable dynamic-qos trace	Enables call trace functionality on the Cisco CMTS router for PacketCable or PacketCable Multimedia gates.
debug cable dynamic-qos subscriber	Enables debugging of the call trace functionality on the Cisco CMTS router for a particular subscriber.
debug cable dynamic-qos trace	Enables call trace debugging on the Cisco CMTS router for all the subscribers for whom call trace is configured.
show cable dynamic-qos trace	Displays the number of subscribers for whom call trace is configured on the Cisco CMTS router.

show packetcable event

To display information the PacketCable event message (EM) server, use the **show packetcable event** command in user EXEC or privileged EXEC mode.

show packetcable event {**df-group** | **radius-server** | **rks-group**}

Syntax Description

df-group	Displays information about the Communications Assistance for Law Enforcement Act (CALEA) Delivery Function (DF) server groups that are configured on the router.
radius-server	Displays information about the EM Remote Authentication Dial In User Service (RADIUS) servers that are configured on the router.
rks-group	Displays information about the Record Keeping Server (RKS) groups that are configured on the router.

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays information about the authentication, authorization, and accounting (AAA) servers that are configured on the Cisco CMTS router for PacketCable operations. These include DF servers (used for CALEA redirection of event messages and traffic), RADIUS servers (used for authentication), and RKS servers (used for billing).

Examples

The following example shows typical output for the **show packetcable event df-group** command, which shows the IP address and UDP port of the DF server to which event messages are being forwarded for CALEA electronic surveillance.

```
Router# show packetcable event df-group
CDC-address      CDC-port
1.9.62.12        1816
Router#
```

The following example shows a typical display for the **show packetcable event radius-server** command, which shows the IP address for each RADIUS server that is configured on the router for PacketCable operations, along with the UDP port number that it is using.

```
Router# show packetcable event radius-server
`
Server-address Port
10.9.62.12     1816
10.9.62.20     1813
```

```
10.9.62.12      1813
Router#
```

The following example shows a typical display for the **show packetcable event rks-group** command.

```
Router# show packetcable event rks-group
Pri-addr       Pri-port Sec-addr       Sec-port Ref-cnt Batch-cnt
1.9.62.12      1813     1.9.62.20      1813       2           0
Router#
```

Table below describes the major fields shown in the **show packetcable event rks-group** display.

Table 251: show packetcable event rks-group Field Display

Field	Description
Pri-addr	IP address for the primary RKS server.
Pri-port	UDP port for the primary RKS server.
Sec-addr	IP address for the secondary RKS server.
Sec-port	UDP port for the secondary RKS server.
Ref-cnt	Number of times that the router send single event messages to the RKS server.
Batch-cnt	Number of times that the router sent batrch messages (multiple Event Messages within a single RADIUS message) to the RKS server.

Tip For complete information about PacketCable event messaging, see the *PacketCable Event Messages Specification*, which is available at the PacketCable Event Messages SpecificationPacketCable web site at the following URL : http://www.packetcable.com

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show packetcable event** command:

```
Router# show packetcable event df-group
CDC-address      CDC-port
1.9.62.12        1816
Router#
```

```
Router# show packetcable event radius-server
Server-address Port
10.9.62.12     1816
10.9.62.20     1813
10.9.62.12     1813
Router#
```

```
Router# show packetcable event rks-group
Pri-addr      Pri-port Sec-addr       Sec-port Ref-cnt Batch-cnt
1.9.62.12     1813     1.9.62.20      1813       2           0
Router#
```

Related Commands

Command	Description
clear packetcable gate counter commit	Resets the counters that track the total number of committed gates.
packetcable	Enables PacketCable operations on the Cisco CMTS.
show packetcable gate counter commit	Displays the total number of committed gates since system reset or since the counter was last cleared.
show packetcable global	Displays the current PacketCable configuration.

show packetcable gate

To display information about one or more gates in the gate database, use the **show packetcable gate** command in user EXEC or privileged EXEC mode.

show packetcable gate [**downstream** | **upstream**] {**summary***gate-id*}

show packetcable gate [**downstream** | **upstream** | **dqos** | **ipv6** | **multimedia**] {**summary***gate-id*}

Syntax Description

downstream	(Optional) Display information only for gates in the downstream direction.
upstream	(Optional) Display information only for gates in the upstream direction.
summary	Display a summary containing the gate ID, subscriber ID, subscriber IP address, and current state information.
gate-id	Display information for a specific gate ID. The valid range is 0 to 4294967295.

Command Default

Displays information about gates on both upstreams and downstreams, if **upstream** or **downstream** is not specified.

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(11)BC3	The output for the **summary** option was enhanced to display the cable interface and service flow IDs (SFIDs) associated with each PacketCable gate.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays information about one or more gates in the gate database on the Cisco CMTS. You can display a summary for all currently active gates, for all downstream or all upstream gates, or you can display detailed information about a specific gate.

Examples

The following example shows typical output for the **show packetcable gate summary** command, which displays all current gates on the CMTS:

```
Router# show packetcable gate summary
GateID    Slot SubscriberID   GC-Addr         State   SFID     SFID
                                                      (us)     (ds)
2566      2/0  3.18.1.4       172.22.87.45    COMMIT  9        10
18950     2/0  3.18.1.5       172.22.87.45    COMMIT  7        8
Total number of gates = 2
Total Gates committed(since bootup or clear counter) = 2
```

The following example shows a typical display for a specific gate. Both downstream and upstream gates are shown unless you also specify either the **downstream** or **upstream** option.

```
Router# show packetcable gate 196

GateID                 : 196
    Subscriber ID      : 4.4.1.22
    GC Address         : 192.168.80.15
    State              : COMMITTED
    Gate specs [UPSTREAM]
      Gate classifier  : [protocol 17,
                          src addr/port 4.4.1.22/0,
                          dest addr/port 3.3.1.3/3456
      diffserv dscp    : 0x6000000
      timer t1(ms)     : 180000
      timer t2(ms)     : 2000
      commit flags     : 0x0
      session class    : 0x1
       flowspec # 1          : [r/b/p/m/M 1176256512/1128792064/1176256512/200/200]
                            [R/S: 1176256512/0]
    Gate specs [DOWNSTREAM]
      Gate classifier  : [protocol 17,
                          src addr/port 3.3.1.3/0,
                          dest addr/port 4.4.1.22/0
      diffserv dscp    : 0x9000000
      timer t1(ms)     : 180000
      timer t2(ms)     : 2000
      commit flags     : 0x0
      session class    : 0x1
       flowspec # 1          : [r/b/p/m/M 1176256512/1128792064/1176256512/200/200]
                           [R/S: 1176256512/0]
    Remote Gate
      address/port     : 172.22.79.22/1812
      gate coord flag  : 2
      algo             : 100
      security key[16] : 30 31 32 33 34 35 36 37 38 39 30 31 32 33 34 35
    Billing Info
      primary RKS      : [addr/port 1.9.62.12/1813]
      secondary RKS    : [addr/port 255.255.255.255/65535]
      flags            : 0
      billing corr ID        : [3D 38 96 CC 20 20 20 20 31 30 20 30 00 00 00 41 ]
```

Table below describes the major fields shown in the **show packetcable gate** display.

Table 252: show packetcable gate Field Display

Field	Description
GateID	Unique number identifying the local gate.
Slot	Cable interface on the Cisco CMTS.
Subscriber ID	IP address for the subscriber for this service request.
GC-Addr	IP address for the gate controller that is responsible for this gate.

Field	Description
State	Describes the current state of the gate in both the upstream and downstream directions. The possible state values are: • ALLOC = The CMTS has received a Gate-Alloc command from the gate controller and has created the gate in response. The CMTS must now wait for the request to be authorized. • AUTH = The CMTS has received a Gate-Set command from the gate controller that authorizes the resources needed for the gate request. The CMTS must now wait for the actual resources to be reserved. • RSVD = All required resources for the gate have been reserved. • COMMIT = All resources have been committed at both the local CMTS and remote CMTS. The local CMTS has also received a commit notification from the local MTA and has finished all gate coordination with the remote end. The gate can now pass traffic. • INVLD = The gate is invalid, typically because of an error condition or lack of resources. The CMTS will eventually delete the gate. • UNKWN = The gate is an unknown state.
SFID (us)	SFID for the upstream associated with this PacketCable gate.
SFID (ds)	SFID for the downstream associated with this PacketCable gate.
Total number of gates	Displays the total number of gates that are currently allocated, authorized, reserved, or committed.
Total Gates committed	Displays the total number of gates that the CMTS has committed since the CMTS was last reset or since the counters were last cleared.

Tip For complete information about the State field, see section 5.4, Gate Control Protocol Operation, in the *PacketCable Dynamic Quality-of-Service Specification* (PKT-SP-DQOS-I03-020116).

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show packetcable gate** command:

```
Router#show packetcable gate summary
GateID     i/f          SubscriberID    GC-Addr        State     Type  SFID(us) SFID(ds)
16383    Ca3/0/1        45.45.0.145     2.39.23.117    COMMIT    MM    815

Total number of gates = 1
Total Gates committed(since bootup or clear counter) = 1
```

This example shows the output of the **show packetcable gate** command for a specific gate ID:

```
Router#show packetcable gate 16383
GateID : 16383
Subscriber ID : 192.0.2.199
```

```
COPS connection :
server handle : 0x7F76F046D988
server address : 1.100.30.2
server port : 57437
client address : 2.39.23.23
State : COMMIT
CALEA Version : -
Gate specs [UPSTREAM]
Gate classifier : protocol 17,
src addr/port 192.0.2.199/0,
dest addr/port 192.0.2.208/53456
diffserv dscp : 0xC0
timer t1(s) : 200
timer t7(s) : 300
timer t8(s) : 10
commit flags : 0x0
session class : 0x1
flowspec # 1 : [r/b/p/m/M 10000/200/10000/200/200] [R/S: 10000/800]
Gate specs [DOWNSTREAM]
Gate classifier : protocol 17,
src addr/port 192.0.2.208/0,
dest addr/port 192.0.2.199/53456
diffserv dscp : 0xC0
timer t1(s) : 200
timer t7(s) : 300
timer t8(s) : 10
commit flags : 0x0
session class : 0x1
flowspec # 1 : [r/b/p/m/M 10000/200/10000/200/200] [R/S: 10000/0]
```

Related Commands

Command	Description
clear packetcable gate counter commit	Resets the counters that track the total number of committed gates.
packetcable	Enables PacketCable operations on the Cisco CMTS.
show packetcable gate counter commit	Displays the total number of committed gates since system reset or since the counter was last cleared.
show packetcable global	Displays the current PacketCable configuration.

show packetcable gate counter commit

To display the total number of gates that the CMTS has put into the COMMITTED state since the CMTS was last reset or since the counter was last cleared, use the **show packetcable gate counter commit** command in user EXEC or privileged EXEC mode.

show packetcable gate counter commit

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command displays the total number of gates that have been committed since the Cisco uBR7200 series router was restarted or since the counter was last cleared with the **clear packetcable gate counter commit** command.

Note This command displays only the count of committed gates. It does not include gates that were allocated, authorized, and reserved but that were not put into the COMMITTED state.

Examples

The following example shows that 132 gates have been committed since the Cisco CMTS was last reset or since the counters were last cleared:

```
Router# show packetcable gate counter commit

Total Gates committed (since bootup or clear counter) = 132
Router#
```

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show packetcable gate counter commit** command:

```
Router#show packetcable gate counter commit
Total gates committed(since bootup or clear counter) = 4
```

Related Commands

Command	Description
clear packetcable gate counter commit	Resets the counters that track the total number of committed gates.
packetcable	Enables PacketCable operations on the Cisco CMTS.
show packetcable gate	Displays information about one or more gates in the gate database.
show packetcable global	Displays the current PacketCable configuration.

show packetcable gate ipv6

To display information about one or more PacketCable gates associated with IPv6 subscriber IDs in the gate database, use the **show packetcable gate ipv6** command in privileged EXEC mode.

show packetcable gate ipv6 summary [**downstream** {*gate-id* | **ipv6 summary**}] [**upstream** {*gate-id* | **ipv6 summary**}]

Syntax Description

ipv6	Specifies IPv6 subscriber IDs.
summary	Displays a summary of gates containing the gate ID, subscriber ID, subscriber IPv6 address, and the state information.
downstream *gate-id*	(Optional) Displays information for the specified gate ID in the downstream direction. The valid range is from 0 to 4294967295.
upstream *gate-id*	(Optional) Displays information for the specified gate ID in the upstream direction. The valid range is from 0 to 4294967295.

Command Default

None

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command provides a summary of all active gates (downstream or upstream gates) for IPv6 subscribers.

Examples

The following is a sample output of the **show packetcable gateipv6 command that shows a summary of all the active downstream and upstream gates for IPv6** subscribers on a Cisco CMTS router:

```
Router# show packetcable gate ipv6 summary
GateID     i/f                    SubscriberID               State   SFID(us) SFID(ds)
13582      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C       COMMIT    74
29962      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C       COMMIT    73
46354      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C       COMMIT    72
62738      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C       COMMIT             69

TTotal number of  gates = 4
Total Gates committed(since bootup or clear counter) = 8
```

The following is a sample output of the **show packetcable gateipv6 command that shows a summary of all downstream gates for IPv6** subscribers on a Cisco CMTS router:

```
Router# show packetcable gate downstream ipv6 summary
GateID     i/f                    SubscriberID                State   SFID(us) SFID(ds)
62738      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C      COMMIT             69

Total number of DS gates = 1
Total Gates committed(since bootup or clear counter) = 8
```

The following is a sample output of the **show packetcable gateipv6 command that shows a summary of all upstream gates for IPv6** subscribers on the Cisco CMTS router:

```
Router# show packetcable gate upstream ipv6 summary
GateID     i/f                    SubscriberID                State   SFID(us) SFID(ds)
13582      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C      COMMIT    74
29962      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C      COMMIT    73
46354      Ca8/1/0      2001:40:1:42:C0B4:84E5:5081:9B5C      COMMIT    72
Total number of US gates = 3
Total Gates committed(since bootup or clear counter) = 8
```

Table below describes the significant fields shown in the **command** display.

Table 253: show packetcable gate Field Display

Field	Description
GateID	Unique number identifying the local gate.
i/f	Cable interface on the Cisco CMTS.
Subscriber ID	IPv6 address of the subscriber for this service request.
State	Describes the state of the gate in both the upstream and downstream directions. The possible state values are: • ALLOC—The CMTS has received a Gate-Alloc command from the gate controller and has created the gate in response. The CMTS must now wait for the request to be authorized. • AUTH—The CMTS has received a Gate-Set command from the gate controller that authorizes the resources needed for the gate request. The CMTS must now wait for the actual resources to be reserved. • RSVD—All required resources for the gate have been reserved. • COMMIT—All resources are committed at both the local CMTS and remote CMTS. The local CMTS has also received a commit notification from the local MTA and has completed all gate coordination with the remote end. The gate can now pass traffic. • INVLD—The gate is invalid, typically because of an error condition or lack of resources. The CMTS will eventually delete the gate. • UNKWN—The gate is in an unknown state.
SFID (us)	SFID for the upstream associated with this PacketCable gate.
SFID (ds)	SFID for the downstream associated with this PacketCable gate.
Total number of gates	Displays the total number of PCMM gates that are allocated, authorized, reserved, or committed.

Field	Description
Total Gates committed (since bootup or clear counter)	Displays the total number of PCMM gates that the CMTS has committed since the CMTS was last reset or since the counters were last cleared.

Related Commands

Command	Description
packetcable	Enables PacketCable operations on a Cisco CMTS router.
show packetcable gate	Displays information about one or more PacketCable gates in the gate database.
show packetcable gate counter commit	Displays the total number of committed PacketCable gates since system reset or since the counter was last cleared.
show packetcable global	Displays the PacketCable configuration.

show packetcable gate multimedia

On Cisco uBR10012 router, to display information about the total number of PacketCable Multimedia (PCMM) multicast gates, use the **show packetcable gate multimedia** command in privileged EXEC mode.

On Cisco cBR-8 router, to display information about the total number of PacketCable Multimedia (PCMM) gates, use the **show packetcable gate multimedia** command in privileged EXEC mode.

show packetcable gate multimedia [**summary**]

Cisco cBR Series Converged Broadband Router
show packetcable gate multimedia[**downstream** | **upstream**]**summary**

Syntax Description

downstream	(Optional) Display information only for Packetcable multimedia downstream gate.
upstream	(Optional) Display information only for Packetcable multimedia upstream gate.
multicast	(Optional for Cisco uBR10012 router) Displays PCMM information.
summary	For Cisco uBR10012 router— Provides a summary of PCMM multicast gate ID, subscriber ID, gate controller address, and current state information. For Cisco cBR-8 router— Provides a summary of PCMM gate ID, subscriber ID, gate controller address, and current state information.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **downstream** and **upstream** keywords were added. PCMM Multicast option is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following is a sample output of the **show packetcable gate multimedia** command on a Cisco CMTS router:

```
Router# show packetcable gate multimedia multicast summary
GateID     i/f          SubscriberID   GC-Addr        State     Type  SFID(us) SFID(ds)
134        Ca5/0/0      60.1.1.202     2.39.26.19     COMMIT    MM             4
Total number of Multimedia-MCAST gates = 1
Total Gates committed(since bootup or clear counter) = 1
```

Table below describes the significant fields shown in the display.

Table 254: show packetcable gate multimedia Field Descriptions

Field	Description
GateID	Unique number identifying the local PCMM multicast gate.
i/f	Cable interface on the Cisco CMTS router.
Subscriber ID	IP address of the subscriber for this service request.
GC-Addr	IP address of the gate controller that is responsible for the gate.
State	Describes the current state of the gate in the downstream direction. The possible state values are: • ALLOC—The CMTS has received a Gate-Alloc command from the gate controller and has created the gate in response. The CMTS must now wait for the request to be authorized. • AUTH—The CMTS has received a Gate-Set command from the gate controller that authorizes the resources needed for the gate request. The CMTS must now wait for the actual resources to be reserved. • RSVD—All required resources for the gate have been reserved. • COMMIT—All resources are committed at both the local CMTS and remote CMTS. The local CMTS has also received a commit notification from the local MTA and has completed all gate coordination with the remote end. The gate can now pass traffic. • INVLD—The gate is invalid, typically because of an error condition or lack of resources. The CMTS will eventually delete the gate. • UNKWN—The gate is in an unknown state.
SFID (us)	Service flow ID (SFID) for the upstream associated with this PCMM multicast gate.
SFID (ds)	SFID for the downstream associated with this PCMM multicast gate.
Total number of Multimedia-MCAST gates	Total number of PCMM multicast gates that are currently allocated, authorized, reserved, or committed.
Total Gates committed (since bootup or clear counter)	Total number of PCMM multicast gates that are committed since the Cisco CMTS router was last reset or since the counters were last cleared.

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show packetcable gate multimedia** command with the **summary** option:

```
Router#show packetcable gate multimedia summary
GateID i/f     SubscriberID  GC-Addr   State  Type SFID(us) SFID(ds)
81919  Ca1/0/4 24.232.100.16 1.2.0.101 COMMIT MM           363
98303  Ca1/0/4 24.232.100.16 1.2.0.101 COMMIT MM           364
114687 Ca1/0/0 24.232.100.46 1.2.0.101 COMMIT MM           301
131071 Ca1/0/0 24.232.100.46 1.2.0.101 COMMIT MM           302
```

```
147455 Ca1/0/4 24.232.100.17 1.2.0.101 COMMIT MM            365
163839 Ca1/0/4 24.232.100.17 1.2.0.101 COMMIT MM            366
180223 Ca1/0/4 24.232.100.32 1.2.0.101 COMMIT MM            367
196607 Ca1/0/4 24.232.100.32 1.2.0.101 COMMIT MM            368
212991 Ca1/0/0 24.232.100.47 1.2.0.101 COMMIT MM            303
229375 Ca1/0/0 24.232.100.47 1.2.0.101 COMMIT MM            304
245759 Ca1/0/0 24.232.100.48 1.2.0.101 COMMIT MM            305
262143 Ca1/0/0 24.232.100.48 1.2.0.101 COMMIT MM            306

Total number of Multimedia gates = 12
Total Gates committed(since bootup or clear counter) = 12
```

This example shows the output of the **show packetcable gate multimedia** command with the **upstream summary** option:

```
Router#show packetcable gate multimedia upstream summary
GateID i/f     SubscriberID  GC-Addr   State  Type SFID(us) SFID(ds)
81919  Ca1/0/4 24.232.100.16 1.2.0.101 COMMIT MM            363
131071 Ca1/0/0 24.232.100.46 1.2.0.101 COMMIT MM            302
147455 Ca1/0/4 24.232.100.17 1.2.0.101 COMMIT MM            365
180223 Ca1/0/4 24.232.100.32 1.2.0.101 COMMIT MM            367
229375 Ca1/0/0 24.232.100.47 1.2.0.101 COMMIT MM            304
245759 Ca1/0/0 24.232.100.48 1.2.0.101 COMMIT MM            305

Total number of Multimedia-US gates = 6
Total Gates committed(since bootup or clear counter) = 12
```

This example shows the output of the **show packetcable gate multimedia** command with the **downstream summary** option:

```
Router#show packetcable gate multimedia downstream summary
GateID i/f     SubscriberID  GC-Addr   State  Type SFID(us) SFID(ds)
98303  Ca1/0/4 24.232.100.16 1.2.0.101 COMMIT MM            364
114687 Ca1/0/0 24.232.100.46 1.2.0.101 COMMIT MM            301
163839 Ca1/0/4 24.232.100.17 1.2.0.101 COMMIT MM            366
196607 Ca1/0/4 24.232.100.32 1.2.0.101 COMMIT MM            368
212991 Ca1/0/0 24.232.100.47 1.2.0.101 COMMIT MM            303
262143 Ca1/0/0 24.232.100.48 1.2.0.101 COMMIT MM            306

Total number of Multimedia-DS gates = 6
Total Gates committed(since bootup or clear counter) = 12
```

Table 255: show packetcable gate multimedia Field Descriptions for Cisco cBR Series Converged Broadband Router

Field	Description
GateID	Unique number identifying the local PCMM gate.
i/f	Cable interface on the Cisco CMTS router.
Subscriber ID	IP address of the subscriber for this service request.
GC-Addr	IP address of the gate controller that is responsible for the gate.

Field	Description
State	Describes the current state of the gate in the downstream direction. The possible state values are: • ALLOC—The CMTS has received a Gate-Alloc command from the gate controller and has created the gate in response. The CMTS must now wait for the request to be authorized. • AUTH—The CMTS has received a Gate-Set command from the gate controller that authorizes the resources needed for the gate request. The CMTS must now wait for the actual resources to be reserved. • RSVD—All required resources for the gate have been reserved. • COMMIT—All resources are committed at both the local CMTS and remote CMTS. The local CMTS has also received a commit notification from the local MTA and has completed all gate coordination with the remote end. The gate can now pass traffic. • INVLD—The gate is invalid, typically because of an error condition or lack of resources. The CMTS will eventually delete the gate. • UNKWN—The gate is in an unknown state.
SFID (us)	Service flow ID (SFID) for the upstream associated with this PCMM gate.
SFID (ds)	SFID for the downstream associated with this PCMM gate.
Total number of Multimedia-xx gates	Total number of PCMM gates that are currently allocated, authorized, reserved, or committed. The "Total number of Multimedia-xx gates" depends on the options used. The field is given as: • If no option is used—"Total number of Multimedia gates" , • For option multicast— "Total number of Multimedia-MCAST gates" • For option downstream— "Total number of Multimedia-DS gates" • For option upstream— "Total number of Multimedia-US gates"
Total Gates committed (since bootup or clear counter)	Total number of PCMM gates that are committed since the Cisco CMTS router was last reset or since the counters were last cleared.

Related Commands

Command	Description
cable multicast source	Configures a multicast session range for a PCMM multicast group on a Cisco CMTS router.
show cable multicast db	Displays the contents of the multicast explicit tracking database.

show packetcable global

To display the current PacketCable configuration, including the maximum number of gates, the Element ID, and the DQoS timer values, use the **show packetcable global** command in user EXEC or privileged EXEC mode.

show packetcable global

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.2(8)BC2	This command was introduced for the Cisco uBR7200 series universal broadband router.
12.2(11)BC1	Support was added to display the Element ID for the CMTS.
12.2(11)BC2	Support was added to display whether non-PacketCable UGS service flows are authorized or not. The T2 and T5 timers were removed from the display to conform to the requirements of the PacketCable DQoS Engineering Change Notice (ECN) 02148.
12.2(15)BC1	Support was added for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

The following example shows a typical PacketCable configuration that is enabled and has the default values for all configurable parameters, except for the Element ID:

```
Router# show packetcable global
Packet Cable Global configuration:
Enabled   : Yes
Element ID: 12456
Max Gates : 1048576
Allow non-PacketCable UGS
Default Timer value -
  T0      : 30000 msec
  T1      : 300000 msec
Router#
```

Table below describes the fields shown in the **show packetcable global** display.

Table 256: show packetcable global Field Display

Field	Description
Enabled	Displays whether PacketCable operation is enabled or disabled. (See the **packetcable** command.)

Field	Description
Element ID	Displays the Element ID for the CMTS. If you do not manually configure this parameter with the **packetcable element-id** command, it defaults to a random value between 0 and 99,999 when PacketCable operations is enabled.
Max Gates	Displays the maximum number of gates that the CMTS supports. (See the **packetcable gate maxcount** command.)
Allow non-PacketCable UGS or Not Allow non-PacketCable UGS	Displays whether non-PacketCable, DOCSIS-style UGS service flows are allowed when PacketCable operations are enabled. (See the **packetcable authorize vanilla-docsis-mta** command.)
Default Timer value	Displays the current values of the following DQoS timers that the CMTS maintains. (See the **packetcable timer** command.)
T0	T0 specifies the amount of time that a gate ID can remain allocated without any specified gate parameters. The timer begins counting when a gate is allocated with a Gate-Alloc command. The timer stops when a Gate-Set command marks the gate as Authorized. If the timer expires without a Gate-Set command being received, the gate is deleted. The valid range is 1 to 1,000,000,000 milliseconds, with a default value of 30000 milliseconds (30 seconds).
T1	T1 specifies the amount of time that an authorization for a gate can remain valid. It begins counting when the CMTS creates a gate with a Gate-Set command and puts the gate in the Authorized state. The timer stops when the gate is put into the committed state. If the timer expires without the gate being committed, the CMTS must close the gate and release all associated resources. The valid range is 1 to 1,000,000,000 milliseconds, with a default value of 200000 milliseconds (200 seconds).

Examples for Cisco cBR Series Converged Broadband Router

This example shows the output of the **show packetcable gate counter commit** command:

```
Router#show packetcable global
Packet Cable Global configuration:
Packetcable DQOS Enabled : Yes
Packetcable Multimedia Enabled : Yes
Element ID: 49137
Max Gates : 512000
Not Allow non-PacketCable UGS
Default Multimedia Timer value -
T1 : 200000 msec
Persistent gate : 0 hour
Volume Limit : RUNNING
Default DQoS Timer value -
T0 : 30000 msec
T1 : 300000 msec
Client Accept Timer: Disabled
Client Accept Timer Expired: 0
```

```
Packetcable DQOS Gate Send SubscriberID Enabled: No
```

Table 257: show packetcable global Field Display

Field	Description
Packetcable DQOS Enabled	For Cisco cBR router— Displays whether PacketCable DQOS operation is enabled or disabled. (See the **packetcable** command.)
Packetcable Multimedia Enabled	For Cisco cBR router— Displays whether PacketCable multimedia operation is enabled or disabled.
Element ID	Displays the Element ID for the CMTS. If you do not manually configure this parameter with the **packetcable element-id** command, it defaults to a random value between 0 and 99,999 when PacketCable operations is enabled.
Max Gates	Displays the maximum number of gates that the CMTS supports. (See the **packetcable gate maxcount** command.)
Allow non-PacketCable UGS or Not Allow non-PacketCable UGS	Displays whether non-PacketCable, DOCSIS-style UGS service flows are allowed when PacketCable operations are enabled. (See the **packetcable authorize vanilla-docsis-mta** command.)
Default Timer value	Displays the current values of the following DQoS timers that the CMTS maintains. (See the **packetcable timer** command.)
T0	T0 specifies the amount of time that a gate ID can remain allocated without any specified gate parameters. The timer begins counting when a gate is allocated with a Gate-Alloc command. The timer stops when a Gate-Set command marks the gate as Authorized. If the timer expires without a Gate-Set command being received, the gate is deleted. The valid range is 1 to 1,000,000,000 milliseconds, with a default value of 30000 milliseconds (30 seconds).
T1	T1 specifies the amount of time that an authorization for a gate can remain valid. It begins counting when the CMTS creates a gate with a Gate-Set command and puts the gate in the Authorized state. The timer stops when the gate is put into the committed state. If the timer expires without the gate being committed, the CMTS must close the gate and release all associated resources. The valid range is 1 to 1,000,000,000 milliseconds, with a default value of 200000 milliseconds (200 seconds).
Client Accept Timer	For Cisco cBR router— Displays whether the Client Accept Timer is enabled.
Client Accept Timer Expired	For Cisco cBR router— Displays the time expired on the Client Accept Timer.
Packetcable DQOS Gate Send SubscriberID Enabled	For Cisco cBR router— Displays whether the Packetcable DQOS Gate Send SubscriberID operation is enabled.

Related Commands

Command	Description
packetcable	Enables PacketCable operations on the Cisco CMTS.
packetcable authorize vanilla-docsis-mta	Allows Unsolicited Grant Service (UGS) service flows without a proper PacketCable gate ID when PacketCable operations are enabled on the Cisco CMTS.
packetcable element-id	Configures the PacketCable Event Message Element ID on the Cisco CMTS.
packetcable gate maxcount	Changes the maximum number of PacketCable gate IDs in the gate database on the Cisco CMTS.
packetcable timer	Changes the value of the different PacketCable DQoS timers.
show packetcable gate	Displays information about one or more gates in the gate database.
show packetcable gate counter commit	Displays the total number of committed gates since system reset or since the counter was last cleared.

show platform hardware diagnostic status

To displays the field diagnostic tests status, use the **show platform hardware diagnostic status slot** *slot-id* command in Privileged EXEC mode.

show platform hardware diagnostic status slot *slot-id*

Syntax Description

slot *slot-id*	Specifies the slot performing field diagnostic test.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show platform hardware diagnostic status slot** *slot-id* command displays field diagnostic test status.

Examples

The following example shows a typical display for the **show platform hardware diagnostic status slot** *slot-id* command:

```
Router# show platform hardware diagnostic status slot 0
Online Offline Diagnostic Status (P=Passed, F=Failed, U=Untested)
State                  Overall Test Num        Test Done Num         Test Result

--------------------------------------------------------------------------------
Running Auto Test      75                      70                    P:69 F:1 U:5
```

Related Commands

Command	Description
request platform hardware diagnostic load	Loads the field diagnostic image and starts field diagnostic test.
request platform hardware diagnostic unload	Unload the field diagnostic image from the line card.

show platform hardware dpic

To display information with regard to the Digital Physical Interface Card, use the **show platform hardware dpic** *slot-id* command in Privileged EXEC mode.

show platform hardware dpic *slot-id*

slot *slot-id*	Specifies the slot for which the information is displayed.

Command Default

None.

Command Modes

Privileged EXEC (#)

Release	Modification
IOS-XE 16.10.1d	This command was introduced on Cisco cBR Series Converged Broadband Routers.

The **show platform hardware dpic** *slot-id* command displays information on the status of the DPIC.

```
Router# show pl hardware dpic subslot 4/2 transceiver 1 show status
Load for five secs: 6%/0%; one minute: 6%; five minutes: 8%
Time source is NTP, 11:13:49.865 CST Mon Mar 4 2019


The Transceiver in slot 2 subslot 1 port 1 is enabled.
  Module temperature                      = +29.582 C
  Transceiver Tx supply voltage           = 3328.6 mVolts
  Transceiver Tx bias current             = 2 uAmps
  Transceiver Tx power                    = -40.0 dBm
  Transceiver Rx optical power            = -2.8 dBm


Router# show pl hardware dpic subslot 4/2 transceiver 0 show idprom
Load for five secs: 3%/0%; one minute: 7%; five minutes: 9%
Time source is NTP, 11:12:46.926 CST Mon Mar 4 2019


IDPROM for transceiver 2/1 port0:
  Description                             = SFP or SFP+ optics (type 3)
  Transceiver Type:                       = SFP+ 10GBASE-SR (273)
  Product Identifier (PID)                = SFP-10G-SR-S
  Vendor Revision                         = G4.1
  Serial Number (SN)                      = AVD2032D1G7
  Vendor Name                             = CISCO-AVAGO
  Vendor OUI (IEEE company ID)            = 00.17.6a (5994)
  CLEI code                               = CMUIAK6CAA
  Cisco part number                       = 10-3105-01
  Device State                            = Initialized.
  Date code (yy/mm/dd)                    = 16/08/09
  Connector type                          = LC.
  Encoding                                = 4b5b
                                            NRZ
                                            Manchester
  Nominal bitrate                         =  (10300 Mbits/s)
```

```
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
```

show platform hardware qfp active cable dpic-lcha if-name

To display DPIC LCHA interface subblock information, use the **show platform hardware qfp [active | standby] cable dpic-lcha if-name** *interface-name* command in privileged EXEC mode.

The commands display the peer interface info. The ouput displays when protect Line Card becomes active. The same peer interface displays on both SUPs.

show platform hardware qfp [active | standby] cable dpic-lcha if-name *interface-name*

Syntax Description

Syntax Description

dpic-lcha	Display DPIC LCHA interface subblock information.
if-name *interface-name*	Enter the interface name.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1w	This command is introduced for the Cisco cBR Series Converged Broadband routers.

Usage Guidelines

The **show platform hardware qfp active cable dpic-lcha if-name** *interface-name* command displays DPIC LCHA interface subblock information.

Examples

The following example shows a typical display for the **show platform hardware qfp active cable us-dpic-lcha** command:

```
router#show platform hardware qfp active cable dpic-lcha if-name te6/1/0
if_h: 30
ppe_addr: 0x3c99dc04
rsrc_h: 0x1ea6770049901803
peer uidb in client: 261554
peer uidb in exmem: 261554
```

The output line `peer uidb in client: 261554` refers to `TE9/1/0` interface.

```
router#show platform hardware qfp active cable dpic-lcha if-name te9/1/0
if_h: 590
ppe_addr: 0x3c99dc00
rsrc_h: 0x1ea6770009901803
peer uidb in client: 262114
peer uidb in exmem: 262114
```

The output line `peer uidb in client: 262114` refers to `TE6/1/0` interface.

```
router#show platform hardware qfp active interface if-handle 30 | i Name|Tx uidb
Interface Name: TenGigabitEthernet6/1/0
Tx uidb: 262114
```

```
router#show platform hardware qfp active interface if-handle 590 | i Name|Tx uidb
Interface Name: TenGigabitEthernet9/1/0
Tx uidb: 261554
router#
```

show platform hardware qfp active cable us-mpls-tc

To display MPLS TC bits marking information, use the **show platform hardware qfp active cable us-mpls-tc** command in Privileged EXEC mode.

show platform hardware qfp active cable us-mpls-tc vslot *vslot_number* **md** *md_number* **uflow-idx** *uflow_index*

Syntax Description

vslot *vslot_number*	Specifies the virtual slot in which the linecard is inserted.
md *md_number*	Specifies the MAC domain.
uflow-idx *uflow_index*	Specifies the SID of the upstream service flow.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.17.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show platform hardware qfp active cable us-mpls-tc** command displays MPLS TC bits marking information.

Examples

The following example shows a typical display for the **show platform hardware qfp active cable us-mpls-tc** command:

```
Router# show cable modem
c8fb.26a5.5402 31.89.0.9       C3/0/0/U2     w-online(pt)      19    -4.50  1781   0   Y
c8fb.26a5.5730 31.89.0.29      C3/0/0/U0     w-online(pt)      20    1.50   1781   0   Y
c8fb.26a5.530c 31.89.0.14      C3/0/0/U3     w-online(pt)      21    -0.50  1782   0   Y

Router# show platform hardware qfp active cable us-mpls-tc vslot 3 md 0 uflow-idx 19
vslot     md       SF_ID  mpls_tc_se...  mpls_tc (hex)
-------------------------------------------------------
    3      0          19            0x1            0x5
Router# show platform hardware qfp active cable us-mpls-tc vslot 3 md 0 uflow-idx 20
vslot     md       SF_ID  mpls_tc_se...  mpls_tc (hex)
-------------------------------------------------------
    3      0          20            0x1            0x5
Router# show platform hardware qfp active cable us-mpls-tc vslot 3 md 0 uflow-idx 21
vslot     md       SF_ID  mpls_tc_se...  mpls_tc (hex)
-------------------------------------------------------
    3      0          21            0x1            0x5
```

Related Commands

Command	Description
show platform hardware qfp active feature docsis mpls_tc-precfy db	Displays MPLS TC bits classification informaiton.

show platform hardware qfp active feature docsis bf

To display DOCSIS bundle-flood feature information, use the **show platform hardware qfp active feature docsis bf** command in Privileged EXEC mode.

show platform hardware qfp active feature docsis bf *bundle-interface-handle* { **replist** | **subblock detail** }

Syntax Description

bf	Specifies the DOCSIS bundle-flood feature.
bundle-interface-handle	Specifies the bundle interface handle. The valid range is from 1 to 2147483647.
replist	Specifies the bundle-flood replication list.
subblock	Specifies the bundle-flood subblock.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show platform hardware qfp active feature docsis bf** command displays DOCSIS bundle-flood information.

Examples

The following example shows a typical display for the **show platform hardware qfp active feature docsis bf** command:

```
Router#  platform hardware qfp active interface if-name Bundle1
General interface information
  Interface Name: Bundle1
  Interface state: VALID
  Platform interface handle: 3689
  QFP interface handle: 7
. . .
Router#  show platform hardware qfp active feature docsis bf ?
<1-2147483647>  Vbundle Intf handle

Router#  show platform hardware qfp active feature docsis bf 7 ?
replist   Cable Bundle Flood Replication List
subblock  Cable Bundle Flood Subblock

Router#  show platform hardware qfp active feature docsis bf 7  replist
  cbl fwd uidx (dec)   replica entry ppe-address (hex)
-------------------------------------------------------
               1839                          3d9c5000
               1840                          3d9c5008
               1841                          3d9c5010
               1842                          3d9c5018
```

```
Router#  show platform hardware qfp active feature docsis bf 7 subblock
Bundle Flood Tx Subblock
  Subblock PPE Address: 0x3bd00000

  Recycle Queue Info:
  Object ID: 84
  Queue Info PPE Address: 0x711453c0

  Replica Info:
  Depth Encoding: 0x01000004
  List Head PPE Address: 0x3d9c5000
```

Related Commands

Command	Description
show platform hardware qfp active interface	Displays QFP interface information. The bundle interface handle can be obtained through this command.

show platform hardware qfp active feature docsis cbl-vrf-steering

To display cable VRF steering feature information, use the **show platform hardware qfp active feature docsis cbl-vrf-steering** command in Privileged EXEC mode.

show platform hardware qfp active feature docsis cbl-vrf-steering *CM-bundle-handle*

Syntax Description

cbl-vrf-steering	Specifies the bundle interface handle. The valid range is from 1 to 2147483647.
CM-bundle-handle	Specifies the bundle interface handle. The valid range is from 1 to 2147483647.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show platform hardware qfp active feature docsis cbl-vrf-steering** command displays cable VRF steering information.

Examples

The following example shows a typical display for the **show platform hardware qfp active feature docsis cbl-vrf-steering** command:

```
Router#   show platform hardware qfp active interface if-name Bundle1
General interface information
  Interface Name: Bundle1
  Interface state: VALID
  Platform interface handle: 3689
  QFP interface handle: 7
  . . .
Router#   show platform hardware qfp active feature docsis cbl-vrf-steering ?
<1-2147483647>  CM Bundle handle

Router#   show platform hardware qfp active feature docsis cbl-vrf-steering 10
 cpe bundle uidx (dec)
--------------------
              245751
Router#
```

Related Commands

Command	Description
show platform hardware qfp active interface	Displays QFP interface information. The CM bundle handle can be obtained through this command.

show platform hardware qfp active feature docsis mpls_tc-precfy db

To display MPLS TC bits classification information, use the **show platform hardware qfp active feature docsis mpls_tc-precfy db**command in Privileged EXEC mode.

show platform hardware qfp active feature docsis mpls_tc-precfy db

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.17.0S	This command was introduced on Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show platform hardware qfp active feature docsis mpls_tc-precfy db** command displays MPLS TC bits classification information.

Examples

The following example shows a typical display for the **show platform hardware qfp active feature docsis mpls_tc-precfy db** command:

```
Router# show platform hardware qfp active feature docsis mpls_tc-precfy db
mpls_tc pre classification database

CM IF HDL     Subblk RSRC HDL       Subblk PPE Addr   VPNTbl RSRC HDL       VPNTbl PPE Addr
-------------------------------------------------------------------------------------------
0x00000740    0x0018fd4009280003    0x498fd400        0x005b3c0009280003    0x4db3c000
0x00000751    0x0018fd4049280003    0x498fd404        0x005b3c0109280003    0x4db3c010
0x0000074e    0x0018fd4089280003    0x498fd408        0x005b3c0209280003    0x4db3c020
```

Related Commands

Command	Description
show platform hardware qfp active cable us-mpls-tc	Displays MPLS TC bits marking informaiton.

show platform hardware qfp active infrastructure punt sbrl

To display and clear the Source-Based Rate Limiting (SBRL) statistics, use the **show platform hardware qfp active infrastructure punt sbrl** command in privileged EXEC mode.

show platform hardware qfp active infrastructure punt sbrl [**sub-mac-addr** | **sub-cm** | **wan-ipv4** | **wan-ipv6**] [**threshold** *threshold_value*] [**clear**]

Syntax Description

sub-mac-addr	(Optional) Displays only the SBRL subscriber-side MAC-address statistics.
sub-cm	(Optional) Displays only the SBRL subscriber-side cable modem statistics.
wan-ipv4	(Optional) Display only the SBRL WAN-side IPv4 statistics.
wan-ipv6	(Optional) Display only the SBRL WAN-side IPv6 statistics.
threshold *threshold_value*	(Optional) Specifies the threshold for displaying SBRL statistics. Rows which have a drop-cnt greater than or equal to the threshold are displayed. The default threshold is 1.
clear	(Optional) Clears the SBRL statistics.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **clear pxf statistics drl cable-wan-ip** command.

Usage Guidelines

The SBRL statistics algorithm stores data for the worst offenders. Sources with small drop counts may be overwritten if the *drop-cnt* is not continually increasing. The *evict-cnt* increases in tandem with *drop-cnt*, and decreases when a source is no longer active. When the *evict-cnt* is below 10, the record may be overwritten.

In the WAN-IPv4 and WAN-IPv6 statistics, the *quar value* is either 1 or 0, where 1 indicates that the source is in quarantine. The *quar value* is updated only when a packet from the source is dropped, so if a source enters quarantine but then stops sending packets, the quar value will remain at 1 even after the source exits quarantine. However, the *drop-cnt* fails to increment.

The statistics can be displayed all at once, or individually. The **threshold** and **clear** keywords can be entered in any order. Only non-zero statistics are displayed.

Examples

The following example shows a typical display for the **show platform hardware qfp active infrastructure punt sbrl** command:

```
Router# show platform hardware qfp active infrastructure punt sbrl
SBRL statistics

Subscriber CM
  drop-cnt  evict-cnt    SID  Interface
```

```
-------------------------------------------------
         1          1      5  Cable3/0/0
       982        982      5  Cable3/0/0

Subscriber MAC-addr
  nothing to report

WAN-IPv4
  drop-cnt  evict-cnt  quar  VRF  cause  IP-address
-------------------------------------------------------
    456788     456788     0    0    050  1.2.0.66

WAN-IPv6
  drop-cnt  evict-cnt  quar  VRF  cause  IP-address
-----------------------------------------------------------------------------
    129334     129334     1    0    011  3046:1829:fefb::ddd1
       965        965     0    0    011  2001:420:2c7f:fc01::3
```

Table 258: show platform hardware qfp active infrastructure punt sbrl Field Descriptions

Field	Description
drop-cnt	Counter for dropped packets.
SID	Service ID.
Interface	Cable interface.
quar	Quarantine status. The value is either 1 or 0, where 1 indicates that the source is in quarantine.
cause	Punt cause.
IP-address	WAN-IPv4 and WAN-IPv6 IP address.

Related Commands

Command	Description
show platform hardware qfp active infrastructure punt summary	Displays the summary of punt-path rate-limiting statistics.
platform punt-sbrl	Rate-limits the packet streams identified by the Source-Based Rate-Limit (SBRL).

show platform hardware qfp active infrastructure punt summary

To display and clear the summary of punt-path rate-limiting statistics, use the **show platform hardware qfp active infrastructure punt summary** command in privileged EXEC mode.

show platform hardware qfp active infrastructure punt summary [**threshold** *threshold_value*] [**clear**]

Syntax Description

threshold *threshold_value*	(Optional) Specifies the threshold for displaying the summary statistics. Rows which have a CPP punt value greater than or equal to the threshold are displayed. The default threshold is 1.
clear	(Optional) Clears the summary statistics.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The summary statistics provide a fast way to determine the status of punt-path rate-limiting. When the Supervisor is receiving an excessive number of punted packets, **clear** and **show** the summary statistics to determine how to configure SBRL and/or punt-policing. The **threshold** and **clear** keywords can be entered in any order. The default behavior is to display only non-zero statistics.

Examples

The following example shows a typical display for the **show platform hardware qfp active infrastructure punt summary** command:

```
Router#  show platform hardware qfp active infrastructure punt summary threshold 10
Punt Path Rate-Limiting summary statistics
Subscriber-side
ID   punt cause               CPP punt        CoPP  ARPfilt/SBRL   per-cause      global
-------------------------------------------------------------------------------------------
017  IPv6 Bad hop limit             22           0             0           0           0
050  IPv6 packet                    13           0             0           0           0
080  CM not online                 335           0             0           0           0

WAN-side
ID   punt cause               CPP punt        CoPP        SBRL   per-cause      global
-------------------------------------------------------------------------------------
017 IPv6 Bad hop limit             471           0           0           0           0
018 IPV6 Hop-by-hop Options      29901           0           0        1430           0
024 Glean adjacency             450911           0      308912           0           0
025 Mcast PIM signaling             19           0           0           0           0
050 IPv6 packet                     11           0           0           0           0
```

Related Commands

Command	Description
show platform hardware active qfp infrastructure punt sbrl	Displays and clears the Source-Based Rate Limiting (SBRL) statistics.
platform punt-sbrl	Rate-limits the packet streams identified by the Source-Based Rate-Limit (SBRL).

show platform integrity

To display checksum record for the boot stages , use the **show platform integrity** command in privileged EXEC mode.

show platform integrity [**sign** [**nonce** *nonce*]]

Syntax Description

sign	(Optional) Show signature
nonce	(Optional) Enter a nonce value

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 17.3.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Example

This example shows how to view the checksum record for boot stages:

```
router#show platform integrity
Platform: CBR-8-CCAP-CHASS
Boot 0 Version: F01013R10.283bb08f92014-10-28
Boot 0 Hash: 9CC305A6C7089195B408D93BF11BD2FB8C000B25B4D14D7AE7AB38AD73C4EB61
Boot Loader Version: 16.7(6r)S
Boot Loader Hash:
F75B1988F328A9BFBF9DE0CB5556D2553EB00F0808B1E5112B8560841A1F05EB9CA694E7FE70BD912A2682D8205DA5B29823B5F62E17FFFA2876EA91BB2498FF
OS Version: 17.03.01w
OS Hashes:
cbrsup-universalk9.17.03.01w.SPA.bin:
2005312A49A02A9BB9BF018012580FFE6E333EA3F09D5058BC9B03566BC3C3F7E753460267A5CAC27B0673574B50BA80958004B1E5874396C0898E21CA924900
cbrsup-clccontrol.17.03.01w.SPA.pkg:
0E2FA5D224738C9F8F7574FAB549C859E74CA3411777EEF270C2DE0175FCD7EE23D4B50CC7C7EA4FB12F4698224D902F6E4F7A5ABD52146E688EB1106DE67C5F
cbrsup-rpvideo.17.03.01w.SPA.pkg:
2BA9A4631C9466A651E59A30841A5BD65B21DDB355D205EE47EBE080747D97F23155FE57C88A2AB18988CFA982BEE6228AC3E2ED20C9D9234557759B78E5100A
cbrsup-rprphy.17.03.01w.SPA.pkg:
44D1811AE7E36C8A6D1A63BF9C5E7EDF2476CB078BB157E429C92EBF689D15F9587BB51AAE38CDF078F42FC19CECAD7F15FF7EA5728518875D45F34F021C14B5
cbrsup-webui.17.03.01w.SPA.pkg:
594C520EB603E253B312C54DC9C92C738CC20E07A07B7695048B627D9396F6BC268DF41331FB65D42DFD8D1F55F163D07E700D62A237F7A31E242ACCB4778FD8
cbrsup-clcdocsis.17.03.01w.SPA.pkg:
615E60F5FC0E1C82E5DA0B1A4D74A2B1DEFEA8DF7016534913955B9C58EDE065160BBBDF21A8ACDD3311A97107105BD2CF074882147E122E7AE7DB7FEBA61596
cbrsup-clcvideokobol.17.03.01w.SPA.pkg:
18CD98F02194D624E8D1F9F14DA50FC7C5FAA85151C427717029383C444D732756CD7FBE1B50F22F45670DD36739EFC342C72AE2C35502DF0DF3123AB9B49AB6
cbrsup-clcvideo.17.03.01w.SPA.pkg:
F81F6C09F9A4125A3CF1E32F8CB2AE6583ED78FE7035BFC29EA4FE4468408861815C91A2924D6C51FE36873F7208CC3ED639A76B41F53D21D36628EF9C550E04
cbrsup-rpaccess.17.03.01w.SPA.pkg:
2DB39AB2C9C5B4913A0C0D1159494FFA464549C1DF99F9C172AAD8116E8932FE99C6902D1EB3DEF9690DF594092EB5FBEFC94C9F36C45CE0A3BC8DDA8A5864E1
cbrsup-clcios.17.03.01w.SPA.pkg:
621D90E67D446F9E60BE8F0FE92F936B2CCB477D73571D23E6D29AEDA8E3D7CA1BF78B79E1EE34DA649BDC37A8CBB29D323AE7F0A711BF4714A8A3D5AC66D367
cbrsup-clciosdb.17.03.01w.SPA.pkg:
19113B4605E7BB528F14B37EA228A57328E34285DC65466EF6470189B7628494661731D292B2162F55EF52FDE27BF63872C54E621E1DAD3C0A55532A75D9D64E
cbrsup-rp-firmware.17.03.01w.SPA.pkg:
52AE6AADB152DFEA9040272C4B295DD74CF380238BB7B21443E01D5F80A6A9BDDB65060966CE706DDE95BCD75F660F3267721F6DCC03FEC8FD6CF511A521E67F
```

```
cbrsup-clcmipsbase.17.03.01w.SPA.pkg:
BA07A071F0AF33D5656D7BC9098B887FCEE1BB101BCD52C499450A5E0ED8A4797E888B4950510481A3942E3CC57F9DD17AC749964F939DCF90AA083BE131A1E4
cbrsup-cciomdsup.17.03.01w.SPA.pkg:
79403B96056330701721F0DECD9A5994F87ED0A7051A788BDFA4C1D22AB597DF5F04ED2CAA0A9F993FD99E0E40E3D5197DA29BB1BEFF3CCE8924702CDD2760D8
cbrsup-rpbase.17.03.01w.SPA.pkg:
239DDBDE502B1F74415D27A3BA66B5367E760CEE9AD056D58F0FD4FD4BB5CF9B99FE661E293273409FEEF18A1356D37B89922FA7638E1466F1EAD117547CC500
cbrsup-espx86base.17.03.01w.SPA.pkg:
09C1C7B01517B38062CFA4F5112F55C6BE27786CB09E03105DD90CECEB452CB2EDA184B78B600FB2B042FCF2903730745FDA5BFC37042ABF3B7C63C347C4E6A8
cbrsup-rpcontrol.17.03.01w.SPA.pkg:
51EDF2EE01B4B78BF7BBA873686704B0F86E0B30A32E7ED3CF75DAB2A4CACD5C5AA4FC338398244297183 75C673556F9D7822B35DE3A9EDAAF9C237D031B7F70
cbrsup-rpios-universalk9.17.03.01w.SPA.pkg:
4280AC6E8D56C37811CA80982173EFA750E589C9B3C0DC2183CD247458C19E43CED1A389DCA008322FCA1B811FEDEC54A063552CE2D8E57C0B8692E20F49BCD7
cbrsup-clc-firmware.17.03.01w.SPA.pkg:
D52D632D807CBA3F78F1CB2EE19CB4A7114E419A884BDADDE2B9563F36E045615B1093567C6241B0E1A37BE57D35A7A17DED383BACBAB6E2B88207D1CC53CD6A
PCR0: 7D29EFC0558B5FB1C35DBD0849EDB8B532BB1842621056DA93867E5F486EEF31
PCR8: 0F420B7149D33A328E1AB34B580F2668AC114B74E4CC32E0E920CD28B1BA52A0
```

Example

This example shows how to view the checksum record for boot stages with a signature:

```
router#show platform integrity  sign
Platform: CBR-8-CCAP-CHASS
Boot 0 Version: F01013R10.283bb08f92014-10-28
Boot 0 Hash: 9CC305A6C7089195B408D93BF11BD2FB8C000B25B4D14D7AE7AB38AD73C4EB61
Boot Loader Version: 16.7(6r)S
Boot Loader Hash:
F75B1988F328A9BFBF9DECCB5556D2553EB00F0808B1E5112B8560841A1F05EB9CA694E7FE70BD912A2682D8205DA5B29823B5F62E17FFEA2876EA91BB2498FF
OS Version: 17.03.01w
OS Hashes:
cbrsup-universalk9.17.03.01w.SPA.bin:
2005312A49A02A9BB9BF018012580FFE6E333EA3F09D5058BC9B03566BC3C3F7E753460267A5CAC27B0673574B50BA80958004B1E5874396C0898E21CA924900
cbrsup-clccontrol.17.03.01w.SPA.pkg:
0E2FA5D224738C9F8F7574EAB549C859E74CA3411777EEF270C2DE0175FCD7EE23D4B50CC7C7EA4FB12F4698224D902F6E4F7A5ABD52146E688EB1106DE67C5F
cbrsup-rpvideo.17.03.01w.SPA.pkg:
2BA9A4631C9466A651E59A30841A5BD65B21DDB355D205EE47EBE080747D97F23155FE57C88A2AB18988CFA982BEE6228AC3E2ED20C9D9234557759B78E5100A
cbrsup-rprphy.17.03.01w.SPA.pkg:
44D1811AE7E36C8A6D1A63BF9C5E7EDF2476CB078BB157E429C92EBF689D15F9587BB51AAE38CDF078F42FC19CECAD7F15FF7EA5728518875D45F34F021C14B5
cbrsup-webui.17.03.01w.SPA.pkg:
594C520EB603E253B312C54DC9C92C738CC20E07A07B7695048B627D9396F6BC268DF41331FB65D42DFD8D1F55F163D07E700D62A237F7A31E242ACCB4778FD8
cbrsup-clcdocsis.17.03.01w.SPA.pkg:
615E60F5FC0E1C82E5DA0B1A4D74A2B1DFFA8DF7016534913955 89C58EDE065160BBBDF21A8ACDD3311A97107105BD2CF074882147E122E7AE7DB7FEBA61596
cbrsup-clcvideokobol.17.03.01w.SPA.pkg:
18CD98F02194D624E8D1F9F14DA50FC7C5FAA85151C427717029383C444D732756CD7FBE1B50F22F45670DD36739EFC342C72AE2C35502DF0DF3123AB9B49AB6
cbrsup-clcvideo.17.03.01w.SPA.pkg:
F81F6C09F9A4125A3CF1E32F8CB2AE6583ED78FE7035BFC29EA4FE4468408861815C91A2924D6C51FE36873F7208CC3ED639A76B41F53D21D36628EF9C550E04
cbrsup-rpaccess.17.03.01w.SPA.pkg:
2DB39AB2C9C5B4913A0C0D1159494FFA464549C1DF99F9C172AAD8116E8932FE99C6902D1EB3DEF9690DF594092EB5FBEFC94C9F36C45CE0A3BC8DDA8A5864E1
cbrsup-clcios.17.03.01w.SPA.pkg:
621D90E67D446F9E60BE8F0FE92F936B2CCB477D73571D23E6D29AEDA8E3D7CA1BF78B79E1EE34DA649BDC37A8CBB29D323AE7F0A711BF4714A8A3D5AC66D367
cbrsup-clciosdb.17.03.01w.SPA.pkg:
19113B4605E7BB528F14B37EA228A57328E34285DC65466EF6470189B7628494661731D292B2162F55EF52FDE27BF63872C54E621E1DAD3C0A55532A75D9D64E
cbrsup-rp-firmware.17.03.01w.SPA.pkg:
52AE6AADB152DFFA9040272C4B295DD74CF380238BB7B21443E01D5F80A6A9BDDB65060966CE706DDE95BCD75F660F3267721F6DCC03FBC8FD6CF511A521E67F
cbrsup-clcmipsbase.17.03.01w.SPA.pkg:
BA07A071F0AF33D5656D7BC9098B887FCEE1BB101BCD52C499450A5E0ED8A4797E888B4950510481A3942E3CC57F9DD17AC749964F939DCF90AA083BE131A1E4
cbrsup-cciomdsup.17.03.01w.SPA.pkg:
79403B96056330701721F0DECD9A5994F87ED0A7051A788BDFA4C1D22AB597DF5F04ED2CAA0A9F993FD99E0E40E3D5197DA29BB1BEFF3CCE8924702CDD2760D8
cbrsup-rpbase.17.03.01w.SPA.pkg:
239DDBDE502B1F74415D27A3BA66B5367E760CEE9AD056D58F0FD4FD4BB5CF9B99FE661E293273409FEEF18A1356D37B89922FA7638E1466F1EAD117547CC500
cbrsup-espx86base.17.03.01w.SPA.pkg:
09C1C7B01517B38062CFA4F5112F55C6BE27786CB09E03105DD90CECEB452CB2EDA184B78B600FB2B042FCF2903730745FDA5BFC37042ABF3B7C63C347C4E6A8
```

```
cbrsup-rpcontrol.17.03.01w.SPA.pkg:
51EDF2EE01B4B78BF7BBA873686704B0F86E0B30A32E7ED3CF75DAB2A4CACD5C5AA4FC33839824429718375C673556F9D7822B35DE3A9EDAAF9C237D031B7F70
cbrsup-rpios-universalk9.17.03.01w.SPA.pkg:
4280AC6E8D56C37811CA80982173EFFA750E589C9B3C0DC2183CD247458C19E43CED1A389DCA008322FCA1B811FEDEC54A063552CE2D8E57C0B8692E20F49BCD7
cbrsup-clc-firmware.17.03.01w.SPA.pkg:
D52D632D807CBA3F78F1CB2FE19CB4A7114E419A884BDADDE2B9563F36E045615B1093567C6241B0E1A37BE57D35A7A17DED383BACBAB6E2B88207D1CC53CD6A
PCR0: 7D29EFC0558B5FB1C35DBD0849EDB8B532BB1842621056DA93867E5F486EEF31
PCR8: 0F420B7149D33A328E1AB34B580F2668AC114B74E4CC32E0E920CD28B1BA52A0
Signature version: 1
[redacted]
```

Example

This example shows how to view the checksum record for boot stages with a signature and nonce:

```
router#show platform integrity  sign nonce 18446744073709551615
Platform: CBR-8-CCAP-CHASS
Boot 0 Version: F01013R10.283bb08f92014-10-28
Boot 0 Hash: 9CC305A6C7089195B408D93BF11BD2FB8C000B25B4D14D7AE7AB38AD73C4EB61
Boot Loader Version: 16.7(6r)S
Boot Loader Hash:
F75B1988F328A9BFBF9DECCB5556D2553EB00F0808B1E5112B8560841A1F05EB9CA694E7FE70BD912A2682D8205DA5E29823B5F62E17FFEA2876EA91BE2498FF
OS Version: 17.03.01w
OS Hashes:
cbrsup-universalk9.17.03.01w.SPA.bin:
2005312A49A02A9EB9BF018012580FFE6E333EA3F09D5058BC9B03566BC3C3F7E753460267A5CAC27B0673574B50BA80958004B1E5874396C0898E21CA924900
cbrsup-clccontrol.17.03.01w.SPA.pkg:
0E2FA5D224738C9F8F7574EAB549C859E74CA3411777EEF270C2DE0175FCD7EE23D4B50CC7C7EA4FB12F4698224D902F6E4F7A5ABD52146E688EB1106DE67C5F
cbrsup-rpvideo.17.03.01w.SPA.pkg:
2BA9A4631C9466A651E59A30841A5ED65B21DDB355D205EE47EBE080747D97F23155FE57C88A2AB18988CFA982BEE6228AC3E2ED20C9D9234557759B78E5100A
cbrsup-rprphy.17.03.01w.SPA.pkg:
44D1811AE7E36C8A6D1A63BF9C5E7EDF2476CB078EB157E429C92EBF689D15F9587BB51AAE38CDF078F42FC19CECAD7F15FF7EA5728518875D45F34F021C14B5
cbrsup-webui.17.03.01w.SPA.pkg:
594C520EB603E253B312C54DC9C92C738CC20E07A07B7695048B627D9396F6BC268DF41331FB65D42DFD8D1F55F163D07E700D62A237F7A31B242ACCB4778FD8
cbrsup-clcdocsis.17.03.01w.SPA.pkg:
615E60F5FC0E1C82E5DA0B1A4D74A2B1DEFFA8DF701653491395589C58EDE065160BBBDF21A8ACDD3311A97107105BD2CF074882147E122E7AE7DB7FEBA61596
cbrsup-clcvideokobol.17.03.01w.SPA.pkg:
18CD98F02194D624E8D1F9F14DA50FC7C5FAA85151C427717029383C444D732756CD7FBE1B50F22F45670DD36739EFC342C72AE2C35502DF0DF3123AB9B49AB6
cbrsup-clcvideo.17.03.01w.SPA.pkg:
F81F6C09F9A4125A3CF1E32F8CB2AE6583ED78FE7035BFC29EA4FE446840861815C91A2924D6C51FE36873F7208CC3ED639A76B41F53D21D36628EF9C550E04
cbrsup-rpaccess.17.03.01w.SPA.pkg:
2DB39AB2C9C5B4913A0C0D1159494FFA464549C1DF99F9C172AAD8116E8932FE99C6902D1EB3DEF9690DF594092EB5FBEFC94C9F36C45CE0A3BC8DDA8A5864E1
cbrsup-clcios.17.03.01w.SPA.pkg:
621D90E67D446F9E60BE8F0FE92F936B2CCB477D73571D23E6D29AEDA8E3D7CA1BF78B79E1EE34DA649BDC37A8CBB29D323AE7F0A711BF4714A8A3D5AC66D367
cbrsup-clciosdb.17.03.01w.SPA.pkg:
19113B4605E7BB528F14B37EA228A57328E34285DC65466EF6470189B7628494661731D292B2162F55EF52FDE27BF63872C54E621E1DAD3C0A55532A75D9D64E
cbrsup-rp-firmware.17.03.01w.SPA.pkg:
52AE6AADB152DFEA9040272C4B295DD74CF380238BB7B21443E01D5F80A6A9BDDB65060966CE706DDE95BCD75F660F3267721F6DCC03FEC8FD6CF511A521E67F
cbrsup-clcmipsbase.17.03.01w.SPA.pkg:
BA07A071F0AF33D5656D7BC9098B887FCEE1BB101BCD52C499450A5E0ED8A4797E888B4950510481A3942E3CC57F9DD17AC749964F939DCF90AA083BE131A1F4
cbrsup-cciomdsup.17.03.01w.SPA.pkg:
79403B960563307017 21F0DECD9A5994F87ED0A7051A788BDFA4C1D22AB597DF5F04ED2CAA0A9F993FD99E0E40E3D5197DA29BB1BEFF3CCE8924702CDD2760D8
cbrsup-rpbase.17.03.01w.SPA.pkg:
239DDBDE502B1F74415D27A3BA66B5367E760CEE9AD056D58F0FD4FD4BB5CF9B99FE661E293273409FEEF18A1356D37B89922FA7638E1466F1FAD117547CC500
cbrsup-espx86base.17.03.01w.SPA.pkg:
09C1C7B01517B38062CFA4F5112F55C6BE27786CB09E03105DD90CECEB452CB2EDA184B78B600FB2B042FCF2903730745FDA5BFC37042ABF3B7C63C347C4E6A8
cbrsup-rpcontrol.17.03.01w.SPA.pkg:
51EDF2EE01B4B78BF7BBA873686704B0F86E0B30A32E7ED3CF75DAB2A4CACD5C5AA4FC33839824429718375C673556F9D7822B35DE3A9EDAAF9C237D031B7F70
cbrsup-rpios-universalk9.17.03.01w.SPA.pkg:
4280AC6E8D56C37811CA80982173EFFA750E589C9B3C0DC2183CD247458C19E43CED1A389DCA008322FCA1B811FEDEC54A063552CE2D8E57C0B8692E20F49BCD7
cbrsup-clc-firmware.17.03.01w.SPA.pkg:
```

```
D52D632D807CBA3F78F1CB2EE19CB4A7114E419A884BDADDE2B9563F36E045615B1093567C6241B0E1A37BE57D35A7A17DED383BACBAB6E2B88207D1CC53CD6A
PCR0: 7D29EFC0558B5FB1C35DBD0849EDB8B532BB1842621056DA93867E5F486EEF31
PCR8: 0F420B7149D33A328E1AB34B580F2668AC114B74E4CC32E0E920CD28B1BA52A0
Signature version: 1
Signature: 0A
```

show platform software cable

To display the out-of-band information for downstream and upstream channels, use the **show platform software cable** command in privileged EXEC mode.

Show commands for OOB downstream channel:

- Shows OOB DS FMAN table details:

  show platform software cable *slot-number* **oob-ds**

- Shows OOB DS FMAN table statistics status:

  show platform software cable *slot-number* **oob-ds statistics**

- Shows OOB DS FMAN table details of the group:

  show platform software cable *slot-number* **oob-ds group** *G2 address*

Show commands for OOB upstream channel:

- Shows OOB US FMAN table details:

  `show platform software cable` *slot-number* `oob-us`

- Shows OOB DS FMAN table statistics status:

  `show platform software cable` *slot-number* `oob-us statistics`

- Shows OOB DS FMAN table details of the source ID:

  `show platform software cable` *slot-number* `oob-us source-id` *RPD source ID*

- Shows information on Upstream RF ports , 55-1 channels, and packet count information of the UEPI sessions.

  `show platform software cable fp active oob-chn-pkts`

Syntax Description

slot-number	The line card that is present in the specified slot. Valid numbers range 0–9, F0 to F1 and R0 to R1.
statistics	Displays the FMAN table statistics status.
group	Displays the line card groups.
RPD source ID	RPD source ID

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Amsterdam 17.3.1x	The output of the option **fp active oob-chn-pkts** was modified to include more 55-1 us oob debug information.

Usage Guidelines

Use this command to display the out-of-band information for downstream or upstream channels:

Displays the OOB Information for Upstream Channels

Use the following commands to verify the US details.

```
show platform software cable F0 oob-us
show platform software cable F0 oob-us statistics
clear platform software cable F0 oob-us statistics
show platform software cable F0 oob-us source-id <RPD source id>
```

Displays the OOB Information for Downstream Channels

Use the following commands to verify the US details.

```
show platform software cable F0 oob-ds
show platform software cable F0 oob-ds statistics
clear platform software cable F0 oob-ds statistics
show platform software cable F0 oob-ds group <G2 address>
```

The following example shows a sample output for the command **show platform software cable fp active oob-chn-pkts**:

```
Router#show platform software  cable fp active oob-chn-pkts
cable OOB US PACKET table information

Session ID    rfport  chn_Id  demodId  Total Cells   Perfect Cells    Corrected Cells
Uncorrected Cells   Power Level      Min Power Lvl    Max Power Lvl
-------------------------------------------------------------------------------------
0x40300003    0       0       32       0000000000    0000000000       0000000000
0000000000          0000000000       0000000000       0000000000
0x60300003    0       0       32       0000000000    0000000000       0000000000
0000000000          0000000000       0000000000       0000000000
0x60300003    0       2       130      0000000000    0000000000       0000000000
0000000000          0000000000       0000000000       0000000000
```

show platform software iomd

To verify the MAC filtering status, use the **show platform software iomd** command in privileged EXEC mode.

```
show platform software iomd slot /bay mac-filter
```

Syntax Description

slot/bay	The SUP slot and SUP-PIC bay number.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.1SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following example shows a typical display for the **show platform software iomd** command:

```
Router# show platform software iomd 4/4 mac-filter
IOMD (Input Output Module Driver) Mac Filter Status


port: 0     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                       0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:04    ff:ff:ff:ff:ff:ff
    0


port: 1     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                       0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:05    ff:ff:ff:ff:ff:ff
 1729


port: 2     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                       0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:06    ff:ff:ff:ff:ff:ff
    0
```

```
port: 3     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                     0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:07    ff:ff:ff:ff:ff:ff
    0


port: 4     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                     0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:08    ff:ff:ff:ff:ff:ff
    0


port: 5     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                     0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:09    ff:ff:ff:ff:ff:ff
   15


port: 6     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                     0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:0a    ff:ff:ff:ff:ff:ff
    0


port: 7     promiscuous mode:     unicast:  enable   multicast:  enable      broadcast:
enable
            Input Drop cnt:                     0      Total Drop cnt:
    0
            Entry Number:   1
    Index      Mode    Action            Entry MAC           Entry MASK             Match
Count
       00    enable      pass    c4:14:3c:16:7c:0b    ff:ff:ff:ff:ff:ff
    0
```

Related Commands

Command	Description
mac-addr-filter	Configures the MAC filtering.

show platform software ios/cdman ipccl

To display information about IPC Client Library (IPCCL) on cable device manager, use the **show platform software** command in privileged EXEC mode. Use **cdman** keyword to display cable device manager's IPCCL statistics on linecards or use **ios** keyword to display IOS IPCCL statistics on Route Processor's or linecards.

show platform software {**ios** | **cdman** } *slot-id* **ipccl** { **log-history** { *port-id* } | **outstanding** { **client** {*port-id client-id* } | **port** {*port-id*} } | **statistics** {**client** { *port-id client-id* } | {**port** { *port-id* [**rx-msg-stat**] } } | { **service** {*port-id* [*svc-id* **apps**] } } }

Syntax Description

cdman *slot-id*	Specifies the cable linecard slot number. The valid linecard slot range is 0-3 and 6- 9.
ios *slot-id*	Specifies the cable linecard slot number. The valid linecard slot range is 0-3, 6-9,R0, R1 and RP active\standby.
log-history	Specifies the log-history.
port-id	Specifies the port layer to which IPC messages are sent and received. The port-id values are for IOS are: • 1 - CABLE_IPCCL_PORT_DOCSIS The port-id values are for IOS-CLC are: • 1 - CABLE_IPCCL_PORT_DOCSIS • 2 - CABLE_IPCCL_PORT_CDMAN_NORMAL • 3 - CABLE_IPCCL_PORT_VIDMAN • 4 - CABLE_IPCCL_PORT_IDB_SYNC The port-id values for cable device manager is: • 2 - CABLE_IPCCL_PORT_CDMAN_NORMAL
outstanding	Specifies the statistics of outstanding messages.
client	Specifies the client statistics.
port	Specifies the port statistics.

client-id	Specifies client statistics. Different client's will use different services and ports: • CABLE_IPCCL_TEST_CLIENT = 1 • CABLE_IPCCL_APP_CLIENT_DUMMY = 2 • CABLE_IPCCL_DOCSIS_APP_CLIENT = 3 • CABLE_IPCCL_DOC_CDM_APP_CLIENT = 4 • CABLE_IPCCL_CDMAN_BINOS_APP_CLIENT = 5 • CABLE_IPCCL_UMP_APP_CLIENT = 6 • CABLE_IPCCL_DMP_APP_CLIENT = 7 • CABLE_IPCCL_MD_APP_CLIENT = 8 • CABLE_IPCCL_MD_CDMAN_APP_CLIENT = 9 • CABLE_IPCCL_DSBG_APP_CLIENT = 10 • CABLE_IPCCL_UCM_APP_CLIENT = 11 • CABLE_IPCCL_DCM_APP_CLIENT = 12 • CABLE_IPCCL_DCM_CDMAN_APP_CLIENT = 13 • CABLE_IPCCL_DSNB_APP_CLIENT = 14 • CABLE_IPCCL_PLAT_CLI_CLIENT = 15 • CABLE_IPCCL_STATS_APP_CLIENT = 16 • CABLE_IPCCL_SNMP_APP_CLIENT = 17 • CABLE_IPCCL_CMTS_IPC_APP_CLIENT = 18 • CABLE_IPCCL_SPECMGMT_APP_CLIENT = 19 • CABLE_IPCCL_SPECSVL_APP_CLIENT = 20 • CABLE_IPCCL_SPECSVL_CDMAN_APP_CLIENT = 21 • CABLE_IPCCL_RFCE_APP_CLIENT = 22 The valid client-id values for cable device manager is: • 2 - CABLE_IPCCL_PORT_CDMAN_NORMAL
statistics	Specifies statistics on route processor.
rx-msg-stat	(Optional) Specifies the RX message statistics based on TDL message type.
service	Specifies the service statistics
svc-id	Specifies the service-id used by clients grouped under service layer. The valid values are: • 0 - Normal • 1 - High • 4 - SNMP_NORMAL
apps	Specifies the list of application used by this service.

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show platform software ios** *slot* **ipccl** command displays information about IPC Client Library (IPCCL) on cable device manager.

Examples

The following example shows a typical display for the **show platform software cdman ipccl** command:

```
Router# show platform software cdman 2 ipccl ?
 log-history  log history
 outstanding  statistics of outstanding messages
 statistics   statistics on Route Processor
```

Related Commands

Command	Description
show platform software infrastructure bipc summary	Displays the IOS XE BIPC summary.
show platform software infrastructure bipc identifier	Displays detailed information about the the BIPC identifier.

show platform software ios ipccl

To display information about the IPC Client Library (IPCCL) relative statistics, use the **show platform software ios ipccl** command in privileged EXEC mode.

show platform software ios *slot* **ipccl** { {**outstanding** {**port** [*port_number*] [*peer_slot_number*] } | {**client** *port_number client_id peer_slot_number* } } | {**statistics** {**port** [*port_number*] [*peer_slot_number*] [**rx-msg-stat**] } | {**client** *port_number peer_slot_number* } | {**service** *port_number service_id peer_slot_number* } } | {**log-history port** *port_number peer_slot_number* } }

Syntax Description

slot	The cable line card Supervisor slot number.
outstanding	Displays statistics of outstanding messages.
port	Displays the port statistics.
port_number	The IPCCL predefined internal port ID.
peer_slot_number	The slot number of IPCCL peer session.
client	Displays the client statistics.
client_id	The IPCCL registered internal client ID.
statistics	Displays statistics on route processor.
rx-msg-stat	(Optional) Specifies the RX message statistics based on TDL message type.
service	Displays the service statistics.
service_id	The IPCCL predefined internal service ID.
log-history	Displays the log history.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show platform software ios** *slot* **ipccl** command displays the IPCCL statistics on Supervisor or line card.

Note To enable the log-history feature, use the **platform ipccl log-history** command in global configuration mode.To enable the rx-msg-stat feature, use the **platform ipccl rx-stat** command in global configuration mode.

Examples

The following example shows a typical display for the **show platform software ios** *slot* **ipccl** command for all cable interfaces:

```
 Router# show platform software ios R0 ipccl statistics ?
  client   client statistics
  port     port statistics
  service  service statistics

Router# show platform software ios R0 ipccl statistics por
Router# show platform software ios R0 ipccl statistics port ?
  1  CABLE_IPCCL_PORT_DOCSIS
  |  Output modifiers
  <cr>

Router# show platform software ios R0 ipccl statistics port 1 ?
  0  Cable-Linecard slot 0
  1  Cable-Linecard slot 1
  2  Cable-Linecard slot 2
  3  Cable-Linecard slot 3
  4  SUP-PIC slot 4
  5  SUP-PIC slot 5
  6  Cable-Linecard slot 6
  7  Cable-Linecard slot 7
  8  Cable-Linecard slot 8
  9  Cable-Linecard slot 9

Router# show platform software ios R0 ipccl statistics port 1 7
-------------------------------------------

IPCCL Port 1 Dest CC7 Session 3604558

Session is up      : True
Session Up Cnt     : 1
Session Down Cnt   : 0
Message Flushed Cnt: 0
TX:
Message Send                   : 2964
Message Send Success           : 2964
Current Outstanding Message    : 0
Outstanding High Watermark     : 0
Port Config MAX Outstanding Msg: 10000
Port Current Pending message   : 0
Port MAX Pending message       : 0
Port Configured High Watermark : 3000
Port Configured Low Watermark  : 1000
Port High Watermark Hit Count  : 0
Port Low Watermark  Hit Count  : 0
Outstanding MAX Hit Count      : 0
Ack Received                   : 2
Overdue Ack Received           : 0
Message Send Error             : 0
Port Driver Error Counter      : 0
TX Msg Drop Counter-Invalid Sess   : 0
TX Msg Drop Counter-Invalid App    : 0
TX Msg Drop Counter-Invalid SVC    : 0
RX:
Message Received            : 894889
Total Ack Send Counter      : 1
RX Msg Drop Counter-Invalid Sess   : 0
RX Msg Drop Counter-Invalid App    : 0
RX Msg Drop Counter-Invalid SVC    : 0
RX Msg Drop Counter-Invalid Field  : 0
RX ACK Drop Counter-Invalid Sess   : 0
```

```
RX ACK Drop Counter-Invalid App    : 0
RX ACK Drop Counter-Invalid Field  : 0
ERR:
EAGAIN                      : 0
ETIMEOUT                    : 0
ENOMEM                      : 0
EFAULT                      : 0
ECANCELED                   : 0
Other Error                 : 0
Average Latencies in Microseconds:
Round Trip                  : 28659
Send                        : 7537
Onwire                      : 5442
Total Ctx Switch            : 14275
Peer Ctx Switch             : 345
Local Ctx Switch            : 13930
Router#show platform software ios R1 ipccl log-history 1 3
IPCCL Port 1 Dest CC3
: 2015-04-16 16:32:50.090 Msg 191 seq 1113408 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.091 Msg 191 seq 1113409 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.092 Msg 191 seq 1113410 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.093 Msg 191 seq 1113411 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.093 Msg 191 seq 1113412 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.094 Msg 191 seq 1113413 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.095 Msg 191 seq 1113414 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.095 Msg 191 seq 1113415 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.096 Msg 191 seq 1113416 NBK MsgRx port 1 clnt 16 slot 3 E0
: 2015-04-16 16:32:50.096 Msg 191 seq 1113417 NBK MsgRx port 1 clnt 16 slot 3 E0

Router# show platform software ios R1 ipccl statistics port 1 3 rx-msg-stat
  client_id     tdl_msg_type      total_msg_count       last_msg_handle_usec
aver_msg_handle_usec      max_msg_handle_used

------------------------------------------------------------------------------

  3             2                 1603                  33                      39
                  3518
  3             6                 1618                  44                      36
                  2758
  3             216               6                     163                     429
                  1821
  3             243               2                     30                      24
                  30
  16            191               64395                 37                      39
                  408
  17            219               1040                  51                      41
                  108
```

show platform software ios socket statistics 0

To display raw socket interprocess communication (IPC) infrastructure statistics for specified field replaceable unit (FRU), use the **show platform software ios** *slot-id* **socket statistics 0**command in privileged EXEC mode.

show platform software ios*slot-id***socket statistics 0**

Syntax Description

slot-id	The field replaceable unit slot number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows a typical display for the **show platform software ios** *slot-id* **socket statistics 0**command:

```
 Router# show platform software ios R0 socket statistics 0
-------------------------------------------

Session Slot             : 2
Socket FD                : 93
Client ID                : 0
Message Receive Count    : 0
Message Receive Bytes    : 0

-------------------------------------------

Session Slot             : 2
Socket FD                : 93
Client ID                : 1
Message Receive Count    : 30155
Message Receive Bytes    : 1326820

-------------------------------------------

Session Slot             : 3
Socket FD                : 86
Client ID                : 0
Message Receive Count    : 0
Message Receive Bytes    : 0

-------------------------------------------

Session Slot             : 3
Socket FD                : 86
Client ID                : 1
Message Receive Count    : 29611
Message Receive Bytes    : 69782901
```

show platform software patch

To display the patch version for each sub package, use the **show platform software patch** command in privileged EXEC mode.

```
show platform software patch slot info
```

To display the detailed patch information for all the field replaceable units (FRUs), use the **show platform software patch info**command in privileged EXEC mode.

```
show platform software patch info
```

Syntax Description

slot	The cable line card slot number.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0SP	This command was modified on the Cisco cBR Series converged Broadband Routers. Only the **show platform software patch info** can be used to get the detailed pacth information for all the FRUs.

Usage Guidelines

The **show platform software patch** *slot* **info** command is used to determine the patch information for each sub package on a particular slot.

The **show platform software patch info** command is used to determine the detailed patch information for all the FRUs. For example, to see the patch info for thirteen FRUs, you need not execute the **show platform software patch** *slot* **info** command thirteen times specifying FRU ID everytime. Instead use **show platform software patch info** , which will display the detailed patch information for all the FRUs.

Examples

The following example shows a typical display for the **show platform software patch** *slot* **info** command for all cable interfaces:

```
Router# show platform software patch 3 info
cbrsup-clciosdb: 3.15 (0.0)
cbrsup-clc-firmware: 3.15 (0.0)
cbrsup-clcvideo: 3.15 (0.0)
cbrsup-clcios: 3.15 (0.0)
cbrsup-clccontrol: 3.15 (0.0)
cbrsup-clcdocsis: 3.15 (0.0)
cbrsup-clcmipsbase: 3.15 (0.0)
```

The following example shows a typical display for the **show platform software patch info** command for all cable interfaces:

```
Router# show platform software patch info
Base Version: 3.18.0
```

```
Subpkg              R0   R1   LC0  LC1  LC2  LC3  LC6  LC7  LC8  LC9
clc-firmware        N/A  N/A  N/A  N/A  N/A  0.0  0.0  0.0  N/A  N/A
clccontrol          N/A  N/A  N/A  N/A  N/A  0.0  0.0  0.0  N/A  N/A
clcdocsis           N/A  N/A  N/A  N/A  N/A  0.0  0.0  0.0  N/A  N/A
clcios              N/A  N/A  N/A  N/A  N/A  4.0  4.0  4.0  N/A  N/A
clciosdb            N/A  N/A  N/A  N/A  N/A  4.0  4.0  4.0  N/A  N/A
clcmipsbase         N/A  N/A  N/A  N/A  N/A  0.0  0.0  0.0  N/A  N/A
clcvideo            N/A  N/A  N/A  N/A  N/A  0.0  0.0  0.0  N/A  N/A
espx86base          0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
rp-firmware         0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
rpaccess            0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
rpbase              0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
rpcontrol           0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
rpios-universalk9   0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
rpvideo             0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
cciomdsup           0.0  0.0  N/A  N/A  N/A  N/A  N/A  N/A  N/A  N/A
```

show platform software ptpd stat stream

To check the detailed stream statistics, use the **show platform software ptpd stat stream** <*id*|*ip*> command.

show platform software ptpd stat stream <*id*|*ip*>

Command Default None

Command Modes Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 16.7.1y	This command was introduced.
Cisco IOS XE Cupertino 17.9.1w	The command output includes units for the current data set section.

Example

This example shows the output for the **show platform software ptpd stat stream** <*id*|*ip*> command:

```
Router# show platform software ptpd stat stream 2001:120:101:16:A94F:61DB:D324:76B4

Load for five secs: 5%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 04:40:43.466 CST Tue Dec 19 2017
IP-Address : 2001:120:101:16:a94f:61db:d324:76b4 Stream-Number: 0
SYNC Contract
Remaining Duration : 105 (secs), State : ACTIVE
Tx packets : 247592, Rx Packets : 0 Error Packets : 0
Announce Contract
Remaining Duration : 105 (secs), State : ACTIVE
Tx packets : 15490, Rx Packets : 0 Error Packets : 0
Delay-Response Contract
Remaining Duration : 101 (secs), State : ACTIVE
Tx packets : 246878, Rx Packets : 0 Error Packets : 0
Router# show platform software ptpd stat stream 0
Load for five secs: 3%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 04:40:26.810 CST Tue Dec 19 2017
LOCK STATUS : FREERUN
SYNC Packet Stats
Time elapsed since last packet: 0.0
Configured Interval : -4, Acting Interval -4
Tx packets : 247325, Rx Packets : 0
Last Seq Number : 0, Error Packets : 0
Delay Req Packet Stats
Time elapsed since last packet: 0.0
Configured Interval : 0, Acting Interval : -4
Tx packets : 0, Rx Packets : 246612
Last Seq Number : 26116, Error Packets : 0
Delay Response Packet Stats
Time elapsed since last packet: 0.0
Configured Interval : -4, Acting Interval : -4
Tx packets : 246612, Rx Packets : 0
Last Seq Number : 0, Error Packets : 0
Announce Packet Stats
Time elapsed since last packet: 0.0
```

```
Configured Interval : 0, Acting Interval : 0
Tx packets : 15474, Rx Packets : 0
Last Seq Number 0 Error Packets 0
Signalling Packet Stats
Time elapsed since last packet: 0.0
Configured Interval : 0, Acting Interval : 0
Tx packets : 162, Rx Packets : 162
Last Seq Number : 0, Error Packets : 0
Current Data Set                            Units     Within tolerance?
  Offset from master :  +0.000000008        seconds          Yes
  Mean Path Delay    :  +0.000005055        seconds          Yes
  Forward Path Delay :  +0.000005063        seconds          Yes
  Reverse Path Delay :  +0.000005026        seconds          Yes
  Steps Removed 1
General Stats about this stream
Packet rate : 0, Packet Delta (ns) : 0
Clock Stream handle : 0, Index : 0
Oper State : 3, Sub oper State : 6
Log mean sync Interval : 0, log mean delay req int : 0
```

show platform software punt-policer

To display the punt policer settings and statistics, and clear the statistics, use the **show platform software punt-policer** command in privileged EXEC mode.

show platform software punt-policer [**clear** | **drop-only**]

Syntax Description

clear	(Optional) Displays the punt policer configuration and statistics and clears the statistics.
drop-only	(Optional) Displays the punt policer with non-zero drop counters.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. The **show platform software punt-policer clear** command replaces the **clear pxf statistics drl max-rate** and **clear pxf statistics drl wan-non-ip** commands.

Example

The following is a sample output of the **show platform software punt-policer** command:

```
Router# show platform software punt-policer

Per Punt-Cause Policer Configuration and Packet Counters

Punt                                Configured (pps)   Conform Packets     Dropped Packets
Cause  Description                   Normal   High     Normal    High       Normal    High

-------------------------------------------------------------------------------------------

  2    IPv4 Options                   4000     3000     0         0          0         0
  3    Layer2 control and legacy      40000    10000    890       0          0         0
  4    PPP Control                    2000     1000     0         0          0         0
  5    CLNS IS-IS Control             2000     1000     0         0          0         0
  6    HDLC keepalives                2000     1000     0         0          0         0
  7    ARP request or response        2000     1000     0         123        0         0
  8    Reverse ARP request or re...   2000     1000     0         0          0         0
  9    Frame-relay LMI Control        2000     1000     0         0          0         0
 10    Incomplete adjacency           2000     1000     0         5          0         0
 11    For-us data                    40000    5000     1523592   0          211       0
```

```
 12    Mcast Directly Connected ...  2000     1000     0          0          0          0
 13    Mcast IPv4 Options data p...  2000     1000     0          0          0          0
 15    MPLS TTL expired              5120     2000     0          0          0          0
 16    MPLS Reserved label (ie: ...  5120     2000     0          0          0          0
 18    IPV6 Hop-by-hop Options       2000     1000     0          0          0          0
 19    Mcast Internal Copy           2000     1000     0          0          0          0
 23    Mcast IGMP Unroutable         2000     1000     0          0          0          0
 24    Glean adjacency               2000     5000     0          1525432    0          0
 25    Mcast PIM signaling           2000     1000     0          0          0          0
 27    Subscriber session control    10000    40000    0          0          0          0
   . . .
 98    cable arp filter              2000     1000     0          0          0          0
 99    Cable L3 mobility             2000     1000     0          0          0          0
100    Source Verify inconclusive    2000     1000     0          0          0          0
101    cable modem pre reg           2000     1000     49         0          0          0
102    mpls receive adj              2000     2000     0          0          0          0
103    MKA EAPoL packet              2000     1000     0          0          0          0
104    ICMP Unreachable              1048     1000     0          0          0          0
105    Cable DHCP                    2000     1000     697        0          0          0
```

The following is a sample output of the **show platform software punt-policer clear** command:

```
Router# show platform software punt-policer clear

Per Punt-Cause Policer Configuration and Packet Counters

Punt                                Configured (pps)   Conform Packets     Dropped Packets
Cause  Description                   Normal   High     Normal    High       Normal    High
-------------------------------------------------------------------------------------------
  2    IPv4 Options                  4000     3000     0         0          0         0
  3    Layer2 control and legacy     40000    10000    890       0          0         0
  4    PPP Control                   2000     1000     0         0          0         0
  5    CLNS IS-IS Control            2000     1000     0         0          0         0
  6    HDLC keepalives               2000     1000     0         0          0         0
  7    ARP request or response       2000     1000     0         123        0         0
  8    Reverse ARP request or re...  2000     1000     0         0          0         0
```

```
 9    Frame-relay LMI Control       2000     1000     0         0          0         0
10    Incomplete adjacency          2000     1000     0         5          0         0
11    For-us data                   40000    5000     1523592   0          211       0
12    Mcast Directly Connected ...  2000     1000     0         0          0         0
13    Mcast IPv4 Options data p...  2000     1000     0         0          0         0
15    MPLS TTL expired              5120     2000     0         0          0         0
16    MPLS Reserved label (ie: ...  5120     2000     0         0          0         0
18    IPV6 Hop-by-hop Options       2000     1000     0         0          0         0
19    Mcast Internal Copy           2000     1000     0         0          0         0
23    Mcast IGMP Unroutable         2000     1000     0         0          0         0
24    Glean adjacency               2000     5000     0         1525432    0         0
25    Mcast PIM signaling           2000     1000     0         0          0         0
27    Subscriber session control    10000    40000    0         0          0         0
  . . .
98    cable arp filter              2000     1000     0         0          0         0
99    Cable L3 mobility             2000     1000     0         0          0         0
100   Source Verify inconclusive    2000     1000     0         0          0         0
101   cable modem pre reg           2000     1000     49        0          0         0
102   mpls receive adj              2000     2000     0         0          0         0
103   MKA EAPoL packet              2000     1000     0         0          0         0
104   ICMP Unreachable              1048     1000     0         0          0         0
105   Cable DHCP                    2000     1000     697       0          0         0
```

The following is a sample output of the **show platform software punt-policer drop-only** command:

```
Router# show platform software punt-policer drop-only

Per Punt-Cause Policer Configuration and Packet Counters


Punt                 Configured (pps)  Conform Packets    Dropped Packets
Cause  Description    Normal   High     Normal    High     Normal  High
-------------------------------------------------------------------------
11    For-us data     40000    5000     1523592   0        211     0
```

Table 259: show platform software punt-policer Field Descriptions

Field	Description
Punt Cause	Punt cause number.

Field	Description
Description	Description of the punt cause.
Configured (pps) Normal	Configured punt policing rate limit for normal-priority punts, in packets per second. Corresponds to the **platform punt-policer** *punt-cause punt-rate* command.
Configured (pps) High	Configured punt policing rate limit for high-priority punts, in packets per second. Corresponds to the **platform punt-policer** *punt-cause punt-rate* **high** command.
Conform Packets Normal	Number of packets that conform to the configured rate limit for normal-priority punts.
Conform Packets High	Number of packets that conform to the configure rate limit for high-priority punts.
Dropped Packets Normal	Number of dropped packets for normal-priority punts.
Dropped Packets High	Number of dropped packets for high-priority punts.

Related Commands

Command	Description
platform punt-policer	This command configures punt policing.

show platform software restart info

To view the stage in which the process restart is in, us the **show platform software restart info** command.

show platform software {**ios** | **us-scheduler**}*slot-number* **restart info**

Syntax Description

ios	Displays information for Cable Line Card Control Plane Restart feature.
us-scheduler	Displays information for Cable Line Card Upstream Scheduler Process Restart feature.
slot-number	Specifies the cable line card slot number for which the information is required to be displayed.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.16.0S	This command was introduced.
IOS-XE 3.17.0S	This command was modified. The **us-scheduler** keyword was added.

Usage Guidelines

This command is used for the following features:

- Cable Line Card Control Plane Restart feature.
- Cable Line Card Upstream Scheduler Process Restart feature.

Restart states displayed, by the **ios** keyword in the command output:

- NOT_RESTARTED — No restart happened after system boot
- GLB_CONFIG_PENDING — Configuration is synchronizing from database process.
- SYNC_PENDING — Modem data is synchronizing from database process.
- RECOVERY_PENDING — Modem data is being reconstructed inside the IOSd.
- RECONCILE_PENDING — Modem data is being reconciled between SUP IOSd, CDMAN and LCHAMAN is occurring.
- DB_RESET_PENDING — Stale modem data in database process is being flushed (This results in restart of database process IOSDB).
- BULK_SYNC_PENDING — Synchronizing the clean data to database process.
- DB_ACTIVE_PENDING — Waiting for confirmation from database process of the bulk synchronization.
- ACTIVE — IOSd active (ready for next restart).

Restart states displayed, by the **us-scheduler** keyword in the command output:

- BOOT — Process is booting up.
- INIT — Process initialization state.
- INFRA_READY — Basic infra is ready.
- IPC_INFRA_READY — Process can talk to other processes.
- OPERATIONAL — Process is ready for new sessions.
- RESTART_INIT — Process has restarted.
- RESTART_INFRA_READY — Basic infra after restart is ready.
- RESTART_IPC_INFRA_READY — Process can talk to other processes after restart.
- RESTART_CFG_RECOVER_DONE — Data has been read from Elcaro database and feature recovery is done.
- RESTART_RECON_PEND — Reconciliation has started.
- RESTART_OPERATIONAL — Process is ready after restart.

Example

This example shows the output for the **show platform software restart info** command with the **ios** keyword:

```
Router#show platform software ios 6 restart info
IOSD process restart info:
  Process restartable: Yes
  IOSD restart state : ACTIVE
  Total Modem Count  : 31
  Active Modem Count : 31
```

This example shows the output for the **show platform software restart info** command with the **us-scheduler** keyword:

```
Router#show platform software us-scheduler 6 restart info
us-scheduler process restart info:
   Process restartable         : Yes
   us-scheduler state          : RESTART_OPERATIONAL
   Features bit map            : 0x001e
   us-scheduler restart count  : 1
```

show platform software trace message lc-veman LC slot number/0

You can use the **show platform software trace message lc-veman <LC slot number>/0** to view the btrace logs that provide for better debugging of VOD failures.

show platform software trace message lc-veman *<LC slot number>* **/ 0**

Syntax Description

LC slot-number	Specifies the cable Line Card slot number for which the log is required to be displayed.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 16.12.1y	This command was introduced.

This example shows the output for the **show platform software trace message lc-veman <LC slot number>/0** command:

```
Router# show platform software trace message lc-veman 8/0

This command is being deprecated. Please use 'show logging process' command.
executing cmd on chassis local ...
2020/02/03 03:34:05.046653 {veman_8-0}{1}: [scs] [7197]: (warn): 02/03 20:34:04.477 [scs]:
[7197]: (warning): PERFORMANCE: entering ScsTask too late (65 ms since last tick)
2020/02/03 03:34:05.046624 {veman_8-0}{1}: [scs] [7197]: (warn): 02/03 20:34:04.179 [scs]:
[7197]: (warning): PERFORMANCE: entering ScsTask too late (67 ms since last tick)
2020/02/03 03:34:05.046558 {veman_8-0}{1}: [scs] [7197]: (warn): 02/03 20:34:04.073 [scs]:
[7197]: (warning): PERFORMANCE: entering ScsTask too late (61 ms since last tick)
```

show ptp clock

To display the PTP clock information synchronized with the PTP primary clock, use the **show ptp clock** command in privileged EXEC mode.

Cisco cBR Series Converged Broadband Router
show ptp clock { **dataset** [**current** | **default** | **parent** | **time-properties**] | **running** *domain* | **running** *domain id* }

Syntax Description

datasetcurrent	Specifies the current dataset for the PTP clock synchronized with the PTP primary clock.
datasetdefault	Specifies default dataset for the PTP clock synchronized with the PTP primary clock.
datasetparent	Specifies parent dataset for the PTP clock synchronized with the PTP primary clock.
datasettime-properties	Specifies time-properties dataset for the PTP clock synchronized with the PTP primary clock.
running *domain-number*	The domain number of the PTP clock synchronized with the RPD synchronized with the PTP primary clock.
running *domain <id>*	Checks the PTP primary clock state.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced.

Usage Guidelines

Use this command to monitor PTP clock status. Use this command to verify the IEEE 1588 PTP configuration and monitor its status.

The following example shows the sample output for the **show ptp clock datasetdefault** command:

```
Router#show ptp clock dataset default

CLOCK [Boundary Clock, domain 10]

  Two Step Flag: No
  Clock Identity: 0x2A:0:0:0:58:67:F3:4
  Number Of Ports: 1
  Priority1: 89
  Priority2: 90
  Domain Number: 10
  Slave Only: No
  Clock Quality:
```

```
    Class: 224
    Accuracy: Unknown
    Offset (log variance): 4252
```

The following example shows the sample output for the **show ptp clock datasetdefault** command:

```
Router#show ptp clock dataset current

CLOCK [Boundary Clock, domain 10]

  Steps Removed: 18522
  Offset From Master: 4661806827187470336
  Mean Path Delay: 314023819427708928
```

The following example shows the sample output for the **show ptp clock datasetparent** command:

```
Router#show ptp clock dataset parent

CLOCK [Boundary Clock, domain 10]

  Parent Stats: No
  Observed Parent Offset (log variance): 0
  Observed Parent Clock Phase Change Rate: 58087144

  Grandmaster Clock:
    Identity: 0x3E:D3:D0:0:0:0:0:0
    Priority1: 42
    Priority2: 0
    Clock Quality:
      Class: 176
      Accuracy: Unknown
      Offset (log variance): 4252
```

The following example shows the sample output for the **show ptp clock datasettime-properties** command:

```
Router#show ptp clock dataset time-properties

CLOCK [Boundary Clock, domain 10]

  Current UTC Offset Valid: TRUE
  Current UTC Offset: 10752
  Leap 59: FALSE
  Leap 61: TRUE
  Time Traceable: TRUE
  Frequency Traceable: TRUE
  PTP Timescale: TRUE
  Time Source: Unknown
```

The following example shows the sample output for the **show ptp clock running domain** command:

```
Router#show ptp clock running domain 0
```

```
                        PTP Ordinary Clock [Domain 0]

          State           Ports          Pkts sent      Pkts rcvd      Redundancy Mode

          PHASE_ALIGNED   1              34856          106046         Hot standby

                                  PORT SUMMARY

                                                                                    PTP Master
Name            Tx Mode      Role         Transport    State        Sessions      Port Addr

slave-from-903 unicast       slave        Lo1588       Slave        1             10.90.3.93


                                SESSION INFORMATION

slave-from-903 [Lo1588] [Sessions 1]

 Peer addr          Pkts in    Pkts out   In Errs    Out Errs

 10.90.3.93         106046     34856      0          0
```

show pxf cable

To display information about the multicast echo, packet intercept, or source-verify features for one or all cable interfaces, use the **show pxf cable** command in user EXEC or privileged EXEC mode.

show pxf cable {**feature-table** [**cx**/**y**/**z**] | **maptable** **cx**/**y**/**z** [*sid*] | **multicast-echo ds-group** | **multicast-echo** *mcast-addr* | **source-verify** [*ip address*]}

Syntax Description

feature-table [*cx/y/z*]	Displays the multicast echo and packet intercept status on the PXF processor. If given without any options, displays the status for all cable interfaces and subinterfaces. If given with an optional cable interface, displays the status for that particular interface.
maptable *cx/y/z* [*sid*]	Displays memory and service ID (SID) information for a particular cable interface. If the optional *sid* parameter is specified, displays information for that particular SID.
multicast-echo ds-group	Displays the cable interfaces that are associated with each downstream group, where each downstream group is a unique DOCSIS MAC domain. (Interfaces that are bundled together are considered one MAC domain.)
multicast-echo *mcast-addr*	Displays the service flow ID (SFID) information for all multicast addresses that hash to the same index as the specified multicast IP address.
source-verify [*ip-address*]	Displays the interface and SFID mapping tables that are maintained by the source-verify feature. If the optional *ip-address* parameter is specified, displays information only for that particular IP address.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.2(11)CY, 12.2(11)BC2	This command was introduced as **show hardware pxf cable** for the Cisco uBR10012 router.
12.2(15)BC2	This command was renamed from **show hardware pxf cable** to **show pxf cable**.
12.3BC	This command was integrated into Cisco IOS release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS release 12.2(33)SCA.
12.2(33)SCB	The command was modified and **verbose** option was removed.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show pxf cable** command displays information about whether multicast echo and packet intercept are enabled on the cable interfaces. It can also be used to display the service flow ID (SFID) used for each multicast address that is being processed by the router.



Note The **source-verify** option is not supported on the PRE-2 module. Instead, use the **show pxf cpu cef verbose** command to display the primary SID information on the PRE-2 module.

Examples

The following example shows a typical display for the **show pxf cable feature-table** command for all cable interfaces:

```
Router# show pxf cable feature-table

Interface       SWInterface    VCCI   McastEcho  Intercept  DSGroup  InterceptGroup
Cable5/0/0      Cable5/0/0      3         On         On        0           0
Cable5/0/0.1    Cable5/0/0      9         On         On        0           0
Cable5/0/1      Cable5/0/1      4         On         Off       255         -
Cable6/0/0      Cable6/0/0      5         On         Off       255         -
Cable6/0/1      Cable6/0/1      6         On         Off       255         -
Cable7/0/0      Cable7/0/0      7         On         Off       1           -
Cable7/0/1      Cable7/0/1      8         On         Off       2           -
```

The following example shows a typical display for the **show pxf cable feature-table** option for a particular cable interface:

```
Router# show pxf cable feature-table c5/0/0

Interface      SWInterface    VCCI   McastEcho  Intercept  DSGroup  InterceptGroup
Cable5/0/0     Cable5/0/0      3         On         On        0           0
Cable5/0/0.1   Cable5/0/0      9         On         On        0           0
```

The following example shows a typical display for the **show pxf cable feature-table** option when a cable interface has a bundle interface configured without a corresponding primary interface:

```
Router# show pxf cable feature-table

Interface   SWInterface    VCCI   McastEcho  Intercept  DSGrp  InterceptGrp
Cable5/0/0  <No Cable Bundle Master Configured>
Cable5/0/1  Cable5/0/1      4         On         Off     11        -
Cable5/1/0  <No Cable Bundle Master Configured>
Cable5/1/1  Cable5/1/1      6         On         Off     15        -
Cable6/0/0  Cable6/0/0      7         On         Off     0         -
Cable6/0/1  Cable6/0/1      8         On         Off     1         -
Cable6/1/0  Cable6/1/0      9         On         Off     6         -
Cable6/1/1  Cable6/1/1      10        On         Off     7         -
Cable7/0/0  Cable7/0/0      11        On         Off     8         -
Cable7/0/1  Cable7/0/1      12        On         Off     9         -
Cable7/1/0  Cable7/1/0      13        On         Off     4         -
Cable7/1/1  Cable7/1/1      14        On         Off     5         -
Cable8/0/0  Cable8/0/0      15        On         Off     255       -
Cable8/0/1  Cable8/0/1      16        On         Off     3         -
Cable8/1/0  Cable8/1/0      17        On         Off     12        -
Cable8/1/1  Cable8/1/1      18        On         Off     13        -
```

Table below describes the fields shown by both forms of the **show pxf cable feature-table** command:

Table 260: show pxf cable feature-table Field Descriptions

Field	Description
Interface	Identifies the cable interface or subinterface.
SWInterface	Identifies the primary cable interface for bundled interfaces.
McastEcho	Displays whether multicast echo is enabled (On) or disabled (Off).
VCCI	Displays the Virtually Cool Common Index (VCCI) for this cable interface or subinterface. The VCCI is an index that uniquely identifies every interface or subinterface on the PXF processor, and that quickly maps that interface to the appropriate set of services and features.
Intercept	Displays whether packet intercept, as per the Communications Assistance of Law Enforcement Act (CALEA), is enabled (On) or disabled (Off).
DSGroup	Displays the downstream group (unique MAC domain) that is associated with this interface or subinterface. Interfaces that are bundled together are considered one MAC domain. **Note** A downstream group number of 255 indicates that the CMTS has not assigned the interface to a MAC domain, typically because the interface is shutdown.
InterceptGroup	Displays the intercept packet group assigned to this cable interface.

The following example shows a typical display for the **show pxf cable maptable** command for a particular cable interface:

```
Router# show pxf cable maptable c5/1/0
SID   VCCI   FIB Index   SrcVfy   Pri SID   CM IP Address
1     3         0          On       1       10.10.11.31
2     3         0          On       2       10.10.11.129
```

Table below describes the fields shown by the **show pxf cable maptable** command:

Table 261: show pxf cable maptable Field Descriptions

Field	Description
SID	Identifies the service ID (SID).
VCCI	Displays the Virtually Cool Common Index (VCCI) for this cable interface or subinterface. The VCCI is an index that uniquely identifies every interface or subinterface on the PXF processor, and that quickly maps that interface to the appropriate set of services and features.
FIB Index	Identifies the forwarding information base (FIB) being used.
SrcVfy	Identifies whether the source-verify feature (enabled with the **cable source-verify** command) is On or Off for this SID and interface.
Pri SID	Identifies the primary SID associated with this SID, in case this SID is a secondary or dynamic SID.
CM IP Address	Displays the IP address for the CM that is associated with this SID.

The following example shows a typical display for the **show pxf cable multicast-echo ds-group** command, listing each downstream multicast group and its associated cable interface:

```
Router# show pxf cable multicast-echo ds-group

DS Group        Interface
0               Cable5/0/0
1               Cable7/0/0
2               Cable7/0/1
```

The following example shows a typical display for the **show pxf cable multicast-echo** command for a particular multicast address:

```
Router# show pxf cable multicast-echo 230.1.1.1

Src        I/f          SFID    DS Jib Header                 Packets     Bytes
230.1.1.1  Cable7/0/1   16385   0x0000 0000 1000 0001 1000        321      2160
```

Table below describes the fields shown by the **show pxf cable multicast-echo** command:

Table 262: show pxf cable multicast-echo Field Descriptions

Field	Description
Src	Multicast address being displayed.
I/F	Cable interface being used for this multicast address.
SFID	Displays the service flow ID (SFID) for this particular multicast address.

Field	Description

DS Jib Header	Shows the bitmask used for this multicast address on the PRE's MAC-layer processor. The bitmask consists of ten hexadecimal bytes in the following format (reading left to right, from most significant to least significant bit):
	• Bytes 9:8 = Specifies the key index for the downstream.
	• Bytes 7:6 = Identifies the rule number used for packet header suppression (if enabled)
	• Byte 5 = Bitmask that defines the type of packet transmitted:
	  • Bit 4 = 1 if padding CRC for data packets, 0 if not padding the CRC
	  • Bit 3 = 1 if inserting an extended header (EH) for PHS processing
	  • Bit 2 = 1 if inserting an extended header (EH) for BPI+ processing
	  • Bits 1:0 = Specifies the packet type: 00 = Data packet 01 = MAC management message for transmitted packets 10 = Internal MAP message on upstream 11 = Special packet
	• Byte 4 = Bitmask that identifies the type of map control and key sequence for the packet:
	  • Bits 6:4 = Destination upstream for the MAP message
	  • Bits 3:0 = BPI Key Sequence number
	• Bytes 3:2 = Index to obtain the downstream modem statistics.
	• Byte 1 = Specifies the assumed minimum size of a packet data unit. Multiply this byte by 4 to get the actual minimum size in bytes.
	• Byte 0 = Specifies the DOCSIS header size, with a maximum value of 0xE0 (248 decimal).

Packets	Number of packets sent to this address.
Bytes	Number of bytes sent to this address.

The following example shows a typical display for the **show pxf cable source-verify** command:

```
Router# show pxf cable source-verify
IP Address     Interface     Fib Index   Mac-Domain   SID
50.1.1.3       Cable5/0/0      0             0        1
50.1.1.29      Cable5/0/0      0             0        2
50.1.1.32      Cable5/0/0      0             0        2
50.1.2.6       Cable8/0/0      0             6        1
50.1.2.19      Cable8/0/0      0             6        1
```

Table below describes the fields shown by the **show pxf cable source-verify** command:

Table 263: show pxf cable source-verify Field Descriptions

Field	Description
IP Address	Identifies the IP addresses that have been verified by the source-verify feature.

Field	Description
Interface	Identifies the cable interface or subinterface used for this IP address.
FIB Index	Identifies the forwarding information base (FIB) being used.
Mac-Domain	Identifies the MAC DOCSIS downstream domain for this IP address.
SID	Identifies the service ID (SID).

Related Commands

Command	Description
cable source-verify	Enables verification of IP addresses for CMs and CPE devices on the upstream.
clear pxf	Clears the direct memory access (DMA) and error checking and correcting (ECC) error counters on the PXF processor.
debug pxf	Enables debugging of the PXF subsystems on the active PRE1 module on the Cisco uBR10012 router.
show pxf cable interface	Displays display DOCSIS-related information about a particular service ID (SID) on a particular cable interface.
show pxf cpu	Displays the display different statistics about the operation of the CPU processor during PXF processing.
show pxf microcode	Displays identifying information for the microcode being used on the processor.
show pxf xcm	Displays the current state of error checking and correcting (ECC) for the External Column Memory (XCM) on the PXF processor.

show pxf cable controller

To display information about radio frequency (RF) channel Versatile Traffic Management System (VTMS) links and link queues, use the **show pxf cable controller** command in privileged EXEC mode.

show pxf cable controller modular-cable *slot /subslot /unit* **rf-channel** *channel* **link queues**

Syntax Description

modular-cable	Specifies the modular cable interface.
slot/subslot/unit	Identifies a cable interface on the Cisco uBR10012 router. The following are valid values: • *slot* = 1 or 3 • *subslot* = 0 or 1 • *unit* = 0
rf-channel	Specifies the RF channel physical port on the Wideband SPA field-programmable gate array (FPGA).
channel	Specifies the number of the RF channel. The range is 0 to 23.
link queues	(Optional) Displays the link queue information for the specified RF channel.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC1	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show pxf cable controller** command displays information about VTMS link queues only on the Cisco uBR10012 universal broadband router.

Examples

The following example using the **show pxf cable controller** command, omitting the **link queues** option, displays only VTMS-related output:

```
Router# show pxf cable controller modular-cable 1/0/0 rf-channel 3
Link ID is 32259
           link next_send:    0x00000000   channel number:     0
           temporary bgbw:    0x00000000    reserved bgbw:     0x00000000
col.6 link bandwidth mult:    55778                shift:     18
col.7 link bandwidth mult:    55778                shift:     18
       link aggregate cir:    0x00000000    aggregate eir:     0x00000000
   bw reclaimed/trunc eir:    0/0            link cir_max:     0xFFFF
             link cir_sum:    70             link eir_sum:     2
              link bw_sum:    0           act. link q num:     0
```

The following example using the **show pxf cable controller** command including the **link queues** option, displays VTMS-related output as well as link queue-related output:

```
Router# show pxf cable controller modular-cable 1/0/0 rf-channel 3 link-queues
Link ID is 32259
           link next_send:    0x00000000   channel number:     0
           temporary bgbw:    0x00000000    reserved bgbw:     0x00000000
col.6 link bandwidth mult:    55778                shift:     18
col.7 link bandwidth mult:    55778                shift:     18
       link aggregate cir:    0x00000000    aggregate eir:     0x00000000
   bw reclaimed/trunc eir:    0/0            link cir_max:     0xFFFF
             link cir_sum:    70             link eir_sum:     2
              link bw_sum:    0           act. link q num:     0

Link Queues :
 QID   CIR(act/conf)       EIR            MIR       WB Chan.   Status
  420   13107/13107        1/1        65535/65535      0       Inactive
  423   32768/32768        1/1        65535/65535      2       Inactive
```

See Table below for descriptions of link queue fields.

Table 264: show pxf cable controller Link Queue Field Descriptions

Field	Description
QID	Displays the identification number of the link queue.
CIR (act/conf)	Displays the information for the committed information rate (CIR) of link queues on this RF channel. • The first number, *act* , indicates the parameter that a link queue is actually using. • The second number, *conf* , indicates the parameter that is configured for a link queue.
EIR	Displays the information for the excess information rate (EIR) of link queues on this RF channel. • The first number in the output indicates the parameter that a link queue is actually using. • The second number in the output indicates the parameter that is configured for a link queue.
MIR	Displays the information for the maximum information rate (MIR) of link queues on this RF channel. • The first number in the output indicates the parameter that a link queue is actually using. • The second number in the output indicates the parameter that is configured for a link queue.
WB Chan	The number of the wideband cable channel.
Status	Displays the state of the link queue.

Related Commands

Command	Description
debug cr10k-rp dbs-queue	Displays debug information for dynamic bandwidth sharing (DBS) on the Cisco uBR10012 universal broadband router.
show pxf cpu queue	Displays parallel express forwarding (PXF) queueing and link queue statistics.

show pxf cable feature

To display multicast echo, packet intercept, or source-verify features for one or all cable interfaces, to include information for virtual interface bundles, use the **show pxf cable feature** command in privileged EXEC mode.

show pxf cable feature

Syntax Description

This command has no additional arguments or keywords.

Command Default

Display output without page breaks and remove passwords and other security information.

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.3(21)BC	This command was introduced to support Multicast with Virtual Interface Bundling on the Cisco CMTS.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Refer to the following document on Cisco.com for additional information about cable interface bundling and virtual interface bundling on the Cisco CMTS:

- *Cable Interface Bundling and Virtual Interface Bundling on the Cisco CMTS*

Examples

The following example illustrates Multicast Echo and virtual interface bundling information on the Cisco uBR10012 router.

```
Router# show pxf cable feature
Interface   SWInterface    VCCI   McastEcho  Intercept  SrcVfy   DHCP  DSGrp  InterceptGrp
Cable5/0/0  Bundle1          36        On         Off        On         On         0
Cable5/0/1  Cable5/0/1       15        On         Off        Off        Off        11
Cable5/1/0  Bundle1          36        On         Off        On         On         0
Cable5/1/1  Cable5/1/1       17        On         Off        Off        Off        9
Cable6/0/0  Bundle1          36        On         Off        On         On         0
Cable6/0/1  Cable6/0/1       19        On         Off        Off        Off        12
Cable6/1/0  Cable6/1/0       20        On         Off        Off        Off        7
Cable6/1/1  Cable6/1/1       21        On         Off        Off        Off        8
Cable7/0/0  Cable7/0/0       22        On         Off        Off        Off        255
Cable7/0/0  Cable7/0/0.1     42        On         Off        Off        Off        255
Cable7/0/1  Bundle200        38        On         Off        Off        Off        3
```

Related Commands

Command	Description
cable bundle	Configures a cable interface to belong to an interface bundle or virtual interface bundle.
show arp	Displays the entries in the router's ARP table.

Command	Description
show cable bundle forwarding-table	Displays the MAC forwarding table for the specified bundle, showing the MAC addresses of each cable modem in a bundle and the physical cable interface that it is currently using.
show cable modem	Displays the cable modems that are online both before and after cable interface bundling has been configured.
show running-config interface cable	Displays the configuration for the specified cable interface.

show pxf cable interface

To display information about a particular service ID (SID) on a particular cable interface, use the **show pxf cable** command in user EXEC or privileged EXEC mode.

show pxf cable interface cable *x/y/z* **sid**
classifiers | **mac-rewrite** | **queue** | **service-flow ds** | **service-flow us**

Syntax Description

cable *x/y/z*	Identifies the cable interface for which information should be displayed.
sid	Identifies the service ID (SID) for which information should be displayed. The valid range is 1 to 8191.
classifiers	Displays the packet classifiers used for this SID.
mac-rewrite	Displays the CPE MAC information for this SID.
queue	Displays the status of the queues being used by this SID.
service-flow ds	Displays the service flow IDs (SFID) associated with the given SID on the downstream for the given cable interface.
service-flow us	Displays the SFIDs associated with the given SID on the upstream for the given cable interface.

Command Default

None

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.2(11)BC2	This command was introduced as **show hardware pxf cable** for the Cisco uBR10012 router.
12.2(15)BC2	This command was renamed from **show hardware pxf cable interface** to **show pxf cable interface**.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show pxf cable interface** command displays the DOCSIS-related information for a particular service ID (SID) on a particular cable interface.

Examples

The following example shows a typical display for SID 1 on cable interface c8/0/0 for the **show pxf cable interface classifiers** command:

```
Router# show pxf cable interface c8/0/0 1 classifiers

CM Classifiers:
Mac Rw Index: 18        CCB Index: 47
```

```
id=1, sfid=91 CFR Index 16461 RP sfindex 16461,
  prio=7, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=17, tos=0,FF
  sport = 0,65535, dport = 0,65535 matches = 0
id=2, sfid=92 CFR Index 16462 RP sfindex 16462,
  prio=6, sip=0.0.0.0, sip mask=0.0.0.0
  dip=1.11.22.2, dip mask=255.255.255.255, prot=256, tos=0,FF
  sport = 0,65535, dport = 0,65535 matches = 0
id=0, sfid=0 CFR Index 0 RP sfindex 0,
  prio=0, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=0, tos=2,1
  sport = 1000,500, dport = 1000,500 matches = 0
id=0, sfid=0 CFR Index 0 RP sfindex 0,
  prio=0, sip=0.0.0.0, sip mask=0.0.0.0
  dip=0.0.0.0, dip mask=0.0.0.0, prot=0, tos=2,1
  sport = 1000,500, dport = 1000,500 matches = 0
-----------------------------------------------------------
Router#
```

Note For a description of the fields that are displayed by this command, see section C.2.1., Packet Classification Encodings, in Appendix C of the DOCSIS 1.1 specification (*Data-Over-Cable Service Interface Specifications Radio Frequency Interface Specification* , SP-RFIv1.1-I08-020301).

The following example shows a typical display for SID 1 on cable interface c8/0/0 for the **show pxf cable interface mac-rewrite** command:

```
Router# show pxf cable interface c8/0/0 1 mac-rewrite

CPE Information for Interface Cable8/0/0 SID 1:
        Link Table Slot: 18  Mac-rw-index: 18
Router#
```

The following example shows a typical display for SID 1 on cable interface c8/0/0 for the **show pxf cable interface queue** command:

```
Router# show pxf cable interface c8/0/0 1 queue

RP SFID 16460 LC SFID 4
Queue Index: 281        QID 281 VCCI 6161       ClassID 9       Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 0/16383 EIR 0/431
        Statistics: Length 0 Pkts 0 Octets 0 TailDrops 0 BufferDrops 0
RP SFID 16461 LC SFID 91
Queue Index: 282        QID 282 VCCI 6161       ClassID 10      Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 0/16383 EIR 0/431
        Statistics: Length 0 Pkts 0 Octets 0 TailDrops 0 BufferDrops 0
RP SFID 16462 LC SFID 92
Queue Index: 283        QID 283 VCCI 6161       ClassID 11      Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 0/16383 EIR 0/431
        Statistics: Length 0 Pkts 0 Octets 0 TailDrops 0 BufferDrops 0
RP SFID 16463 LC SFID 93
Queue Index: 284        QID 284 VCCI 6161       ClassID 12      Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 0/16383 EIR 0/431
        Statistics: Length 0 Pkts 0 Octets 0 TailDrops 0 BufferDrops 0
RP SFID 16464 LC SFID 94
Queue Index: 285        QID 285 VCCI 6161       ClassID 13      Refcount 1
        Priority: Lo    Rates:(Act/Conf) CIR 0/0 MIR 0/16383 EIR 0/431
        Statistics: Length 0 Pkts 0 Octets 0 TailDrops 0 BufferDrops 0
Router#
```

The following example shows a typical display for SID 1 on cable interface c8/0/0 for the **show pxf cable interface service-flow ds** command:

```
Router# show pxf cable interface c8/0/0 1 service-flow ds

RP SFID         LC SFID         Bytes           Packets         QID
16460           4               0               0               281
16461           91              0               0               282
16462           92              0               0               283
16463           93              0               0               284
16464           94              0               0               285
Router#
```

The following example shows a typical display for SID 1 on cable interface c8/0/0 for the **show pxf cable interface service-flow us** command:

```
Router# show pxf cable interface c8/0/0 1 service-flow us
SFID            SID
3               1
90              21
Router#
```

Related Commands

Command	Description
clear pxf	Clears the direct memory access (DMA) and error checking and correcting (ECC) error counters on the PXF processor.
debug pxf	Enables debugging of the PXF subsystems on the active PRE1 module on the Cisco uBR10012 router.
show pxf cable	Displays information about the multicast echo and packet intercept features for one or all cable interfaces.
show pxf cpu	Displays the display different statistics about the operation of the CPU processor during PXF processing.
show pxf microcode	Displays identifying information for the microcode being used on the processor.
show pxf xcm	Displays the current state of error checking and correcting (ECC) for the External Column Memory (XCM) on the PXF processor.

show pxf cable multicast

To display information about multicast routes (mroute) in the PXF processor for a specified group, use the **show pxf cable multicast** command in privileged EXEC mode.

show pxf cable multicast [*multicast-group*]

Syntax Description

multicast-group	(Optional) Displays the name of the multicast group.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(33)SCB	The command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **show pxf cable multicast** command displays information about whether routes are enabled on the cable interfaces.

Examples

The following example shows a typical display for the **show pxf cable multicast** command for all cable interfaces:

```
Router# show pxf cable multicast multicast-group

MDB Flags: L - Local, F - Register flag, T - SPT-bit set, J - Join SPT
Z - Multicast Tunnel, N- No FastSwitching
OIF Flags: P - Prune Flag, A - Assert Flag
PXF multicast switching for vrf default is enabled.
Mdb at index= 3 hash= 0xE9F7:
next_mdb_idx: 0, fib_root: 0x0001, source_addr: 0.0.0.0, group_addr: 230.1.1.1
uses: 0, bytes: 0, vcci_in: 0, oif: 0x000002
rpf_failed: 0, drop_others: 0
rp_bit_mask:0x00, flags: [0xA0]
Ref Count=0, MDB Flags=0x0082, MDB FastFlags=0x10
```

Related Commands

Command	Description
show pxf cable interface	Displays display DOCSIS-related information about a particular service ID (SID) on a particular cable interface.
show pxf cpu	Displays the display different statistics about the operation of the CPU processor during PXF processing.

show pxf cpu

To display the different statistics about the operation of the CPU on the Performance Routing Engine (PRE1) module during Parallel eXpress Forwarding (PXF) processing, use the **show pxf cpu** command in user EXEC or privileged EXEC mode.

show pxf cpu {**access-lists** {**qos** | **security**} | **buffers** | **cef** [**mem** | **verbose** | **vrf** *ip-address mask*] | **context** | **mroute** [*ipaddress1*] [*ipaddress2*] | **queue** [*interface*] | **schedule** [*interface* | **summary**] | **statistics** [**diversion** | **drop** [*interface*] | **ip** | **mlp**] | **subblocks** [*interface*]}

Syntax Description

access-lists {**qos** | **security**}	Displays information for either quality of service (QoS) access lists (ACLs) or security access lists. **Note** The PRE module automatically compiles all access lists into the turbo ACL format, so that they can be efficiently processed by the PXF processors. The only exception are very simple access lists that would require more processing time to be compiled than to be executed.
buffers	Displays information about buffer usage on the processor.
cef [**mem** | **verbose** | **vrf** *ip-address mask*]	Displays information about the memory usage and routing tables in the PXF processors for Cisco Express Forwarding (CEF) operation. Optionally displays detailed information about memory usage and about a particular entry in the virtual private network (VPN) routing/forwarding (VRF) tables.
context	Displays performance statistics on the processing of contexts on the processors. (A context is a unit of packet processing time on the PXF processor.) **Note** The **show pxf cpu context** command displays more useful information on the PXF processor's performance than the **show processor cpu command** that is used on other platforms.
mroute [*ipaddress1*] [*ipaddress2*]	Displays multicast static route (mroute) information for all groups, for one particular group, or for a range of groups. Displays information about IP multicast routes in the PXF processor for a specified IP prefix. For a more user-friendly display of the same information, use the **show ip mroute** command.
queue [*interface*]	Displays queue drop counters for all interfaces, or optionally for one selected interface. This can be useful in determining if traffic is being properly distributed among the correct interfaces.
schedule [*interface* | **summary**]	Displays the timing wheel dequeue schedule counters for all interfaces, or optionally for one interface, or optionally a summary of all interfaces.

statistics [**diversion** | **drop** [*interface*] | **ip** | **mlp**]	Displays statistics for the packets that the PXF has processed. The default is to display all packet statistics, or you can optionally specify one of the following keywords to display a particular type of statistics: • **diversion**—(Optional) Displays packets that the PXF diverted to the main route processor for special handling. • **drop** [*interface*]—(Optional) Displays dropped packets and bytes. You can also optionally display the dropped packets for a particular interface. • **ip**—(Optional) Displays statistics for the processing of IP and ICMP packets. • **mlp**—(Optional) Displays statistics for multilink point-to-point protocol (MLPPP) packets.
subblocks [*interface*]	Displays subblocks information for all interfaces, or optionally for one interface.

Command Default

No default behavior or values

Command Modes

User EXEC, Privileged EXEC

Command History

Release	Modification
12.2(1)XF1	This command was introduced as **show hardware pxf cpu** for the Cisco uBR10012 router.
12.2(11)BC2	The MAC domain was added to the display of the **show pxf cpu subblocks** command for a particular cable interface.
12.2(15)BC2	This command was renamed from **show hardware pxf cpu** to **show pxf cpu**. In addition, the **cef** option was enhanced to display CEF tag adjacency information. The **verbose** option was also added to the **cef** option to display more detailed information about the Forwarding Information Base (FIB) tables being maintained by the CEF subsystem.
12.2(15)BC2	The **detail** option and additional counters were added to the **show pxf cpu statisticsdiversion** command.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

See the following sections for typical displays for the different forms of the **show pxf cpu** command.

Access-Lists

The following example shows a typical display for the **access-list qos** option, which displays information about the processing of quality-of-service (QoS) access-lists:

```
Router# show pxf cpu access qos

PXF QoS ACL statistics:
 ACL         State      Tables  Entries  Config  Fragment  Redundant  Memory
101         Operational    1        9        1         0          0      1Kb
First level lookup tables:
Block      Use              Rows       Columns   Memory used
  0   TOS/Protocol            1/128     0/32      16384
```

```
  1   IP Source (MS)          1/128     0/32      16384
  2   IP Source (LS)          1/128     0/32      16384
  3   IP Dest (MS)            1/128     0/32      16384
  4   IP Dest (LS)            1/128     0/32      16384
  5   TCP/UDP Src Port        1/128     0/32      16384
  6   TCP/UDP Dest Port       1/128     0/32      16384
  7   TCP Flags/Fragment      1/128     0/32      16384
Banknum   Heapsize   Freesize  %Free
   0       4172800    4172800   100
   1       4128768    4128768   100
   2       2818048    2818048   100
   3       4194304    4194304   100
   4       3342336    3309568    99
   5       3670016    3637248    99
   6       3342336    3309568    99
   7       3342336    3309568    99
Router#
```

The following example shows a typical display for the **access-list security** option:

```
Router# show pxf cpu access security

PXF Security ACL statistics:
 ACL         State      Tables  Entries  Config  Fragment  Redundant  Memory
104         Operational    5      536      514        46         29    818Kb
105         Operational    1        4        6         0          3      7Kb
190         Operational    1       27       26         0          0      8Kb
cit01       Operational    1       26       24        12         11      9Kb
130         Unneeded
131         Unneeded
First level lookup tables:
Block      Use              Rows       Columns   Memory used
  0   TOS/Protocol           18/128     5/32      16384
  1   IP Source (MS)         27/128     5/32      16384
  2   IP Source (LS)         36/128     5/32      16384
  3   IP Dest (MS)           29/128     5/32      16384
  4   IP Dest (LS)           37/128     5/32      16384
  5   TCP/UDP Src Port       12/128     5/32      16384
  6   TCP/UDP Dest Port      10/128     5/32      16384
  7   TCP Flags/Fragment     13/128     5/32      16384
Banknum   Heapsize   Freesize  %Free
   0       4156416    3451904    83
   1       4194304    4180992    99
   2       4194304    4161536    99
   3       4194304    4107264    97
   4       3670016    3637248    99
   5       3670016    3637248    99
   6       3670016    3637248    99
   7       3670016    3637248    99
Router#
```

Table below describes the fields shown in the **show pxf cpu access-list** command:

Table 265: Field Descriptions for the show pxf cpu access-list Command

Field	Description
ACL	Identifies the access list (ACL) in use, by either name or number.

Field	Description
State	Displays the current state of the access list: • Copying—The ACL is in the process of being created or compiled. • Operational—ACL is active and filtering packets. • Out of acl private mem—ACL has run out of the private memory that was allocated exclusively to it. • Out of shared mem—ACL has run out of the memory that it shares with other ACLs. • Unknown Failure—ACL has failed because of an uncategorized reason. • Unneeded—ACL was allocated but is not currently in use.
Tables	Displays the number of tables that the ACL is currently using.
Entries	Displays the number of table entry slots for the fields or values that the ACL is currently using to match packets.
Config	Displays the number of simple or extended entries for this ACL.
Fragment	Displays the number of entries that were configured with the **fragments** keyword.
Redundant	Displays the number of duplicate entries for this ACL.
Memory	Displays the total amount of memory, rounded up to the nearest kilobyte, that the ACL is currently using.
First level lookup tables	Describes the blocks of memory that store the IP fields that are used to match packets for access list processing.
Block	Identifies the block of memory used for this particular lookup table.
Use	Describes the IP packet field that is being matched.
Rows	Describes the number of table rows currently in use and the total number of rows.
Columns	Describes the number of table columns currently in use and the total number of columns.
Memory used	Describes the total amount of memory, in bytes, currently being used by the memory block.
Banknum	Identifies the block of memory used for this particular lookup table.
Heapsize	Identifies the total amount of memory, in bytes, allocated for this block of memory.
Freesize	Identifies the amount of memory, in bytes, that is currently available for use by this block of memory.
%Free	Identifies the percentage of memory that is free and available for use for this block of memory.

Buffers

The following example shows a typical display for the **buffers** option:

```
Router# show pxf cpu buffers

FP buffers
    pool   size    # buffer    available   allocate failures
    ----------------------------------------------------------
    0      9216    3203        3203        0
    1      1536    6406        6406        0
    2      640     89432       89432       0
    3      256     76872       76872       0
    4      64      128120      128120      0
Router#
```

Table below describes the fields shown in the **show pxf cpu buffers** command:

Table 266: Field Descriptions for the show pxf cpu buffers Command

Field	Description
pool	Identifies the buffer pool.
size	Displays the size, in bytes, of each buffer in this particular pool.
# buffer	Displays the total number of buffers in this particular pool.
available	Displays the number of buffers that are currently available.
allocate failures	Displays the number of attempts to allocate a buffer that have failed since the last reset.

CEF

The following example shows a typical display for the **cef** option:

```
Router# show pxf cpu cef

Shadow 10-9-5-8 Toaster Mtrie:
  97 leaves, 3104 leaf bytes, 40 nodes, 41056 node bytes
  141 invalidations
  233 prefix updates
  refcounts:  10293 leaf, 10144 node
Prefix/Length        Refcount   Parent
0.0.0.0/0          4512
1.10.0.0/16        1665        0.0.0.0/0
1.10.0.2/32        4           1.10.0.0/16
1.10.0.3/32        4           1.10.0.0/16
1.10.37.22/32      4           1.10.0.0/16
1.10.45.16/32      4           1.10.0.0/16
1.10.85.0/24       259         1.10.0.0/16
1.10.85.0/32       4           1.10.85.0/24
1.11.0.0/16        42          0.0.0.0/0
1.11.37.0/24       4           1.11.0.0/16
127.0.0.0/8        1601        0.0.0.0/0
127.0.0.0/32       4           127.0.0.0/8
144.205.188.0/24   259         0.0.0.0/0
```

```
144.205.188.0/32   4           144.205.188.0/24
144.205.188.1/32   4           144.205.188.0/24
144.205.188.2/32   4           144.205.188.0/24
144.205.188.255/32  4           144.205.188.0/24
164.120.151.128/25  131         0.0.0.0/0
164.120.151.128/32  4           164.120.151.128/25
164.120.151.129/32  4           164.120.151.128/25
166.135.216.255/32  4           166.135.216.128/25
221.222.140.0/22   772         0.0.0.0/0
221.222.140.0/32   4           221.222.140.0/22
221.222.141.1/32   4           221.222.140.0/22
221.222.143.255/32  4           221.222.140.0/22
223.255.254.0/24   4           0.0.0.0/0
=======================================
26 routes with less specific overlapping parent route
FP CEF/MFIB/TFIB XCM Type usage:
Type Name Col Total  Alloc  Size   Start    End      BitMap0  BitMap1  Error
  0  Root 1   1000   1000   4096   50003100 503EB100 713AC814 61DFB48C 0
  1  Node 1   2048   2009   2048   53000000 53400000 713AC8C0 61DFB538 0
  2  Node 1   32768  2013   128    50864000 50C64000 713AC9F0 61DFB668 0
  3  Node 1   4096   1021   1024   53864000 53C64000 713ADA20 61DFC698 0
  4  Leaf 1   524288 8107   8      51064000 51464000 713ADC50 61DFC8C8 0
  5  Adj  1   524288 3046   8      51820000 51C20000 713BDC80 61E0C8F8 0
  6  Mac  5   524288 2040   8      58400000 58800000 713D12C4 61E1FF3C 0
  7  Load 1   110376 4052   76     52000000 527FFFE0 713CDCB0 61E1C928 0
  8  Mdb  1   65536  1      4      53440000 53480000 61E66AAC 714168CC 0
  9  Midb 1   262144 1      4      51C20000 51D20000 61E68ADC 714188FC 0
  10 TagI 1   51200  1008   68     53480000 537D2000 714012EC 61E4FF64 0
  11 TagR 1   102400 2010   4      50800000 50864000 61E51894 71412C18 0
FP CEF state: 2
```

Note If the value in the Alloc column is equal to the number in the Total column, then the PXF has run out of its allocated memory for that level and the CEF entries for that particular level have been exhausted.

Table below describes the fields shown in the **show pxf cpu cef** command:

Table 267: Field Descriptions for the show pxf cpu cef Command

Field	Description
Shadow 10-9-5-8 Toaster Mtrie	Header for the memory used by the CEF switching tables, which use the optimized multiway tree (Mtrie) data structure format.
leaves	Number of leaves in the CEF Mtrie table.
leaf bytes	Number of bytes used by the leaves in the Mtrie table.
nodes	Number of nodes in the Mtrie table.
node bytes	Number of bytes used by the nodes in the Mtrie table.
invalidations	Number of times an existing entry in the adjacency table was invalidated because of updated information.
prefix updates	Number of updates made to the adjacency table.

Field	Description
refcounts	Number of references (leaves and nodes) to an adjacency that are currently stored in the adjacency table. There is one reference for each corresponding entry in the CEF table, plus a few others for maintenance and system purposes.
Prefix/Length	IP prefix and length (IP network or host number, with subnet) that is in the CEF adjacency table.
Refcount	Number of times this prefix is referenced in the adjacency table.
Parent	Parent of this prefix's leaf or node entry in the adjacency table.
FP CEF/MFIB/TFIB XCM Type usage—The following fields display the memory usage of the shadow forwarding information base (FIB).	
Type	Level number of this particular memory block.
Name	Identifier for this particular memory block.
Total	Total number of nodes available on each level and changes to other data structures.
Alloc	Number of nodes currently allocated.
Start, End	Starting and ending addresses for the memory block.
Error	Number of errors discovered in the memory block.

Context

The following example shows a typical display for the **context** option, which displays performance statistics for the PXF processors over the past 1-minute, 5-minute, and 60-minute periods:

```
Router# show pxf cpu context

 FP context statistics  count       rate
  ---------------------  ----------  ----------
      feed_back          2002946946  645161
      new_work           3992307360  1293715
      null               2261726736  708206
                                     ----------
                                     2647082

  FP average context/sec 1min        5min        60min
  ---------------------  ----------  ----------  ----------
      feed_back          679377      707217      191844     cps
      new_work           1358758     1414842     391367     cps
      null               587560      520274      2171829    cps
  ---------------------  ----------  ----------  ----------
      Total              2625695     2642333     2755040    cps

  FP context utilization 1min        5min        60min
  ---------------------  ----------  ----------  ----------
      Actual             77  %       80  %       21  %
```

```
      Theoretical          65  %       67  %       18  %
      Maximum              84  %       84  %       88  %
Router#
```

Note The **show pxf cpu context** command displays more useful information on the processor's performance than the **show processor cpu command** that is used on other platforms.

This display shows statistics that are based on three counters on the PXF processors:

- feed_back—Incremented each time the processor requires another processor cycle to process a packet. Each PXF processor contains 8 columns that perform different packet header processing tasks, such as ACL processing or QoS processing. A typical IP packet passes through all 8 columns only once, but some types of packets can require more than one pass through these columns, and each additional pass through the PXF processor is referred to as feedback. This counter represents the amount of traffic that cannot be processed in an optimal manner.
- new_work—Incremented for new packets that come into the PXF pipeline. This counter represents a snapshot of the amount of incoming traffic being processed by the processor.
- null—Incremented for every context during which the PXF pipe is not processing traffic. This counter represents the processor's potential to handle additional traffic. As the processor becomes more busy, the value for null decreases until it becomes 0, at which point the processor has reached its maximum usage.

Table below describes the fields shown in the **show pxf cpu context** command:

Table 268: Field Descriptions for the show pxf cpu context Command

Field	Description
FP context statistics	
feed_back	Displays the current value for the feed_back counter and the rate that the counter is increasing per second (the difference between the current value and the previous value divided by the time period between the two).
new_work	Displays the current value for the new_work counter and the rate that the counter is increasing per second (the difference between the current value and the previous value divided by the time period between the two).
null	Displays the current value for the null counter and the rate that the counter is increasing per second (the difference between the current value and the previous value divided by the time period between the two).
FP average context/sec	
feed_back	Displays the rate, in terms of the number of contexts per second (cps) for the feed_back counter for the last 1-minute, 5-minute, and 60-minute time periods.
new_work	Displays the rate, in terms of the number of contexts per second (cps) for the new_work counter for the last 1-minute, 5-minute, and 60-minute time periods.
null	Displays the rate, in terms of the number of contexts per second (cps) for the null counter for the last 1-minute, 5-minute, and 60-minute time periods.

Field	Description
FP context utilization	
Actual	Displays the actual percentage of processor usage per second, compared to the theoretical maximum, for the last 1-minute, 5-minute, and 60-minute time periods. The value for Actual = (new_work+feed_back)*100/(new_work+feed_back+null).
Theoretical	Displays the percentage of processor usage compared to the ideal theoretical capacities for the last 1-minute, 5-minute, and 60-minute time periods. The value for Theoretical = (new_work+feed_back)*100/3125000. (The theoretical maximum for the PXF processors is 3,125,000 contexts per second.)
Maximum	Displays the actual maximum percentage of processor usage that has occurred for the last 1-minute, 5-minute, and 60-minute time periods. The value for Actual = (new_work+feed_back+null)*100/3125000.

Mroute

The following example shows a typical display for the **mroute** option:

```
Router# show pxf cpu mroute

Shadow G/SG[5624]: s: 0.0.0.0 g: 224.0.1.40 uses: 0 bytes 0 flags: [D ] LNJ
Interface                  vcci  offset   rw_index mac_header
In :                       0     0x000004
Shadow G/SG[3195]: s: 0.0.0.0 g: 234.5.6.7 uses: 0 bytes 0 flags: [5 ] NJ
Interface                  vcci  offset   rw_index mac_header
In :                       0     0x000008
Out: Cable5/1/0            5     0x00002C 1B       00000026800001005E05060700010
Out: Cable6/1/1            9     0x000028 1A       00000026800001005E05060700010
Out: Cable6/0/0            6     0x000024 19       00000026800001005E05060700010
Out: Cable5/0/0            3     0x000020 18       00000026800001005E05060700010
Out: Cable7/0/0            A     0x00001C 17       00000026800001005E05060700010
Out: Cable7/1/1            C     0x000018 16       00000026800001005E05060700010
Out: Cable7/1/0            B     0x000014 15       00000026800001005E05060700010
Out: Cable6/1/0            8     0x000010 14       00000026800001005E05060700010
Out: Cable6/0/1            7     0x00000C 13       00000026800001005E05060700010
Out: Cable5/0/1            4     0x000008 12       00000026800001005E05060700010
Router#
```

Table below describes the fields shown in the **show pxf cpu mroute** command:

Table 269: Field Descriptions for the show pxf cpu mroute Command

Field	Description
Interface	Cable interface or subinterface.
vcci	Virtually Cool Common Index (VCCI) for this cable interface or subinterface. The VCCI is an index that uniquely identifies every interface or subinterface on the PXF processor, and that quickly maps that interface to the appropriate set of services and features.
rw index	Index used to read and write into the multicast table for this entry.

Field	Description
mac_header	MAC header that is used when rewriting the packet for output.

Queue

The following example shows a typical display for the **queue** option, which displays the chassis-wide counters for the PXF pipeline counters that show drops on the output side of the processor:

```
Router# show pxf cpu queue

FP queue statistics for RP
  Queue number 0    Shared
    wq_avg_qlen             0           wq_flags_pd_offset      1B48001
    wq_drop_factor          74
    wq_buffer_drop          0           wq_limit_drop           0
    wq_invalid_enq_wqb_drop 0           wq_invalid_deq_wqb_drop 0
    wq_rnd_pkt_drop         0           wq_rnd_byte_drop        0
    wq_static_qlen_drop     0
    wq_len                  0
    Packet xmit             804833      Byte xmit               487438911
  Queue number 15   Shared  High priority
    wq_avg_qlen             0           wq_flags_pd_offset      1BC8001
    wq_drop_factor          174
    wq_buffer_drop          0           wq_limit_drop           0
    wq_invalid_enq_wqb_drop 0           wq_invalid_deq_wqb_drop 0
    wq_rnd_pkt_drop         0           wq_rnd_byte_drop        0
    wq_static_qlen_drop     0
    wq_len                  0
    Packet xmit             69647       Byte xmit               41230926
Router#
```

The following example shows a typical display for the **queue** option for a particular cable interface:

```
Router# show pxf cpu queue c6/0/0

FP queue statistics for Cable5/0/0
FP queue statistics for Cable6/0/0
  Queue algorithm 0x0
  Queue number 0    Shared
    wq_avg_qlen             0           wq_flags_pd_offset      18A0001
    wq_drop_factor          40
    wq_buffer_drop          0           wq_limit_drop           0
    wq_invalid_enq_wqb_drop 0           wq_invalid_deq_wqb_drop 0
    wq_rnd_pkt_drop         0           wq_rnd_byte_drop        0
    wq_static_qlen_drop     0
    wq_len                  0
    Packet xmit             56414       Byte xmit               14322357
  Queue number 15   Shared  High priority
    wq_avg_qlen             0           wq_flags_pd_offset      18A8001
    wq_drop_factor          1000
    wq_buffer_drop          0           wq_limit_drop           0
    wq_invalid_enq_wqb_drop 0           wq_invalid_deq_wqb_drop 0
    wq_rnd_pkt_drop         0           wq_rnd_byte_drop        0
    wq_static_qlen_drop     0
    wq_len                  0
    Packet xmit             0           Byte xmit               0
Router#
```

Schedule

The following example shows a typical display for the **schedule summary** option:

```
Router# show pxf cpu schedule summary

FP average dequeue schedule rate in pps
Interface             Level 1    Level 2     maximum   1min      5min      60min
--------------------- ---------- ----------  --------  --------  --------  -----
Total                 32  / 32   1   / 1     3125000   0     %   0     %   0   %
Router#
```

The following example shows a typical display for the **schedule** option for a particular interface:

```
Router# show pxf cpu schedule c5/0/0

FP average dequeue schedule rate in pps
Interface             Level 1    Level 2     maximum   1min      5min      60min
--------------------- ---------- ----------  --------  --------  --------  -----
Cable5/0/0            1   / 32   1   / 1     97656     0     %   0     %   0   %
Router#
```

Table below describes the fields shown in the **show pxf cpu schedule** command:

Table 270: Field Descriptions for the show pxf cpu schedule Command

Field	Description
Interface	Identifies the cable interface or subinterface.
Level 1	Displays the number of occupied level 1 (port) wheel slots and the total number of wheel slots for this interface or subinterface.
Level 2	Displays the number of occupied level 2 (channel) wheel slots and the total number of wheel slots for this interface or subinterface.
maximum	Displays the maximum number of packet dequeues per second.
1 min	Displays the dequeue rate for the last 1-minute period.
5 min	Displays the dequeue rate for the last 5-minute period.
60 min	Displays the dequeue rate for the last 60-minute period.

Statistics

The following example shows a typical display for the **statistics diversion** option, which shows chassis-wide statistics for PXF diversions, which occur whenever the PXF processor sends a packet to the main route processor for special processing (such as errored packets, address resolution protocol (ARP) packets, point-to-point protocol (PPP) control packets, an unsupported Layer 2 packet header, and so forth).

```
Router#  show pxf cpu statistics diversion
```

```
Diversion Cause Stats:
  local     = 263171
  dest      = 0
  option    = 0
  protocol  = 0
  encap     = 541943
  oam f5 seg= 0
  oam f5 ete= 0
  oam f4 seg= 0
  oam f4 ete= 0
  atm ilmi  = 0
  fr_term   = 0
  comp      = 0
  ip_sanity = 0
  ip_bcast  = 0
  ip_dest   = 0
  fib_punt  = 0
  mtu       = 0
  arp       = 127
  rarp      = 0
  icmp      = 0
  dsap_ssap = 0
  acl       = 0
  divert    = 0
  no_group  = 0
  direct    = 0
  local_mem = 0
  p2p_prune = 0
  assert    = 0
  dat_prune = 0
  join_spt  = 0
  null_out  = 0
  igmp      = 69
  register  = 0
  no_fast   = 136
  ipc_resp  = 0
  keepalive = 0
  min_mtu   = 0
  icmp_frag = 0
  icmp_bad  = 0
  mpls_ttl  = 0
  tfib      = 0
  multicast = 69656
  clns_isis = 0
  fr_lmi    = 0
  ppp_cntrl = 0
Router#
```

Note As shown in this display, the majority of dropped packets should typically be either local (sent to the router for routing), encap (encapsulated for another protocol), or multicast (IP multicast traffic).

The following example shows a typical display for the **statistics drop** option, which shows chassis-wide PXF drop statistics:

```
Router# show pxf cpu statistics drop

FP drop statistics
                      packets            bytes
    icmp_on_icmp      0                  0
    ipc_cmd_invalid   0                  0
```

```
  icmp_unrch_interval 294                31164
  bad_tag_opcode      0                  0
  bad_ch_handle       0                  0
  no_touch_from_rp    0                  0
  dst_ip_is_mcast     0                  0
  ib_re_bit           0                  0
  encap_too_big       0                  0
  no_tfib_route       0                  0
  mc_disabled         0                  0
  mc_rpf_failed       0                  0
  mc_prune_rate_limit 0                  0
  mc_null_oif         0                  0
  bad_drop_code       0                  0
   cobalt_re[00]      0                  0
           [01]       0                  0
           [02]       0                  0
           [03]       0                  0
           [04]       0                  0
           [05]       0                  0
           [06]       0                  0
           [07]       0                  0
           [08]       0                  0
           [09]       0                  0
           [10]       0                  0
           [11]       0                  0
           [12]       0                  0
           [13]       0                  0
           [14]       0                  0
           [15]       0                  0
           [16]       0                  0
           [17]       0                  0
  null_config[00]     0                  0
             [01]     0                  0
             [02]     0                  0
             [03]     0                  0
             [04]     0                  0
             [05]     0                  0
             [06]     0                  0
             [07]     1                  362
             [08]     0                  0
             [09]     0                  0
             [10]     0                  0
             [11]     0                  0
             [12]     0                  0
             [13]     0                  0
             [14]     0                  0
             [15]     0                  0
             [16]     0                  0
             [17]     0                  0
inval_ib_resource[00] 0                  0
                 [01] 0                  0
                 [02] 0                  0
                 [03] 0                  0
                 [04] 0                  0
                 [05] 0                  0
                 [06] 0                  0
                 [07] 0                  0
                 [08] 0                  0
                 [09] 0                  0
                 [10] 0                  0
                 [11] 0                  0
                 [12] 0                  0
                 [13] 0                  0
                 [14] 0                  0
```

```
                    [15] 0                  0
                    [16] 0                  0
                    [17] 0                  0
                    [18] 0                  0
                    [19] 0                  0
                    [20] 0                  0
                    [21] 0                  0
                    [22] 0                  0
                    [23] 0                  0
                    [24] 0                  0
                    [25] 0                  0
                    [26] 0                  0
                    [27] 0                  0
                    [28] 0                  0
                    [29] 0                  0
                    [30] 0                  0
                    [31] 0                  0
    master drop count   794
Router#
```

The following example shows a typical display for the **statistics drop** option for a particular cable interface, which shows the input-side drop statistics for that particular interface:

```
Router# show pxf cpu statistics drop c7/1/0

FP drop statistics for Cable7/1/0
                           packets            bytes
    vcci undefined         0                  0
  vcci B
    bad hdlc addr          0                  0
    mac length mismatch    0                  0
    bad ip checksum        0                  0
    ip length mismatch     0                  0
    ip length short        0                  0
    ip length long         0                  0
    ip version mismatch    0                  0
    bad rpf                0                  0
    acl failure            0                  0
    police                 0                  0
    ttl                    0                  0
    unreachable            0                  0
    mlp_frag_received      0                  0
    mlp_unexpected_pkt     0                  0
    df_multicast           0                  0
    encap_not_supported    0                  0
    mtu_too_wee            0                  0
    mtu_too_big            0                  0
    atm_fp_rx_cell_size_err 0                 0
    Data Received          0                  0
Router#
```

The following example shows a typical display for the **statistics ip** option, which displays chassis-wide PXF forwarding statistics for IP, multicast, fragmented, and ICMP packets:

```
ROuter# show pxf cpu statistics ip

FP ip statistics
    dropped        0
    forwarded      1291
    punted         11393
    input_packets  14049
    icmps_created  1365
    noadjacency    0
```

```
    noroute        300
    unicast_rpf    0
    unresolved     0
FP ip multicast statistics
    mcast total    69665
    mcast drops    0
    mcast rpf      0
    mcast inputacl 0
    mcast outptacl 0
    mcast punts    69665
    mcast switched 0
    mcast failed   0
FP ip frag statistics
    packets        0
    fragments      0
    fragfail       0
    dontfrag       0
    mcdontfrag     0
FP icmp statistics
    unreachsent    0
    ttlsent        0
    echorepsent    0
    echorcv        0
    checksumerr    0
Router#
```



Note The noroute counter increases whenever the router drops a packet because its destination IP address is 0.0.0.0. This counter also increases whenever the Cisco Express Forwarding (CEF) adjacency tables drop a packet because it has a null, discard, or drop adjacency.

Subblocks

The following example shows a typical display for the **subblocks** option for all interfaces:

```
Router# show pxf cpu subblocks

Interface              Status   ICB   WQB_ID Fwding  Encap  VCCI map  VCCI
POS1/0/0               initiali 6000  6146   disable 5      81800000  E
GigabitEthernet3/0/0   reset    E000  6148   disable 1      81800004  1
GigabitEthernet4/0/0   up       12000 6150   PXF     1      81800008  2
Cable5/0/0             down     14000 4096   disable 59     81805400  3
Cable5/0/1             down     14100 4097   disable 59     81805C00  4
Cable5/1/0             up       16000 4098   PXF     59     81806400  5
Cable6/0/0             up       18000 4099   PXF     59     81806C00  6
Cable6/0/1             up       18100 4100   PXF     59     81807400  7
Cable6/1/0             up       1A000 4101   PXF     59     81807C00  8
Cable6/1/1             up       1A100 4102   PXF     59     81808400  9
Cable7/0/0             up       1C000 4103   PXF     59     81808C00  A
Cable7/1/0             up       1E000 4104   PXF     59     81809400  B
Cable7/1/1             up       1E100 4105   PXF     59     81809C00  C
Cable7/1/1.1           up       1E100 4105   PXF     59     8180A400  D
Router#
```

The following example shows a typical display for the **subblocks** option for a particular cable interface:

```
Router# show pxf cpu subblocks c7/0/0
```

```
Cable7/0/0 is up
  ICB = D000,  LinkId = 0, interface PXF, enabled
  IOS encapsulation type 59  MCNS
  PXF encapsulation type 5
  Min mtu: 14      Max mtu: 1538
  VCCI maptable location = A2B20000
  VCCI 2C7
    icmp ipaddress 0.0.0.0          timestamp 0
    fib_root 0x1, ipv6_fib_root 0x0, ipv6_rpf_root 0x0, vrf_mpls_tableid 0x0
    col0 cicb_flags 0x10, cicb_flags_ext 0x00 flags/netmask 0x00
    col1 cicb_out_flags 0x00
    interface_ip_addr 0x0
    col5 ib_chan 0x1000, encap_type 5, flags_srpthreshold 0x6
    mce_ds_group_index 0xFF, cable_flags 0x10
    col_4_cicb_flags: 0x10
  Inbound IP ACL CICB at A2002C70, acl_index = 0, Stats address = 00000000
  Outbound IP ACL CICB at A2002C70, acl_index = 0, Stats address = 00000000
  Inbound IPv6 ACL CICB at A5002C70, acl_index = 0, Stats address = 00000000
  Outbound IPv6 ACL CICB at A5002C70, acl_index = 0, Stats address = 00000000
Router#
```

Table below describes the fields shown in the display for the **show pxf cpu subblocks** command.

Table 271: show pxf cpu subblocks Field Descriptions

Field	Description
Interface	Identifies the interface or subinterface.
Status	Displays the status of the interface: • Administ—The interface has been shut down and is in the administrative down state. • Deleted—The subinterface has been removed from the router's configuration. • Down—The interface is down because of a cable or other connectivity problem. • Initiali—The interface is in the process of initializing. • Reset—The interface is currently being reset. • Up—The interface is up and passing traffic.
ICB	Displays the Interface Control Block (ICB) that is mapped to this interface.
MAC Domain	Displays the DOCSIS-layer domain for this interface or subinterface.
WQB_ID	Displays the Work Queue Block (WQB) identifier for this interface.
Fwding	Displays whether traffic is being forwarded (PXF) or not (disable).
Encap	Identifies the type of encapsulation being used on the interface. The most common types of encapsulation are: 0 = None 1 = Ethernet ARPA 2 = Ethernet SAP 3 = 802.2 SNAP 5 = Serial, raw HDLC 8 = Serial, LAPB 9 = Serial, X.25 20 = Frame Relay 21 = SMDS 22 = MAC level packets 27 = LLC 2 28 = Serial, SDLC (primary) 30 = Async SLIP encapsulation 33 = ATM interface 35 = Frame Relay with IETF encapsulation 42 = Dialer encapsulation 46 = Loopback interface 51 = ISDN Q.921 59 = DOCSIS (previously known as MCNS) 61 = Transparent Mode 62 = TDM clear channel 64 = PPP over Frame Relay 65 = IEEE 802.1Q 67 = LAPB terminal adapter 68 = DOCSIS Cable Modem

Field	Description
VCCI map	Displays the memory address for the Virtually Cool Common Index (VCCI) map table for this particular VCCI. The VCCI is an index that uniquely identifies every interface or subinterface on the PXF processor and that quickly maps that interface to the appropriate set of services and features.
VCCI	Identifies the VCCI (in hexadecimal) that is assigned to the interface or subinterface.

Related Commands

Command	Description
clear pxf	Clears the direct memory access (DMA) and error checking and correcting (ECC) error counters on the PXF processor.
debug pxf	Enables debugging of the PXF subsystems on the active PRE1 module on the Cisco uBR10012 router.
show pxf cable	Displays information about the multicast echo and packet intercept features for one or all cable interfaces.
show pxf cable interface	Displays information about a particular service ID (SID) on a particular cable interface.
show pxf dma	Displays information for the current state of the PXF DMA buffers, error counters, and registers.
show pxf microcode	Displays identifying information for the microcode being used on the processor.
show pxf xcm	Displays the current state of ECC for the External Column Memory (XCM) on the PXF processor.
show ip mroute	Displays the contents of the IP multicast routing table.

show pxf cpu drl-trusted-sites

To display the configured Divert-Rate-Limit (DRL) trusted sites, use the **show pxf cpu drl-trusted-sites** command in privileged EXEC mode.

show pxf cpu drl-trusted-sites

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to display the configured DRL trusted sites.

Examples

The following example shows sample output for the **show pxf cpu drl-trusted-sites** command:

```
Router# show pxf cpu drl-trusted-sites
Divert-Rate-Limit Trusted-Site list
 IP-addr          IP-addr mask     ToS   ToS mask  VRF
 50.0.0.0         255.255.255.0    0x18  0xF8      global internet
 50.0.1.0         255.255.0.0      0x01  0xFF      all
 60.0.1.0         255.255.255.0    0x18  0xF8      blue
```

Table below describes the significant fields shown in the display.

Table 272: show pxf cpu drl-trusted-sites Field Descriptions

Field	Description
IP-addr	The IP address of the host or CM.
IP-addr mask	The IP address mask of the host or CM.
ToS	Type of Service value to be matched by the filter.
ToS Mask	Type of Service mask to be matched by the filter.
VRF	Name of the virtual interface that has been configured for DRL trusted sites.

Related Commands

Command	Description
show pxf cpu statistics drl cable-wan-ip	This command displays the PXF DRL cable/wan-ip statistics table.
show pxf cpu statistics drl wan-non-ip	This command displays the PXF DRL wan-non-ip statistics.

show pxf cpu queue wb-spa

To send queue and service flow information to and from the uBR10-MC 5x20 line cards, use the **show pxf cpu queue wb-spa** command in privileged EXEC mode.

show pxf cpu queue wb-spa

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(23)BC	This command was introduced for the uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

A virtual time management system (VTMS) link and two queues are set up for each Wideband SPA allowing MAC Management Messages (MMM) to be sent from the uBR10-MC 5x20 line card to the Wideband SPA, which in turn sends the messages to the appropriate RF channels.

In addition to this, another VTMS link and two queues are set up for each uBR10-MC 5x20 line card so that the SIP can send statistics IPC messages and cable monitor packets to the uBR10-MC 5x20 line card. The queue and service flow information for these data paths can be displayed by using the **show pxf cpu queue wb-spa** command.

The output of this command shows the two RP service flows for each SPA, including the RP service flow index and the associated queue ID. Refer to the **show pxf cpu queue** *qid* command for more information.

Examples

The following is a sample output of the **show pxf cpu queue wb-spa** command for the Cisco Wideband SPA port 1, slot 1, and bay 0:

```
Router# show pxf cpu queue wb-spa
SPA 1/0/0
MAP/UCD Service Flow Index: 32926
  Ironbus Channel: 0x8000  Queue ID: 266  Queue Flags: 0x2
LP-MMM  Service Flow Index: 32768
  Ironbus Channel: 0x8000  Queue ID: 264  Queue Flags: 0x0
CableInternal5/1
Statistics Service Flow Index: 32887
  Ironbus Channel: 0x500  Queue ID: 504  Queue Flags: 0x0
Cable Monitor Service Flow Index: 129
  Ironbus Channel: 0x500  Queue ID: 505  Queue Flags: 0x0
CableInternal6/0
Statistics Service Flow Index: 32893
  Ironbus Channel: 0x500  Queue ID: 516  Queue Flags: 0x0
Cable Monitor Service Flow Index: 135
  Ironbus Channel: 0x500  Queue ID: 517  Queue Flags: 0x0
```

The following is a sample output of the **show pxf cpu queue wb-spa** command for the Cisco Wideband SPA sharing downstreams with the Cisco uBR-MC3GX60V line card, in Cisco IOS Release 12.2(33)SCG:

```
Router# show pxf cpu queue wb-spa
SPA 1/1/0
MAP/UCD and LP-MMM Flow (IronBus Channel: 0xC020):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
8         0/255  251121646  0           0         1/10000  0       32771  hi-pri
131100    0/255  9634685    0           0         1/10000  0       32770  lo-pri
SPA 1/3/0
MAP/UCD and LP-MMM Flow (IronBus Channel: 0xC030):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
66        0/255  0          0           0         1/10000  0       32775  hi-pri
131216    0/255  4596528    0           0         1/10000  0       32774  lo-pri
Fauna6/0
Statistics and Cable Monitor Flow (IronBus Channel: 0x1FFF):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
131441    0/255  0          0           0         1/240    0       205   def
CableInternal6/0
Statistics and Cable Monitor Flow (IronBus Channel: 0x7000):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
178       0/255  0          0           0         1/10000  0       32789  hi-pri
131440    0/255  2303963    0           0         1/10000  0       32788  lo-pri
131439    0/255  0          0           0         1/240    0       20     def
CableInternal6/1
Statistics and Cable Monitor Flow (IronBus Channel: 0x0500):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
185       0/255  0          0           0         1/10000  0       32791  hi-pri
131454    0/255  2394164    0           0         1/10000  0       32790  lo-pri
131453    0/255  0          0           0         1/240    0       21     def
Fauna7/0
Statistics and Cable Monitor Flow (IronBus Channel: 0x1FFF):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
131557    0/255  0          0           0         1/240    0       266   def

CableInternal7/0
Statistics and Cable Monitor Flow (IronBus Channel: 0x7000):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
236       0/255  4596556    0           0         1/10000  0       32793  hi-pri
131556    0/255  2377280    0           0         1/10000  0       32792  lo-pri
131555    0/255  0          0           0         1/240    0       22     def

Fauna8/0
Statistics and Cable Monitor Flow (IronBus Channel: 0x1FFF):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
131903    0/255  0          0           0         1/240    0       453   def

CableInternal8/0
Statistics and Cable Monitor Flow (IronBus Channel: 0x7000):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
409       0/255  0          0           0         1/10000  0       32797  hi-pri
131902    0/255  3350878    0           0         1/10000  0       32796  lo-pri
131901    0/255  0          0           0         1/240    0       24     def
```

```
Fauna8/1
Statistics and Cable Monitor Flow (IronBus Channel: 0x1FFF):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
132261    0/255  0          0           0         1/240    0       697   def

CableInternal8/1
Statistics and Cable Monitor Flow (IronBus Channel: 0x7000):
QID     Len/Max  Dequeues   TailDrops   MinRt  Wt/Quantum  ShapeRt FlowId
                                        (Kbps)             (Kbps)
582       0/255  0          0           0         1/10000  0       32799  hi-pri
132260    0/255  0          0           0         1/10000  0       32798  lo-pri
132259    0/255  0          0           0         1/240    0       25     def
```

Table below describes the fields shown in the **show pxf cpu queue wb-spa** command display.

Table 273: show pxf cpu queue WB-SPA Field Descriptions

Field	Description
QID	CPU Queue ID.
Len/Max	Current CPU queue length/ CPU maximum queue length.
TailDrops	Number of CPU queue packet drops.
ShapeRt (Kbps)	Queue packet rate shaping.
FlowId	Service flow ID.

Related Commands

Command	Description
show pxf cpu queue *qid*	Displays parallel express forwarding queue statistics.

show pxf cpu statistics drl ipv4

To verify drop counters for WAN-IPv4 packets, use the **show pxf cpu statistics drl ipv4** command in the privileged EXEC mode.

show pxf cpu statistics drl ipv4 [*thresholdoutput modifiers*]

Syntax Description

threshold	The packet threshold value. The valid range is 0 to 4294967295.
output modifiers	The following output modifiers are used. • append—Appends the redirected output to URL (URLs supporting append operation only) • begin—Begins with the line that matches. • exclude—Excludes the lines that match. • include—Includes the lines that match. • redirect—Redirects the output to the URL. • section—Filters a specific section of the output. • tee—Copies the output to the URL.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following examples indicate the drop counters for WAN-IPv4 packets.

```
Router# show pxf cpu statistics drl ipv4
Divert-Rate-Limit WAN-IPv4 statistics
   dropped   identifier
       460   11.12.13.10  VRF: global  divert_code: fib_rp_dest
       150   11.12.13.10  VRF: global  divert_code: fib_limited_broadcast
Router#
Router# show pxf cpu statistics drl ipv4 threshold 400
Divert-Rate-Limit WAN-IPv4 statistics :: threshold = 400
   dropped   identifier
       460   11.12.13.10  VRF: global  divert_code: fib_rp_dest
```

Related Commands

Command	Description
clear pxf statistics drl ipv4	Clears all the entries in the WAN IPv4 statistics table.
service divert-rate-limit trusted-site-ipv6	Adds IPv6-specific entries to the trusted site list.

Command	Description
show pxf cpu statistics drl us-cable	Displays the number of upstream cable packets that are dropped from the CMTS.
show pxf cpu statistics drlipv6	Verifies the drop counters for WAN-IPv4 packets.

show pxf cpu statistics drl ipv6

To verify drop counters for WAN-IPv6 packets, use the **show pxf cpu statistics drl ipv6** command in the privileged EXEC mode.

show pxf cpu statistics drl ipv6 [*thresholdoutput modifiers*]

Syntax Description

threshold	The packet threshold value. The valid range is 0 to 4294967295.
output modifiers	The following output modifiers are used. • append—Appends the redirected output to URL (URLs supporting append operation only) • begin—Begins with the line that matches. • exclude—Excludes the lines that match. • include—Includes the lines that match. • redirect—Redirects the output to the URL. • section—Filters a specific section of the output. • tee—Copies the output to the URL.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following examples indicate the drop counters for WAN-IPv6 packets.

```
Router# show pxf cpu statistics drl ipv6
Divert-Rate-Limit WAN-IPv6 statistics
   dropped   identifier
       460   10FA:6604:8136:6502::/64  VRF: global  divert_code: ipv6_rp_dest
       150   10FA:6604:8136:6502::/64  VRF: global  divert_code: ipv6_rp_punt
Router#
Router# show pxf cpu statistics drl ipv6 threshold 400
Divert-Rate-Limit Cable/WAN-IP statistics :: threshold = 400
   dropped   identifier
       460   10FA:6604:8136:6502::/64  VRF: global  divert_code: ipv6_rp_dest
Router#
```

Related Commands

Command	Description
clear pxf statistics drl ipv6	Clears all the entries in the WAN IPv6 statistics table.
service divert-rate-limit trusted-site-ipv6	Adds IPv6-specific entries to the trusted site list.

Command	Description
show pxf cpu statistics drlus-cable	Displays the number of upstream cable packets that are dropped from the CMTS.
show pxf cpu statistics drl ipv4	Verifies the drop counters for WAN-IPv4 packets.

show pxf cpu statistics drl max-rate us-cable

To verify drop counters for the DRL max-rate on the upstream cable interface, use the **show pxf cpu statistics drlmax-rate us-cable** command in the privileged EXEC mode.

show pxf cpu statistics drl max-rate us-cable

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCJ	This command was introduced.

Example

The following examples indicate the drop counters for max-rate on the upstream cable interface.

```
Router#show pxf cpu statistics drl max-rate us-cable

Load for five secs: 44%/4%; one minute: 45%; five minutes: 28%
Time source is hardware calendar, 16:52:36.953 CST Thu Dec 17 2015
Divert-Rate-Limit max-rate US-cable statistics
dropped divert_code
No max-rate US-cable drops.
```

Related Commands

Command	Description
service divert-rate-limit max-rate us-cable	Sets per-divert-code rate limit on the upstream cable interface

show pxf cpu statistics drl max-rate wan

To verify drop counters for the DRL max-rate on the WAN interface, use the **show pxf cpu statistics drlmax-rate wan** command in the privileged EXEC mode.

show pxf cpu statistics drl max-rate wan threshold [*threshold-valueoutput modifiers*]

Syntax Description

threshold	The packet threshold value. The valid range is 0 to 4294967295.
output modifiers	The following output modifiers are used. • begin—Begins with the line that match. • exclude—Excludes the lines that match. • include—Includes the lines that match. • redirect—Redirects the output to the URL. • section—Filters a section of the output. • tee—Copies output to the URL.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCH3	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Example

The following examples indicate the drop counters for max-rate on the WAN interface.

```
Router#show pxf cpu statistics drl max-rate wan threshold 10
   dropped   divert_code
        18   fib_rp_dest
```

Related Commands

Command	Description
service divert-rate-limit max-rate wan	Sets per-divert-code rate limit on the WAN interface
clear pxf statistics drl max-rate	Clears the DRL max-rate statistics on the WAN interface.

show pxf cpu statistics drl us-cable

To view and verify the number of upstream cable packets that are dropped from the CMTS, use the **show pxf cpu statistics drl us-cable** command in the privileged EXEC mode.

show pxf cpu statistics drl us-cable [*threshold* | *output modifiers*]

Syntax Description

threshold	The packet threshold value. The valid range is 0 to 4294967295.
output modifiers	The following output modifiers are used. • append—Appends the redirected output to URL (URLs supporting append operation only) • begin—Begins with the line that matches. • exclude—Excludes the lines that match. • include—Includes the lines that match. • redirect—Redirects the output to the URL. • section—Filters a specific section of the output. • tee—Copies the output to the URL.

Command Default

Disabled

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCE	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following examples indicate the statistics of upstream cable packets that are dropped from the CMTS.

```
Router# show pxf cpu statistics drl us-cable
Divert-Rate-Limit US-cable statistics
   dropped   identifier
       361   interface: Cable6/0/1   SID: 28
      2457   interface: Cable6/0/0   SID: 1
Router# show pxf cpu statistics drl us-cable threshold 400
Divert-Rate-Limit US-cable statistics :: threshold = 400
   dropped   identifier
      2457   interface: Cable6/0/0   SID: 1
Router#
```

Related Commands

Command	Description
clear pxf statistics drl us-cable	Clears all the entries in the US-cable statistics table.

Command	Description
service divert-rate-limit trusted-site-ipv6	Adds IPv6-specific entries to the trusted site list.
show pxf cpu statistics drl ipv6	Verifies the drop counters for WAN-IPv6 packets.
show pxf cpu statistics drl ipv4	Verifies the drop counters for WAN-IPv4 packets.

show redundancy

To display the current redundancy status, use the **show redundancy** command in user EXEC or privileged EXEC mode.

Cisco uBR10012 Router
show redundancy [**clients** | **counters** | **history** | **states**]

Cisco cBR Series Converged Broadband Router
show redundancy [**application** | **clients** | **config-sync** | **counters** | **domain** | **history** | **ibd-sync-history** | **lincecard** | **rii** | **states** | **switchover history** | **trace history**]

Syntax Description

application	(Optional on Cisco cBR router) Displays box to box application information
clients	(Optional) Displays the Redundancy Facility (RF) client list.
counters	(Optional) Displays RF operational counters.
domain	(Optional on Cisco cBR router) Specifies the RF domain.
history	(Optional) Summarizes RF history.
idb-sync-history	(Optional on Cisco cBR router) Displays the Redundancy Facility (RF) IDB sync history
states	(Optional) Displays RF states for active and standby modules.
switchover history	(Optional on Cisco cBR router) Displays the redundancy Facility (RF) switchover history.

Command Default

None

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.2(4)XF1	This command was introduced for the Cisco uBR10012 router.
12.2(11)BC3	The **clients**, **counters**, **history**, and **states** option were added, and the default display was enhanced to show the version of Cisco IOS software that is running on the standby PRE module.
12.2(15)BC2	The default display includes additional information about the history of switchovers, as well as a stack trace from the secondary PRE module's ROMMON for when it last crashed, if ever.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.

Release	Modification
12.2(44)SQ	This command was integrated into Cisco IOS Release 12.2(44)SQ. Support for the Cisco RF Gateway 10 was added.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router. The **application**, **domain**, **idb-sync-history**, and **switchover** keywords were added.

Usage Guidelines

The **show redundancy** command shows whether the PRE A slot or PRE B slot contains the active (primary) Performance Routing Engine (PRE1) module, the status of the standby (secondary) PRE1 module, and the values for the standby PRE1 module's boot variables and configuration register. In Cisco IOS Release 12.2(13)BC1 and later releases, it also shows the version of Cisco IOS software that is running on the standby PRE module.

Note The **show redundancy** command always shows the correct location of the active PRE1 module. The other PRE slot will always be marked as **Secondary**, even if a standby PRE1 module is not installed.

Cisco RF Gateway 10

The **show redundancy** command shows whether the Supervisor A slot or Supervisor B slot contains the active (primary) Supervisor card, the status of the standby (secondary) Supervisor card, and the values for the standby Supervisor card's boot variables and configuration register.

Note The **show redundancy** command always shows the correct location of the active Supervisor card. The other Supervisor slot will always be marked as **secondary**, even if a standby Supervisor card is not installed.

Cisco cBR Series Converged Broadband Router

The Cisco cBR Series Converged Broadband Router supports redundancy of Supervisor card and line cards. The **show redundancy** command shows whether the Supervisor A slot or Supervisor B slot contains the active (primary) Supervisor card, the status of the standby (secondary) Supervisor card, and the values for the standby Supervisor card's parameters

Examples

This section contains examples of typical displays for each of the options that are available for the **show redundancy** command.

Default Displays

The following example shows a typical display from the **show redundancy** command in Cisco IOS Release 12.2(15)BC2 and later releases:

```
PRE A              : Secondary
PRE B (This PRE)   : Primary
Uptime since this PRE switched to active : 5 minutes
Total system uptime from reload      : 37 minutes
Switchovers this system has experienced : 5
Secondary failures since this PRE active  : 0
```

```
The secondary PRE has been up for    : 1 minute
The reason for last switchover:  ACTIVE RP CRASHED
Secondary PRE information....
Secondary is up.
Secondary has 524288K bytes of memory.
Secondary BOOT variable = slot0:ubr10k-k8p6-mz.122-11.CY,12;
Secondary CONFIG_FILE variable = bootflash:030227.config
Secondary BOOTLDR variable =
Secondary Configuration register is 0x0
Secondary version:
Cisco Internetwork Operating System Software
IOS (tm) 10000 Software (UBR10K-K8P6-M), Experimental Version 12.2(15)BC2
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Mon 01-Mar-04 12:01 by anxrana
Primary version:
Cisco Internetwork Operating System Software
IOS (tm) 10000 Software (UBR10K-K8P6-M), Released Version 12.2(15)BC2
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Mon 01-Mar-04 12:01 by anxrana
Redundant RP last failure info as reported by Standby:
bus error at PC 0x605C8B24, address 0xFF012345
10000 Software (UBR10K-K8P6-M), Experimental Version 12.3(20040211:230003) [narana-geo_cable
 123]
Compiled Mon 01-Mar-04 12:01 by anxrana
Image text-base: 0x60008CB8, data-base: 0x61F80000
Stack trace from system failure:
FP: 0x7234C8C8, RA: 0x605C8B24
FP: 0x7234CA30, RA: 0x604940F4
FP: 0x7234CA90, RA: 0x60151FF0
FP: 0x7234CAB0, RA: 0x604A5554
FP: 0x7234CB40, RA: 0x6051F638
FP: 0x7234CB58, RA: 0x6051F61C
```

The following example shows a typical display from the **show redundancy** command in Cisco IOS Release 12.2(15)BC1 and earlier releases. The active PRE1 module is in PRE slot A, and the standby PRE1 module is in PRE slot B:

```
Router# show redundancy

 PRE A (This PRE)   : Primary
 PRE B              : Secondary

 Redundancy state is REDUNDANCY_PEERSECONDARY_INITED

 Secondary PRE information....
 Secondary is up.
 Secondary has 524288K bytes of memory.
 Secondary BOOT variable = bootflash:ubr10k-k8p6-mz
 Secondary CONFIG_FILE variable =
 Secondary BOOTLDR variable = bootflash:c10k-eboot-mz
 Secondary Configuration register is 0x2102
 Secondary version:
 Cisco Internetwork Operating System Software
 IOS (tm) 10000 Software (UBR10K-K8P6-M), Released Version 12.2(11)BC3
 Copyright (c) 1986-2003 by cisco Systems, Inc.
 Compiled Mon 03-Mar-03 11:28 by texbnt
Router#
```

The following example shows the same display but after a switchover has occurred. The **show redundancy** command now shows that the active (primary) PRE has changed slots (in this case, moving from slot A to slot B):

```
Router# show redundancy

 PRE A              : Secondary
 PRE B (This PRE)   : Primary

 Redundancy state is REDUNDANCY_PEERSECONDARY_INITED

 Secondary PRE information....
 Secondary is up.
 Secondary BOOT variable = bootflash:ubr10k-k8p6-mz
 Secondary CONFIG_FILE variable =
 Secondary BOOTLDR variable = bootflash:c10k-eboot-mz
 Secondary Configuration register is 0x2
 Secondary version:
 Cisco Internetwork Operating System Software
 IOS (tm) 10000 Software (UBR10K-K8P6-M), Released Version 12.2(13)BC2
 Copyright (c) 1986-2003 by cisco Systems, Inc.
 Compiled 26 08-Feb-03 11:28 by texbnt
Router#
```

The following example shows a typical display when the standby PRE1 module is not installed or is not operational. The standby (secondary) PRE1 module is shown as not up, and its boot variables and configuration register are not shown.

```
Router# show redundancy

 PRE A (This PRE)   : Primary
 PRE B              : Secondary
 Redundancy state is REDUNDANCY_PEERSECONDARY_NONOPERATIONAL
 Secondary PRE information....
 Secondary PRE is not up
Router#
```

This example shows the output of the **show redundancy** command on the Cisco cBR router:

```
Router#show redundancy
Redundant System Information :
------------------------------
       Available system uptime = 1 day, 17 hours, 50 minutes
Switchovers system experienced = 0
              Standby failures = 0
        Last switchover reason = none

                 Hardware Mode = Simplex
    Configured Redundancy Mode = sso
     Operating Redundancy Mode = Non-redundant
              Maintenance Mode = Disabled
                Communications = Down      Reason: Failure

Current Processor Information :
------------------------------
               Active Location = slot 4
        Current Software state = ACTIVE
       Uptime in current state = 1 day, 17 hours, 50 minutes
                 Image Version = Cisco IOS Software, cBR  Software
(X86_64_LINUX_IOSD-UNIVERSALK9-M)
, Experimental Version 15.5(20150504:162424)
[mcp_docsis31_ds3_ios-japatel-mcp_docsis31_ds3_ios_0504
-ds3-20 105]
Copyright (c) 1986-2015 by Cisco Systems, Inc.
Compiled Mon 04-May-15 14:24 by japatel
```

```
                        BOOT =
                 CONFIG_FILE =
        Configuration register = 0x0

Peer (slot: 5) information is not available because it is in 'DISABLED' state

Router#
```

Clients Display

The following example shows a typical display for the **show redundancy clients** command:

```
Router# show redundancy clients
 clientID = 0       clientSeq = 0        RF_INTERNAL_MSG
 clientID = 25      clientSeq = 130      CHKPT RF
 clientID = 5       clientSeq = 170      RFS client
 clientID = 50      clientSeq = 530      Slot RF
 clientID = 65000   clientSeq = 65000    RF_LAST_CLIENT
```

This example shows the output on the Cisco cBR router:

```
Router#show redundancy clients
 clientID = 29       group_id = 1        clientSeq = 60       Redundancy Mode RF
 clientID = 139      group_id = 1        clientSeq = 61       IfIndex
 clientID = 25       group_id = 1        clientSeq = 68       CHKPT RF
 clientID = 3062     group_id = 1        clientSeq = 70       UBRCCE PLFM RF Client
 clientID = 77       group_id = 1        clientSeq = 84       Event Manager
 clientID = 1340     group_id = 1        clientSeq = 101      RP Platform RF
 clientID = 1501     group_id = 1        clientSeq = 102      Cat6k CWAN HA
 clientID = 78       group_id = 1        clientSeq = 106      TSPTUN HA
 clientID = 305      group_id = 1        clientSeq = 107      Multicast ISSU Consolidation
 RF
 clientID = 304      group_id = 1        clientSeq = 108      IP multicast RF Client
 clientID = 22       group_id = 1        clientSeq = 109      Network RF Client
 clientID = 88       group_id = 1        clientSeq = 110      HSRP
 clientID = 114      group_id = 1        clientSeq = 111      GLBP
 clientID = 225      group_id = 1        clientSeq = 112      VRRP
 clientID = 4700     group_id = 1        clientSeq = 114      COND_DEBUG RF
 clientID = 1341     group_id = 1        clientSeq = 115      IOSXE DPIDX
 clientID = 1505     group_id = 1        clientSeq = 116      Cat6k SPA TSM
 clientID = 75       group_id = 1        clientSeq = 126      Tableid HA
 clientID = 1344     group_id = 1        clientSeq = 127      IOSXE RP SBC RF
 clientID = 227      group_id = 1        clientSeq = 128      SBC-RF RF Client
 clientID = 1345     group_id = 1        clientSeq = 129      VOIP RF CLIENT
 clientID = 71       group_id = 1        clientSeq = 135      XDR RRP RF Client
 clientID = 24       group_id = 1        clientSeq = 136      CEF RRP RF Client
 clientID = 146      group_id = 1        clientSeq = 138      BFD RF Client
 clientID = 301      group_id = 1        clientSeq = 142      MRIB RP RF Client
 clientID = 306      group_id = 1        clientSeq = 146      MFIB RRP RF Client
 clientID = 3064     group_id = 1        clientSeq = 150      UBRCCE SUP RF Client
 clientID = 3065     group_id = 1        clientSeq = 151      PKTCBL RF client
 clientID = 1504     group_id = 1        clientSeq = 153      Cat6k CWAN Interface Events
 clientID = 401      group_id = 1        clientSeq = 155      NAT HA
 clientID = 404      group_id = 1        clientSeq = 156      NAT64 HA
 clientID = 402      group_id = 1        clientSeq = 157      TPM RF client
 clientID = 520      group_id = 1        clientSeq = 158      RFS RF
 clientID = 5        group_id = 1        clientSeq = 160      Config Sync RF client
 clientID = 68       group_id = 1        clientSeq = 191      Virtual Template RF Client
 clientID = 23       group_id = 1        clientSeq = 194      Frame Relay
```

```
clientID = 49       group_id = 1        clientSeq = 195      HDLC
clientID = 72       group_id = 1        clientSeq = 196      LSD HA Proc
clientID = 113      group_id = 1        clientSeq = 197      MFI STATIC HA Proc
clientID = 290      group_id = 1        clientSeq = 198      MPLS TP HA
clientID = 209      group_id = 1        clientSeq = 202      L2FIB
clientID = 199      group_id = 1        clientSeq = 205      ELB RF
```

Counters Display

The following example shows a typical display for the **show redundancy counters** command:

```
Router# show redundancy counters
Redundancy Facility OMs
               comm link up = 1
        comm link down down = 0
          invalid client tx = 0
          null tx by client = 0
                tx failures = 0
      tx msg length invalid = 0
      client not rxing msgs = 0
 rx peer msg routing errors = 0
           null peer msg rx = 0
         errored peer msg rx = 0
                 buffers tx = 1009
     tx buffers unavailable = 0
                 buffers rx = 1006
      buffer release errors = 0
 duplicate client registers = 0
  failed to register client = 0
       Invalid client syncs = 0
```

This example shows the output on the Cisco cBR router:

```
Router#show redundancy counters
Redundancy Facility OMs
               comm link up = 0
             comm link down = 0

          invalid client tx = 0
          null tx by client = 0
                tx failures = 0
      tx msg length invalid = 0

      client not rxing msgs = 0
 rx peer msg routing errors = 0
           null peer msg rx = 0
         errored peer msg rx = 0

                 buffers tx = 0
     tx buffers unavailable = 0
                 buffers rx = 0
      buffer release errors = 0

 duplicate client registers = 0
  failed to register client = 0
       Invalid client syncs = 0


Router#
```

History Display

The following example shows a typical display for the **show redundancy history** command:

```
Router# show redundancy history
00:00:00 client added: RF_INTERNAL_MSG(0) seq=0
00:00:00 client added: RF_LAST_CLIENT(65000) seq=65000
00:00:00 client added: CHKPT RF(25) seq=130
00:00:01 client added: Slot RF(50) seq=530
00:00:15 client added: RFS client(5) seq=170
00:00:16 *my state = INITIALIZATION(2) *peer state = DISABLED(1)
00:00:16 RF_PROG_INITIALIZATION(100) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) CHKPT RF(25) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) RFS client(5) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) Slot RF(50) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:16 *my state = NEGOTIATION(3) peer state = DISABLED(1)
00:00:16 RF_EVENT_GO_ACTIVE(512) op=0 rc=0
00:00:16 *my state = ACTIVE-FAST(9) peer state = DISABLED(1)
00:00:16 RF_STATUS_MAINTENANCE_ENABLE(403) CHKPT RF(25) op=0 rc=0
00:00:16 RF_STATUS_MAINTENANCE_ENABLE(403) RFS client(5) op=0 rc=0
00:00:16 RF_STATUS_MAINTENANCE_ENABLE(403) Slot RF(50) op=0 rc=0
00:00:16 RF_PROG_ACTIVE_FAST(200) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) CHKPT RF(25) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) RFS client(5) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) Slot RF(50) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:16 *my state = ACTIVE-DRAIN(10) peer state = DISABLED(1)
00:00:16 RF_PROG_ACTIVE_DRAIN(201) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_DRAIN(201) CHKPT RF(25) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_DRAIN(201) RFS client(5) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_DRAIN(201) Slot RF(50) op=0 rc=11
```

This example shows the output on the Cisco cBR router:

```
Router#show redundancy history
00:00:05 client added: Redundancy Mode RF(29) seq=60
00:00:05 client added: IfIndex(139) seq=61
00:00:05 client added: CHKPT RF(25) seq=68
00:00:05 client added: Event Manager(77) seq=84
00:00:05 client added: RP Platform RF(1340) seq=101
00:00:05 client added: Cat6k CWAN HA(1501) seq=102
00:00:05 client added: Network RF Client(22) seq=109
00:00:05 client added: Cat6k SPA TSM(1505) seq=116
00:00:05 client added: IOSXE RP SBC RF(1344) seq=127
00:00:05 client added: SBC-RF RF Client(227) seq=128
00:00:05 client added: XDR RRP RF Client(71) seq=135
00:00:05 client added: CEF RRP RF Client(24) seq=136
00:00:05 client added: MFIB RRP RF Client(306) seq=146
00:00:05 client added: UBRCCE SUP RF Client(3064) seq=150
00:00:05 client added: Cat6k CWAN Interface Events(1504) seq=153
00:00:05 client added: RFS RF(520) seq=158
00:00:05 client added: Config Sync RF client(5) seq=160
00:00:05 client added: DHCPC(100) seq=225
00:00:05 client added: DHCPD(101) seq=226
00:00:05 client added: SNMP RF Client(34) seq=238
00:00:05 client added: CWAN APS HA RF Client(1502) seq=239
00:00:05 client added: History RF Client(35) seq=248
00:00:05 client added: REDSSOC(91) seq=269
00:00:05 client added: Dialer(48) seq=270
```

```
00:00:05 client added: ARP(57) seq=278
00:00:05 client added: IOSXE SpaFlow(1342) seq=297
00:00:05 client added: IOSXE IF Flow(1343) seq=298
00:00:05 client added: IOS STILE RF Client(1111) seq=299
00:00:05 client added: Call-Home RF(1510) seq=342
00:00:05 client added: IP Tunnel RF(151) seq=349
00:00:05 client added: Config Verify RF client(94) seq=350
00:00:05 client added: SISF table(515) seq=359
00:00:05 client added: IKE RF Client(135) seq=363
00:00:05 client added: IPSEC RF Client(136) seq=364
00:00:05 client added: CRYPTO RSA(130) seq=365
00:00:05 client added: PKI RF Client(131) seq=366
00:00:05 client added: GKM RF Client(157) seq=367
00:00:05 client added: DHCPv6 Relay(148) seq=372
00:00:05 client added: DHCPv6 Server(149) seq=373
00:00:05 client added: ISSU Test Client(4005) seq=381
00:00:05 client added: Network RF 2 Client(93) seq=385
00:00:05 client added: FEC Client(205) seq=387
00:00:05 client added: DATA DESCRIPTOR RF CLIENT(141) seq=395
00:00:05 client added: CTS HA(1000) seq=405
00:00:05 client added: UBRCCE DB(4040) seq=412
00:00:05 client added: VIDEO RPHA(4042) seq=413
00:00:05 client added: CBR LCHA(4044) seq=415
00:00:05 client added: IOS Config ARCHIVE(4020) seq=425
00:00:05 client added: IOS Config ROLLBACK(4021) seq=426
00:00:05 client added: ANCP(4031) seq=427
00:00:05 client added: Smart_Agent_RF_Client(1376) seq=448
00:00:05 client added: Flow Metadata(255) seq=471
00:00:07 *my state = INITIALIZATION(2) peer state = DISABLED(1)
00:00:07 RF_PROG_INITIALIZATION(100) First Slave(0) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) Slave(3) op=0 rc=23
00:00:07 RF_PROG_INITIALIZATION(100) Redundancy Mode RF(29) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) IfIndex(139) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) CHKPT RF(25) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) Event Manager(77) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) RP Platform RF(1340) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) Cat6k CWAN HA(1501) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) Network RF Client(22) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) Cat6k SPA TSM(1505) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) IOSXE RP SBC RF(1344) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) SBC-RF RF Client(227) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) XDR RRP RF Client(71) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) CEF RRP RF Client(24) op=0 rc=11
00:00:07 RF_PROG_INITIALIZATION(100) MFIB RRP RF Client(306) op=0 rc=11
```

States Display

The following example shows a typical display for the **show redundancy states** command:

```
Router# show redundancy states
       my state = 13 -ACTIVE
     peer state = 8  -STANDBY HOT
           Mode = Duplex
           Unit = Primary
        Unit ID = 0
  Redundancy Mode = Hot Standby Redundancy
 Maintenance Mode = Disabled
     Manual Swact = Enabled
   Communications = Up
            client count = 5
```

```
 client_notification_TMR = 30000 milliseconds
           RF debug mask = 0x0
```

This example shows the output on the Cisco cBR router:

```
Router#show redundancy states
       my state = 13 -ACTIVE
     peer state = 1  -DISABLED
           Mode = Simplex
           Unit = Primary
        Unit ID = 48

Redundancy Mode (Operational) = Non-redundant
Redundancy Mode (Configured)  = sso
Redundancy State              = Non Redundant
     Maintenance Mode = Disabled
    Manual Swact = disabled (system is simplex (no peer unit))
 Communications = Down      Reason: Simplex mode

   client count = 120
 client_notification_TMR = 30000 milliseconds
           RF debug mask = 0x0

Router#
```

Cisco RF Gateway 10

The following example shows sample output for the show redundancy command on the Cisco RF Gateway 10:

```
Router#show redundancy
Redundant System Information :
------------------------------
       Available system uptime = 3 minutes
Switchovers system experienced = 0
              Standby failures = 0
        Last switchover reason = none
                  Hardware Mode = Simplex
    Configured Redundancy Mode = Stateful Switchover
     Operating Redundancy Mode = Stateful Switchover
              Maintenance Mode = Disabled
                Communications = Down      Reason: Simplex mode
Current Processor Information :
-------------------------------
               Active Location = slot 1
        Current Software state = ACTIVE
       Uptime in current state = 2 minutes
                 Image Version = Cisco IOS Software, Catalyst 4500 L3 Switch So
tware (rfgw-ENTSERVICES-M), Version 12.2(FLO_RFGW_NIGHT_MON.2008-08-11) UBUILDI
 Image, CISCO DEVELOPMENT TEST VERSION
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Mon 11-Aug-08 04:54 by aswitzer
                        BOOT =
        Configuration register = 0x2100
Peer (slot: 2) information is not available because it is in 'DISABLED' state
Router
```

Clients Display

The following example shows a typical display for the **show redundancy clients** command:

```
Router# show redundancy clients
 clientID = 0       clientSeq = 0        RF_INTERNAL_MSG
 clientID = 25      clientSeq = 130      CHKPT RF
 clientID = 5       clientSeq = 170      RFS client
 clientID = 50      clientSeq = 530      Slot RF
 clientID = 65000   clientSeq = 65000    RF_LAST_CLIENT
```

Table below describes the significant fields shown in the display.

Table 274: show redundancy clients Field Descriptions

Field	Description
clientID	Displays the client ID number.
clientSeq	Displays the client notification sequence number.

Counters Display

The following example shows a typical display for the **show redundancy counters** command:

```
Router# show redundancy counters
Redundancy Facility OMs
               comm link up = 1
        comm link down down = 0
          invalid client tx = 0
          null tx by client = 0
                tx failures = 0
      tx msg length invalid = 0
      client not rxing msgs = 0
 rx peer msg routing errors = 0
           null peer msg rx = 0
         errored peer msg rx = 0
                 buffers tx = 1009
     tx buffers unavailable = 0
                 buffers rx = 1006
      buffer release errors = 0
 duplicate client registers = 0
  failed to register client = 0
       Invalid client syncs = 0
```

History Display

The following example shows a typical display for the **show redundancy history** command:

```
Router# show redundancy history
00:00:00 client added: RF_INTERNAL_MSG(0) seq=0
00:00:00 client added: RF_LAST_CLIENT(65000) seq=65000
00:00:00 client added: CHKPT RF(25) seq=130
```

```
00:00:01 client added: Slot RF(50) seq=530
00:00:15 client added: RFS client(5) seq=170
00:00:16 *my state = INITIALIZATION(2) *peer state = DISABLED(1)
00:00:16 RF_PROG_INITIALIZATION(100) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) CHKPT RF(25) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) RFS client(5) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) Slot RF(50) op=0 rc=11
00:00:16 RF_PROG_INITIALIZATION(100) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:16 *my state = NEGOTIATION(3) peer state = DISABLED(1)
00:00:16 RF_EVENT_GO_ACTIVE(512) op=0 rc=0
00:00:16 *my state = ACTIVE-FAST(9) peer state = DISABLED(1)
00:00:16 RF_STATUS_MAINTENANCE_ENABLE(403) CHKPT RF(25) op=0 rc=0
00:00:16 RF_STATUS_MAINTENANCE_ENABLE(403) RFS client(5) op=0 rc=0
00:00:16 RF_STATUS_MAINTENANCE_ENABLE(403) Slot RF(50) op=0 rc=0
00:00:16 RF_PROG_ACTIVE_FAST(200) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) CHKPT RF(25) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) RFS client(5) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) Slot RF(50) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_FAST(200) RF_LAST_CLIENT(65000) op=0 rc=11
00:00:16 *my state = ACTIVE-DRAIN(10) peer state = DISABLED(1)
00:00:16 RF_PROG_ACTIVE_DRAIN(201) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_DRAIN(201) CHKPT RF(25) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_DRAIN(201) RFS client(5) op=0 rc=11
00:00:16 RF_PROG_ACTIVE_DRAIN(201) Slot RF(50) op=0 rc=11
```

States Display

The following example shows a typical display for the **show redundancy state** command:

```
Router# show redundancy states
       my state = 13 -ACTIVE
     peer state = 8  -STANDBY HOT
           Mode = Duplex
           Unit = Primary
        Unit ID = 0
  Redundancy Mode = Hot Standby Redundancy
 Maintenance Mode = Disabled
     Manual Swact = Enabled
   Communications = Up
            client count = 5
 client_notification_TMR = 30000 milliseconds
           RF debug mask = 0x0
```

Related Commands

Command	Description
associate	Associates two line cards for Automatic Protection Switching (APS) redundancy protection.
clear redundancy	Clears the counters and history information that are used by the Redundancy Facility (RF) subsystem.
mode (redundancy)	Configures the redundancy mode of operation.
redundancy	Enters redundancy configuration mode.
redundancy force-failover main-cpu	Forces a manual switchover between the active and standby PRE1 modules or Supervisor cards.

Command	Description
redundancy force-switchover	Forces the standby PRE or Supervisor card to assume the role of the active PRE or Supervisor card.
show redundancy config-sync	Displays failure information generated during a bulk synchronization from the active PRE to the standby PRE.
show redundancy platform	Displays active and standby PRE and software information.

show redundancy config-sync

To display failure information generated during a bulk synchronization from the active Performance Routing Engine (PRE) to the standby PRE, use the **show redundancy config-sync** command in user EXEC or privileged EXEC modes.

show redundancy config-sync {**failures** {**bem** | **mcl** | **prc**} | **ignored failures mcl**}

Syntax Description

failures	Displays failures related to bulk synchronisation of the standby PRE.
bem	Displays Best Effort Method (BEM) failure list.
mcl	Displays Mismatched Command List (MCL) failure list.
prc	Displays Parser Return Code (PRC) failure list.
ignored failures mcl	Displays mismatched commands in the MCL that are ignored.

Command Default

None

Command Modes

User EXEC (>)
Privilieged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

This command is used on the active PRE only.

If there are mismatched commands between the active and standby PRE, remove the configuration lines that are not supported on the standby image. If it is not possible to remove the mismatched lines, or it has been determined that the mismatched lines are not critical to the operation of the system, use the command **redundancy config-sync ignore mismatched-commands** to temporarily ignore them.

Examples

The examples in this section are supported on the Cisco cBR Series Converged Broadband Router.

The following example displays a mismatched command list:

```
Router# show redundancy config-sync failures mcl
Mismatched Command List
-----------------------
- tacacs-server host 209.165.200.225 timeout 5
```

The following example shows that no mismatched commands are ignored:

```
router# show redundancy config-sync ignored failures mcl
Ignored Mismatched Command List
```

```
------------------------------
The list is Empty
```

The following example displays a Parser Return Code failure list:

```
router# show redundancy config-sync failures prc
PRC Failed Command List
-----------------------
router bgp 999
address-family ipv4 vrf TEST2
- bgp dampening 44 66 66 44
! </submode> "address-family"
address-family ipv4 vrf TEST1
- bgp dampening 44 66 66 44
! </submode> "address-family"
```

The following example displays a Best Effort Method failure list:

```
router# show redundancy config-sync failures bem
BEM Failed Command List
-----------------------
interface Tunnel0
- tunnel mpls traffic-eng priority 7 7
! </submode> "interface"
- next-address loose 10.165.202.158
- next-address loose 10.165.202.129
```

Related Commands

Command	Description
redundancy force-switchover	Forces the standby PRE to assume the role of the active PRE.
show redundancy	Displays current active and standby PRE redundancy status.
show redundancy platform	Displays active and standby PRE and software information.

show redundancy linecard

To display information about the line card redundancy, use the **show redundancy linecard** command in privileged EXEC mode.

show redundancy linecard { **all** | **group** {*group-id* | **all** } | **history** | **slot** *slot* | {**sub-block all** } }

Syntax Description

all	Displays role and state information for all line cards.
group *group-id*	Displays the line card redundancy information for the line card groups. The valid value is 0.
group all	Displays all the line card groups.
history	Displays the state change history log for all the line cards.
slot *slot*	Displays the redundancy information for the line card slot number.
sub-block	Displays the sub-block information.

Command Default

None.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE Release 3.16.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to display the redundancy group information:

```
Router# show redundancy linecard group all
Group Identifier: 0
Revertive, Revert Timer: OFF (60000 sec)
Reserved Cardtype: 0xFFFFFFFF 4294967295
Group Redundancy Type: INTERNAL SWITCH
Group Redundancy Class: 1:N
Group Redundancy Configuration Type: LINECARD GROUP
Primary: Slot 6
Primary: Slot 7
Secondary: Slot 0
```

The following example shows how to displays the role and state information for all line cards:

```
Router# show redundancy linecard all
LC My Peer Peer Peer
Slot Subslot Group State State Slot Subslot Role Mode
--------------------------------------------------------------------------------
9 - 0 Active Stdby Cold 0 - Active Primary
8 - 0 Active Stdby Warm 0 - Active Primary
7 - 0 Active Stdby Warm 0 - Active Primary
6 - 0 Active Stdby Cold 0 - Active Primary
3 - 0 Active Stdby Cold 0 - Active Primary
```

```
2 - 0 Active Stdby Cold 0 - Active Primary
1 - 0 Active Stdby Cold 0 - Active Primary
0 - 0 - - Multiple None Standby Secondary
```

The following is a sample output of the command when secondary card becomes active for a primary card, and the N+1 redundancy is changed to 1+1 redundancy:

```
Router# show redundancy linecard all
LC My Peer Peer Peer
Slot Subslot Group State State Slot Subslot Role Mode
------------------------------------------------------------------------------
9 - 0 Stdby Hot Active 0 - Standby Primary
8 - 0 Active Unavail 0 - Active Primary
7 - 0 Active Unavail 0 - Active Primary
6 - 0 Active Unavail 0 - Active Primary
3 - 0 Active Unavail 0 - Active Primary
2 - 0 Active Unavail 0 - Active Primary
1 - 0 Active Unavail 0 - Active Primary
0 - 0 Active Stdby Hot 9 - Active Secondary
```

The following example displays the redundancy information for the line card:

```
Router# show redundancy linecard slot 9
LC Redundancy Is Configured:
LC Group Number: 0
LC Slot: 9 (idx=9)
LC Peer Slot: 0
LC Card Type: 0x4076 , 16502
LC Name: 9
LC Mode: Primary
LC Role: Active
LC My State: Active
LC Peer State: Stdby Warm
```

The following example displays the state change history for all line cards:

```
Router# show redundancy linecard history
Jan 05 2012 12:24:27 20559 - st_mem(9): MY State Change, (Active Wait) -> (Active)
Jan 05 2012 12:24:27 20559 - st_mem(9): MY FSM execution, Active Wait:Init:State Ntfy
Jan 05 2012 12:24:27 20559 - st_mem(9): MY State Change, (Active LC Cfg Dnld) -> (Active
Wait)
Jan 05 2012 12:24:27 20559 - st_mem(9): MY FSM execution, Active LC Cfg Dnld:Init:Cfg
Dnld Done
Jan 05 2012 12:24:27 20559 - st_mem(9): MY State Change, (Active Cold) -> (Active LC
Cfg Dnld)
Jan 05 2012 12:23:09 12763 - st_mem(9): MY FSM execution, Active Cold:Init:Cfg Dnld
Jan 05 2012 12:23:09 12760 - st_mem(9): MY State Change, (Init) -> (Active Cold)
Jan 05 2012 12:23:09 12760 - st_mem(9): MY FSM execution, Init:Init:Up
Jan 05 2012 12:21:39 3746 - st_mem(9): PEER FSM Execution , Init:Init:Reset
```

Related Commands

Command	Description
class	Configures redundancy class on the line card.
description	Adds a description to the line card group.
member slot	Adds a slot to the line card redundancy group.
redundancy slot	Enters redundancy configuration mode.

show redundancy platform

To display active and standby Performance Routing Engine (PRE) and software information, use the **show redundancy platform** command in user EXEC or privileged EXEC modes.

show redundancy platform

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Router.

Examples

The following example displays active and standby PRE information such as PRE states, reason for last failover, total system uptime, Cisco IOS release version, and so on:

```
Router# show redundancy platform

PRE A (This PRE)   : Active
PRE B              : Standby
                                Operating mode : SSO
Uptime since this PRE became active from reload : 13 minutes
         Standby failures since this PRE active : 0
                The standby PRE has been up for : 3 minutes
Previous rp_cre_redun_reg bits    - 1057h
Current  rp_cre_redun_reg bits    - 1041h
Previous peer_ready_reg - 0l
Current  peer_ready_reg - 1l
Standby PRE information....
Standby is up
Standby has 1044480K bytes of memory
Standby BOOT variable = disk1:ubr10k2-k9p6u2-mz.Prednld-prototype-2,12;
Standby CONFIG_FILE variable =
Standby BOOTLDR variable =
Standby Configuration register is 0x0
Standby version:
Cisco IOS Software, 10000 Software (UBR10K2-K9P6U2-M), Version 12.2(122_33_SCA.2008-02-15)
 UBUILDIT Image, CISCO DEVELOPMENT TEST VERSION
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Sat 16-Feb-08 03:12 by jdkerr
Active version:
Cisco IOS Software, 10000 Software (UBR10K2-K9P6U2-M), Version 12.2(122_33_SCA.2008-02-15)
 UBUILDIT Image, CISCO DEVELOPMENT TEST VERSION
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Sat 16-Feb-08 03:12 by jdkerr
```

Related Commands

Command	Description
debug ehsa	Enables debug information on the EHSA module.
redundancy force-switchover	Forces the standby PRE to assume the role of the active PRE.
show redundancy (ubr10012)	Displays the current redundancy status.
show redundancy config-sync	Displays failure information generated during a bulk synchronization from the active PRE to the standby PRE.

show running-config interface cable

To display the bundles that are configured on a Cisco CMTS router and display the running configuration for each of the cable interfaces, use the **show running-config interface cable** command in privileged EXEC mode.

Cisco IOS Release 12.2(33)SCE and later

show running-config interface cable {*slot/cable-interface-index* | *slot/subslot/cable-interface-index* }

showrunning-configinterfacecable
slot/ | *subslot /* | *port /*

Cisco IOS Release 12.2(33)SCE and later
show running-config interface cable
slot/cable-interface-index | *slot/subslot /cable-interface-index*

Cisco cBR Series Converged Broadband Router
show running-config interface cable
slot/subslot /cable-interface-index

Syntax Description

slot	Slot where the line card resides. • Cisco uBR7225VXR router—The valid value is 1 or 2. • Cisco uBR7246VXR router—The valid range is from 3 to 6. • Cisco uBR10012 router—The valid range is from 5 to 8. • Cisco cBR router—The valid range is 0 to 3, and 6 to 9.
subslot	(Cisco uBR10012 only) Secondary slot number of the cable interface line card. The valid subslots are 0 or 1. On the Cisco cBR router, the subslot is always 0.
port	Downstream port number. • Cisco uBR7225VXR router and Cisco uBR7246VXR router—The valid value is 0 or 1. • Cisco uBR10012 router—The valid range is from 0 to 4 (depending on the cable interface).
cable-interface-index	Downstream port of the Cisco uBR10-MC5X20 and Cisco uBR-MC28 line cards, or MAC domain index of the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V line cards. Cisco uBR7225VXR and Cisco uBR7246VXR routers—The valid port value is 0 or 1. Cisco uBR10012 router—The valid range for the Cisco uBR-MC20X20V and Cisco uBR-MC5X20 line cards is from 0 to 4. The valid range for the Cisco uBR-MC3GX60V line card is from 0 to 14. Cisco cBR router—The valid range is 0 to 7.

Command Default

Displays screen output without page breaks, removes passwords and other security information.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
12.3(21)BC	This command was enhanced to support cable interface bundling and virtual interface bundling.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	The command output was modified to display profile description for the specified profile.
12.2(33)SCE	This command was modified. The port parameter was changed to cable-interface-index to indicate the MAC domain index for the Cisco uBR-MC20X20V and Cisco uBR-MC3GX60V cable interface line cards.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Router.

Examples

```
The following example displays typical output for the show running-config command for a
specified cable interface:
Router# show running-config interface cable 8/1/0

Building configuration...
Current configuration : 1563 bytes
!
interface Cable8/1/0
 downstream Modular-Cable 1/3/0 rf-channel 0 upstream 0-4
 no cable packet-cache
 cable bundle 1
 cable downstream channel-id 203
 cable downstream annex B
 cable downstream modulation 64qam
 cable downstream interleave-depth 32
 cable downstream frequency 525000000
 cable downstream rf-shutdown
 cable upstream max-ports 4
 cable upstream 0 connector 0
 cable upstream 0 frequency 5800000
 cable upstream 0 channel-width 1600000 1600000
 cable upstream 0 docsis-mode tdma
 cable upstream 0 minislot-size 4
 cable upstream 0 range-backoff 3 6
 cable upstream 0 modulation-profile 21
 cable upstream 0 attribute-mask 20000000
 no cable upstream 0 shutdown
 cable upstream 1 connector 1
 cable upstream 1 channel-width 1600000 1600000
 cable upstream 1 docsis-mode tdma
 cable upstream 1 minislot-size 4
```

```
 cable upstream 1 range-backoff 3 6
 cable upstream 1 modulation-profile 21
 cable upstream 1 attribute-mask 20000000
 no cable upstream 1 shutdown
 cable upstream 2 connector 2
 cable upstream 2 channel-width 1600000 1600000
 cable upstream 2 docsis-mode tdma
 cable upstream 2 minislot-size 4
 cable upstream 2 range-backoff 3 6
 cable upstream 2 modulation-profile 21
 cable upstream 2 attribute-mask 20000000
 cable upstream 2 shutdown
 cable upstream 3 connector 3
 cable upstream 3 channel-width 1600000 1600000
 cable upstream 3 docsis-mode tdma
 cable upstream 3 minislot-size 4
 cable upstream 3 range-backoff 3 6
 cable upstream 3 modulation-profile 21
 cable upstream 3 attribute-mask 20000000
 cable upstream 3 shutdown
end
```

The following example displays the virtual bundle information for the specified bundle:

```
Router# show running-config interface Bundle 1
Building configuration...
Current configuration : 158 bytes
!
interface Bundle1
 ip address 1.60.0.1 255.255.255.0
 cable arp filter request-send 3 2
 cable arp filter reply-accept 3 2
 no cable ip-multicast-echo
end
```

The following examples displays subinterface information for the specified bundle on a Cisco uBR10012 router:

```
Router# show ip interface brief | include Bundle
Wideband-Cable8/0/0:0  Bundle2         YES unset  up                    up
In8/0/0:0              Bundle2         YES unset  up                    up
Bundle1                1.60.0.1        YES NVRAM  up                    up
Bundle2                1.80.0.1        YES NVRAM  up                    up
Bundle5                unassigned      YES NVRAM  up                    up
Router# show rununning interface Bundle150.1
Building configuration...
Current configuration : 93 bytes
!
interface Bundle150.1
 ip address 30.0.0.1 255.0.0.0
 cable helper-address 1.8.35.200
end
```

The following example displays the profile description specified for a interface on a Cisco uBR10012 router:

```
Router#show running-config | include gold
cable multicast auth profile gold
   profile-description gold profile for higher bandwidth
```

```
   bootfile gold11_bpi.cm
tftp-server disk0:gold2.cm alias gold2.cm
tftp-server disk0:gold11_bpi.cm alias gold11_bpi.cm
tftp-server disk0:gold11_bpi.cm
```

Related Commands

Command	Description
cable bundle	Configures a cable interface to belong to an interface bundle or virtual interface bundle.
profile description	Configures profile descriptions for each profile in the selected cable multicast authorization profile.
show arp	Displays the entries in the router's ARP table.
show cable bundle *number* **forwarding-table**	Displays the MAC forwarding table for the specified bundle, showing the MAC addresses of each cable modem in a bundle and the physical cable interface that it is currently using.
show cable modem	Displays the cable modems that are online both before and after cable interface bundling has been configured.

show run interface VirtualPortGroup

To verify the VirtualPortGroup interface configuration, use the **show run interface VirtualPortGroup** command in privileged EXEC mode.

show run interface VirtualPortGroup *number*

Syntax Description

number	Displays the information of the VirtualPortGroup with this number.

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to verify the VirtualPortGroup interface configuration.

The following sample output shows the VirtualPortGroup interface configuration:

```
router#show run interface VirtualPortGroup 5
Building configuration...

Current configuration : 145 bytes
!
interface VirtualPortGroup5
 ip address 1.2.2.2 255.255.255.0 secondary
 ip address 1.2.2.1 255.255.255.0
 no mop enabled
 no mop sysid
end
```

Related Commands

Command	Description
mgmt-intf	Defines a cable video management interface.
interface	Defines a VirtualPortGroup interface.
show run | include mgmt-intf	Displays the cable video management interface configuration.
show interfaces VirtualPortGroup	Displays the VirtualPortGroup interface state.

show run | se ptp

You can use the **show run | se ptp** command to check the PTP configuration on both cBR and RPD.

show run | se ptp

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Everest 16.7.1y	Support for checking PTP configuration was introduced.

Usage Guidelines

Use the **show run | se ptp** command to view the PTP configuration status.

The following example shows the sample output for the **show run | se ptp** command:

```
Router# show run | se ptp

ptp clock boundary domain 55
servo tracking-type R-DTI
clock-port 22 master profile g8275.2
sync interval -5
sync one-step
transport ipv6 unicast interface Lo1588 negotiation
clock-port 33 master profile g8275.2
sync interval -5
sync one-step
transport ipv6 unicast interface Lo1589 negotiation
ptp r-dti 1
profile G.8275.2
ptp-domain 55
clock-port 22
ethernet 0
transport ipv6
clock source ipv6 2001:158:158:158::158 gateway ipv6 2001:120:101:16::1
clock source ipv6 2001:158:158:158::159 gateway ipv6 2001:120:101:16::2 alternate
```

show snmp | i queue

You can use the **show snmp | i queue** command to display the SNMP queue size. You can also view if the queue size has dropped and can also view the maximum queue size.

show snmp | i queue

Command Default

None

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced.

Usage Guidelines

Use the **show snmp | i queue** command to view the SNMP queue size.

The following example shows the sample output for the **show snmp | i queue** command:

```
Router# show snmp | i queue
0 Input queue packet drops (Maximum queue size 1000)
0 Dispatcher queue packet drops (Maximum queue size 75)
Packets currently in SNMP process input queue: 0, max 1000
Packets currently in SNMP PDU dispatcher queue: 0, max 75
Router#
```

The table below describes the significant fields shown in the display:

Table 275: `show snmp | i queue` Field Descriptions

Field	Description
Input queue	The process input queue holds SNMP packets from the dispatcher queue, waiting to be processed.
Dispatcher queue	The dispatcher queue holds SNMP packets from socket.

Related Commands

Command	Description
snmp snmp-server dispatcher-queue-size	Specify the dispatcher queue size.
snmp snmp-server local-queue-size	Specify the local queue size.

show tech-support

To automatically run **show** commands that display system information, use the **show tech-support** command in the EXEC mode.

show tech-support *keywords*

Syntax Description

Firewall	Displays firewall related information.
aaa	Displays aaa related information.
alg	Displays ALG related information.
appnav	Displays AppNav related information.
bgp	Displays BGP information.
called-number	Displays Called Number commands.
called-number-pool	Displays Called Number Pool commands.
cef	Displays CEF related information.
cft	Displays CFT related information.
cmts	Displays CMTS related information.
cmts rpd	Displays downstream cable and RPHY related information.
cmts queuestuck	Useful for debugging and working around queue stuck issues.
cube	Displays cube related information.
dhcpv4	Displays DHCPv4 related information.
dhcpv6	Displays DHCPv6 related information.
diagnostic	Displays diagnostic related information.
dial-peer	Displays dial-peer group.
dmvpn	Displays DMVPN related information.
dpg	Displays dial-peer groups.
e164-pattern-map	Displays e164 pattern maps.
e164-translation	Displays voice class e164-translation.
eigrp	Displays EIGRP related information.
ethernet	Displays ethernet protocols related information.
evc	Displays EVC related information.

fnf	Displays Flexible Netflow information
ipc	Displays IPC related information.
ipmulticast	Displays IP multicast related information.
ipsec	Displays IPSEC related information.
isis	Displays CLNS and ISIS related information.
issu	Displays ISSU related information.
iwan	Displays IWAN related information.
l2vpn	Displays L2VPN related information.
lisp	Displays Locator/ID Separation Protocol.
mdns-sd	Displays mdns-sd related information.
memory	Displays memory related information.
mfib	Displays MFIB related information.
mpls	Displays MPLS forwarding and application related information.
mvpn	Displays multicast VPN related information.
nat	Displays NAT related information.
nbar	Displays NBAR related information.
onep	Displays ONEP related information.
ospf	Displays OSPF related information.
ospfv3	Displays OSPFv3 related information.
otv-isis	Displays OTV and ISIS related information.
page	Displays page through output.
password	Includes passwords.
perf_measure	Displays PERF_MEASURE related information.
performance-monitor	Displays performance monitor related information.
pfrv3	Displays PfRv3 related information.
pki	Displays PKI related information.
route-string	Displays route-string commands.
rsvp	Displays IP RSVP related information.
sbc	Displays SBC related information.

segment-routing	Displays segment-routing related information.
server-group	Displays server groups.
sip-options-keepalive	Displays voice class sip-options-keepalive.
sip-predefined-profiles	Displays predefined voice class sip profiles.
sisf	Displays SISF information.
subscriber	Displays subscriber related information.
video	Displays video related information.
virtual-service	Displays virtualization manager related information
voice	Displays voice related information.
vrrp	Displays VRRP related information.
wccp	Displays WCCP related information.

Command Default

None

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Fuji 16.8.2	This command was introduced.
Cisco IOS XE Bengaluru 17.6.1x	This command was updated to include the **cmts rpd** keywords.

Usage Guidelines

This command generates technical support information that is useful for Cisco Technical Support representatives when troubleshooting a router. If you want to share the command output with Cisco Technical Support, use **redirect show tech | redirect harddisk:<filename>.txt** to export the command output to a plain text file and share.

Examples

The commands that run automatically when you run the **show tech-support** command include but not limited to the following:

```
show clock
show version
show running-config
show redundancy history
show redundancy states
show redundancy switchover history
show stacks
show interfaces
show interfaces history
show controllers
show user
show data-corruption
```

```
show memory statistics
show process memory sorted
show process memory platform sorted
show process cpu sorted
show process cpu platform sorted
show process cpu extended history
show process cpu history
show file systems
show file descriptors
show bootflash: all
show harddisk: all
show webui: all
show stby-bootflash: all
show stby-harddisk: all
show controllers t1
show controllers e1
show ipc nodes
show ipc ports
show ipc queue
show ipc status
show derived-config interface
show cable card 0/0 ds-phy trigger
show alignment
show process cpu sorted
show facility-alarm status
show facility-alarm status critical
show redundancy
show redundancy counters
show redundancy linecard all
show lcha rfsw
show redundancy linecard history
show lcha logging level info
show platform hardware network-clocks
show platform diag
show diag all eeprom detail
show environment all
show environment power
show platform software ios RP active ipccl statistics port
show platform software ios RP active ipccl statistics client
show platform software ios RP active ipccl statistics service 1
show platform hardware qfp active infrastructure chipset 0 ver
show platform software object f0 pending-ack-update sorted 600
show platform software object f1 pending-ack-update sorted 600
show platform hardware qfp active system fault stats
```

Examples

The commands that run automatically when you run the **show tech-support cmts rpd** command include but not limited to the following:

```
show cable rpd
show cable rpd ipv6
show cable rpd version
show cable rpd sw-version
show cable rpd lcha
show cable rpd depi
show cable rpd log rev
show cable rpd info
show cable rpd md-association
show cable rpd sum
show ip spd
show ipv6 spd
show ptp clock running
```

```
show platform software us-scheduler infra cpu utilization
show platform software process slot x monitor
show cable card cdman chunk
show cable card ds-mac all
show cable card scheduler info
show cable card us-mac counts all
show cable card us-triggered-spectrum uts-common
show controllers Downstream-Cable all
show controllers Downstream-Cable association
show controllers Downstream-Cable bandwidth rf-channel
show controllers Downstream-Cable bandwidth wb-channel
show controllers Downstream-Cable counter rf-channel
show controllers Downstream-Cable counter ofdm-channel
show controllers Downstream-Cable counter wb-channel
show controllers Downstream-Cable rpd
show controllers Downstream-Cable rf-channel 0-162 verbose
show controllers Downstream-Cable rf-channel prof-order
show platform software rphyman rp active gcp statistics in
show platform software rphyman rp active gcp statistics me
show platform software rphyman rp active gcp statistics ms
show logging process rphyman internal reverse
```

show usb-devices summary

To view a summary of all the system USB devices (eUSB Flash), use **show usb-devices summary** command in Privileged Exec mode.

show usb-devices summary

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Privileged Exec (#)

Command History

Release	Modification
Cisco IOS XE Dublin 17.12.1	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to display a summary of the system USB devices:

```
Router# show usb-devices summary
Load for five secs: 3%/0%; one minute: 4%; five minutes: 4%
Time source is NTP, 21:37:37.209 EDT Mon Jun 26 2023

USB Device: EHCI Host Controller
Bus: 01 Port: 00 Cnt: 00 Speed: 480
Vendor: 1d6b ProdID: 0002 Rev: 5.15
Manufacturer: Linux 5.15.12 ehci_hcd
Serial Number: 0000:00:1d.0

USB Device:
Bus: 01 Port: 00 Cnt: 01 Speed: 480
Vendor: 8087 ProdID: 0020 Rev: 0.00
Manufacturer:
Serial Number:

USB Device: DataTraveler 3.0
Bus: 01 Port: 00 Cnt: 01 Speed: 480
Vendor: 0951 ProdID: 1666 Rev: 1.00
Manufacturer: Kingston
Serial Number: 60A44C3FACCEB221996A0158

USB Device: EUSB
Bus: 01 Port: 03 Cnt: 02 Speed: 480
Vendor: 0e39 ProdID: 2f00 Rev: 3.49
Manufacturer: SMART
Serial Number: STP22370JF8
```

In this example `USB Device: DataTraveler 3.0` indicates a front panel usb drive and `USB Device: EUSB` indicates a eUSB flash drive.

Related Commands

Command	Description
show hdd-devices summary	Displays a summary of all the system HDD devices(SSD).



Cable Commands: snmp through w

- snmp manager, on page 3126
- snmp server dispatcher-queue-size, on page 3128
- snmp-server enable traps cable, on page 3129
- snmp-server enable traps rpd-event, on page 3132
- snmp-server enable traps docsis-cm, on page 3133
- snmp-server enable traps docsis-cmts, on page 3135
- snmp-server enable traps docsis-resil, on page 3137
- snmp-server enable traps video-cable, on page 3139
- snmp-server host traps docsis-resil, on page 3141
- snmp-server host traps version 2c public udp-port, on page 3142
- snmp server local-queue-size, on page 3143
- snmp-trap input-stream-failure multicast, on page 3144
- source-id, on page 3145
- spectrum-inversion, on page 3146
- start-delay, on page 3148
- start-frequency, on page 3150
- stop-delay, on page 3151
- strong-pairing-enforce, on page 3153
- subcarrier-spacing, on page 3154
- switchover pxf restart, on page 3156
- switchover timeout, on page 3158
- symbol-rate, on page 3160
- table-based, on page 3161
- tag, on page 3162
- test cable dcc (Supporting Dynamic Channel Change), on page 3163
- test cable pnm rxmer ifIndex get all, on page 3167
- test cable pnm rxmer show, on page 3168
- test cable voice, on page 3169
- threshold, on page 3170
- tier-based, on page 3172
- timeout init-session, on page 3173
- timeout idle-session, on page 3174
- timeout off-session, on page 3175

- timestamp, on page 3176
- tlv, on page 3178
- tos, on page 3179
- tos (multicast qos), on page 3180
- trans-start-delay, on page 3181
- trans-stop-delay, on page 3183
- type, on page 3185
- type (ECMG), on page 3186
- upgrade fpd auto, on page 3187
- upgrade fpd file, on page 3189
- upgrade fpga auto-upgrade, on page 3190
- upgrade fpga file, on page 3192
- upgrade hw-programmable cable, on page 3194
- upstream, on page 3196
- upstream (config-lb-group), on page 3197
- upstream cable channel, on page 3199
- upstream cable connector, on page 3201
- upstream freq-range, on page 3203
- upstream upstream-cable, on page 3205
- us-channel, on page 3206
- us-channel chan-class-id , on page 3209
- us-channel channel-width , on page 3210
- us-channel cyclic-prefix, on page 3212
- us-channel description, on page 3213
- us-channel docsis-mode , on page 3214
- us-channel equalization-coefficient , on page 3216
- us-channel frequency , on page 3218
- us-channel hop-priority , on page 3220
- us-channel ingress-noise-cancellation , on page 3222
- us-channel maintain-psd , on page 3223
- us-channel minislot-size , on page 3224
- us-channel modulation-profile , on page 3226
- us-channel power-level, on page 3228
- us-channel rng-holdoff, on page 3230
- us-channel spectrum-group , on page 3231
- us-channel subcarrier-spacing, on page 3232
- us-channel threshold , on page 3233
- us-channel threshold hysteresis , on page 3235
- vcg, on page 3236
- vcg (config-video-bd), on page 3237
- vcg (table-based), on page 3239
- vei-bundle, on page 3240
- video, on page 3242
- virtual-arpd, on page 3244
- virtual-carrier-group, on page 3245
- virtual-edge-input-ip, on page 3246

- virtual-om, on page 3248
- vrf (multicast qos), on page 3249
- weekend duration, on page 3250
- weekend off, on page 3252
- weekend peak-time1, on page 3253
- width, on page 3256

snmp manager

To create a DOCSIS configuration file that specifies the IP address for the Simple Network Management Protocol (SNMP) manager, use the **snmp manager** command in cable config-file configuration mode. To disable this function, use the **no** form of this command.

snmp manager *ip-address*
no snmp manager

Syntax Description

ip-address	Specifies an IP address for the SNMP manager.

Command Default

No SNMP manager is defined.

Command Modes

Cable config-file configuration

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For SNMP commands that affect the operation of the CMTS, see the Cisco IOS Configuration Fundamentals Command Reference Guide.

Examples

The following example shows how to specify the IP address of the SNMP manager in a DOCSIS configuration file:

```
router(config)# cable config-file snmp.cm
router(config-file)# snmp manager 10.10.1.1
router(config-file)# exit

router(config)#
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
access-denied	Disables access to the network.
channel-id	Specifies upstream channel ID.
cpe max	Specifies CPE information.
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.

Command	Description
option	Provides config-file options.
privacy	Specifies privacy options for baseline privacy images.
service-class	Specifies service class definitions for the configuration file.
timestamp	Enables time-stamp generation.

snmp server dispatcher-queue-size

Use the **snmp-server dispatcher-queue-size** command in global configuration mode, to configure dispatcher queue size for SNMP global configuration. To disable this function, use the **no** form of this command.

snmp-server dispatcher-queue-size *dispatcher-queue-size*
no snmp-server dispatcher-queue-size

Syntax Description

dispatcher-queue-size	Specify the the maximum value for SNMP dispatcher queue size. The dispatcher queue holds SNMP packets from socket. The range is 75-100000 and the default value is 75.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced.

Examples

The following example shows how to configure **snmp snmp-server dispatcher-queue-size**:

```
router(config)# snmp-server dispatcher-queue-size 150
router(config)#
```

Related Commands

Command	Description
snmp snmp-server local-queue-size	Specify the local queue size.

snmp-server enable traps cable

To enable the sending of Simple Network Management Protocol (SNMP) traps for cable related events, use the **snmp-server enable traps cable** command in global configuration mode. To disable the sending of traps, use the **no** form of this command.

Cisco uBR10012 Universal Broadband Router and Cisco cBR-8 Converged Broadband Router
snmp-server enable traps cable [**admission_control**] [**cm-chover**] [**cm-onoff**] [**cm-remote-query**] [**dmic-lock**] [**enfrule-violation**] [**hccp-failover**] [**hopping**] [**metering**] [**rfswitch-polling**] [**sfp-link**]
no snmp-server enable traps cable [**admission_control**] [**cm-chover**] [**cm-onoff**] [**cm-remote-query**] [**dmic-lock**] [**enfrule-violation**] [**hccp-failover**] [**hopping**] [**metering**] [**rfswitch-polling**] [**sfp-link**]

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers
snmp-server enable traps cable [**admission_control**] [**cm-chover**] [**cm-onoff**] [**cm-remote-query**] [**dmic-lock**] [**enfrule-violation**] [**hccp-failover**] [**hopping**] [**metering**]
no snmp-server enable traps cable [**admission_control**] [**cm-chover**] [**cm-onoff**] [**cm-remote-query**] [**dmic-lock**] [**enfrule-violation**] [**hccp-failover**] [**hopping**] [**metering**]

Syntax Description

admission_control	Enables traps for Service Flow Admission Control (SFAC), as defined in CISCO-CABLE-ADMISSION-CTRL-MIB.
cm-chover	Enables traps that are sent upon completion of CMTS channel override operations, as defined in CISCO-DOCS-EXT-MIB.
cm-onoff	Enables traps for CM online/offline status changes, as defined in CISCO-DOCS-EXT-MIB.
cm-remote-query	Enables traps that are sent when the remote polling of CMs has been completed, as defined in CISCO-DOCS-REMOTE-QUERY-MIB.
dmic-lock	Enables traps that are sent when a cable modem fails the dynamic shared-secret security checks, as defined in CISCO-DOCS-EXT-MIB.
enfrule-violation	Enables traps that are sent when a user violates their quality of service (QoS) profile, as defined in the CISCO-CABLE-QOS-MONITOR-MIB.
hccp-failover	Enables traps for Hot Standby Connection-to-Connection Protocol (HCCP) redundancy switchover events, as defined in CISCO-CABLE-AVAILABILITY-MIB.
hopping	Enables traps for spectrum hopping events, as defined in CISCO-CABLE-SPECTRUM-MIB.
metering	Enables traps that are sent to indicate success or failure in creating the metering record file or streaming it to the collection server, as defined in CISCO-CABLE-METERING-MIB.
rfswitch-polling	Enables traps that are sent when the connectivity between the Cisco CMTS and the Cisco RF Switch is lost, as defined in CISCO-CABLE-AVAILABILITY-MIB.

sfp-link	Enables the traps that are sent when the SFP port link status changes on the Cisco Wideband SPA, and on the Cisco uBR-MC3GX60V line card, as defined in CISCO-CABLE-WIDEBAND-MIB.

Command Default

No SNMP traps for cable-related events are enabled. You can specify one type of trap or any combination of traps. When the **snmp-server enable traps cable** command is given without any options, all cable-related traps are enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(5)T	This command, with the **cm-chover** and **cm-onoff** options, was added.
12.0(7)XR2, 12.1(1)T	The **cm-remote-query** option, along with the CISCO-DOCS-REMOTE-QUERY-MIB MIB, was introduced.
12.1(2)EC1	This command was supported on the 12.1 EC train.
12.1(7)CX1	The **hopping** and **cmts-event** options were introduced.
12.2(4)BC1	This command was supported on the Cisco uBR10012 universal broadband router. The **cmts-event** option was also removed as redundant.
12.2(8)BC1	The **hccp-failover** option was supported on the Cisco uBR10012 router.
12.2(11)BC1	The **hccp-failover** option was supported on the Cisco uBR7200 series router.
12.2(15)BC1	The **enforce-rule** option was added to generate traps for subscribers who violate their enforce-rule QoS profile.
12.2(15)BC21	The **dmic-lock** and **usage** options were added.
12.3BC	The **admission_control**, **metering**, and **rfswitch-polling** options were added.
12.2(33)SCG	The **sfp-link** option was added to generate traps when the SFP port link status changed on the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For other SNMP commands that affect the operation of the CMTS, see the Cisco CMTS Universal Broadband Router Series MIB Specifications Guide.

Examples

The following example shows how to enable all traps for cable-related events except HCCP switchover on the CMTS:

```
Router# configure terminal
Router(config)# snmp-server enable traps cable cm-chover cm-onoff cm-remote-query hopping
Router(config)#
```

The following example shows how to enable traps for any HCCP switchovers that occur on the CMTS:

```
Router# configure terminal
Router(config)# snmp-server enable traps cable hccp-failover
Router(config)#
```

The following example shows how to enable traps for when a user violates the maximum bandwidth for the quality of service (QoS) profile specified by their enforce-rule.

```
Router# configure terminal
Router(config)# snmp-server enable traps cable enforce-rule
Router(config)#
```

The following example shows how to enable traps for to see the SFP port link status on the Cisco uBR10012 router and Cisco cBR-8 router.

```
Router# configure terminal
Router(config)# snmp-server enable traps cable sfp-link
Router(config)#
```

Related Commands

Command	Description
cable modem remote-query	Enables and configures the remote-query feature to gather CM performance statistics on the CMTS.
debug cable remote-query	Turns on debugging to gather information from remote CMs.
show cable modem remote-query	Displays the statistics accumulated by the remote-query feature.

snmp-server enable traps rpd-event

To enable RPD event traps to send RPD events using SNMP traps, use the **snmp-server enable traps rpd-event** command in global configuration mode. To disable RPD event traps, use the **no** form of this command.

snmp-server enable traps rpd-event *priority*
no snmp-server enable traps rpd-event *priority*

Syntax Description

priority	Priority can be 1-8, where: 1—Enable RPD event trap for emergency priority 2— Enable RPD event trap for alert priority 3—Enable RPD event trap for critical priority 4— Enable RPD event trap for error priority 5— Enable RPD event trap for warning priority 6— Enable RPD event trap for notice priority 7— Enable RPD event trap for informational priority 8— Enable RPD event trap for debug priority

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable enable RPD event traps:

```
Router# configure terminal
Router(config)# snmp-server enable traps rpd-event 1
Router(config)#
```

snmp-server enable traps docsis-cm

To enable one or more Simple Network Management Protocol (SNMP) traps for DOCSIS 1.1 events, use the **snmp-server enable traps docsis-cm** command in global configuration mode. To disable the SNMP traps, use the **no** form of this command.

Cisco uBR905 and Cisco uBR925 cable access routers, and Cisco CVA122 Cable Voice Adapter
snmp-server enable traps docsis-cm [**bpi** | **bpkm** | **dccack** | **dccreq** | **dccrsp** | **dhcp** | **dsack** | **dsreq** | **dsrsp** | **dynsa** | **swupcvc** | **swupfail** | **swupinit** | **swupsucc** | **tlv**]
no snmp-server enable traps docsis-cm [**bpi** | **bpkm** | **dccack** | **dccreq** | **dccrsp** | **dhcp** | **dsack** | **dsreq** | **dsrsp** | **dynsa** | **swupcvc** | **swupfail** | **swupinit** | **swupsucc** | **tlv**]

Syntax Description

bpi	(Optional) Enables Baseline Privacy Interface (BPI) initialization failure traps.
bpkm	(Optional) Enables Baseline Privacy Key Management (BPKM) initialization failure traps.
dccack	(Optional) Enables dynamic channel change acknowledgement failure traps.
dccreq	(Optional) Enables dynamic channel change request failure traps.
dccrsp	(Optional) Enables dynamic channel change response failure traps.
dhcp	(Optional) Enables DHCP failure traps.
dsack	(Optional) Enables dynamic service acknowledgement failure traps.
dsreq	(Optional) Enables dynamic service request failure traps.
dsrsp	(Optional) Enables dynamic service response failure traps.
dynsa	(Optional) Enables dynamic SA failure traps.
swupcvc	(Optional) Enables secure software upgrade code verification certificate (CVC) failure traps.
swupfail	(Optional) Enables secure software upgrade failure traps.
swupinit	(Optional) Enables secure software upgrade initialization failure traps.
swupsucc	(Optional) Enables secure software upgrade success traps.
tlv	(Optional) Enables unknown Type/Length/Value (TLV) traps.

Command Default

No traps are enabled. If no options are specified, all DOCSIS-related traps are enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.2(15)CZ	This command was introduced on the Cisco uBR905 and Cisco uBR925 cable access routers, and the Cisco CVA122 Cable Voice Adapter.

Usage Guidelines

This command enables the sending of SNMP traps when DOCSIS-related events occur. Multiple traps can be enabled at the same time.



Note The traps are described in the DOCS-CABLE-DEVICE-TRAP-MIB. MIB, which is an extension of the CABLE DEVICE MIB that is defined in RFC 2669.

Examples

The following example shows the BPI+ and secure software download traps being enabled:

```
Router# config terminal

Router(config)# snmp-server enable traps docsis-cm bpi bpkm swupcvc swupfail swupinit
swupsucc

Router(config)#
```

Related Commands

Command	Description
show snmp	Checks the status of SNMP communications.
snmp-server manager	Starts the SNMP manager process.

snmp-server enable traps docsis-cmts

To enable the sending of Simple Network Management Protocol (SNMP) traps for DOCSIS-related events, use the **snmp-server enable traps docsis-cmts** command in global configuration mode. To disable the sending of traps, use the **no** form of this command.

snmp-server enable traps docsis-cmts [*docsis-events*]
no snmp-server enable traps docsis-cmts [*docsis-events*]

Syntax Description

docsis-events	Specifies one or more of the following DOCSIS event types: • **bpi**—Enables traps for BPI initialization failure events. • **bpkm**—Enables traps for BPKM failure events. • **dccack**—Enables traps for the failure of Dynamic Channel Change Acknowledgement (DCC-ACK) requests. • **dccreq**—Enables traps for the failure of Dynamic Channel Change Request (DCC-REQ) requests. • **dccrsp**—Enables traps for the failure of Dynamic Channel Change Response (DCC-RSP) requests. • **dsac**—Enables traps for the failure of Dynamic Service Acknowledgement (DSx-ACK) requests. • **dsreq**—Enables traps for the failure of Dynamic Service Request (DSx-REQ) requests. • **dsrsp**—Enables traps for the failure of Dynamic Service Response (DSx-RSP) requests. • **dynsa**—Enables traps for the failure of Dynamic Service Addition (DSA-ACK) requests. • **regack**—Enables traps for the failure of Registration Acknowledgement (REG-ACK) requests. • **regreq**—Enables traps for the failure of Registration Request (REG-REQ) requests. • **regrsp**—Enables traps for the failure of Registration Response (REG-RSP) requests.

Command Default

No SNMP traps for DOCSIS-related events are enabled. When the **snmp-server enable traps docsis-cmts** command is given without any options, all DOCSIS-related traps are enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.1(7)CX1, 12.2(4)BC1	This command, along with the DOCS-CABLE-DEVICE-TRAP-MIB MIB, was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables traps that are defined in the DOCS-CABLE-DEVICE-TRAP-MIB MIB.

For other SNMP commands that affect the operation of the CMTS, see the Cisco IOS Configuration Fundamentals Command Reference Guide.

Examples

The following example shows how to enable traps for the failure of DOCSIS registration-related events on the CMTS:

```
router(config)# snmp-server enable traps docsis-cmts reqack reqreq regrsp

router(config)#
```

Related Commands

Command	Description
snmp-server enable traps cable	Enables traps for cable-related events.

snmp-server enable traps docsis-resil

To enable Simple Network Management Protocol (SNMP) traps for Wideband Resiliency specific events on the Cisco CMTS, use the **snmp-server enable traps docsis-resil** command in global configuration mode. To disable SNMP traps, use the **no** form of this command.

snmp-server enable traps docsis-resil [*resil-events*]
no snmp-server enable traps docsis-resil [*resil-events*]

Syntax Description

resil -events	Specifies one or more of the following wideband resiliency specific event types: • **cm-pmode**—Enables the wideband resiliency cable modem partial service trap. • **cm-recover**—Enables the wideband resiliency cable modem full service trap. • **event**—Enables the wideband resiliency event trap. • **rf-down**—Enables the wideband resiliency RF channel down status trap. • **rf-up**—Enables the wideband resiliency RF channel up status trap.

Command Default

No SNMP traps for wideband resiliency specific events are enabled. When the **snmp-server enable traps docsis-resil** command is given without any options, all wideband resiliency specific traps are enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables traps that are defined in the CISCO-DOCS-EXT-MIB.my MIB.

For other SNMP commands that affect the operation of the Cisco CMTS, see the Cisco IOS Configuration Fundamentals Command Reference Guide.

Examples

The following example shows how to enable traps when the RF channel logical status changes to DOWN on the Cisco CMTS:

```
router(config)# snmp-server enable traps docsis-resil rf-down
router(config)#
```

Associated Features

The **snmp-server enable traps docsis-resil** command is associated with the Wideband Modem Resiliency feature.

Related Commands

Command	Description
cableresiliencytraps-interval	Sets the interval at which traps must be sent for Wideband Resiliency related events for each cable modem on the Cisco CMTS.
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.
snmp-server enable traps cable	Enables traps for cable-related events on the Cisco CMTS.

snmp-server enable traps video-cable

To enable alarm event traps for cable related events, use the **snmp-server enable traps video-cable** command in global configuration mode. To disable the alarm event traps, use the **no** form of this command.

snmp-server enable traps video-cable backup-source-active[**cemconn** | **d6conn** | **ecmgconn** | **eisconn** | **gqiconn**] **input-stream-failure** [**pidcflct** | **pmeecm**] **pmt-missing**[**progcflct** | **qamovr**]
no snmp-server enable traps video-cable backup-source-active[**cemconn** | **d6conn** | **ecmgconn** | **eisconn** | **gqiconn**] **input-stream-failure** [**pidcflct** | **pmeecm**] **pmt-missing**[**progcflct** | **qamovr**]

Syntax Description

backup-source-active	Enable backup source active trap.
cemconn	Enable CEM connection error trap.
d6conn	Enable D6 connection error trap.
ecmgconn	Enable ECMG connection error trap.
eisconn	Enable EIS connection error trap.
gqiconn	Enable GQI connection error trap.
input-stream-failure	Enable input stream failure error trap.
pidcflct	Enable PID Conflict trap.
pmeecm	Enable PME ECM missing trap.
pmt-missing	Enable PMT missing error trap.
progcflct	Enable Program Conflict trap.
qamovr	Enable QAM Over-subscription trap.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE Fuji 16.7.1	This command was indroduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE Fuji 16.8.1d	The **backup-source-active**, **input-stream-failure**, and **pmt-missing** keywords were added.

Examples

The following example shows how to enable alarm event traps :

```
Router# configure terminal
Router(config)# snmp-server enable traps video cable backup-source-active cemconn d6conn
```

Related Commands

Command	Description
showcable video snmp-alarms	Display the active alarms in the system.
show cable video snmp-alarm-config	Display the alarm configuration in the system.
report-stream-error input-stream-failure report-interval syslog	Configure a timeout value and syslog message for input stream failure trap for multicast sources.
snmp-trap input-stream-failure multicast	Disable input stream failure trap for EAS stream.

snmp-server host traps docsis-resil

To enable Wideband Resiliency trap notifications to a specific Simple Network Management Protocol (SNMP) host on the Cisco CMTS, use the **snmp-server host traps docsis-resil** command in global configuration mode. To disable Wideband Resiliency trap notifications to a specific SNMP host, use the **no** form of this command.

snmp-server host *ipaddr* **traps** *string* **docsis-resil**
no snmp-server host *ipaddr* **traps** *string*

Syntax Description

ipaddr	IPv4 or IPv6 address of the SNMP notification host.
string	SNMPv1 community string, SNMPv2c community string, or SNMPv3 username.

Command Default

Wideband Resiliency trap notifications are not sent to an SNMP host.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to start or stop sending Wideband Resiliency traps to a specific SNMP host.

Examples

The following example shows how to enable Wideband Resiliency trap notifications to an SNMP host:

```
Router# configure terminal
Router(config)# snmp-server host 172.17.2.0 traps snmphost01 docsis-resil
```

Associated Features

The **snmp-server host trapsdocsis-resil** command is associated with the Wideband Modem Resiliency feature.

Related Commands

cable resiliency traps-interval	Sets the interval at which traps must be sent for Wideband Resiliency related events for each cable modem on the Cisco CMTS.
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.
snmp-server enable traps docsis-resil	Enables SNMP Wideband Resiliency traps for Wideband Resiliency specific events on the Cisco CMTS.

snmp-server host traps version 2c public udp-port

To configure SNMP trap server on the cable modem, use the **snmp-server host traps version 2c public udp-port** command in global configuration mode. To disable SNMP trap server, use the **no** form of this command.

snmp-server host *ip address* **traps version 2c public udp-port** *port number*
`no snmp-server host` *ip address* `traps version 2c public udp-port` *port number*

Syntax Description

ip address	IP address of the server.
port number	The UDP port number assigned to receive the SNMP traps. Configure the same port number on the SNMP server.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 16.8.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how configure SNMP trap server on the cable modem:

```
router(config)# snmp-server host 209.165.201.1 traps version 2c public udp-port 443
router(config)#
```

snmp server local-queue-size

Use the **snmp-server local-queue-size** command in global configuration mode, to configure local queue size for SNMP global configuration. To disable this function, use the **no** form of this command.

snmp-server local-queue-size *local-queue-size*
no snmp-server local-queue-size

Syntax Description

local-queue-size	Specify the maximum value for SNMP local queue size. The process input queue holds SNMP packets from the dispatcher queue, waiting to be processed. The range is 1000-100000 and the default value is 1000.

Command Default

None

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Cupertino 17.9.1x	This command is introduced.

Examples

The following example shows how to configure **snmp snmp-server local-queue-size**:

```
router(config)# snmp-server local-queue-size 2000
router(config)#
```

Related Commands

Command	Description
snmp snmp-server dispatcher-queue-size	Specify the dispatcher queue size.

snmp-trap input-stream-failure multicast

To disable input stream failure trap for EAS stream, use the **snmp-trap input-stream-failure multicast** command in video configuration mode.

snmp-trap input-stream-failure multicast *multicast ip* **disable**

Command Default

None

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE Fuji 16.8.1d	This command was indroduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to enable alarm event traps :

```
Router# configure terminal
Router(config)#cable video
Router(config-video)# snmp-trap input-stream-failure multicast 230.1.1.1 disable
```

Related Commands

Command	Description
showcable video snmp-alarms	Display the active alarms in the system.
show cable video snmp-alarm-config	Display the alarm configuration in the system.
report-stream-error input-stream-failure report-interval syslog	Configure a timeout value and syslog message for input stream failure trap for multicast sources.
snmp-server enable traps video-cable	Enable alarm event traps for cable related events.

source-id

To configure the source ID for virtual ARPD, use the **source-id** command in OOB virtual ARPD configuration mode. To void the source ID configuration, use the **no** form of this command.

source-id *id*

no source-id *id*

Syntax Description

id	Specifies the source ID value.

Command Default

None

Command Modes

OOB Virtual ARPD configuration (config-oob-varpd)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the source ID for virtual ARPD.

Examples

The following example shows how to configure the source ID for virtual ARPD:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)# virtual-arpd 1
Router(config-oob-varpd)# source-id 12
```

Related Commands

Command	Description
virtual-arpd	Defines a virtual ARPD configuration.
ip	Configures the virtual ARPD source IP address.
nc	Configures the network controller for virtual ARPD.

spectrum-inversion

To enable or disable the spectrum-inversion for a specific QAM profile, use the **spectrum-inversion** command in QAM profile configuration mode.

spectrum-inversion { **off | on** } [**interop**]

Syntax Description

off	Disables the spectrum inversion.
on	Enables the spectrum inversion.
interop	Enables the spectrum inversion explicit setting.

Command Default

None

Command Modes

QAM profile configuration (config-qam-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
IOS XE 17.6.1w	This command was updated on the Cisco cBR Series Converged Broadband Routers. **Interop** keyword was added.

Usage Guidelines

Use this command to enable or disable the spectrum-inversion for a specific QAM profile.

When using the inversion flag in combination with different Annex types, the following table shows the spectrum inversion output on a Cisco RPD:

Table 276: Spectrum Inversion Output on a Cisco RPD

spectrum-inversion command option	annex A	annex B	annex B
on	normal	inverted	normal
off	inverted	normal	inverted
on interop	inverted	inverted	inverted
off interop	normal	normal	normal

Examples

The following example shows how to enable the spectrum-inversion for a specific QAM profile:

```
Router# configure terminal
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)# spectrum-inversion on
```

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.
interleaver-depth	Set the interleaver-depth.
modulation	Set the QAM modulation format.
annex	Set the MPEG framing format.
symbol-rate	Set the symbol rate.

start-delay

To configure the time between start of crypto period and start of ECM broadcast, use the **start-delay** command in the DVB scrambling ECMG overrule configuration mode. To void the start delay configuration, use the **no** form of this command.

start-delay *time*
no start-delay

start-delay *time*	Specifies the time between start of crypto period and start of ECM broadcast in milliseconds.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the time between start of crypto period and start of ECM broadcast in milliseconds. The valid range is from -30000 to 0.

The following is an example of how to configure the time between start of crypto period and start of ECM broadcast in milliseconds:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#start-delay 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.

Command	Description
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.
min-cp-duration	Specifies the minimum crypto period.
rep-period	Specifies the time between two ECM packets at the output.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

start-frequency

To specify the starting frequency associated with the first configurable subcarrier in the profile determined by the width, use the **start-frequency** command in OFDM modulation profile configuration mode. To undo the start frequency assignment, use **no** form of this command.

start-frequency *freqency*

no start-frequency

Syntax Description

freqency	OFDM channel start frequency in Hz.

Command Default

None

Command Modes

OFDM modulation profile configuration (config-ofdm-mod-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the starting frequency associated with the first configurable subcarrier in the profile determined by the width.

Modulation profiles configured with a start frequency can only be applied to channels with the same start frequency. If no start frequency is configured, the profile can be applied to any channel.

Examples

The following example shows how to specify the starting frequency:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 21
Router(config-ofdm-mod-prof)# start-frequency 108000000
```

Related Commands

Command	Description
cable downstream ofdm-modulation-profile	Define the OFDM modulation profile on the OFDM channel.
description (OFDM modulation profile)	Specify a user defined description for the profile up to 64 characters.
assign	Assign modulations to subcarriers.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.
width	Specify width of profile in Hz.

stop-delay

To configure the time between end of crypto period and end of ECM broadcast, use the **stop-delay** command in the DVB scrambling ECMG overrule configuration mode. To void the stop delay configuration, use the **no** form of this command.

stop-delay *time*
no stop-delay

stop-delay *time*	Specifies the time between end of crypto period and end of ECM broadcast in milliseconds.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the time between end of crypto period and end of ECM broadcast in milliseconds. The valid range is from 0 to 30000.

The following is an example of how to configure the time between end of crypto period and end of ECM broadcast in milliseconds:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#stop-delay 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.

Command	Description
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.
min-cp-duration	Specifies the minimum crypto period.
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.
trans-stop-delay	Specifies the transition stop delay.

strong-pairing-enforce

To switch on the NDS strong pairing enforcement, use the **strong-pairing-enforce** command in the DVB scrambling configuration mode. To switch off the NDS strong pairing enforcement, use the **no** form of this command.

strong-pairing-enforce
no strong-pairing-enforce

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Strong pairing enforcement is used in the NDS CA setup. When strong pairing enforcement is enabled, the strong pairing enforcement bit is always reset in the control word.

The following is an example of how to switches on the NDS strong pairing enforcement:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#strong-pairing-enforce
```

Related Commands

Command	Description
dvb	Enters DVB scrambling configuration mode.
scramble-video-audio	Scrambles only video and audio pids.
check-scg-at-prov	Enables Check SCG at provision time.
route-ecmg	Configures the route to the ECMG server.
mgmt-ip	Configures the manangement IP for EIS/Broadcast ECMG.
ca-interface	Configures the conditional access interface.
tier-based	Enters the tier-based scrambling configuration mode.
ecmg	Enters the ECM Generator configuration mode.
eis	Enters the Event Information Scheduler configuration mode.

subcarrier-spacing

To specify the spacing for specific subcarriers configured in this profile, use the **subcarrier-spacing** command in OFDMA modulation profile, OFDM modulation profile, or OFDM channel profile configuration mode. To undo the spacing assignment, use **no** form of this command.

subcarrier-spacing [**25KHz** | **50KHz**]

no subcarrier-spacing

Command Default

50 KHz

Command Modes

OFDM modulation profile configuration (config-ofdm-mod-prof)

OFDM channel profile configuration (config-ofdm-chan-prof)

OFDMA modulation profile configuration (config-ofdma-mod-profile)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.
Cisco IOS XE Everest 16.6.1	This command can be used in the OFDMA modulation profile configuration (config-ofdma-mod-profile) command mode.

Usage Guidelines

Use this command to specify the spacing for specific subcarriers configured in this profile.

When a modulation profile is configured in a channel profile, the modulation profile subcarrier spacing must match the channel profile subcarrier spacing.

Examples

The following example shows how to specify the subcarrier spacing:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 21
Router(config-ofdm-mod-prof)# subcarrier-spacing 25KHz
```

The following example shows how to specify the subcarrier spacing for OFDMA channel:

```
outer# configure terminal
Router(config)# cable mod-profile-ofdma 466
Router(config-ofdma-mod-profile)# subcarrier-spacing 50KHz
```

Related Commands

Command	Description
cable downstream ofdm-modulation-profile	Define the OFDM modulation profile on the OFDM channel.
description (OFDM modulation profile)	Specify a user defined description for the profile up to 64 characters.
assign	Assign modulations to subcarriers.

Command	Description
start-frequency	(Optional) Specify the starting frequency associated with the first configurable subcarrier in the profile determined by the width.
width	Specify width of profile in Hz.

switchover pxf restart

To configure the maximum number of PXF crashes that are allowed within a specified time period, use the **switchover pxf restart** command in redundancy configuration (main-cpu) mode. To reset the router to its default values, use the **no** form of this command.

switchover pxf restart *number-of-crashes time-period*
no switchover pxf restart

Syntax Description

number-of-crashes	Maximum number of PXF crashes that are allowed within the specified time period. If the PXF processors crash this many times within the given time period, the router switches over to the redundant PRE1 module. The valid range is 1 to 25, with a default of 2.
time-period	Time period, in hours, that PXF crashes are monitored. The valid range is 0 to 120 hours, with a default of 5.

Command Default

2 PXF crashes within 5 hours are allowed (**switchover pxf restart 2 5**)

Command Modes

Redundancy configuration, main-cpu mode

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The PXF processors that are onboard the PRE1 module automatically restart themselves if a crash occurs. Occasional crashes could be expected, but repeated crashes could indicate a hardware problem.

The **switchover pxf restart** command specifies the maximum number of times that a PXF processor can crash during a specified time period before the router switches over to the redundant PRE1 module. If the PXF processors crash this number of times, the router assumes a hardware problem and initiates a switchover to the redundant PRE1 module.



Note When a switchover occurs because of repeated PXF crashes, the router displays the following system message: C10KEVENTMGR-3-PXF_FAIL_SWITCHOVER: Multiple PXF failures, switchover to redundant PRE initiated.

Examples

The following example shows how to configure the router so that if five PXF crashes occur within a one-hour period, the router should initiate a switchover to the redundant PRE1 module.

```
Router# config t
Router(config)# redundancy
```

```
Router(config-r)# main-cpu

Router(config-r-mc)# switchover pxf restart 5 1
Router(config-r-mc)# exit

Router(config-f)# exit

Router(config)#
```

Related Commands

Command	Description
main-cpu	Enters main-CPU redundancy configuration mode, so that you can configure the synchronization of the active and standby Performance Routing Engine (PRE1) modules.
redundancy	Configures the synchronization of system files between the active and standby PRE1 modules.
redundancy force-failover main-cpu	Forces a manual switchover between the active and standby PRE1 modules.

switchover timeout

To configure the switchover timeout period of the PRE1 module, use the **switchover timeout** command in redundancy configuration (main-cpu) mode. To reset the timeout period to its default value, use the **no** form of this command.

switchover timeout *timeout-period*
no switchover timeout

Syntax Description

timeout-period	Specifies the timeout, in milliseconds. The range is 0 to 25000 milliseconds (25 seconds), where 0 specifies no timeout period.

Command Default

0

Command Modes

Redundancy configuration, main-cpu mode

Command History

Release	Modification
12.2(11)BC3	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **switchover timeout** command specifies how long the standby PRE module should wait when it does not detect a heartbeat from the active PRE module before initiating a switchover and assuming responsibility as the active PRE module. If set to 0, the standby PRE module initiates a switchover immediately when the active PRE module misses a scheduled heartbeat.

Examples

The following example shows how to set the timeout period to 60 milliseconds:

```
Router# config t
Router(config)# redundancy
Router(config-r)# main-cpu
Router(config-r-mc)# switchover timeout 60
Router(config-r-mc)# exit
Router(config-f)# exit
Router(config)#
```

Related Commands

Command	Description
main-cpu	Enters main-CPU redundancy configuration mode, so that you can configure the synchronization of the active and standby Performance Routing Engine (PRE1) modules.

Command	Description
redundancy	Configures the synchronization of system files between the active and standby PRE1 modules.
redundancy force-failover main-cpu	Forces a manual switchover between the active and standby PRE1 modules.

symbol-rate

To set the symbol rate for a specific QAM profile, use the **symbol-rate** command in QAM profile configuration mode.

symbol-rate *symbol-rate*

Syntax Description

symbol-rate	Specifies the symbol rate value in kilo-symbol/sec.

Command Default

None

Command Modes

QAM profile configuration (config-qam-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the symbol rate for a specific QAM profile.

Examples

The following example shows how to set the symbol rate for a specific QAM profile:

```
Router# configure terminal
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)# symbol-rate 5361
```

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.
interleaver-depth	Set the interleaver-depth.
modulation	Set the QAM modulation format.
spectrum-inversion	Set the spectrum-inversion on or off.
annex	Set the MPEG framing format.

table-based

To define a table based video session, use the **table-based** command in video configuration mode. To delete all table based sessions, use the **no** form of this command.

table-based
no table-based

Command Default

None

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines the video session as table based.

Examples

The following example shows how to define a table based video session:

```
Router# configure terminal
Router(config)#cable video
Router(config-video)#table-based
```

Related Commands

Command	Description
session	Specifies and configures the table based video session.
vei-bundle	Bundles the virtual edge inputs for a particular LED.
show cable video vei-bundle	Displays the virtual edge input bundle information.
show controllers integrated-cable	Displays the integrated cable configuration information.
show cable video integrated-cable	Displays the integrated cable controller information.

tag

To add a tag to a restricted load balancing group (RLBG), use the **tag** command in the config-lb-group configuration mode. To remove the tag, use the **no** form of this command.

tag *tag-name*
no tag *tag-name*

Syntax Description

tag-name	The name of the tag that has been created and configured for the load balancing group.

Command Default

No default behavior or values.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can use the **tag** command to add a tag to a RLBG, only if the tag is already created using the **cable tag** command for the DOCSIS load balancing group on the CMTS.

Examples

The following example shows how to add a tag to a RLBG using the **tag** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# restricted
Router(config-lb-group)# tag CSCO
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.
cable tag	Configures a tag for a DOCSIS load balancing group on the CMTS.

test cable dcc (Supporting Dynamic Channel Change)

To move a specified cable modem or a group of cable modems to another channel, or to test Dynamic Channel Change (DCC) for load balancing on the Cisco CMTS, use the following command in privileged EXEC mode.

test cable dcc {*source-interface* [**cable** *slot*/*subslot*/*cable-interface-index* | **integrated-cable** *slot*/*subslot*/*cable-interface-index* | **modular-cable** *slot*/*subslot*/*cable-interface-index*] | **sid** | **ip-addr** | **mac-addr** | **frequency** *frequency*} {**destination-interface** [**cable** *slot*/*subslot*/*cable-interface-index* | **integrated-cable** *slot*/*subslot*/*cable-interface-index* | **modular-cable** *slot*/*subslot*/*cable-interface-index*] **upstream-port**} {*init-tech* | *force* | *tlv*}

Cisco cBR Series Converged Broadband Routers
test cable dcc { **source-interface** [**integrated-cable** *slot/subslot/cable-interface-index* | **ip-addr** | **mac-addr** } {**destination-interface** [**integrated-cable** *slot/subslot/cable-interface-index*] **upstream-port**} {*init-tech*}

Syntax Description

source-interface	Source interface of the cable modem. Use any one of the following options: • (Not applicable for Cisco cBR Series Converged Broadband Routers) **cable**—Specifies the name of the source downstream interface for the DCC transaction. • (For Cisco cBR Series Converged Broadband Routers) **integrated-cable**—Specifies the name of the integrated-cable interface to which the cable modem belongs. • (Not applicable for Cisco cBR Series Converged Broadband Routers) **modular-cable**—Specifies the name of the modular-cable interface to which the cable modem belongs. • *slot*/*subslot*/*cable-interface-index*—Slot, subslot, and downstream controller number assigned to the cable modem.
sid	(Optional) Specifies the primary Service ID (sid) value of the cable modem for that interface.
ip-addr	Specifies the IP address of the cable modem to be moved for DCC test.
mac-addr	Specifies the MAC address of the cable modem to be moved for DCC test.
frequency *frequency*	Specifies the DCC downstream frequency parameter. (Not applicable for Cisco cBR Series Converged Broadband Routers) *frequency*—New downstream frequency in Hz. The valid range is between 55000000 to 1050000000 Hz.

destination-interface	Destination interface of the cable modem. Use any one of the following options: • **cable**—Specifies the name of the target or destination downstream interface to which the cable modem should be moved. • **integrated-cable**—Specifies the name of the integrated-cable interface to which the cable modem should be moved. • **modular-cable**—Specifies the name of the modular-cable interface to which the cable modem should be moved. • *slot*/*subslot*/*cable-interface-index*—Slot, subslot, and downstream controller number assigned to the cable modem.
upstream-port	Specifies the upstream port of the destination interface.
init-tech	(Optional) DOCSIS 3.0 GLBG DCC initialization techniques. The valid range is from 1 to 4. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 4. **Note** If *init-tech* is not specified, its value is taken as 0.
force	(Optional) (Not for Cisco cBR Series Routers) Target modem or group of modems that are forced to move to the specified downstream interface or upstream channel. **Note** This option is available only when init-tech is set to 0 and is used to move cable modems with Internet Group Management Protocol (IGMP) or Resource-reservation protocol (RSVP) configuration. **Note** This option cannot be used with the *tlv* option.
tlv	(Optional) (Not for Cisco cBR Series Routers) Specifies the type-length-value (TLV) in a DCC request message. This is represented as HEX data. **Note** *force* option is not available if the *tlv* option is used.

Command Default

Test functions are disabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(17a)BC	This command was introduced on the Cisco uBR10012 router and the Cisco uBR7246VXR router, with supporting broadband processing engines (BPEs) or cable interface line cards on the respective routers.
12.2(33)SCF2	The *force* argument was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following examples illustrate DCC verification, using the **test cable dcc** command.

The following example shows how to move a target cable modem, specified by MAC address, IP address, or the primary SID value on the source interface to a target downstream with the specified frequency using DCC intialization technique 0:

```
Router# test cable dcc [<mac-addr>|<ip-addr>|<cable-if-src><sid>] frequency <freq-value>
Frequency-value: <55000000-858000000>  New Downstream Frequency in HZ.
```

The following example shows how to move a target cable modem, specified by MAC address, IP address, or the primary SID value on the source interface to a upstream channel on a target downstream with the DCC-REQ TLV given in the specified HEX data.

```
Router# test cable dcc [<mac-addr>|<ip-addr>|<cable-if-src><sid>] TLV<Hex-data>
```

The following example shows how to move all cable modems on a source interface to a target downstream with the specified frequency using DCC intialization technique 0.

```
Router# test cable dcc <cable-if-src> frequency<frequency-value>
Frequency-value: <55000000-858000000>  New Downstream Frequency in HZ.
```

The following example shows how to force a cable modem to move to a modular-cable interface 7/0/0:2 with init-tech set to 0:

```
Router# test cable dcc 0023.4ed0.db25 modular-Cable 7/0/0:0 0 0 force
Router# show cable modem 0023.4ed0.db25
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *10:00:48.167 SGT Wed Nov 16 2011
                                                                                D
MAC Address    IP Address     I/F           MAC           Prim RxPwr  Timing Num I
                                            State         Sid  (dBmv) Offset CPE P
0023.4ed0.db25 30.11.2.118    C7/0/0/U0     offline       19   0.50   1862   0   N
```

The following example illustrates using **test cable dcc**command on Cisco cBR Series Converged Broadband Routers:

```
Router# test cable dcc 0025.2e2d.77c8 integrated-Cable 3/0/0:0 1 0
Router# show cable modem 0025.2e2d.77c8
DMAC Address IP Address I/F MAC Prim RxPwr Timing Num I
State Sid (dBmv) Offset CPE P
0025.2e2d.77c8 100.1.0.2 C3/0/0/U1 online 1 -1.00 1796 0 N

test dcc integrated-Cable 3/0/0:0 1 integrated-Cable 3/0/0:0 0 1


Router# show cable modem 0025.2e2d.77c8
MAC Address IP Address I/F MAC Prim RxPwr Timing Num I
State Sid (dBmv) Offset CPE P
0025.2e2d.77c8 100.1.0.2 C3/0/0/U0 online 1 -1.00 1796 0 N
```

Usage Guidelines

This command is subject to the restrictions and prerequisites described in Load Balancing, Dynamic Channel Change, and Dynamic Bonding Change on the Cisco CMTS Routers .

The Cisco CMTS does not support the *force* option for **test cable dcc tlv** command where *tlv* is a HEXDATA node.

Related Commands

Command	Description
cable load-balance group (Supporting Dynamic Channel Change)	Sets multiple parameters for load balancing with DCC.
cable load-balance group dcc-init-technique (Supporting Dynamic Channel Change)	Sets the initialization technique for Dynamic Channel Change (DCC) for load balancing.
cable load-balance group policy (Supporting Dynamic Channel Change)	Sets the type of service flow policy (PacketCable MultiMedia (PCMM) or Unsolicited Grant Service (UGS)) for use with load balancing and DCC.
cable load-balance group threshold (Supporting Dynamic Channel Change)	Sets the threshold levels for corresponding service flow types for the specified load balancing group, supporting Dynamic Channel Change (DCC).
show controllers cable	Displays statistics for Dynamic Channel Change (DCC) for load balancing.
show cable modem	Displays the information about registered and unregistered cable modems.

test cable pnm rxmer ifIndex get all

To display the count of all the Proactive Network Management RxMER jobs by ifIndex, use the **test cable pnm rxmer <ifIndex> get all** command.

test cable pnm rxmer <*ifIndex*> **get all**

Syntax Description

ifIndex	The value of the ifIndex.

Command Default

No default behavior or values.

Command Modes

Command History

Release	Modification
IOS-XE 16.12.1y	This command was introduced.

Usage Guidelines

You can use the **test cable pnm rxmer <ifIndex> get all** command to display the count of all the Proactive Network Management RxMER jobs by ifIndex.

Examples

The following example shows you a command usage:

```
Router# test cable pnm rxmer 389838 get all
PNM RxMER MIB for ifIndex 389838
Status: INACTIVE
CM-mac: 0000.0000.0000
Enable: False
Pre-Eq: OFF
Num-Avgs: 1
TFTP filename: <default>
```

test cable pnm rxmer show

To display the status of PNM RxMER jobs by ifIndex, use the **test cable pnm rxmer show** command.

test cable pnm rxmer show

Command Default

No default behavior or values.

Command Modes

Command History

Release	Modification
IOS-XE 16.12.1y	This command was introduced.

Usage Guidelines

You can use the **test cable pnm rxmer show** command to display the status of PNM RxMER jobs by ifIndex.

Examples

The following example shows you a command usage:

```
Router# test cable pnm rxmer show

Job  Client  ifIndex  CM-Mac          Status          Enable  Pre-Eq  Num-Avgs  Retry
-------------------------------------------------------------------------------------
0    SNMP    389838   0000.0000.0000  INACTIVE        N       N       1         0
0    SNMP    389839   0000.0000.0000  INACTIVE        N       N       1         0
0    SNMP    389933   0000.0000.0000  INACTIVE        N       N       1         0
0    SNMP    389981   0000.0000.0000  INACTIVE        N       N       1         0
.
.
.
0    SNMP    404239   0000.0000.0000  INACTIVE        N       N       1         0
0    SNMP    404246   0000.0000.0000  INACTIVE        N       N       1         0
0    SNMP    404247   0000.0000.0000  INACTIVE        N       N       1         0

PNM RxMER job count 33
```

test cable voice

To manually set voice tag of a cable modem, use the test cable voice command in privileged EXEC mode.

test cable voice {*mac-addrip-addr*}

Syntax Description

mac-addr	Specifies the MAC address of an individual CM, or of any CPE devices or hosts behind that CM.
ip-addr	Specifies the IP address of an individual CM, or of any CPE devices or hosts behind that CM.

Command Default

No voice tags are enabled

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **test cable voice**command is intended for use by Cisco Systems technical support personnel.

Examples

The following example shows how to enable the voice tag of a cable modem:

```
Router# test cable voice 209.165.200.225
```

Related Commands

Commands	Description
show cable modem voice	Displays the detected voice-enabled modems.
clear cable modem voice	Clears the voice tag that is set for a cable modem.

threshold

To specify the load limit beyond which load balancing occurs, use the **threshold** command in the config-lb-group configuration mode. To remove the specified load limit, use the **no** form of this command.

threshold {**load** | {**minimum***1-100* | **1-100**} | **pcmm***1-100* | **stability***0-100* | **ugs***1-100*}
nothreshold {**load** | {**minimum***1-100* | **1-100**} | **pcmm***1-100* | **stability***0-100* | **ugs***1-100*}

Syntax Description

load {**minimum**}	Specifies interface load threshold settings as a percentage value. You can also set minimum number of modems/flows difference ranging from 1 to 100 before load balancing starts.
pcmm	Specifies PCMM service flow threshold as a percentage value.
stability	Specifies stability condition detection threshold as a percentage value.
ugs	Specifies stability detection threshold as a percentage value.
1-100	Interface utilization threshold in percentage of the interface capacity. **Note** When utilization method is used, the *1-100* utilization threshold is a percentage of the interface capacity. When modem method is used, the *1-100* utilization threshold is a percentage difference of number of modems between the two interfaces.

Command Default

None

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the threshold of the DOCSIS LBG using the **threshold** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# threshold load minimum 10
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.

Command	Description
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

tier-based

To enter the tier-based scrambling configuration mode, use the **tier-based** command in the DVB scrambling configuration mode. To void the tier-based scrambling configuration, use the **no** form of this command.

tier-based
no tier-based

Command Default

None

Command Modes

DVB scrambling configuration mode (config-video-encrypt-dvb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to enter the tier-based scrambling configuration mode:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#tier-based
Router(config-video-encrypt-dvb-tier)#
```

Related Commands

Command	Description
ecmg	Configures the tier-based scrambling.
enable	Enables the tier-based scrambling.

timeout init-session

To set the default video session initial ranging timeout, use the **timeout init-session** command in the video configuration mode.

timeout init-session *number*

Syntax Description

number	The initial ranging timeout value . The default video session init timeout is 1000 msec. The permissible range is 100 to 60000 msec.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the default video session initial ranging timeout.

The following example shows how to change the default video session initial ranging timeout:

```
configure terminal
cable video
timeout init-session 5000
```

timeout idle-session

To set the default video timeout idle-session, use the **timeout idle-session** command in the video configuration mode.

timeout idle-session *number*

Syntax Description

number	The idle session timeout value. The default video idle session timeout is 250 msec. The permissible range is 100 to 5000 msec.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the default video timeout idle-session.

The following example shows how to change the default video timeout idle-session:

```
configure terminal
cable video
timeout idle-session 1500
```

timeout off-session

To set the default off-session timeout, use the **timeout off-session** command in the video configuration mode.

timeout off-session *number*

Syntax Description

number	Off session timeout value. The default value is 60 seconds. The permissible range is 1 to 1800.

Command Default

None.

Command Modes

Video configuration mode (config-video)

Command History

Release	Modification
Cisco IOS-XE Release 3.18.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command is used to change the default off session timeout value.

The following example shows how to change the default off session timeout value:

```
configure terminal
cable video
timeout off-session 100
```

timestamp

To create a DOCSIS configuration file that enables timestamp generation, use the **timestamp** command in cable config-file configuration mode. To disable this function, use the **no** form of this command.

timestamp
no timestamp

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Cable config-file configuration

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS specification supports the optional time-stamping of DOCSIS configuration files by adding a field to the file that shows the time that the file was sent to the CM. This prevents someone from trying to subvert DOCSIS security by replaying a valid DOCSIS configuration file to another CM. The timestamp is expressed as the number of seconds since midnight on January 1, 1900.

Examples

The following example shows how to enable timestamp generation for the DOCSIS configuration file.

```
router(config)# cable config-file upgrade.cm
router(config-file)# timestamp
router(config-file)# exit

router(config)#
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
access-denied	Disables access to the network.
channel-id	Specifies upstream channel ID.
cpe max	Specifies CPE information.
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.

Command	Description
option	Provides config-file options.
privacy	Specifies privacy options for baseline privacy images.
service-class	Specifies service class definitions for the configuration file.
snmp manager	Specifies Simple Network Management Protocol (SNMP) options.

tlv

To configure a TLV type tag matching rule, use the **tlv** command in CMTS-tag configuration mode.

tlv *type value*

Syntax Description

type	Specifies the type identifier. It can be one of the following: • **mrcs** - Multiple Receive Channel Support. • **mtcs** - Multiple Transmit Channel Support. • **ufrs** - Upstream Frequency Range Support.
value	Specifies a decimal number value for the type tag. The range is 0 to 255.

Command Default

None

Command Modes

CMTS tag configuration mode (config-cmts-tag).

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the **tlv** command:

```
Router# configure terminal
Router(config)# cable tag 1
Router(config-cmts-tag)# tlv mrcs 3
```

Related Commands

Command	Description
cable tag	To configure a tag for a DOCSIS load balancing group on the CMTS.

tos

To configure the Type of Service (ToS) byte in the header of Layer 2 tunneled packets, use the **tos** command in DEPI tunnel configuration mode. To disable a configured ToS value, use the **no** form of this command.

tos value
no tos value

Syntax Description

value	Value of the ToS byte for IP packets in a Layer 2 Tunnel Protocol version 3 (L2TPv3) data session. The valid values range from 0 to 255. The default value is 0.

Command Default

None

Command Modes

DEPI tunnel configuration

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **tos** command allows you to manually configure the value of the ToS byte used in the headers of Layer 2 tunneled packets.

Examples

The following example shows how to assign a ToS value of 100:

```
Router# configure terminal
Router(config)# depi-tunnel rf6
Router(config-depi-tunnel)# tos 100
```

Related Commands

Command	Description
depi-tunnel	Specifies the name of the depi-tunnel and enters the DEPI tunnel configuration mode.

tos (multicast qos)

To set type of service (ToS) low byte, high byte, and mask values within a multicast QoS group, use the **tos** command in multicast QoS configuration mode. To disable the type of service, use the **no** form of this command.

tos *low-byte high-byte mask*
no tos *low-byte high-byte mask*

Syntax Description

low-byte	Specifies the minimum ToS data bytes for a multicast QoS group. The valid range is 0–255.
high-byte	Specifies the maximum ToS data bytes for a multicast QoS group. The valid range is 0–255.
mask	Specifies the ToS mask for a multicast QoS group. The valid range is 0–255.

Command Default

ToS parameters are not defined for a specific multicast QoS group.

Command Modes

Multicast QoS configuration (config-mqos)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The three precedence bits in the ToS byte in the IP header specifies a class of service assignment for each packet. Those packets with the precedence bit set in the ToS field are given higher priority.

Examples

The following example defines the low and high ToS rates and the mask value using the **tos** command:

```
Router(config)# cable multicast qos group 20 priority 55 global
Router(config-mqos)# tos 1 6 15
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface bundle multicast-sessions	Displays multicast session information for a specific virtual cable bundle.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

trans-start-delay

To configure the transition start delay, use the **trans-start-delay** command in the DVB scrambling ECMG overrule configuration mode. To void the transition start delay configuration, use the **no** form of this command.

trans-start-delay *time*
no trans-start-delay

trans-start-delay *time*	Specifies the transition start delay in milliseconds.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the transition start delay in milliseconds. The valid range is from -30000 to 0.

The following is an example of how to configure the transition start delay in milliseconds:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#trans-start-delay -10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.
min-cp-duration	Specifies the minimum crypto period.

Command	Description
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-stop-delay	Specifies the transition stop delay.

trans-stop-delay

To configure the transition stop delay, use the **trans-stop-delay** command in the DVB scrambling ECMG overrule configuration mode. To void the transition stop delay configuration, use the **no** form of this command.

trans-stop-delay *time*
no trans-stop-delay

trans-stop-delay *time*	Specifies the transition stop delay in milliseconds.

Command Default

None

Command Modes

DVB scrambling ECMG overrule configuration mode (config-video-encrypt-dvb-ecmg-overrule)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the transition stop delay in milliseconds. The valid range is from 0 to 30000.

The following is an example of how to configure the transition stop delay in milliseconds:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#overrule
Router(config-video-encrypt-dvb-ecmg-overrule)#trans-stop-delay 10000
```

Related Commands

Command	Description
overrule	Enters DVB scrambling configuration mode.
ac-start-delay	Specifies the time between start of first CP after a change in AC and start of ECM broadcast.
ac-stop-delay	Specifies the time between end of last CP preceding a change in AC and end of ECM broadcast.
max-comp-time	Specifies the maximum time needed by ECMG to compute an ECM.
max-streams	Specifies the maximum number of simultaneous open streams supported by the ECMG on a channel.
min-cp-duration	Specifies the minimum crypto period.

Command	Description
rep-period	Specifies the time between two ECM packets at the output.
start-delay	Specifies the delay between the start of CP and ECM broadcast.
stop-delay	Specifies the delay between the end of CP and ECM broadcast.
trans-start-delay	Specifies the transition start delay.

type

To define the QAM data type, use the **type** command in the RF channel sub configuration mode.

type {**docsis** | **video**}

Syntax Description

docsis	Defines the QAM data type as DOCSIS.
video	Defines the QAM data type as video.

Command Default

None.

Command Modes

RF channel sub configuration mode (config-rf-chan)

Usage Guidelines

This command is used to define the QAM data type.

The following example shows how to change the output mode:

```
router#configure terminal
router(config)#controller integrated-cable 3/0/0
router(config-controller)#rf-chan 5 10
router(config-controller)#shutdown
router(config-rf-chan)#type video
router(config-rf-chan)#frequency 723000000
router(config-rf-chan)#rf-output alt
router(config-rf-chan)#exit
router(config-controller)#exit
router(config)#exit
router#show controller integrated-Cable 3/0/0 rf-channel 5 10
Chan State Admin Frequency  Type   Annex Mod  srate Interleaver  dcid  power  output
 5   TEST   UP   723000000  VIDEO  B    256   5361  I32-J4       164  34     ALT
 10  TEST   UP   753000000  VIDEO  B    256   5361  I32-J4       169  34     ALT
```

Related Commands

Command	Description
controller integrated-cable	Enters the controller configuration mode.
frequency	Defines the RF channel frequency.
qam-profile	Defines the QAM profile number.
rf-chan	Enters the RF channel sub configuration mode.
rf-output	Defines the QAM output mode.
power-adjust	Defines the channel power level.

type (ECMG)

To configure the ECMG type, use the **type** command in the DVB scrambling ECMG configuration mode.

type {**hitachi** | **irdeto** | **nagra** | **pkey** | **standard**}

Command Default

None

Command Modes

DVB scrambling ECMG configuration mode (config-video-encrypt-dvb-ecmg)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

The following is an example of how to configure the ECMG type:

```
Router>enable
Router#configure terminal
Router(config)#cable video
Router(config-video)#encryption
Router(config-video-encrypt)#dvb
Router(config-video-encrypt-dvb)#ecmg ECMG-7 id 7
Router(config-video-encrypt-dvb-ecmg)#type standard
```

Related Commands

Command	Description
ecmg	Enters the ECM Generator configuration mode.
auto-channel-id	Enables automatic channel ID selection.
connection	Configures the ECMG connection.
ecm-pid-source	Configures the source of ECM PID.
ca-system-id	Configures the CA system ID.
mode	Configures the application mode of ECMG.
desc-rule	Configures the descriptor rule.
overrule	Overrules the default settings.

upgrade fpd auto

To enable automatic upgrade of the Field Programmable Device (FPD) image on the Cisco cBR-8 router, use the **upgrade fpd auto** command in privileged EXEC mode.

upgrade fpd auto

no upgrade fpd auto

Command Default

FPD auto upgrade is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **upgrade fpga auto-upgrade** command.

Usage Guidelines

The FPD auto upgrade feature enables automatic upgrade of the FPD image on the Cisco cBR-8 router. To disable auto upgrade of the FPD, use the **no upgrade fpd auto** command.

Examples

The following example shows how to enable automatic upgrade of the FPD firmware on the Cisco cBR-8 router:

```
Router# upgrade fpd auto
```

The following example shows how to disable automatic upgrade of the FPD firmware on the Cisco cBR-8 router:

```
Router# no upgrade fpd auto
```

The following example shows how to display the FPD version:

```
Router# show upgrade fpd table
Field Programmable Devices (FPD) Bundle Information Table:
============================================================

For IOS version 15.5(20150412:160914)


Entry #1: RF Switch PIC (0xB86), Minimal H/W Version: 0.0
FPD ID FPD Name Min. Req. Version
------ ------------------------ -----------------
34 CBR RFSW PIC 7.35

Entry #2: RF Switch PIC (0xB87), Minimal H/W Version: 0.0
FPD ID FPD Name Min. Req. Version
------ ------------------------ -----------------
35 CBR STEALTHSTAR 7.13

Entry #3: 8x10GE Supervisor PIC (0xB82), Minimal H/W Version: 0.0
FPD ID FPD Name Min. Req. Version
```

```
------ ------------------------ -----------------
36 CBR SUP PIC 0.130
```

Related Commands

Command	Description
upgrade fpd file	Upgrades the FPD on the PRE4 module on the Cisco uBR10012 router.

upgrade fpd file

To upgrade the Field-Programmable Device (FPD) image on the Cisco cBR-8 router, use the **upgrade fpd file** command in privileged EXEC mode.

upgrade hw-module subslot *slot/subslot* **fpd bundled**

Syntax Description

slot	The slot where a SIP resides. On the Cisco cBR-8 router, slots 0 to 9 can be used for a SIP.
subslot	The subslot where the Wideband SIP resides. On the Cisco cBR-8 router, subslot 1 is always specified.

Command Default

FPD is disabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **upgrade fpga file** command.

Usage Guidelines

Use this command to upgrade the FPD image on the Cisco cBR-8 router.

Examples

The following example shows how to upgrade the FPD on the Cisco cBR-8 router:

```
Router# upgrade hw-module subslot 4/1 fpd bundled
```

Related Commands

Command	Description
show upgrade fpd progress	Display in progress FPD image upgrade.

upgrade fpga auto-upgrade

To perform a firmware Field-Programmable Gate Array (FPGA) automatic upgrade on the PRE4 module on the Cisco uBR10012 router, use the **upgrade fpga auto-upgrade** command in privileged EXEC mode.

upgrade fpga auto-upgrade {**debug-off** | **debug-on** | **disable** | **enable** | **show**}

Syntax Description

debug-off	Turns off debugging of the firmware FPGA auto upgrade of the PRE4 module.
debug-on	Turns on debugging of the firmware FPGA auto upgrade of the PRE4 module.
disable	Disables auto upgrade of the FPGA.
enable	Enables auto upgrade of the FPGA.
show	Displays information on the FPGA upgrade on the Cisco uBR10012 router.

Command Default

FPGA auto upgrade is enabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **upgrade fpd auto** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The FPGA auto upgrade feature enables automatic upgrade of the FPGA image on the PRE4 module on the Cisco uBR10012 router. To disable auto upgrade of the FPGA, use the **upgrade fpga auto-upgrade disable** command.

Examples

The following example shows how to activate the FPGA debugging on the Cisco uBR10012 router:

```
Router# upgrade fpga auto-upgrade debug-on
Router#
```

The following example shows how to disable automatic upgrade of the FPGA firmware on the Cisco uBR10012 router:

```
Router# upgrade fpga auto-upgrade disable
```

The following example shows how to display the FPGA version, which is the FPGA in the flash on the PRE4 module:

```
Router# upgrade fpga auto-upgrade show
Alternative IOFPGA Running, version - 0x05111800
Default IOFPGA version - 0x00000000
Alternative IOFPGA version - 0x00000000
```

```
Bundle IOFPGA version - 0x0A0A0D01
IOFPGA auto-upgrade enabled - No
IOFPGA auto-upgrade debug - No
IOFPGA auto-upgrade test mode - (Default IOFPGA:flash image verify error)
```

Table below describes the significant fields shown in the display.

Table 277: upgrade fpga auto-upgrade show Field Descriptions

Field	Description
Alternative IOFPGA Running, version	Alternative IOFPGA image that is running, and its version.
Default IOFPGA version	Default IOFPGA version.
Alternative IOFPGA version	Alternative IOFPGA version.
Bundled IOFPGA version	Bundled IOFPGA version.
IOFPGA auto-upgrade enabled	IOFPGA auto-upgrade is enabled.
IOFPGA auto-upgrade debug	IOFPGA debug is turned on.
IOFPGA auto-upgrade test mode	IOFPGA test mode is turned on.

Associated Features

The **upgrade fpga auto-upgrade** command is used to automatically upgrade of the FPGA on the PRE4 module on the Cisco uBR10012 router.

- Cisco uBR10012 Universal Broadband Router Performance Routing Engine Module

Related Commands

Command	Description
upgrade fpga file	Upgrades the FPGA on the PRE4 module on the Cisco uBR10012 router.

upgrade fpga file

To upgrade the Field-Programmable Gate Array (FPGA) image on the Performance Routing Engine 4 (PRE4) module on the Cisco uBR10012 router, use the **upgrade fpga file** command in privileged EXEC mode.

upgrade fpga {**alt** | **def**} **file** {*urlversion* }

Syntax Description

alt	Specifies the alternative IOFPGA version.
def	Specifies the default IOFPGA version.
url	URL of the IOFPGA file.
version	Version of the IOFPGA file.

Command Default

FPGA is disabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCG	This command is modified. The argument *version* is added to the command.
IOS-XE 3.15.0S	This command was replaced by the **upgrade fpd file** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to upgrade the FPGA image on the PRE4 module on the Cisco uBR10012 router.

In Cisco IOS Releases 12.2(33)SCG, you must specify the version of the IOFPGA file to manually upgrade the PRE4 module.

If you are using a PRE4 VE board and running Cisco IOS Release 12.2(33)SCG, use the **upgrade fpga** {**alt | def**} **file** {*url* }command upgrade the PRE4 module.

Examples

The following example shows how to upgrade the FPGA on the Cisco uBR10012 router:

```
Router# upgrade fpga alt file disk0:pre4_iofpga.bin 0x0A0A0D01
```

Associated Features

The **upgrade fpga file** command is used to manually upgrade the FPGA on the PRE4 module on the Cisco uBR10012 router. For more information, see

- Cisco uBR10012 Universal Broadband Router Performance Routing Engine Module

Related Commands

Command	Description
upgrade fpga auto-upgrade	Performs automatic upgrade of the IOFPGA on the PRE4 module on the Cisco uBR10012 router.

upgrade hw-programmable cable

To perform a downstream PHY firmware upgrade on the Cisco cBR-8 router, use the **upgrade hw-programmable cable** command in privileged EXEC mode.

Note This command can be performed on the standby line card if the line card is not actively protecting the active line card.

upgrade hw-programmable cable *slot number* **dsphy** {**cpld** | **psoc**} **pkg-name** *package name*

Syntax Description

slot number	Specifies the slot number. These commands are applicable to cable line cards only. The valid values are 0, 1, 2, 3, 6, 7, 8, 9.
dsphy	Specifies the downstream PHY firmware.
cpld	Perform a Complex Programmable Logic Device (CPLD) upgrade on the Cisco cBR-8 router.
psoc	Perform a Programmable System-on-Chip (PSOC) upgrade on the Cisco cBR-8 router.
pkg-name *package name*	Specifies the hardware programmable upgrade cable package file and its file location. For example: */harddisk/rp-prog.pkg*

Command Default

CPLD or PSOC is not upgraded.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.18.0S	This command was introduced on the Cisco cBR-8 Converged Broadband Router.

Examples

The following example shows how to upgrade downstream PHY CPLD firmware on the Cisco cBR-8 router:

```
Router# upgrade hw-programmable cable 3 dsphy cpld pkg-name /harddisk/rp-prog.pkg
Please wait for firmware download to complete.
Router#
*Jan  1 09:08:22.830 EDT: %IOSXE-5-PLATFORM: CLC3: cdman:  DSPHY manual downloading gemini
 0 PSOC or CPLD FW,  0 packets done
*Jan  1 09:08:28.671 EDT: %IOSXE-5-PLATFORM: CLC3: cdman:  DSPHY manual downloading gemini
 0 CPLD FW,          1000 packets done
*Jan  1 09:08:33.381 EDT: %IOSXE-5-PLATFORM: CLC3: cdman:  DSPHY manual downloading gemini
 0 CPLD FW,          2000 packets done
*Jan  1 09:08:38.117 EDT: %IOSXE-5-PLATFORM: CLC3: cdman:  DSPHY manual downloading gemini
```

```
 0 CPLD FW,          3000 packets done
*Jan  1 09:08:42.822 EDT: %IOSXE-5-PLATFORM: CLC3: cdman:  DSPHY manual downloading gemini
 0 CPLD FW,          4000 packets done
*Jan  1 09:08:43.036 EDT: %IOSXE-5-PLATFORM: CLC3: cdman:  DSPHY downloading gemini 0 FW
done, total packets 4035
*Jan  1 09:08:43.036 EDT: %IOSXE-5-PLATFORM: CLC3: cdman: Suggest reload the line card for
 new FW to take effect using CLI: hw slot <slot-id> reload
```

The following example shows how to upgrade downstream PHY PSOC firmware on the Cisco cBR-8 router:

```
Router# upgrade hw-programmable cable 3 dsphy psoc pkg-name /harddisk/rp-prog.pkg
Please wait for firmware download to complete.
Router#
*Jan  1 09:24:21.026 EDT: %IOSXE-5-PLATFORM: CLC3: cdman: gemini psoc img ID 1, starting
to download, is GeminiII ? 0
*Jan  1 09:24:21.046 EDT: %IOSXE-5-PLATFORM: CLC3: cdman: DSPHY manual downloading gemini
0 PSOC or CPLD FW,        0 packets done
*Jan  1 09:25:19.861 EDT: %IOSXE-5-PLATFORM: CLC3: cdman: DSPHY downloading gemini 0 FW
done, total packets 430
*Jan  1 09:25:19.861 EDT: %IOSXE-5-PLATFORM: CLC3: cdman: Suggest reload the line card for
 new FW to take effect using CLI: hw slot <slot-id> reload
```

Related Commands

Command	Description
upgrade rom-monitor	For performing SUP ROMMON upgrade.

upstream

To add upstream channels to an upstream bonding group, use the **upstream** command in upstream bonding configuration submode. To disable this configuration, use the **no** form of this command.

upstream *number*
no upstream *number*

Syntax Description

number	Upstream channel number. The valid range is from 0 to 7.

Command Default

None

Command Modes

Upstream bonding configuration submode (config-upstream-bonding)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

DOCSIS 3.0-certified cable modems can support only four upstream channels on an upstream bonding group. These cable modems cannot accept additional upstream channels that you have added to an upstream bonding group.

Examples

The following example shows how to add upstream channels to an upstream bonding group on a cable interface line card on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable7/1/0
Router(config-if)# cable upstream bonding-group 20
Router(config-upstream-bonding)# upstream 0
Router(config-upstream-bonding)# upstream 1
Router(config-upstream-bonding)# upstream 2
Router(config-upstream-bonding)# upstream 3
```

Related Commands

Command	Description
cable upstream bonding-group	Creates an upstream bonding group on a cable interface.
cable fiber-node	Creates a fiber node and enters cable fiber-node configuration mode.

upstream (config-lb-group)

To set upstream channels in a DOCSIS load balancing group, use the **upstream** command in the config-lb-group configuration mode. To disable the upstream channel configuration, use the **no** form of this command.

Cisco cBR Series Router
upstream Upstream-Cable *slot /card /port* **us-channel** *grouplist*
no upstream Upstream-Cable *slot /card /port* **us-channel** *grouplist*

Cisco uBR10012 Router
upstream cable *slot /subslot /port* **upstream-list**
no upstream cable *slot /subslot /port* **upstream-list**
upstream

Cisco uBR7225VXR and Cisco uBR7246VXR Routers
upstream cable *slot /port* **upstream-list**
no upstream cable *slot /port* **upstream-list**

Syntax Description

cable *slot/card/port*	Specifies the CMTS interface slot, subslot, and port number parameters on the Cisco cBR series router. • *slot*—Slot where the line card resides. The permitted range is from 0 to 9. • *card*—Subslot where the line card resides. The available slots is 0. • *port*—The downstream controller number on the line card. The permitted range is from 0 to 7.
cable *slot/subslot/port*	Specifies the CMTS interface slot, subslot, and port number parameters on the Cisco uBR10002 router. • *slot*—Slot where the line card resides. The permitted range is from 5 to 8. • *subslot*—Subslot where the line card resides. The available slots are 0 or 1. • *port*—The downstream controller number on the line card. The permitted *port* range is from 0 to 4.

cable *slot/port*	Specifies the CMTS interface slot and port number parameters on the Cisco uBR7246VXR or Cisco uBR7225VXR router.
	• *slot*—Slot where the line card resides.
	  • Cisco uBR7225VXR router—The range is from 1 to 2.
	  • Cisco uBR7246VXR router—The range is from 3 to 6.
	• *port*—Downstream controller number on the line card. The permitted *port* values are 0 or 1.

upstream-list	Upstream channel list ranging from 0 to 7.
grouplist	Upstream channel number ranging from .

Command Default

None

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value ranges for the *slot/card/port* variables were changed.

Examples

The following example shows how to set upstream channels in a DOCSIS LBG using the upstream command on the Cisco uBR series router.

```
Router# configure terminal
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# upstream cable 1/0/1 2
```

The following example shows how to set upstream channels in a DOCSIS LBG using the upstream command on the Cisco cBR series router.

```
Router# configure terminal
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# upstream Upstream-Cable 3/0/1 us-channel 1
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of load balancing operations on the router.

upstream cable channel

To configure upstream channels, use the **upstream cable channel** command in channel group or fiber node configuration modes. To disable the configuration, use the **no** form of the command.

upstream cable *slot/subslot/port* **channel** *grouplist*

no upstream cable *slot/subslot/port* **channel** *grouplist*

Syntax Description

cable *slot/subslot/port*	Specifies the cable interface. • *slot*—Chassis slot number of the cable interface line card. The valid range is from 5 to 8. • *subslot*—Secondary slot number of the cable interface line card. The valid range is from 0 to 1. • *port*—Port number on the line card. The valid range is from 0 to 14.
channel *grouplist*	Specifies the list of upstream channels. • *grouplist*—List or range of upstream channel numbers. The value can be one or more upstream channel numbers, a range of channel numbers separated by a hyphen, or a combination of both. The valid range is from 0 to 7 for the channel group configuration and 0 to 3 for the fiber node configuration.

Command Default

Upstream channel is not configured.

Command Modes

Channel group configuration (config-ch-group)

Fiber node configuration (config-fiber-node)

Command History

Release	Modification
Cisco IOS Release 12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

All the upstream channels in a channel group must be associated with the same connector.

The following example shows how to configure upstream channels for a channel group:

```
Router# configure terminal
Router(config)# cable channel-group 1
Router(config-ch-group)# upstream Cable 7/1/0 channel 0-3
```

Related Commands

Command	Description
cable channel-group	Configures channel group.

Command	Description
show cable channel-group	Displays the channel group information.
show cable fiber-node	Displays the fiber node information.

upstream cable connector

To configure an upstream cable connector for a fiber node, use the **upstream cable connector** command in cable fiber node configuration mode. To disable the configuration, use the **no** form of this command.

Cisco uBR10012 Router
upstream cable *slot / subslot* **connector** *port-number*
no upstream cable *slot / subslot* **connector** *port-number*

Cisco uBR7225VXR and Cisco uBR7246VXR Routers
upstream cable *slot* **connector** *port-number*
no **upstream cable** *slot* **connector** *port-number*

Syntax Description

cable *slot/ subslot*	Identifies the cable interface on the Cisco uBR10012 router. • *slot* —Chassis slot number of the cable interface line card. The valid range is from 5 to 8. *subslot* —Secondary slot number of the cable interface line card. The valid range is from 0 or 1.
cable *slot*	Identifies the cable interface on the Cisco uBR7246VXR or Cisco uBR7225VXR router. • *slot* —Slot where the line card resides. • Cisco uBR7246VXR router: The valid range is from 3 to 6. • Cisco uBR7225VXR router: The valid range is from 1 to 2.
connector	Specifies the physical upstream port connector on the cable interface line card.
port-number	A range of physical port numbers on the cable interface line card. The *port-number* can be one or more port numbers or a range of port numbers separated by a hyphen or combinations of both. • Cisco uBR10012 router—The range for port numbers is from 0 to 19. • Cisco uBR7246VXR or Cisco uBR7225VXR router—The range for port numbers is from 0 to 7.

Command Default

None

Command Modes

Cable fiber node configuration (config-fiber-node)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.

Release	Modification
12.2(33)SCD	This command was modified. Added support for Cisco uBR7246VXR and Cisco uBR7225VXR routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure upstream channels for fiber node 1. Notice that the list of port numbers (connectors) can be a single port number, a range of port numbers, or some combination of the two.

```
Router(config)# cable fiber-node 1

Router(config-fiber-node)# upstream cable 5/0 connector 0
Router(config-fiber-node)# upstream cable 5/0 connector 1-2
Router(config-fiber-node)# upstream cable 6/0 connector 0 1-2 3
```

Related Commands

Command	Description
cable fiber-node	Enters cable fiber-node configuration mode to configure a fiber node.
cable upstream bonding-group	Creates an upstream bonding group on a cable interface line card.
description (cable fiber-node)	Specifies a description for a fiber node.
downstream cable	Assigns a primary downstream channel for a fiber node.
downstream modular-cable rf-channel	Specifies the RF channels that are available for wideband channels on a fiber node.

upstream freq-range

To configure the Cisco CMTS router for the range of frequencies that are acceptable on upstreams, use the **upstream freq-range** command in global configuration mode. To restore the default value of North American ranges, use the **no** form of this command.

upstream freq-range [**european** | **japanese** | **north american**]
no upstream freq-range

Syntax Description

european	Configures the Cisco CMTS router to accept upstream frequency ranges that conform with the EuroDOCSIS specifications (5 MHz to 65 MHz).
japanese	Configures the Cisco CMTS router to accept upstream frequency ranges that conform to the expanded range used in Japan (5 MHz to 55 MHz).
north american	Configures the Cisco CMTS router to accept upstream frequency ranges that conform to the DOCSIS specifications (5 MHz to 42 MHz).

Command Default

North American (DOCSIS, 5 MHz to 42 MHz)

Command Modes

Global configuration

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

In Cisco IOS Release 12.2(15)BC2 and later, the Cisco CMTS router supports three different modes of operation, depending on the cable interface line cards being used. The range of frequencies that are allowed in each mode are as follows:

- North American DOCSIS (Annex B)—Upstreams use frequencies between 5 MHz and 42 MHz.
- European EuroDOCSIS (Annex A)—Upstreams use frequencies between 5 MHz and 65 MHz.
- Japanese Expanded Range (Annex B)—Upstreams use frequencies between 5 MHz and 55 MHz.

To configure the router so that it supports the proper range of upstream frequencies, use the **upstream freq-range** command. After you have configured the router with the **upstream freq-range** command, the **cable upstream frequency** command then accepts only frequencies that are in the configured range.



Note This command configures only the range of frequencies that can be configured on an upstream. It does not configure the upstreams for the DOCSIS (Annex B) or EuroDOCSIS (Annex A) modes of operation, which is done using the **cable downstream annex** interface command. (Annex C mode is not supported.)

The allowable range for the upstream channel frequency depends on the cable interface line card and Cisco IOS software release being used. See Table 2-12 for the currently supported values.

Examples

The following example shows how to configure the Cisco CMTS router to support the EuroDOCSIS upstream frequency range of 5 MHz to 65 MHz:

```
Router# configure terminal
Router(config)# upstream freq-range european
Router(config)#
```

The following example shows how to configure the Cisco CMTS router to support the expanded Japanese upstream frequency range of 5 MHz to 55 MHz:

```
Router# configure terminal
Router(config)# upstream freq-range japanese
Router(config)#
```

The following example shows how to configure the Cisco CMTS router for its default configuration (DOCSIS upstream frequency range of 5 MHz to 42 MHz):

```
Router# configure terminal
Router(config)# upstream freq-range north american
Router(config)#
```

The following example shows all of the commands that are needed to configure the cable interface and upstream on a Cisco uBR-MC28U/X cable interface line card to support a frequency in the EuroDOCSIS upstream frequency range of 5 MHz to 65 MHz:

```
Router# configure terminal
Router(config)# upstream freq-range european
Router(config)# interface 3/0
Router(config-if)# cable downstream annex a
Router(config-if)# cable upstream 0 frequency 62500000
Router(config-if)#
```

Related Commands

Command	Description
cable spectrum-group (global configuration)	Creates spectrum groups, which contain one or more upstream frequencies.
cable upstream frequency	Configures a fixed frequency of the upstream radio frequency (RF) carrier for an upstream port.
show controllers cable	Displays information about the cable interface, including the upstream center frequency.

upstream upstream-cable

To configure upstream port, use the **upstream upstream-cable** command in fiber node configuration modes. To disable the configuration, use the **no** form of the command.

upstream upstream-cable *slot/subslot/port*

no upstream upstream-cable *slot/subslot/port*

Syntax Description

slot/subslot/port Specifies the cable interface.

- *slot*—Chassis slot number of the cable interface line card. The valid range is from 0 to 3 and 6 to 9.
- *subslot*—Subslot number of the cable interface line card. The valid range is 0.
- *port*—Port number on the line card. The valid range is from 0 to 15.

Command Default

Upstream port is not configured.

Command Modes

Fiber node configuration (config-fiber-node)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

All the upstream channels in a port must be associated with the same fiber node.

The following example shows how to configure upstream port for a fiber node:

```
Router# configure terminal
Router(config)# cable fiber-node 1
Router(config-fiber-node)# upstream Upstream-Cable 6/0/0
```

Related Commands

Command	Description
cable fiber-node	Configures fiber node.
show cable fiber-node	Displays the fiber node information.

us-channel

To configure the OOB upstream channel, use the **us-channel** command in the profile configuration mode. To void the OOB upstream channel configuration, use the **no** form of this command.

us-channel *id* **{frequency** *f-value* **| shutdown | varpd-portid** *va-id* **varpd-demodid** *vd-id*

us-channel *id* **[docsis-mode ofdma] [subcarrier-spacing** *value*] **[frequency-range** *start value end value*] **[modulation-profile** *id*] **[cyclic-prefix** *value* **roll-off-period** *value*] **[symbols-per-frame** *value*] **[data-iuc** *id* **band** *start-value end-value* **modulation** *value* **pilot-pattern** *value*]

no ds-channel *id* **{frequency | shutdown | varpd-portid}**

Syntax Description

f-value	Specifies the OOB upstream channel frequency value.
va-id	Specifies the OOB upstream channel virtual ARPD portid.
vd-id	Specifies the OOB upstream channel virtual ARPD demodid.
docsis-mode ofdma	Configures the upstream for DOCSIS 3.1 Orthogonal frequency-division multiple access (OFDMA) modulation profiles.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in modulation profile.
frequency-range	Configure the frequency range of OFDMA channel.
modulation-profile	Modulation profile number.
[**cyclic-prefix** *value* **roll-off-period** *value*]	Set cyclic prefix for OFDMA only.
symbols-per-frame	Configure number of symbols per frame for OFDMA channel
[**data-iuc** *id* **band** *start value end value* **modulation** *value* **pilot-pattern** *value*]	Configure the data iuc profile for the channel.
shutdown	Shutdown the upstream channel.

Command Default

None

Command Modes

Profile configuration (config-profile)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Release	Modification
Cisco IOS XE Everest 16.6.1	The **docsis-mode ofdma**, **subcarrier-spacing**, **frequency-range**, **modulation-profile**, **cyclic-prefix**, **roll-off-period**, **symbols-per-frame**, **data-iuc**, **band, modulation**, **shutdown**and **pilot-pattern** keywords were added.

Examples

The following example shows how to configure the OFDMA channel:

```
Router# enable
Router# configure terminal
Router(config)# controller Upstream-Cable 1/0/4
Router(config-controller)# us-channel 12 docsis-mode ofdma
Router(config-controller)# us-channel 12 subcarrier-spacing 25KHz
Router(config-controller)# us-channel 12 frequency-range 40000000 85000000
Router(config-controller)# us-channel 12 modulation-profile 423
Router(config-controller)# us-channel 12 cyclic-prefix 640 roll-off-period 224
Router(config-controller)# us-channel 12 symbols-per-frame 9
Router(config-controller)# us-channel 12 data-iuc 9 band 50000000 60000000 modulation 512-QAM
 pilot-pattern 8
Router(config-controller)# no us-channel 12 shutdown
```

The following example shows how to configure the Exclusion / Unused Bands:

```
Router# enable
Router# configure terminal
Router(config)# controller Upstream-Cable 1/0/2
Router(config-controller)# cable ofdma-frequency-exclusion-band 48000000 54200000
Router(config-controller)# cable ofdma-frequency-unused-band 50000000 52000000
Router(config-controller)# us-channel 12 docsis-mode ofdma
Router(config-controller)# us-channel 12 subcarrier-spacing 25KHz
Router(config-controller)# us-channel 12 modulation-profile 423
Router(config-controller)# us-channel 12 frequency-range 45000000 70000000
Router(config-controller)# us-channel 12 cyclic-prefix 96 roll-off-period 64
Router(config-controller)# us-channel 12 symbols-per-frame 18
```

The following example shows how to override the modulation and pilot pattern used by a particular IUC on a given OFDMA channel:

```
Router# enable
Router# configure terminal
Router(config)# controller Upstream-Cable 1/0/2
Router(config-controller)# us-channel 12 docsis-mode ofdma
Router(config-controller)# us-channel 12 subcarrier-spacing 25KHz
Router(config-controller)# us-channel 12 modulation-profile 423
Router(config-controller)# us-channel 12 frequency-range 28000000 70000000
Router(config-controller)# us-channel 12 cyclic-prefix 96 roll-off-period 64
Router(config-controller)# us-channel 12 symbols-per-frame 18
Router(config-controller)# us-channel 12 data-iuc 6 band 60000000 65000000 modulation 128-QAM
pilot-pattern 9
Router(config-controller)# no us-channel 12 shutdown
```

The following example shows how to configure the OOB upstream channel:

```
Router# configure terminal
Router(config)# controller upstream-oob 55d1-profile 1
```

```
Router(config-profile)# us-channel 1 frequency 6000000
Router(config-profile)# us-channel 1 varpd-portid 3 varpd-demodid 4
```

Related Commands

Command	Description
controller upstream-oob 55d1-profile	Configures the OOB upstream controller profile.

us-channel chan-class-id

To configure a channel class ID for a logical upstream channel, use the **us-channel chan-class-id** command in controller configuration mode. To disable the channel class ID configuration, use the **no** form of this command.

us-channel *n* **chan-class-id** *id*
no us-channel *n* **chan-class-id** *id*

Syntax Description

n	Specifies the upstream port number. The valid range is from 0 to 11.
id	Channel class ID for the logical upstream channel in the hexadecimal format. The valid range is from 0 to ffffffff. The default value is 0.

Command Default

None

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream chan-class-id** command.

Usage Guidelines

The **us-channel chan-class-id** command is associated with the https://www.cisco.com/c/en/us/td/docs/cable/cbr/configuration/guide/b_cbr_full_book_docsis/cable_mode_steering.html feature.

An upstream channel descriptor (UCD) message includes type, length, value (TLV) 18 and 19 for an upstream logical channel based on the channel class ID and ranging hold-off priority configuration. If a channel class ID is not configured, the UCD does not include TLV18 and 19 irrespective of the ranging hold-off priority configuration.

Examples

The following example shows how to configure a channel class ID for a logical upstream channel on a cable interface line card on the cisco cBR router:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 3 chan-class-id ff
```

Related Commands

Command	Description
us-channel rng-holdoff	Configures an upstream ranging hold-off priority value for an upstream logical channel on the router.
show cable modem verbose	Displays information about the registered and unregistered cable modems connected to the CMTS router.

us-channel channel-width

To set the channel-width in upstream channel configuration, use the **us-channel channel-width** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **channel-width** {*first-choice-width* [*last-choice-width*]}
no us-channel *n* **channel-width**

Syntax Description

n	Specifies the upstream port number. The valid range is from 0 to 11.
first-choice-width	Specifies the upstream channel width in hertz. The valid values are 1600000, 3200000 and 6400000.
last-choice-width	(Optional) Specifies the upstream channel width in hertz. The valid values are 1600000, 3200000 and 6400000.

Command Default

The default channel width is 1600000 Hz.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream channel-width** command.

Usage Guidelines

When you specify both channel width values, the smaller value is taken as the last-choice-width parameter and the larger value is taken as the first-choice-width parameter. In the event of noise in the channel, the symbol rate automatically steps down to a value that is lower than the first-choice-width and greater or equal to the last-choice-width to maintain a stable channel.

Refer to the **cable upstream channel-width** command for more information.

Examples

The following example shows how to set the channel-width using **us-channel channel-width** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 channel-width 1600000
Router(config-controller)#
```

Related Commands

Command	Description
cable upstream hopping blind	Disables optimum frequency hopping on the Cisco uBR-MC16S and Cisco uBR-MC5X20S cable interface line cards.
cable upstream minislot-size	Specifies the minislot size for a specific upstream interface.

Command	Description
cable upstream modulation-profile	Overrides modulation types specified in the modulation profile for the specified upstream channel.
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.

us-channel cyclic-prefix

To specify the upstream channel cyclic-prefix, use the **us-channel cyclic-prefix** command in OFDM channel profile configuration mode. To undo the cyclic-prefix assignment, use **no** form of this command.

us-channelcyclic-prefix [**192** | **256** | **512** | **768** | **1024**]**roll-off-period** [**64** | **128** | **192** | **256**]

no us-channelcyclic-prefix

Syntax Description

roll-off-period *value*	Specifies the channel roll-off value. Valid values are 64, 128, 192, and 256.

Command Default

192

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify the upstream channel cyclic-prefix.

Examples

The following example shows how to specify the channel cyclic-prefix:

```
Router# enable
Router# configure terminal
Router(config)# controller Upstream-Cable 1/0/4
Router(config-controller)# us-channel 12 cyclic-prefix 640 roll-off-period 224
```

Related Commands

Command	Description
us-channel subcarrier-spacing	
us-channel frequency-range	
us-channel symbols-per-frame	
us-channel data-iuc	

us-channel description

To assign a label to an upstream, use the **us-channel description** command in controller configuration mode. To remove the label from the upstream, use the **no** form of this command.

us-channel *n* **description** *label*

Syntax Description

n	Upstream channel number. The range is from 0 to 11 on the Cisco cBR-8 router.
label	An arbitrary string, up to 80 characters long, that describes this upstream for management and tracking purposes. If the string contains any spaces, enclose the string within quotes.

Command Default

No description is assigned to upstreams.

Command Modes

Controller configuration—upstream-cable only (config-controller)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream description** command.

Usage Guidelines

Use the **us-channel description** command to assign arbitrary labels to the upstreams. These labels can contain any information that identifies the upstream and that could aid in network management or troubleshooting.

Example

The following example shows how to assign descriptions to the first two upstreams for upstream-cable 3/0/1 on the Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# controller upstream-Cable 3/0/1
Router(config-controller)# us-channel 0 description  "SJ-Node1-Uupstream channel 0"
Router(config-controller)# us-channel 1 description  "SJ-Node1-Upstream channel 1 (Unused)"
Router(config-controller)#
```

Related Commands

Command	Description
show interfaces cable	Displays the current configuration and status of the cable interface.

us-channel docsis-mode

To configure an upstream to use DOCSIS modulation profiles, use the **us-channel docsis-mode** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **docsis-mode** {**atdma** | **tdma** | **tdma-atdma** | **ofdma**}
no us-channel *n* **docsis-mode** {**atdma** | **tdma** | **tdma-atdma** | **ofdma**}

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11. OFDMA use upstream channel range from 12 to 15.
atdma	Configures the upstream only for DOCSIS 2.0 Advanced Time Division Multiple Access (A-TDMA) modulation profiles.
tdma	Configures the upstream only for DOCSIS 1.0/DOCSIS 1.1 Time Division Multiple Access (TDMA) modulation profiles.
tdma-atdma	Configures the upstream for both A-TDMA and TDMA operations (mixed mode).
ofdma	Configures the upstream for DOCSIS 3.1 Orthogonal frequency-division multiple access (OFDMA) modulation profiles.

Command Default

All upstreams are configured ATDMA-only mode

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream docsis-mode** command.
Cisco IOS XE Everest 16.6.1	The **ofdma** keyword was added to this command.

Usage Guidelines

The DOCSIS 2.0 specification builds on the existing TDMA to support advanced modulation profiles that increase potential upstream bandwidth. The A-TDMA profiles support higher QAM rates of up to 64-QAM and wider channel widths of up to 6.4 MHz (5.12 Msymbols).

Starting from Cisco IOS XE Everest 16.6.1 release, DOCSIS 3.1 Upstream OFDMA channel can be bonded with DOCSIS 3.0 ATDMA channel. If the user wants to utilize the non-best effort flows, it is recommended to bond the OFDMA channel with one or more ATDMA channel. But be aware that in Cisco IOS XE Everest 16.6.1 release, a maximum of one OFDMA channel and four ATDMA channels can be bonded together.

Refer to the **cable upstream docsis-mode** command for more information .

Examples

The following example shows how configure an upstream to use DOCSIS TDMA mode using **us-channel docsis-mode** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 docsis-mode tdma
```

The following example shows how configure an upstream to use DOCSIS OFDMA mode using **us-channel docsis-mode ofdma**command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 1/0/4
Router(config-controller)# us-channel 12 docsis-mode ofdma
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for use on the router.
cable modulation-profile global-scheme	Defines a global modulation profile for use on the router.
cable upstream channel-width	Specifies an upstream channel width for an upstream port.
cable upstream equalization-coefficient	Enables the use of a DOCSIS 1.1 pre-equalization coefficient on an upstream.
cable upstream maintain-psd	Requires DOCSIS 2.0 CMs on an A-TDMA-only upstream to maintain a constant power spectral density after a modulation rate change.
cable upstream modulation-profile	Assigns one or two modulation profiles to an upstream port.
show cable modulation-profile	Displays the modulation profile information for a Cisco CMTS.
show interface cable mac-scheduler	Displays the current time-slot scheduling state and statistics.

us-channel equalization-coefficient

To enable equalization-coefficient in upstream channel configuration, use the **us-channel equalization-coefficient** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **equalization-coefficient**
no us-channel *n* **equalization-coefficient**

Syntax Description

n	Specifies the upstream port number. The valid range is from 0 to 11.

Command Default

None.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream equalization-coefficient** command.

Usage Guidelines

The DOCSIS 1.1 and 2.0 specifications allow a CMTS to specify a pre-equalization coefficient in the DOCSIS ranging response (RNG-RSP) MAC management messages it forwards to the cable modems (CM)s. When this is enabled, a CM can engage in transmit-side equalization (pre-equalization) to mitigate the effects of certain impairments in the cable plant, such as in-channel tilt, and group delay.

Refer to the **cable upstream equalization-coefficient** command for more information.

Examples

The following example shows how to enable equalization-coefficient in controller configuration mode using **us-channel equalization-coefficient** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 equalization-coefficient
Router(config-controller)#
```

Related Commands

Command	Description
show cable modem phy	Displays the physical layer RF parameters of the cable modem, including USSNR estimate (MER).
show cable modem docsis version	Displays the DOCSIS version of a cable modem, and the upstream DOCSIS mode— TDMA or ATDMA.
show cable modem [verbose]	Displays detailed information about the cable modem. Lines with the string Equalizer describe modem specific equalizer data.

Command	Description
debug cable range	Debugging commands to display the equalizer coefficients being sent by the CMTS to the cable modem in the DOCSIS RNG-RSP MAC management messages.
debug cable interface *{interface} {cm-mac-address}***[verbose]**	Debugging commands to display the equalizer coefficients being sent by the CMTS to the cable modem in the DOCSIS RNG-RSP MAC management messages. **Caution** Certain debug settings can produce a very large amount of data on a production router, and should be used with caution. Specifying the CM mac-address will dramatically reduce the amount of data produced.

us-channel frequency

To enter a fixed frequency of the upstream radio frequency (RF) carrier for an upstream port, use the **us-channel frequency** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n***frequency** {*up-freq-hz* }
no us-channel *n* **frequency** {*up-freq-hz* }

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
up-freq-hz	The upstream center frequency configured to a fixed Hertz (Hz) value. The valid range is from 5000000 Hz to 85000000 Hz

Command Default

The default upstream channel number is 0. The default frequency is 0 Hz.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream frequency** command.

Usage Guidelines

The upstream channel frequency of your RF output must be set to comply with the expected input frequency of your cable interface line card. To configure an upstream channel frequency, you may:

- Configure a fixed frequency between the allowable ranges and enable the upstream port, or
- Create a global spectrum group, assign the interface to it, and enable the upstream port.

Refer to the **cable upstream frequency** command for more information.

Examples

The following example shows how configure how to configure the upstream center frequency using **us-channel frequency** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 frequency 5700000
```

Related Commands

Command	Description
cable spectrum-group (global configuration)	Creates spectrum groups, which contain one or more upstream frequencies.
show controllers cable	Displays information about the cable interface, including the upstream center frequency.

Command	Description
upstream freq-range	Configures the Cisco CMTS router for the range of frequencies that are acceptable on upstreams.

us-channel hop-priority

To configure the priority of the corrective actions to be taken when a frequency hop is necessary due to ingress noise on the upstream, use the **us-channel hop** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **hop-priority frequency modulation channel-width**
us-channel *n* **hop-priority modulation frequency channel-width**
us-channel *n* **hop-priority frequency channel-width modulation**

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
frequency, modulation, channel-width	Specifies the priority of corrective actions to be taken when ingress noise occurs on a downstream.

Command Default

The default priority is **frequency**,**modulation**, and **channel-width**.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream hop-priority** command.

Usage Guidelines

This command specifies the priority of the corrective actions that should be taken when a frequency hop is necessary to correct excessive ingress noise on an upstream.

Refer to the **cable upstream hop-priority** command for more information.

Examples

The following example shows the usage of **us-channel hop-priority** command when ingress noise on the upstream exceeds the threshold allowed for the primary modulation profile:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 hop-priority modulation frequency channel-width
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable upstream channel-width	Configures an upstream for a range of allowable channel widths.
cable upstream modulation-profile	Configures an upstream for one modulation profile (static profile) or two modulation profiles (Dynamic Upstream Modulation).
show cable hop	Displays the current hop period and threshold for an upstream, along with other statistics.

Command	Description
show cable modulation-profile	Displays the cable modulation profiles that have been created.

us-channel ingress-noise-cancellation

To configure how often a cable interface line card should train its noise-cancellation circuitry so as to adjust to noise levels on the upstream, use the **us-channel ingress-nosie-cancellation** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **ingress-nosie-cancellation** [*interval*]
no us-channel *n* **ingress-nosie-cancellation** [*interval*]

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
interval	(Optional) Triggering interval in milliseconds. The valid range is from 40 to 300.

Command Default

Enabled.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream hop-prioingress-nosie-cancellation** command.

Usage Guidelines

The **us-channel ingress-nosie-cancellation** command is used to configure how often these line cards should train their noise cancellation circuity so as adapt to changes in the noise types and levels.

Examples

The following example shows how to perform ingress noise cancellation every 200 milliseconds using **us-channel ingress-nosie-cancellation** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 ingress-nosie-cancellation 200
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for use on the router.
cable upstream channel-width	Specifies an upstream channel width for an upstream port.

us-channel maintain-psd

To maintain a constant power spectral density (PSD) after a modulation rate change, use the **us-channel maintain-psd** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **maintain-psd**
no us-channel *n* **maintain-psd**

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.

Command Default

Enabled.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream maintain-psd** command.

Usage Guidelines

Use this command to specify whether DOCSIS 2.0 CMs should maintain their power spectral density when the Cisco CMTS changes their upstream modulation rate in an upstream channel descriptor (UCD) message.

Refer to **cable upstream maintain-psd** command for more information.

Examples

The following example shows how to maintain a constant power spectral density after a modulation rate change using **us-channel maintain-psd** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 maintain-psd
```

Related Commands

Command	Description
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.

us-channel minislot-size

To specify the minislot size (in ticks) for a specific upstream interface, use the **us-channel minislot-size** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **minislot-size** *size*
no us-channel *n* **minislot-size**

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
size	Specifies the minislot size in time ticks. valid minislot sizes are: • 1 • 2 • 4 • 8 • 16 • 32 • 64

Command Default

The default minislot size is 4.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream minislot-size**command.

Usage Guidelines

The minislot size determines the minimum amount of information that can be transmitted on the upstream. How much a particular minislot size can contain depends on the modulation profile and channel width being used, with higher-bandwidth settings allowing larger amounts of data.

Refer to **cable upstream minislot-size**command for more information.

Examples

The following example shows how to set the minislot size using **us-channel minislot-size** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 minislot-size 64
```

Related Commands

Command	Description
cable upstream modulation-profile	Assigns one or two modulation profiles to an upstream port.
show cable hop	Displays CM configuration settings.

Command	Description
show cable modulation-profile	Displays the modulation profile information for a Cisco CMTS.
show interface cable mac-schedule	Displays the current time-slot scheduling state and statistics.
show interface cable sid	Displays cable interface information.

us-channel modulation-profile

To assign modulation profiles to an upstream port, use the **us-channel modulation-profile** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **modulation-profile** *primary-profile number* [*secondary-profile-number*] [*tertiary-profile-number*]
no us-channel *n* **modulation-profile** *primary-profile number* [*secondary-profile-number*] [*tertiary-profile-number*]

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
primary-profile number	Specifies the primary modulation profile. The valid range is from 1 to 400.
secondary-profile-number	(Optional) Specifies the secondary modulation profile. The valid range is from 1 to 400.
tertiary-profile-number	(Optional) Specifies the tertiary modulation profile. The valid range is from 1 to 400.

Command Default

The default value is 221.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream modulation-profile**command.

Usage Guidelines

The **us-channel modulation-profile** command assigns up to three modulation profiles to an upstream port, depending on the type of cable interface and Cisco IOS software release being used.

Refer to the **cable upstream modulation-profile**command for more information.

Examples

The following example shows how assign modulation profiles using **us-channel modulation-profile** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 modulation-profile 2 1
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable modulation-profile global-scheme	Defines a global modulation profile for use on the router.

Command	Description
cable upstream hop-priority	Determines the order of the corrective actions to be taken when ingress noise exceeds the allowable value for an upstream. This command is related to the **cable upstream modulation-profile** command only when using advanced dynamic modulation configuration, that is, when spectrum group is defined for the upstream channel.
show cable modulation-profile	Displays the cable modulation profiles that have been created.

us-channel power-level

To set the input power level for the upstream radio frequency (RF) carrier in decibels per millivolt (dBmV), use the **us-channel power-level** command in controller configuration mode. To restore the input power level to its default value, use the **no** form of this command.

us-channel *n* **power-level** *dbmv*

Syntax Description

n	Upstream channel number. The range is from 0 to 11 on the Cisco cBR-8 router.
dbmv	Decibels per millivolt designating the upstream signal input power level. The range is from –13 to 23 on the Cisco cBR-8 router depending on the upstream symbol rate (channel width).

Command Default

0 dBmV

Command Modes

Controller configuration—upstream-cable only (config-controller)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream power-level** command.

Usage Guidelines

The Cisco CMTS controls the output power levels of the CMs to meet the desired upstream input power level. The nominal input power level for the upstream RF carrier is specified in decibels per millivolt (dBmV). The default setting of 0 dBmV is the optimal setting for the upstream power level.

The valid range for the input power level depends on the data rate, as expressed as the symbol rate and channel width. The table below shows the valid power levels for each allowable rate, as given in the DOCSIS specification. Higher (more positive) values cause the CMs to increase their transmit power, achieving a greater carrier-to-noise ratio (CNR).

Table 278: Allowable DOCSIS Power Levels

Symbol Rate (Symbols per second)	Channel Width (Hz)	Allowable Power Range (dBmV)
160,000	200,000	–16 to +14 (minimum valid value for DOCSIS is –13)
320,000	400,000	–13 to +17
640,000	800,000	–10 to +20
1,280,000	1,600,000	–7 to +23
2,560,000	3,200,000	–4 to +26 (maximum valid value for DOCSIS is +23)
5,120,000[24]	6,400,000	–1 to +29 (maximum valid value for DOCSIS is +23)

[24] The 5.12 MSymbols/sec symbol rate and 6.4 MHz channel width are supported only on upstreams that are configured for DOCSIS 2.0 A-TDMA-only operation.

Tip You can use inline attenuators to force CMs to transmit at higher power levels and to achieve a higher CNR value on the network.

Caution If you increase the input power level or add inline attenuators before the Cisco CMTS, the CMs on your HFC network increase their transmit power level. Be careful if you adjust this parameter. You might violate the upstream return laser design parameters or exceed the CM's maximum transmit power level.

Note Do not adjust your input power level by more than 5 dB in a 30-second interval. If you increase the power level by more than 5 dB within 30 seconds, you will disrupt CM service on your network. If you decrease the power level by more than 5 dB within 30 seconds, the CMs on your network will be forced to re-range.

Tip When setting upstream power levels, we recommend that the adjacent channels of equal bandwidth do not have a large variation. The recommended maximum input power variance is 5 to 6 dB.

Example

The following example shows how to input power level for upstream channel 10 on the Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# controller upstream-Cable 3/0/1
Router(config-controller)# us-channel 10 power-level 22
Router(config-controller)#
```

Related Commands

Command	Description
show interfaces cable	Displays the current configuration and status of the cable interface.

us-channel rng-holdoff

To hold off a cable modem from initial ranging (init rl) on a logical upstream channel, use the **us-channel rng-holdoff** command in controller configuration mode. To disable the ranging hold-off, use the **no** form of this command.

us-channel *n* **rng-holdoff** *priority*
no us-channel *n* **rng-holdoff** *priority*

Syntax Description

n	Specifies the upstream port number. The valid range is from 0 to 11.
rng-holdoff*priority*	Specifies the ranging hold-off priority value in the hexadecimal format. The valid range is from 0 to ffffffff. The default value is 0.

Command Default

None

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream rng-holdoff**command.

Usage Guidelines

The **us-channel rng-holdoff** command is associated with the https://www.cisco.com/c/en/us/td/docs/cable/cbr/configuration/guide/b_cbr_full_book_docsis/cable_mode_steering.html feature.

An upstream channel descriptor (UCD) message includes type, length, value (TLV) 18 and 19 for an upstream logical channel based on the channel class ID and ranging hold-off priority configuration. If a ranging hold-off priority value is not configured, the value of TLV 18 becomes zero. If an upstream channel class ID is configured and a ranging hold-off priority value is not configured, the UCD message includes TLV 18 and 19, and the value of TLV 18 becomes zero.

Examples

The following example shows how to specify a ranging hold-off priority value for a logical upstream channel on a cable interface line card on the cisco cBR router:

```
Router# config terminal
Router(config)# controller upstream-cable 3/0/0
Router(config-controller)# us-channel 3 rng-holdoff ff
```

Related Commands

Command	Description
us-channel chan-class-id	Configures a channel class ID for a logical upstream channel on the CMTS router.
show cable modem verbose	Displays information about the registered and unregistered cable modems connected to the CMTS router.

us-channel spectrum-group

To set up spectrum group in upstream channel configuration, use the **us-channel spectrum-group** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *upstream channel number* **spectrum-group** {*spectrum group number* }
no us-channel *upstream channel number* **spectrum-group**

Syntax Description

upstream channel number	The upstream channel number. The valid range is from 0 to 11.
spectrum-group	Specifies spectrum group set up.
spectrum group number	The spectrum group number. The valid range is from 1 to 40.

Command Default

None.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream spectrum-group** command.

Usage Guidelines

This command assigns a spectrum group to a single us-channel in the upstream-controller. To configure the spectrum groups, use the set of **cable spectrum-group** commands in global configuration mode.

In addition, you can also spectrum groups to all of the us-channels for one specific upstream-controller, use the **cable spectrum-group** (upstream-cable controller configuration) command.

Examples

The following example shows how to assign spectrum group 12 to the first us-channel of the upstream-cable controller 0 in slot 9/0:

```
Router(config)# controller upstream-cable 9/0/0

Router(config-controller)# us-channel 0 spectrum-group 12

Router(config-controller)# exit
Router(config)#
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for using on the router.
cable spectrum-group(global configuration)	Create and configure a spectrum-group.
cable spectrum-group hop period	Changes the minimum time between frequency hops.
cable spectrum-group hop threshold	Specifies a frequency hop threshold for a spectrum group.

us-channel subcarrier-spacing

To specify the spacing for specific subcarriers configured in modulation profile, use the **us-channel subcarrier-spacing** command in OFDM modulation profile or OFDM channel profile configuration mode. To undo the spacing assignment, use no form of this command.

us-channel *n* **subcarrier-spacing** [**25KHz** | **50KHz**]

no us-channel subcarrier-spacing

Syntax Description

n	Upstream channel number. The valid range is from 12 to 15.

Command Default

No description is assigned to upstreams.

Command Modes

Controller configuration—upstream-cable only (config-controller)

Command History

Release	Modification
Cisco IOS XE Everest 16.6.1	This command was introduced on the Cisco cBR Series Converged Broadband Router.

Usage Guidelines

When a modulation profile is configured in a channel profile, the modulation profile subcarrier spacing must match the channel profile subcarrier spacing.

Example

The following example shows how to specify the subcarriers spacing:

```
Router# enable
Router# configure terminal
Router(config)# controller Upstream-Cable 1/0/4
Router(config-controller)# us-channel 12 subcarrier-spacing 25KHz
```

Related Commands

Command	Description
us-channel docsis-mode	
us-channel subcarrier-spacing	
us-channel frequency-range	
us-channel cyclic-prefix	
us-channel symbols-per-frame	
us-channel data-iuc	

us-channel threshold

To set spectrum management thresholds in upstream channel configuration, use the **us-channel threshold** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *upstream channel number* **threshold** { {**cnr-profile1 cnr-profile2** {*bypass CNR threshold* | *CNR threshold in DB* } } | {**corr-fec** {*corrected FEC threshold in percentage*} } | {**snr-profile1 snr-profile2** {*bypass SNR threshold* | *SNR threshold in DB* } } | {**uncorr-fec** {*uncorrected FEC threshold in percentage* } } }
us-channel *upstream channel number* **threshold** { {**cnr-profile1 cnr-profile2** } | {**corr-fec** } | {**snr-profile1 snr-profile2**} | {**uncorr-fec** } }

Syntax Description

upstream channel number	The upstream channel number. The valid range is from 0 to 11.
cnr-profiles	Specifies CNR thresholds.
bypass CNR threshold	Bypasses CNR threshold for modulation profile1 and profile2. The valid value is 0.
CNR threshold in DB	The CNR threshold in Decibel for the modulation profile1 and profile2. The valid range is from 5 to 35.
corr-fec	Specifies corrected FEC threshold.
corrected FEC threshold in percentage	The corrected FEC threshold in percentage. The valid range is from 0 to 30 where 0 denotes the bypass threshold.
snr-profiles	Specifies SNR thresholds .
bypass SNR threshold	Bypasses SNR threshold for modulation profile1 and profile2. The valid value is 0.
SNR threshold in DB	The SNR threshold in Decibel for the modulation profile1 and profile2. The valid range is from 5 to 35.
uncorr-fec	Specifies uncorrected FEC threshold.
uncorrected FEC threshold in percentage	The uncorrected FEC threshold in percentage. The valid range is from 0 to 30 where 0 denotes the bypass threshold.

Command Default

The default value for:

- **cnr-profile1** is 25.
- **cnr-profile2** is 13.
- **corr-fec** is 3
- **uncorr-fec** is 1.
- **snr-profile1** is 25.
- **snr-profile2** is 13.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream threshold** command.

Usage Guidelines

The **us-channel threshold** command allows setting the of spectrum management thresholds in upstream channel configuration.

Examples

The following example shows how to set spectrum management thresholds in upstream channel configuration using **us-channel threshold** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 threshold ?
Router(config-controller)# cnr-profiles  CNR thresholds in dB
  corr-fec      Corrected FEC threshold
  hysteresis    CNR/SNR upgrade threshold hysteresis value
  snr-profiles  SNR thresholds in dB
  uncorr-fec    Uncorrected FEC threshold
```

Related Commands

Command	Description
show cable hop thresholds	Displays all the thresholds of the active line card.

us-channel threshold hysteresis

To upgrade CNR/SNR threshold hysteresis value, use the **us-channel threshold hysteresis** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *upstream channel number* **threshold hysteresis** *CNR/SNR upgrade threshold hysteresis in DB*
us-channel *upstream channel number* **threshold hysteresis**

Syntax Description

upstream channel number	The upstream channel number. The valid range is from 0 to 11.
CNR/SNR upgrade threshold hysteresis in DB	The CNR/SNR upgrade threshold hysteresis in Decibel. The valid range is from 0 to 10.

Command Default

The default value for **thershold hystersis** is 3.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream threshold hysteresis** command.

Usage Guidelines

The **us-channel threshold hysteresis** command allows upgrading the CNR/SNR threshold hysteresis value in the controller configuration mode.

Examples

The following example shows how to upgrade CNR/SNR threshold hysteresis value using **us-channel threshold hysteresis** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 threshold hysteresis 1
Router(config-controller)#
```

vcg

To specify the virtual carrier group assigned to this logical edge device, use the **vcg** command in logical edge device protocol configuration mode. To undo the virtual carrier group assignment, use the **no** form of this command.

vcg *name*
no vcg *name*

Syntax Description

vcg *name*	Specifies the virtual carrier group.

Command Default

None.

Command Modes

Logical edge device protocol configuration (config-video-led-protocol)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command specifies the virtual carrier group assigned to this logical edge device.

Examples

The following example shows how to specify the virtual carrier group assigned to this logical edge device:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# logical-edge-device vod id 1
Router(config-video-led)# protocol table-based
Router(config-video-led-protocol)# vcg vod
```

Related Commands

Command	Description
logical-edge-device	Define a logical edge device.
protocol	Specifies the protocol used in the logical edge device.
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
active	Activates the logical edge device.
show cable video logical-edge-device	Displays the logical edge device information.

vcg (config-video-bd)

To configure the virtual carrier group and service distribution group for replication, use the **vcg** *name* **sdg** *name* command in virtual carrier group binding configuration mode. To undo the virtual carrier group assignment, use the **no** form of this command.

vcg *name* **sdg** *name*
no vcg *name* **sdg** *name*

Syntax Description

vcg *name*	Specifies the virtual carrier group.
sdg *name*	Specifies the service distribution group.

Command Default

None.

Command Modes

Virtual carrier group binding configuration (config-video-bd)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command configures the virtual carrier group and service distribution group for replication.

Examples

The following example shows how to configure the virtual carrier group and service distribution group for replication:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# service-distribution-group sdg-replication id 1
Router(config-video-sdg)# rf-port integrated-cable 7/0/0
Router(config-video-sdg)# rf-port integrated-cable 7/0/1
Router(config-video-sdg)# rf-port integrated-cable 7/0/2
Router(config-video-sdg)# rf-port integrated-cable 7/0/3
Router(config-video-sdg)# virtual-carrier-group vcg-replication
Router(config-video-vcg)# virtual-edge-input-ip 172.31.1.1 input-port-number 1
Router(config-video-vcg)# rf-channel 21-31 tsid 21-31 output-port-number 21-31
Router(config-video-vcg)# bind-vcg
Router(config-video-bd)# vcg vcg-replication sdg sdg-replication
```

Related Commands

Command	Description
service-distribution-group	Defines a service distribution group.
virtual-carrier-group	Defines a virtual carrier group.
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
rf-port integrated-cable	Specifies the RF ports in a service distribution group.

Command	Description
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
bind-vcg	Binds a set of virtual RF-channels defined in the virtual carrier group to the physical port in the service distribution group.
show cable video virtual-carrier-group	Displays the virtual carrier group information.

vcg (table-based)

To specify the virtual carrier group associated with the table-based session, use the **vcg** command in cable video configuration mode. To delete the configuration, use the **no** form of this command.

vcg *name*
no vcg *name*

Command Default

None.

Command Modes

Table-based session configuration (config-video-tb)

Release	Modification
IOS-XE 16.4.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to set session jitter:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# table-based
Router(config-video-tb)# vcg vcg1
```

Related Commands

Command	Description
table-based	Defines a table based video session.

vei-bundle

To bundle the virtual edge inputs, use the **vei-bundle** *id* **input-port-number** *numbers* command in logical edge device protocol configuration mode. To delete a virtual edge input bundle, use the **no** form of this command.

vei-bundle *id* **input-port-number** *numbers*
no vei-bundle *id* **input-port-number** *numbers*

Syntax Description

vei-bundle *id*	Specifies the virtual edge input bundle ID. The valid range is from 1 to 65535.
input-port-number *numbers*	Specifies the virtual edge input port number. You can specify maximum of five input port numbers separated by commas.

Command Default

None.

Command Modes

Logical edge device protocol configuration (config-video-led-protocol)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command bundles the virtual edge inputs.

Examples

The following example shows how to bundle the virtual edge inputs:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# service-distribution-group sdg-vei id 1
Router(config-video-sdg)# rf-port integrated-cable 7/0/3
Router(config-video-sdg)# virtual-carrier-group vcg-vei id 1
Router(config-video-vcg)# virtual-edge-input-ip 111.111.111.111 input-port-number 111
Router(config-video-vcg)# virtual-edge-input-ip 222.222.222.222 input-port-number 222
Router(config-video-vcg)# virtual-edge-input-ip 33.33.33.33 input-port-number 33
Router(config-video-vcg)# virtual-edge-input-ip 44.44.44.44 input-port-number 44
Router(config-video-vcg)# rf-channel 0-4 tsid 0-4 output-port-number 1-5
Router(config-video-vcg)# virtual-carrier-group vcg-vei1 id 2
Router(config-video-vcg)# virtual-edge-input-ip 111.111.111.111 input-port-number 111
Router(config-video-vcg)# virtual-edge-input-ip 222.222.222.222 input-port-number 222
Router(config-video-vcg)# virtual-edge-input-ip 33.33.33.33 input-port-number 33
Router(config-video-vcg)# virtual-edge-input-ip 44.44.44.44 input-port-number 44
Router(config-video-vcg)# rf-channel 5-10 tsid 5-10 output-port-number 5-10
Router(config-video-vcg)# bind-vcg
Router(config-video-bd)# vcg vcg-vei sdg sdg-vei
Router(config-video-bd)# vcg vcg-vei1sdg sdg-vei
Router(config-video-bd)# logical-edge-device led-vei id 1
Router(config-video-led)# protocol table-based
Router(config-video-led-protocol)# virtual-edge-input-ip 11.11.11.11 input-port-number 11
Router(config-video-led-protocol)# virtual-edge-input-ip 22.22.22.22 input-port-number 22
Router(config-video-led-protocol)# virtual-edge-input-ip 66.66.66.66 input-port-number 66
Router(config-video-led-protocol)# virtual-edge-input-ip 77.77.77.77 input-port-number 77
```

```
Router(config-video-led-protocol)# virtual-edge-input-ip 222.222.222.222 input-port-number
 222
Router(config-video-led-protocol)# vcg vcg-vei
Router(config-video-led-protocol)# vei-bundle 40000 input-port-number 33,44,66,77,222
Router(config-video-led-protocol)# active
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.
virtual-carrier-group	Defines a virtual carrier group.
protocol	Specifies the protocol used in the logical edge device.
virtual-edge-input-ip	Specifies and configures a cable multicast QoS group.
rf-port integrated-cable	Specifies the RF ports in a service distribution group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
bind-vcg	Binds a set of virtual RF-channels defined in the virtual carrier group to the physical port in the service distribution group.
active	Activates the logical edge device.
show cable video virtual-carrier-group	Displays the virtual carrier group information.

video

The following commands are intented only for troubleshooting. For details, contact Cisco Support.

video set default

video show default

Syntax Description

cas-system-id	Set default CAS System ID.
config	Set config context.
cr-mode	Set default clock recovery mode.
encrypt	Set default session encryption flag.
jitter	Set default network jitter.
owner-id	Set default owner ID.
session-qos	Set default session QoS.
timer	Set default timer parameters.

Command Default

None.

Command Modes

NA

Command History

Release	Modification
Cisco IOS XE Amsterdam 17.2.x	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use these commands only for troubleshooting. For details, contact Cisco Support.

Example: Set Default Clock Recovery Mode

To set the default clock recovery mode, use the following command:

```
ng_cli> video set default cr-mode

cbr             Unified CBR clock recovery mode
primary-subordinate Primary-subordinate clock recovery mode (CBR)
vbr             Unified VBR clock recovery mode
```

To view the default video configuration, run the following command:

```
ng_cli> video show default                          e
Config: 3
Clock recovery mode: primary-subordinate
Jitter 300, delay 150
Timer: init 2000, idle 500, off 30
Session QoS: 0
Encrypt flag: 0
```

```
Owner ID: 0
CAS System ID: 57344
ng_cli>
```

virtual-arpd

To configure the virtual advanced return path demodulator (ARPD), use the **virtual-arpd** command in OOB configuration mode. To void the virtual ARPD configuration, use the **no** form of this command.

virtual-ARPD *id*

no virtual-ARPD *id*

Command Default

None

Command Modes

OOB configuration (config-oob)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the virtual ARPD.

Examples

The following example shows how to configure the virtual ARPD:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)# virtual-ARPD 1
Router(config-oob-varpd)#
```

Related Commands

Command	Description
virtual-om	Defines a virtual OOB modulator configuration.
cable oob	Enters the OOB configuration mode.

virtual-carrier-group

To define a virtual carrier group, use the **virtual-carrier-group** command in video configuration mode. To delete a virtual carrier group, use the **no** form of this command.

virtual-carrier-group *name* [**id** *id*]
no virtual-carrier-group *name* [**id** *id*]

Syntax Description

virtual-carrier-group *name*	Specifies the virtual carrier group name.
id *id*	Specifies the virtual carrier group identifier.

Command Default

None.

Command Modes

Video configuration (config-video)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command defines a virtual carrier group.

Examples

The following example shows how to define a virtual carrier group:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# virtual-carrier-group vod id 1
```

Related Commands

Command	Description
virtual-edge-input-ip	Defines a virtual edge input.
encrypt	Encrypts the virtual carrier group.
service-type	Specifies the service type of the virtual carrier group.
rf-channel	Specifies the virtual RF channels in a virtual carrier group.
show cable video virtual-carrier-group	Displays the virtual carrier group information.

virtual-edge-input-ip

To define a virtual edge input, use the **virtual-edge-input-ip** *ip* [**vrf** *vrf name*] **input-port-number** *port*command in virtual carrier group configuration mode or logical edge device protocol configuration mode. To delete a virtual edge input, use the **no** form of this command.

virtual-edge-input-ip *ip* [**vrf***vrf name*]**input-port-number** *port*
no virtual-edge-input-ip *ip* [**vrf** *vrf name*]**input-port-number** *port*

Syntax Description

virtual-edge-input-ip *ip*	Specifies the virtual edge input IP address.
vrf *vrf name*	Specifies the virtual edge input VRF name.
input-port-number *port*	Specifies the virtual edge input port number.

Command Default

None.

Command Modes

Virtual carrier group configuration (config-video-vcg)

Logical edge device protocol configuration (config-video-led-protocol)

Command History

Release	Modification
IOS-XE 3.18.0S	This command is introduced on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.18.0Sa	This command was modified. An optional parameter **vrf** *vrf name*was added.

Usage Guidelines

This command defines a virtual edge input.

Examples

The following example shows how to define a virtual edge input in virtual carrier group configuration:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# virtual-carrier-group vod id 1
Router(config-video-vcg)# virtual-edge-input-ip 174.1.1.1 input-port-number 1
```

The following example shows how to define a virtual edge input in logical edge device protocol configuration:

```
Router# configure terminal
Router(config)# cable video
Router(config-video)# logical-edge-device vod id 1
Router(config-video-led)# protocol table-based
Router(config-video-led-protocol)# virtual-edge-input-ip 174.1.1.1 input-port-number 1
```

Related Commands

Command	Description
logical-edge-device	Defines a logical edge device.
virtual-carrier-group	Defines a virtual carrier group.
show cable video logical-edge-device	Displays the logical edge device information.
show cable video virtual-carrier-group	Displays the virtual carrier group information.

virtual-om

To configure the virtual OOB modulator (OM), use the **virtual-om** command in OOB configuration mode. To void the virtual OM configuration, use the **no** form of this command.

virtual-om *id*

no virtual-om *id*

Syntax Description

id	Specifies the virtual OM ID.

Command Default

None

Command Modes

OOB configuration (config-oob)

Command History

Release	Modification
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to configure the virtual OM.

Examples

The following example shows how to configure the virtual OM:

```
Router# configure terminal
Router(config)# cable oob
Router(config-oob)# virtual-om 1
Router(config-oob-vom)#
```

Related Commands

Command	Description
virtual-arpd	Defines a virtual advanced return path demodulator configuration.
cable oob	Enters the OOB configuration mode.

vrf (multicast qos)

To specify the name for a virtual routing and forwarding (VRF) instance, use the **vrf** command in multicast QoS configuration mode. To disable the VRF instance, use the **no** form of this command.

vrf *name*
no vrf *name*

Syntax Description

name	Specifies the routing and forwarding instance that is populated with multicast Virtual Private Network (MVPN) routes.

Command Default

A VRF name is not defined for the multicast QoS group.

Command Modes

Multicast QoS configuration (config-mqos)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If a multicast QoS (MQoS) group is not defined for the named VRF instance, you will see an error message. You must either define a specific MQoS group for each VRF instance, or define a default MQoS that can be assigned in those situations where no matching MQoS group is found.

Examples

The following example identifies a multicast QoS group VRF name using the **vrf** command:

```
Router(config)# cable multicast qos group 20 priority 55 global
Router(config-mqos)# vrf name1
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface bundle multicast-sessions	Displays multicast session information for a specific virtual cable bundle.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

weekend duration

To configure different subscriber monitoring options over weekends on a Cisco CMTS router, use the **weekend duration** command in enforce-rule configuration mode. To remove the weekend monitoring configuration and to return to the same monitoring conditions for all days of the week, use the **no weekend** form of this command.

weekend duration *minutes* **avg-rate** *rate* **sample-interval** *interval* [**penalty-period** *duration*] {**downstream** | **upstream**} [**enforce**]
no weekend duration *minutes* **avg-rate** *rate* **sample-interval** *interval* [**penalty-period** *duration*] {**downstream** | **upstream**} [**enforce**]
no weekend

Syntax Description

minutes	Specifies the size of the sliding window (in minutes) during which subscriber usage is monitored. The range is 10 to 44640 with a default of 360 minutes (6 hours).
avg-rate *rate*	Specifies the average sampling rate in kilobits per second for the specified duration. The range is 1 to 400000 kilobits with no default.
sample-interval *interval*	Specifies how often (in minutes) the CMTS router should sample a service flow to get an estimate of subscriber usage. The range is 1 to 30, with a default value of 15.
(Optional) Specifies the period (in minutes) during which a cable modem (CM) can be under penalty. The range is 1 to 10080. **penalty-period** *minutes*	(Optional) Specifies the period (in minutes) during which a cable modem (CM) can be under penalty. The range is 1 to 10080. (Optional) Specifies the period during which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile. The range is 1 to 10080.
downstream	Specifies monitoring of traffic in the downstream direction.
upstream	Specifies monitoring of traffic in the upstream direction.
enforce	(Optional) Specifies that the enforce-rule QoS profile should be applied automatically if a user violates their registered QoS profile.

Command Default

Weekend monitoring is disabled.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD2	The **penalty** keyword option was added.

Release	Modification
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Note This command is applicable only after the **monitoring-basics** command is configured with the keyword legacy.

The **weekend duration** command works similarly to the **duration** command for subscriber traffic monitoring. Use the **weekend duration** command when you want to configure different monitoring parameters for subscribers on weekends.

This command can only be used when you have already configured the **duration** or **peak-time1** commands as weekday monitoring conditions for an enforce-rule.

If you still want to monitor traffic over the weekend, but want to return to the same monitoring conditions for every day of the week, use the **no weekend** command. This command removes the weekend monitoring conditions, but still performs monitoring over the weekends according to the other monitoring options that you have configured in the enforce-rule.

If you want to disable monitoring entirely over the weekend, use the **weekend off** command.

The **penalty** duration, which is configured using the **weekend duration** command, is unique to weekends, and takes precedence over the global penalty duration configured using the **penalty-period** command.

Examples

The following example specifies automatic monitoring of upstream traffic over the weekend if a subscriber is identified as violating their QoS profile. The monitoring will take place every 10 minutes and last for 5 minutes, with traffic sampled at an average rate of 2 kb/s:

```
Router(enforce-rule)# weekend duration 5 avg-rate 2 sample-interval 10 penalty 11 upstream
 enforce
```

Related Commands

Command	Description
duration	Specifies the time period and sample rate to be used for monitoring subscribers.
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
penalty-period	Specifies the period during which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile.
weekend off	Disables peak and offpeak monitoring on weekends on a Cisco CMTS router.
weekend peak-time1	Configures peak and offpeak subscriber monitoring over weekends on a Cisco CMTS router.

weekend off

To disable peak and offpeak monitoring on weekends on a Cisco CMTS router, use the **weekend off** command in enforce-rule configuration mode. To re-enable the configuration for weekend monitoring, use the **no** form of this command.

weekend off
no weekend off

Syntax Description

This command has no arguments or keywords.

Command Default

Weekend monitoring is enabled once you configure the **weekend duration** or **weekend peak-time1** commands.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **weekend off** command to disable previously configured weekend monitoring and stop the CMTS router from monitoring cable modems (CMs) with that enforce-rule over the weekend. This command allows you to retain or modify your weekend monitoring configuration without enabling it for actual monitoring use on the CMTS router.

To perform weekend monitoring according to the same parameters used for weekday monitoring, use the **no weekend** command.

Examples

The following example shows how to disable weekend monitoring when weekend peak-time monitoring has previously been configured on a Cisco CMTS router:

```
Router(config)# cable qos enforce-rule test
Router(enforce-rule)# weekend peak-time1 8 duration 60 avg-rate 100 peak-time2 20 duration
 60 avg-rate 10000 duration 90 avg-rate 20000 sample-interval 20 downstream enforce
Router(enforce-rule)# weekend off
```

Related Commands

Command	Description
weekend duration	Configures different subscriber monitoring options over weekends on a Cisco CMTS router.
weekend peak-time1	Configures peak and offpeak subscriber monitoring over weekends on a Cisco CMTS router.

weekend peak-time1

To configure peak and offpeak subscriber monitoring over weekends on a Cisco CMTS router, use the **weekend peak-time1** command in enforce-rule configuration mode. To remove the peak and offpeak weekend monitoring configuration, use the **no** form of this command.

weekend peak-time1 {*hourhh:mm*}
duration *minutes* **avg-rate***rate*
peak-time2 {*hourhh:mm*} **duration** *minutes* **avg-rate rate**
duration *offpeak-minutes* **avg-rate** *offpeak-rate*
sample-interval *minutes*
penalty-period *minutes*
downstream | **upstream**
enforce
weekend peak-time1 {*hourhh:mm*}
duration *minutes* **avg-rate***rate*
peak-time2 {*hourhh:mm*} **duration** *minutes* **avg-rate rate**
duration *offpeak-minutes* **avg-rate** *offpeak-rate*
sample-interval *minutes*
penalty-period *minutes*
downstream | **upstream**
enforce

weekend peak-time1 {*hourhh:mm*}**duration** *minutes* **avg-rate***rate* [**peak-time2** {*hourhh:mm*}**duration** *minutes* **avg-rate** *rate*] **duration** *minutes* **avg-rate** *rate* **sample-interval** *minutes* [**penalty-period** *minutes*] {**downstream** | **upstream**} [**enforce**]
no weekend peak-time1 {*hourhh:mm*}**duration** *minutes* **avg-rate***rate* [**peak-time2** {*hourhh:mm*}**duration** *minutes* **avg-rate** *rate*] **duration** *minutes* **avg-rate** *rate* **sample-interval** *minutes* [**penalty-period** *minutes*] {**downstream** | **upstream**} [**enforce**]
no weekend

Syntax Description

hour | *hour:minutes*	Specifies the time of day, in either hh or hh:mm format, during which monitoring occurs for the peak time. If the time is specified in hour (hh), the valid range is 1 to 23 using a 24-hour clock. If the time is specified in hour:minutes (hh:mm), the valid range for hour is 1 to 23 using a 24-hour clock, and the valid range for minutes is 0 to 59.
duration *minutes*	Specifies the size of the sliding window (in minutes) during which the subscriber usage is monitored for the first peak time, and optionally for a second peak time when used with the **peak-time2** keyword. The valid range is 60 to 1440. For Cisco cBR Series Converged Broadband Routers, the valid range is 6 to 1440.
avg-rate *rate*	Specifies the average sampling rate in kilobits per second for the specified duration. The valid range is 1 to 400000 kilobits with no default.

duration *offpeak-minutes*	(Optional) Specifies the size of the sliding window during which the subscriber usage is monitored for the remaining offpeak time (time not specified for peak monitoring). Valid range is 60 to 1440 minutes.
avg-rate *offpeak-rate*	Specifies the average sampling rate in kilobits per second for the specified offpeak duration. The valid range is 1 to 400000 kilobits with no default.
peak-time2	(Optional) Specifies the time of day during which monitoring occurs for a second peak time. The time can be specified either in hours or hour:minutes format.
sample-interval *minutes*	Specifies how often (in minutes) the CMTS router should sample a service flow to get an estimate of subscriber usage. The valid range is 1 to 30, with a default value of 15 For Cisco cBR Series Converged Broadband Routers, the valid range is 1 to 30.
penalty *minutes* **penalty-period** *minutes*	(Optional) Specifies the period (in minutes) during which a cable modem can be under penalty. The range is 1 to 10080. Specifies the period for which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile. The range is from 1 to 10080.
downstream	Specifies monitoring of traffic in the downstream direction.
upstream	Specifies monitoring of traffic in the upstream direction.
enforce	(Optional) Specifies that the enforce-rule QoS profile should be applied automatically if a user violates their registered QoS profile.

Command Default

Weekend monitoring is disabled. The only default value for the **weekend peak-time1** command is the 15-minute sample interval.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD2	The **minute-level granularity (hh:mm) for weekend peak-time1 and peak-time2 duration, and the penalty** keyword option were added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.
IOS-XE 3.17.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines



Note This command is applicable only after the monitoring-basics command is configured with the keyword **peak-offpeak**.

The **weekend peak-time1** command is similar to the **peak-time1** command for subscriber traffic monitoring. Use the **weekend peak-time1** command when you want to configure different peak and offpeak monitoring parameters for subscribers on weekends.

This command can only be used when you have already configured the **duration** or **peak-time1** commands as weekday monitoring conditions for an enforce-rule.

The **penalty** duration, which is configured using the **weekend peak-time1** command, is unique to weekends, and takes precedence over the global penalty duration configured using the penalty-period command.

Examples

The following example shows configuration of two peak monitoring windows on the weekend, with the first monitoring period beginning at 8:00 A.M. for one hour and the second monitoring period beginning at 8:00 P.M. for one hour, and monitoring at all other times of the weekend for 1-1/2 hours (90 minutes) for downstream traffic. The unique penalty period for both **weekend peaktime1** and **peaktime2** is configured as 60 minutes:

```
Router(enforce-rule)# weekend peak-time1 8 duration 60 avg-rate 10000 peak-time2 20 duration
 60 avg-rate 100 duration 90 avg-rate 20000 sample-interval 20 penalty 60 downstream enforce
```

Related Commands

Command	Description
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
weekend duration	Configures different subscriber monitoring options over weekends on a Cisco CMTS router.
penalty-period	Specifies the period for which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile.
weekend off	Disables peak and offpeak monitoring on weekends on a Cisco CMTS router.

width

To specify width of profile in Hz, use the **width** command in OFDM modulation profile configuration mode. To undo the width assignment, use **no** form of this command.

width *width*

no width

Syntax Description

width	Profile width in Hz.

Command Default

192000000

Command Modes

OFDM modulation profile configuration (config-ofdm-mod-prof)

Command History

Release	Modification
IOS-XE 3.18.0SP	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to specify width of profile in Hz.

The width determines the range of subcarriers that can be assigned specific modulations in lists or ranges using the **assign** command. Regardless of the specified width, each modulation profile has a default modulation range that covers the entire FFT spectrum (204.8 MHz) from subcarrier 0 to 4095 or 8192 depending on spacing. The default modulation is configured using the **assign** command.

Examples

The following example shows how to specify the width:

```
Router# configure terminal
Router(config)# cable downstream ofdm-modulation-profile 21
Router(config-ofdm-mod-prof)# width 24000000
```

Related Commands

Command	Description
cable downstream ofdm-modulation-profile	Define the OFDM modulation profile on the OFDM channel.
description (OFDM modulation profile)	Specify a user defined description for the profile up to 64 characters.
assign	Assign modulations to subcarriers.
subcarrier-spacing	Specify the spacing for specific subcarriers configured in this profile.
start-frequency	(Optional) Specify the starting frequency associated with the first configurable subcarrier in the profile determined by the width.



Cisco CMTS Router ROM Monitor Commands

- alias, on page 3258
- boot, on page 3260
- break, on page 3264
- confreg, on page 3266
- cont, on page 3269
- context, on page 3271
- cpu_card_type, on page 3273
- dev, on page 3274
- dir, on page 3275
- dis, on page 3276
- frame, on page 3278
- help, on page 3280
- history, on page 3282
- meminfo, on page 3284
- repeat, on page 3285
- reset, on page 3287
- set, on page 3289
- show_spd, on page 3291
- stack, on page 3293
- sync, on page 3295
- sysreset, on page 3297
- unalias, on page 3299
- unset, on page 3301

alias

To define an alias to be used at the ROM monitor prompt, use the **alias** command in ROM monitor mode.

alias [*name=value*]

Syntax Description

[*name=value*]	(Optional) Specifies the name of the alias to be defined and its corresponding command string. If the *value* parameter includes spaces, you must include the string within double quotes.

Command Default

If no arguments are given, displays the aliases that are currently defined.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

Aliasing allows you to abbreviate commands or to set up a command so that it is automatically run with certain options. The ROM monitor's [*name=value*]**alias** function is based on the syntax used in the Korn shell on Unix systems.

Normally, only the first word at the ROM monitor prompt is checked for an alias. However, when you define an alias that contains a space as its last character, the ROM monitor also checks the next word at the ROM monitor prompt for an alias.

Note If an alias contains any spaces, the entire command must be enclosed within quotes when you define it with the **alias** command. To create an alias for multiple commands, separate the commands with a semicolon (;) delimiter.

Tip Use the **unalias** command to delete an alias.

Examples

The following example shows how to display the currently defined aliases:

```
rommon 13 > alias

r=repeat
h=history
?=help
b=boot
ls=dir
i=reset
k=stack
rommon 14 >
```

The following example defines an alias named “cpuinfo” that executes three separate CPU-related commands:

```
rommon 31 > alias cpuinfo="cpu_card_type;meminfo;context"

rommon 32 >
```

The following example shows how to define an alias **dird** that lists the file contents of the Flash Disk in the disk0 slot:

```
rommon 18 > alias dird="dir disk0:"

rommon 19 > alias

r=repeat
h=history
?=help
b=boot
ls=dir
i=reset
k=stack
dird=dir disk0:
rommon 20 >
```

Related Commands

Command	Description
sync	Writes the current values of aliases and monitor environment variables to Flash memory.
unalias	Deletes a currently-defined alias.

boot

To boot a router manually, use the **boot** command in ROM monitor mode.

boot [**-xv**]
boot [**-xv**] [*device:*] [*imagename*]
boot [**-xv**] *filename* [*tftp-ip-address*]
boot [**-xv**] *tftp://server/path/filename*

Syntax Description

x	(Optional) Loads the specified image into the router's memory but does not execute it.
v	(Optional) Enables verbose mode to display debugging information as the image is loaded and executed.
device:	(Optional) Specifies that the router should boot an image on the specified device. If not specified, the router boots from the default memory device.
imagename	(Optional) Specifies the filename for the image to be booted and loaded. If not specified, the router boots the first file on the specified device. **Note** When specifying both a *device:* and *imagename* , do not put any spaces between the two arguments.
filename	Specifies the path and filename for the image that the router should download from a Trivial File Transfer Protocol (TFTP) server. **Note** You must specify the full path for the desired file, as it exists on the TFTP server.
tftp-ip-address	(Optional) Specifies the IP address for the TFTP server from which the router should download and boot the specified *filename* . If not specified, the router sends a TFTP request to the IP broadcast address of 255.255.255.255 and uses the first TFTP server that responds.
tftp://server/path/filename	Specifies the complete TFTP URL for the filename to be downloaded and run. This URL should specify the fully-qualified *server* name (or IP address), full *path* on the TFTP server, and *filename* to be downloaded.

Command Default

If specified without any options, the **boot** command loads and executes the first file on the default memory device. If a *device* is specified without a *filename* , the **boot** command loads and executes the first file on that device. If a *filename* is specified without a TFTP server IP address, the boot command advertises for a TFTP server using the IP broadcast address of 255.255.255.255 and uses the first TFTP server that responds.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.

Release	Modification
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **boot** command allows a network administrator to boot the router from the ROM monitor (ROMMON) prompt. The router can enter ROMMON for the following reasons:

- The administrator interrupted the boot sequence or Cisco IOS software by pressing the BREAK signal.
- The router's configuration register is set to boot into ROMMON (0x00).
- The router entered ROMMON because of a software exception or error.

The **boot** command allows the administrator to continue the boot process or to load a new software image.



Note To upgrade the router to a new Cisco IOS software image, you can use either the **boot** command in ROMMON mode or the **boot system** commands in global configuration mode.

Boot Changes in Cisco IOS Release 12.2

Cisco IOS Release 12.2 changed the behavior of the ROM monitor (ROMMON) during the bootup sequence. Previously, users could issue the break signal during the bootup sequence to break into ROMMON, and then immediately boot a new Cisco IOS image using the **boot** command.

This behavior is no longer allowed when the router is using a boot image that is based on Cisco IOS Release 12.2, because interrupting the boot process could leave the hardware and software registers in an unknown state. Instead, use the following procedure when using a router with a Cisco IOS Release 12.2 boot image:

1. At the router's console prompt, send a BREAK signal to interrupt the boot process and enter ROMMON.
2. Set the configure register to boot into ROMMON by giving the **confreg 0x0** command.
3. Use the **reset** command to reset the NPE and to boot into ROMMON. This ensures a clean boot into ROMMON, with all registers set to a known state.
4. Set the configure register to boot an IOS image by giving the **confreg 0x2102** command.
5. Use the **boot** command to boot the desired Cisco IOS image.

Examples

The following example shows how to boot the router using the first file in the default device:

```
rommon 1 > boot

Self decompressing the image :
################################################################################################
[OK]
(Software image boots...)
Router>
```

The following example shows how to specify that the router should download and boot the file named "newimage.bin" in the subdirectory named "ubrimages" on the TFTP server with the IP address of 10.10.10.31:

```
rommon 45> boot tftp://10.10.10.31/ubrimages/newimage.bin

Self decompressing the image :
################################################################################################
[OK]
(Software image boots...)
Router>
```

The following example shows how to use the alternate syntax to specify that the router should download and boot the file named newimage.bin on the TFTP server with the IP address of 10.10.10.31:

```
rommon 45> boot newimage.bin 10.10.10.31

Self decompressing the image :
################################################################################################
[OK]
(Software image boots...)
Router>
```

The following example shows the new ROMMON boot procedure that is required when using a Cisco IOS Release 12.2 (or later) boot image:

```
Router-NPE#
telnet> send brk

*** System received an abort due to Break Key ***
signal= 0x3, code= 0x0, context= 0x6208b290
PC = 0x606b5ab0, SP = 0x80007e00, RA = 0x606d2370
Cause Reg = 0xffffffff, Status Reg = 0x3400ff03
rommon 2 > boot flash:newiosimage.bin

Please reset before booting
rommon 3 > confreg 0x0

You must reset or power cycle for new config to take effect
rommon 4 > reset

System Bootstrap, Version 12.2(11)BC3a, RELEASE SOFTWARE (fc1)
Copyright (c) 2002 by cisco Systems, Inc.
UBR7200 platform with 524288 Kbytes of main memory
rommon 1 > boot flash:newiosimage.bin

Self decompressing the image :
################################################################################################
[OK]
(Software image boots...)
Router>
```

Related Commands

Command	Description
break	Sets or clears the debugger breakpoint.

Command	Description
cont	Continues the execution of the Cisco IOS software image that has been interrupted by a BREAK or debugger command.
reset	Reinitializes the ROM monitor and return it to a known state.
sync	Writes the current values of aliases and monitor environment variables to Flash memory.
sysreset	Displays the return information from the system image that was last booted.
tftpdnld	Downloads a file from a Trivial File Transfer Protocol (TFTP) server.

break

To set or clear the debugger breakpoint, use the **break** command in ROM monitor mode.

break [**-s** *address* | **-c**]

Syntax Description

-s *address*	(Optional) Sets the breakpoint to the specified *address* in memory. The *address* must be specified in hexadecimal.
-c	(Optional) Clears the currently-defined breakpoint.

Command Default

If no arguments are given, the command displays the currently-defined breakpoint.

Command Modes

ROM monitor

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The ROM monitor supports one breakpoint. If set, the processor runs normally, but when its program counter reaches the breakpoint address, the system breaks into ROM monitor mode. You can examine memory locations or register contents, and then continue normal program execution by using the **cont** command.

Examples

The following example shows how to set a breakpoint so that when the processor breaks into ROM monitor mode when its program counter reaches 0xbfc02708:

```
rommon 37 > break -s 0xbfc02708
breakpoint set to 0xbfc02708
rommon 38 >
```

The following example shows how to display the currently-defined breakpoint:

```
rommon 38 > break

breakpoint set to 0xbfc02708
rommon 39 >
```

The following example shows how to clear the currently-defined breakpoint:

```
rommon 39 > break -c
```

```
breakpoint is cleared
rommon 40 >
```

Related Commands

Command	Description
boot	Boots the router manually.
cont	Continues the execution of the Cisco IOS software image that has been interrupted by a BREAK or debugger breakpoint.

confreg

To change the value of the router's configuration register, use the **confreg** command in ROM monitor mode.

confreg [*value*]

Syntax Description

value	(Optional) New value for the configuration register, expressed as a 16-bit hexadecimal value. The valid range for *value* is 0x0 to 0xFFFF. If *value* is not specified, the command interactively prompts you for the individual register settings.

Command Default

0x2102 (boots the Cisco IOS software image and allows the use of the BREAK signal to enter ROMMON)

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The configuration register determines the router's behavior when it boots. Typically, an administrator changes the configuration register so that it boots either into ROMMON mode or boots a Cisco IOS software image, but other options are also available.

If given without an argument, the **confreg** command interactively prompts you for the new values of the individual register settings, using English descriptions. You can either keep the current settings unchanged or change them as desired. The new value of the configuration register is written into the router's nonvolatile Flash memory (NVRAM) immediately, but does not take effect until you reset the router.

If you specify an argument with the **confreg** command, it must be a 16-bit hexadecimal value in the following format:

Table 279: Configuration Register Bit Field Descriptions

Bit	Description
15	If set, enables the router's diagnostic mode (for example, 0x8000).
14	If set, uses the network number in IP broadcasts (for example, 0x4000).
13	If set, allows the router to fall back into ROMMON mode if the boot procedure fails. If not set, the router attempts each valid **boot** command (as specified by bits 3–0) for a total of 5 times each, until one of the commands is successful (for example, 0x2000).

Bit	Description
12–11	Defines the speed, in bps, for the console port: 00 = 0x0000 = 9600 01 = 0x0800 = 4800 10 = 0x1000 = 1200 11 = 0x1800 = 2400 **Note** On the Cisco CMTS routers, the console port speed is fixed at 9600 bps and cannot be changed.
10	If set, uses an IP broadcast address that consists of all ones (for example, 0x0400).
9	If set, disables the secondary bootstrap (for example, 0x0200).
8	If set, the router enables the BREAK key, allowing users to break into ROMMON during the boot process (for example, 0x0100).
7	Unused on the Cisco CMTS routers.
6	If set, the router ignores the configuration file in its Flash memory. This is typically done when the user has forgotten the router's enable password (for example, 0x0040).
5–4	Unused on the Cisco CMTS routers.
3–0	Defines the router's boot behavior: 0x0000 = Boots to the ROMMON prompt 0x0001 = Boots the ROMMON boot helper software (first file in bootflash:) 0x0002 to 0x000F = Boots a Cisco IOS software image, based on the values of the router's boot variables. Each **boot system** command in the configuration file is tried until a valid image is booted.

For example, for normal operations the configuration register is set to 0x2102, which sets bit 13 (allows the router to fall into ROMMON mode if the boot fails), bit 8 (allows the user to break into ROMMON), and bit 1 (boots a Cisco IOS software image). Bits 11 and 12 are cleared, which sets the console port to 9600 bps.

The following are the most commonly-used configuration register values:

- 0x0 = Boot into ROMMON.
- 0x2002 = Normal boot for standard operations, but the BREAK signal cannot be used to break into ROM monitor mode.
- 0x2102 = Normal boot for standard operations, enabling the BREAK signal.
- 0x2142 = Normal boot but the router ignores the configuration file in Flash memory.



Tip The **confreg** command is identical in function to the **config-register** command that is available in global configuration mode.

Examples

The following example shows how to change the configuration register by using the English prompts. In this example, the only change is to have the router boot the Cisco IOS software image instead of entering ROMMON mode:

```
rommon 1 > confreg

    Configuration Summary
enabled are:
```

```
break/abort has effect
console baud: 9600
boot: the ROM Monitor
do you wish to change the configuration? y/n  [n]:  y

enable  "diagnostic mode"? y/n  [n]:
enable  "use net in IP bcast address"? y/n  [n]:
enable  "load rom after netboot fails"? y/n  [n]:
enable  "use all zero broadcast"? y/n  [n]:
disable "break/abort has effect"? y/n  [n]:
enable  "ignore system config info"? y/n  [n]:
change console baud rate? y/n  [n]:
change the boot characteristics? y/n  [n]:  y

enter to boot:
 0 = ROM Monitor
 1 = the boot helper image
 2-15 = boot system
    [0]:  2

    Configuration Summary
enabled are:
break/abort has effect
console baud: 9600
boot: image specified by the boot system commands
      or default to: cisco2-C10000
do you wish to change the configuration? y/n  [n]: n

         You must reset or power cycle for new config to take effect.
rommon 2 >
```



Note After changing the configuration register in interactive mode, the system displays the new values and prompts you again as to whether you want to change them. If the values are correct, answer **no** and the system returns you to the ROMMON prompt. If you made any changes, the system reminds you that you must reset or power cycle the router before the new configuration register takes effect.

The following example shows how to set the configuration register to the typical value of 0x2102, so that it boots a Cisco IOS software image:

```
rommon 7 > confreg 0x2102

         You must reset or power cycle for new config to take effect.
rommon 8 >
```

Related Commands

Command	Description
boot	Boots the router manually.

cont

To continue the execution of the Cisco IOS software image that has been interrupted by a BREAK signal or debugger breakpoint, use the **cont** command in ROM monitor mode.

cont [*address*]

Syntax Description

address	(Optional) Specifies the address in memory at which the router should continue execution. If *address* is not specified, the command continues execution at the address currently stored in the program counter (PC) register. **Caution** Do not use the *address* option unless instructed to do so by Cisco TAC engineers.

Command Default

If given without any arguments, the command continues execution at the address currently stored in the processor's program counter (PC) register.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **cont** command typically is used when a user has interrupted the operation of the Cisco IOS software by using the BREAK signal to enter ROM monitor mode, and then wants to continue with the original Cisco IOS software image. This command can also be used to continue program execution when the user uses the BREAK signal to interrupt the Cisco IOS software boot procedure, or has used the **break** command to set a debug breakpoint.

Examples

In the following example, the **cont** command continues executing the Cisco IOS software image, after the user has interrupted the software by sending a BREAK signal:

```
Router#
telnet> send brk
*** System received an abort due to Break Key ***
signal= 0x3, code= 0x0, context= 0x6208b290
PC = 0x606b5ab0, SP = 0x80007e00, RA = 0x606d2370
Cause Reg = 0xffffffff, Status Reg = 0x3400ff03
rommon 5 > cont
```

```
Router#
```

Related Commands

Command	Description
boot	Boots the router manually.
break	Sets or clears the debugger breakpoint.
reset	Reinitializes the ROM monitor and return it to a known state.
sysreset	Displays the return information from the system image that was last booted.

context

To display the processor context at the time of the most recent fault or exception, use the **context** command in ROM monitor mode.

context

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

When the processor fault or exception occurs, the ROM monitor preserves the processor context at the time of the fault. The **context** command displays this processor context, which includes information about the kernel registers and the process mode of the booted image (if available).

Examples

The following example shows how to display the CPU context at the time of the most recent fault or exception:

```
rommon 21 > context

Kernel Level Context:
 Reg       MSW        LSW      | Reg       MSW        LSW
------  ---------- ---------- | -----   ---------- ----------
zero   : 00000000   00000000  | s0     : ffffffff   80018a90
AT     : 00000000   00000050  | s1     : 00000000   00000002
v0     : ffffffff   fffffffc  | s2     : 00000000   00000006
v1     : 00000000   02000000  | s3     : ffffffff   80007798
a0     : ffffffff   80018a90  | s4     : 00000000   00000002
a1     : 00000000   00000002  | s5     : 00000000   000000ec
a2     : ffffffff   80007798  | s6     : 00000000   00000002
a3     : 00000000   00000002  | s7     : 00000000   00000000
t0     : ffffffff   ba000004  | t8     : ffffffff   800268b0
t1     : 00000000   00000002  | t9     : 00000000   00000000
t2     : 00000000   00000000  | k0     : 00000000   3040f001
```

```
t3     : 00000000   00000020  | k1     : ffffffff   be800014
t4     : 00000000   20642e31  | gp     : 00000000   60336f00
t5     : 00000000   30306153  | sp     : ffffffff   80007728
t6     : 00000000   446e7369  | s8     : 00000000   00000002
t7     : 00000000   206b4453  | ra     : ffffffff   80010570
HI     : 00000000   00000004  | LO     : 00000000   00007a2a
EPC    : ffffffff   80010250  | ErrPC  : ffffffff   bfc00c54
Stat   : 3040f003             | Cause  : 00008000
context: process context is not valid
rommon 22 >
```

Related Commands

Command	Description
boot	Boots the router manually.
sysreset	Displays the return information from the system image that was last booted.

cpu_card_type

To display the type of processor card that is installed in the router, use the **cpu_card_type** command in ROM monitor mode.

cpu_card_type

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Examples

The following example shows that the router is using an NPE-225 processor card:

```
rommon 92 > cpu_card_type

CPU card type is NPE-225
rommon 93 >
```

Related Commands

Command	Description
boot	Boots the router manually.
sysreset	Displays the return information from the system image that was last booted.

dev

To list the known storage and memory devices for the router, use the **dev** command in ROM monitor mode.

dev

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Examples

The following example shows how to display the known file systems on a router:

```
rommon 3 > dev
Devices in device table:
        id  name
bootflash:  boot flash
    slot0:  PCMCIA slot 0
    slot1:  PCMCIA slot 1
    disk0:  PCMCIA slot 0
    disk1:  PCMCIA slot 1
    disk2:  PCMCIA slot 2
    eprom:  eprom
rommon 4 >
```



Note The disk2 device is available only on a Cisco uBR7246VXR router using the NPE-G1 processor card.

Related Commands

Command	Description
dir	Lists the files on one of the router's file systems.

dir

To list the files on one of the router's file systems, use the **dir** command in ROM monitor mode.

dir *device:*

Syntax Description

device:	Specific device to be displayed.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Examples

The following example shows how to list the files on the slot0: and bootflash: devices.

```
rommon 40 > dir slot0:

         File size           Checksum   File name
        65 bytes (0x41)       0xb49d       basic.cm
   2229799 bytes (0x220627)   0x469e       uBR7200-k.z

rommon 41 > dir bootflash:

         File size           Checksum   File name
   1378560 bytes (0x150900)   0x6607c732    ubr7200-kboot-mz.122.11.BC3
     16220 bytes (0x3f5c)     0x47e9a02c    bundle.cfg
        76 bytes (0x4c)       0x313b6bb0    config.cm
    189250 bytes (0x2e342)    0xe95da48e    crashinfo_20030515-212829
rommon 42 >
```

Related Commands

Command	Description
dev	Lists the known storage and memory devices for the router.

dis

To disassemble a segment of main memory, use the **dis** command in ROM monitor mode.

dis [*address*] [*num-of-bytes*]

Syntax Description

address	(Optional) Address in main memory at which the disassembly should begin.
num-of-bytes	(Optional) Number of bytes to disassemble.

Command Default

If no arguments are given, the command prompts for the *address* and *num-of-bytes* parameters.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Examples

The following example shows a typical disassembly:

```
rommon 23 > dis 0x60696358 0x20
0x60696358: 1040012b               beq v0, zero, #0x60696808
0x6069635c: 00008821               addu s1, zero, zero
0x60696360: 8e0285d0               lw v0, -31280(s0)
0x60696364: 14400006               bne v0, zero, #0x60696380
0x60696368: 00002021               addu a0, zero, zero
0x6069636c: 0c1a2d93               jal 0x6068b64c
0x60696370: 00002021               addu a0, zero, zero
0x60696374: 8e0285d0               lw v0, -31280(s0)
rommon 24 >
The following example shows the command's interactive mode being used to perform the same
disassembly:
rommon 25 > dis

Enter in hex the start address [0x0]:  0x60696358

Enter in hex the test size or length in bytes [0x0]:  0x20

0x60696358: 1040012b               beq v0, zero, #0x60696808
0x6069635c: 00008821               addu s1, zero, zero
```

```
0x60696360: 8e0285d0                lw v0, -31280(s0)
0x60696364: 14400006                bne v0, zero, #0x60696380
0x60696368: 00002021                addu a0, zero, zero
0x6069636c: 0c1a2d93                jal 0x6068b64c
0x60696370: 00002021                addu a0, zero, zero
0x60696374: 8e0285d0                lw v0, -31280(s0)
rommon 26 >
```

The dis command displays an exception if you attempt to disassemble a non-existent address or if you specify an argument that the system interprets as a non-existent address. For example, the following command shows the **dis disk0:** command being given. The system interprets the **disk0:** argument as a memory address of 0xd, and because this address does not exist, displays the exception message:

```
rommon 3 > dis disk0:

Warning : address not word aligned, 0xd
*** TLB (Load/Fetch) Exception ***
Access address = 0xc
PC = 0xbfc11074, Cause Reg = 0x8, Status Reg = 0x3040d003
monitor: command "dis" aborted due to exception
rommon 4 >
```

Related Commands

Command	Description
frame	Displays an individual stack frame.
stack	Displays a stack trace.

frame

To display an individual stack frame, use the **frame** command in ROM monitor mode.

frame [*number*]

Syntax Description

number	(Optional) Number of the stack frame to be displayed. The default is 0 (the most current frame).

Command Default

Displays stack frame 0.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **frame** command displays a particular stack frame. Use the **stack** command to list the available stack frames and their frame numbers.

Examples

The following example shows the **frame** command being used to display the details of an individual frame displayed by the **stack** command:

```
rommon 5 > stack 6

Stack trace:
PC = 0x02004adc
Frame 00: FP = 0x02003938    RA = 0x02005f2a
Frame 01: FP = 0x02003948    RA = 0x02005df0
Frame 02: FP = 0x02003960    RA = 0x020050ee
Frame 03: FP = 0x02003994    RA = 0x02004034
Frame 04: FP = 0x02003b00    RA = 0x00012ca6
Frame 04: FP = 0x02003b34    RA = 0x020a703c
rommon 6 > frame 2

         Frame 02: FP = 0x02003960    RA = 0x020050ee
         at 0x02003968 (fp + 0x08) = 0x02004f8d
         at 0x0200396c (fp + 0x0c) = 0x0200f390
         at 0x02003970 (fp + 0x10) = 0x02006afc
         at 0x02003974 (fp + 0x14) = 0xc0a82983
         at 0x02003978 (fp + 0x18) = 0x02003a7e
```

```
          at 0x0200397c (fp + 0x1c) = 0x02002630
          at 0x02003980 (fp + 0x20) = 0x00000000
          at 0x02003984 (fp + 0x24) = 0x02000000
          at 0x02003988 (fp + 0x28) = 0x0200c4a4
          at 0x0200398c (fp + 0x2c) = 0x0200f448
rommon 7 >
```

Related Commands

Command	Description
boot	Boots the router manually.
dis	Disassembles a segment of main memory.
stack	Displays a stack trace.
sysreset	Displays the return information from the system image that was last booted.

help

To display a short list of the commands that are available at the ROM monitor prompt, use the **help** command in ROM monitor mode.

help

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **help** command displays a list of available ROM monitor commands, along with a brief description of each. To display additional details for a specific command, enter the command name followed by the **-?** option.

Examples

The following example shows a typical display of the **help** screen:

```
rommon 12 > help
alias               set and display aliases command
boot                boot up an external process
break               set/show/clear the breakpoint
confreg             configuration register utility
cont                continue executing a downloaded image
context             display the context of a loaded image
cpu_card_type       display CPU card type
dev                 list the device table
dir                 list files in file system
dis                 disassemble instruction stream
frame               print out a selected stack frame
help                monitor builtin command help
history             monitor command history
meminfo             main memory information
repeat              repeat a monitor command
reset               system reset
set                 show all monitor variables
show_spd            show all SPD data
```

```
stack               produce a stack trace
sync                write monitor environment to NVRAM
sysret              print out info from last system return
unalias             unset an alias
unset               unset a monitor variable
rommon 13 >
```

The following example shows how to display additional help for the **alias** command:

```
rommon 14 > alias -?

usage: alias [name=value]
rommon 15 >
```

Related Commands

Command	Description
boot	Boots the router manually.

history

To display the last 16 commands given at the ROM monitor prompt, use the **history** command in ROM monitor mode.

history

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The ROM monitor keeps a record of the last commands given at the ROM monitor prompt (up to 16), similar to the way this is done with the Korn shell. Use the **history** command to display these commands, and the **repeat** command to repeat them one or more times.

Tip When you use an **alias**, the **history** list includes the alias and not the actual commands that were executed.

Note The **repeat** command is not added to the history list.

Examples

The following example shows how to reset the ROM monitor and return it to a known state:

```
rommon 9 > history

1   boot sysfiles/ubr10k-k8p6-mz.12211BC3
2   dev
3   dir disk0:
4   confreg
5   confreg 0x00
```

```
6   cont
7   break -c
8   break
9   history
rommon 10 >
```

Related Commands

Command	Description
alias	Defines an alias to be used at the ROM monitor prompt.
boot	Boots the router manually.
repeat	Repeats a particular ROM monitor command.

meminfo

To display information about the available range of main memory and Flash memory, use the **meminfo** command in ROM monitor mode.

meminfo

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **meminfo** command displays the size of available main memory, its starting address, the size of available packet memory, and the size of nonvolatile Flash memory.

Examples

The following example shows how to display information about the current memory usage:

```
rommon 9 > meminfo

Main memory size: 512 MB.
Available main memory starts at 0xa000e000, size 0x7ffc8 KB
NVRAM size: 0x80000
rommon 10 >
```

Related Commands

Command	Description
boot	Boots the router manually.
sysreset	Displays the return information from the system image that was last booted.

repeat

To repeat a particular ROM monitor command from the history list, use the **repeat** command in ROM monitor mode.

repeat [*number* [*count*] | *string* [*count*]]

Syntax Description

number	(Optional) Specifies the number, as listed in the **history** command, of the command to be repeated.
string	(Optional) Specifies a string to be compared against the commands in the history list. The most recent command that matches the *string* is repeated. If the *string* includes spaces, it must be enclosed within quotes.
count	(Optional) Specifies the number of times the command should be executed. The default is 1.

Command Default

If given without any arguments, repeats the previous command once.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated nto Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **repeat** command repeats one of the commands in the history list (which can contain up to 16 commands). You can specify the command to be repeated by its history number (as shown by the **history** command) or by a string that will match the command.

If you do not give any arguments with the command, it repeats the last command in the history list once.

Note The **repeat** command is not added to the history list, so you cannot repeat the **repeat** command. You also cannot include the **repeat** command on a command line that has multiple commands separated by a semicolon delimiter.

Examples

The following example shows how to use the repeat command to execute one of the commands in the history list:

```
rommon 9 > history

1   boot sysfiles/ubr10k-k8p6-mz.12211BC3
2   dev
3   dir disk0:
4   confreg
5   confreg 0x00
6   cont
7   break -c
8   break
9   history
rommon 10 > repeat 9
1   boot sysfiles/ubr10k-k8p6-mz.12211BC3
2   dev
3   dir disk0:
4   confreg
5   confreg 0x00
6   cont
7   break -c
8   break
9   history
10  history
rommon 11 >
```

Related Commands

Command	Description
boot	Boots the router manually.
history	Displays the last 16 commands given at the ROM monitor prompt.
sysreset	Displays the return information from the system image that was last booted.

reset

To reinitialize the ROM monitor and return it to a known state, use the **reset** command in ROM monitor mode.

reset [**-s**]

Syntax Description

-s	(Optional) Saves the current environment (environment variables and aliases) to nonvolatile memory before performing the reset.

Command Default

If given without any arguments, resets all environment variables and aliases to their initialized states.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command ws integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **reset** command returns the ROM monitor to its initial state, without requiring a complete system reboot by performing a warm reset. This is useful if you have been setting and unsetting registers and variables, and no longer know whether the system is in a stable state.

If you specify the **-s** option, the system saves the current environment variables and aliases to nonvolatile memory before resetting the ROM monitor, so as to preserve their current values.

Examples

The following example shows how to reset the ROM monitor and return it to a known state:

```
rommon 59 > reset

System Bootstrap, Version 12.0(9r)SL2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
Reset Reason Register = RESET_REASON_RESET_REG (0x76)
C10000 platform with 524288 Kbytes of main memory
rommon 1 >
```

Related Commands

Command	Description
boot	Boots the router manually.

Command	Description
sysreset	Displays the return information from the system image that was last booted.

set

To display the contents of the currently-defined environment variables, use the **set** command in ROM monitor mode.

set

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The set command displays the environment variables that are currently defined in the ROM monitor. Variables are defined at the ROM monitor prompt in a manner similar to that of the Korn shell, by specifying *variable =value* .



Tip Use the **unset** command to delete a monitor variable.

Examples

The following example shows how to display the values of the currently defined monitor variables:

```
rommon 13 > set

PS1=rommon ! >
RET_2_RTS=17:28:46 PST Tue Oct 12 1993
BSI=0
RET_2_RUTC=
?=1
rommon 14 >
```

The following example shows the PS1 variable (which defines the ROM monitor prompt) being changed, and the **set** command displaying the new value:

```
rommon 12 > PS1="Rommon-CMTS ! >"

Rommon-CMTS 13 > set

PS1=Rommon-CMTS ! >
RET_2_RTS=17:28:46 PST Tue Oct 12 1993
BSI=0
RET_2_RUTC=
?=1
Rommon-CMTS 14 >
```

Related Commands

Command	Description
sync	Writes the current values of aliases and monitor environment variables to Flash memory.
tftpdnld	Downloads a file from a Trivial File Transfer Protocol (TFTP) server.
unset	Deletes the current contents of a monitor environment variable.

show_spd

To display the contents of the processor's Serial Presence Detect (SPD) device (an electrically erasable programmable read-only memory (EEPROM) device), use the **show_spd** command in ROM monitor mode.

show_spd

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **show_spd** command displays the contents of the processor card's SPD/EEPROM memory device. This information is typically useful only to Cisco TAC engineers.



Note The **show_spd** command displays a large volume of data. Enable the capture buffer on your terminal program so that you can preserve this data and review it later.

Examples

The following example shows how to display the SPD data (only a portion of the command's display is shown):

```
rommon 15 > show_spd

DIMM 0 SPD specifications:
byte 0 - 0x80000000
byte 1 - 0x8000000
byte 2 - 0x4000000
...
byte 125 - 0xff000000
byte 126 - 0x64000000
byte 127 - 0xad000000
DIMM 1 SPD specifications:
```

```
byte 0 - 0xff000000
byte 1 - 0xff000000
byte 2 - 0xff000000
...
byte 125 - 0xff000000
byte 126 - 0xff000000
byte 127 - 0xff000000
DIMM 2 SPD specifications:
byte 0 - 0xff000000
byte 1 - 0xff000000
byte 2 - 0xff000000
...
byte 125 - 0xff000000
byte 126 - 0xff000000
byte 127 - 0xff000000
DIMM 3 SPD specifications:
byte 0 - 0xff000000
byte 1 - 0xff000000
byte 2 - 0xff000000
...
byte 125 - 0xff000000
byte 126 - 0xff000000
byte 127 - 0xff000000
DIMM 0: Tclk cycle time = 12, Tac access from clk = 7
DIMM 0: Trp precharge = 20
DIMM 0: Trcd RAS to CAS = 20
DIMM 1: Tclk cycle time = 15, Tac access from clk = 15
DIMM 1: Tclk = 15 may NOT support CL = 2
DIMM 1: Tac = 15 may NOT support CL = 2
DIMM 1: Trp precharge = 255
DIMM 1: Trp = 255 CANNOT support SRASPrchg = 2
DIMM 1: Trcd RAS to CAS = 255
DIMM 1: Trcd = 255 CANNOT support SRAStoSCAS = 2
DIMM 2: Tclk cycle time = 15, Tac access from clk = 15
DIMM 2: Tclk = 15 may NOT support CL = 2
DIMM 2: Tac = 15 may NOT support CL = 2
DIMM 2: Trp precharge = 255
DIMM 2: Trp = 255 CANNOT support SRASPrchg = 2
DIMM 2: Trcd RAS to CAS = 255
DIMM 2: Trcd = 255 CANNOT support SRAStoSCAS = 2
DIMM 3: Tclk cycle time = 15, Tac access from clk = 15
DIMM 3: Tclk = 15 may NOT support CL = 2
DIMM 3: Tac = 15 may NOT support CL = 2
DIMM 3: Trp precharge = 255
DIMM 3: Trp = 255 CANNOT support SRASPrchg = 2
DIMM 3: Trcd RAS to CAS = 255
DIMM 3: Trcd = 255 CANNOT support SRAStoSCAS = 2
rommon 16 >
```

Related Commands

Command	Description
sync	Writes the current values of aliases and monitor environment variables to Flash memory.
unalias	Deletes a currently-defined alias.

stack

To display a stack trace, use the **stack** command in ROM monitor mode.

stack [*number*]

Syntax Description

number	(Optional) Number of stack frames to display. The default is 5 frames.

Command Default

Displays 5 stack frames

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **stack** command displays a stack trace of the most recently booted software image. This trace includes the value of the program counter and the selected number of frames from the kernel stack and process stack (if available) from that software image.

Tip To display details for an individual frame stack, use the **frame** command.

Examples

The following example shows how to display a stack trace with 6 frames:

```
rommon 5 > stack 6

Stack trace:
PC = 0x02004adc
Frame 00: FP = 0x02003938    RA = 0x02005f2a
Frame 01: FP = 0x02003948    RA = 0x02005df0
Frame 02: FP = 0x02003960    RA = 0x020050ee
Frame 03: FP = 0x02003994    RA = 0x02004034
Frame 04: FP = 0x02003b00    RA = 0x00012ca6
Frame 04: FP = 0x02003b34    RA = 0x020a703c
rommon 6 >
```

The following example shows how to display a stack trace with the default of 5 frames, when a process stack is available:

```
rommon 21 > stack

Kernel Level Stack Trace:
Initial SP = 0x61bb4d30, Initial PC = 0x606931b0, RA = 0x6067bca0
Frame 0 : FP= 0x61bb4d30, PC= 0x606931b0,   0 bytes
Frame 1 : FP= 0x61bb4d30, PC= 0x6067bca0,  24 bytes
Frame 2 : FP= 0x61bb4d48, PC= 0x6068db30,  48 bytes
Frame 3 : FP= 0x61bb4d78, PC= 0x6069157c,  32 bytes
Frame 4 : FP= 0x61bb4d98, PC= 0x606905e0,  88 bytes
Process Level Stack Trace:
Initial SP = 0x80007e08, Initial PC = 0x60696358, RA = 0x60699080
Frame 0 : FP= 0x80007e08, PC= 0x60696358, 192 bytes
Frame 1 : FP= 0x80007ec8, PC= 0x606939d0,  56 bytes
Frame 2 : FP= 0x80007f00, PC= 0x60008c94,  32 bytes
Frame 3 : FP= 0x80007f20, PC= 0x80008ae0,  32 bytes
Frame 4 : FP= 0x80007f40, PC= 0x80008840, 128 bytes
rommon 22 >
```

Related Commands

Command	Description
boot	Boots the router manually.
dis	Disassembles a segment of main memory.
frame	Displays an individual stack frame.
sysreset	Displays the return information from the system image that was last booted.

sync

To write the current values of aliases and monitor environment variables to Flash memory, use the **sync** command in ROM monitor mode.

sync

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **sync** command writes the current values of the monitor environment variables and aliases to Flash memory so that they are read on the next reset. If you do not do this, all variables and aliases are deleted upon reset and replaced with the default values.

Examples

The following example shows how to synchronize the monitor variables and aliases:

```
rommon 39 > sync

rommon 40 >
```

Related Commands

Command	Description
alias	Defines an alias to be used at the ROM monitor prompt.
boot	Boots the router manually.
set	Displays the currently-defined monitor environment variables.
sysreset	Displays the return information from the system image that was last booted.
unalias	Deletes a currently-defined alias.

Command	Description
unset	Deletes the current contents of a monitor environment variable.

sysreset

To display information about the system image that was last booted, use the **sysreset** command in ROM monitor mode.

sysreset

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **sysreset** command displays the information about the last system image that was booted and then terminated. This includes the reason for why the last image ended its execution, the values of the program counter and error address registers when the program ended execution, and a stack trace holding the last eight frames. Any exception information is also shown.

Examples

The following example shows a typical display from the **sysreset** command:

```
rommon 22 > sysreset

System Return Info:
count: 19,  reason: user reload
pc:0x6053059c,  error address: 0x0
Stack Trace:
FP: 0x6558b0d0, PC: 0x6053059c
FP: 0x6558b0d0, PC: 0x605163a4
FP: 0x6558b0e8, PC: 0x60535b84
FP: 0x6558b170, PC: 0x60488c50
FP: 0x6558b268, PC: 0x60474aa8
FP: 0x6558b2c8, PC: 0x6014d5d0
FP: 0x6558b2e8, PC: 0x60487928
FP: 0x6558b378, PC: 0x604fe80c
rommon 23 >
```

Related Commands

Command	Description
boot	Boots the router manually.
reset	Reinitializes the ROM monitor and return it to a known state.

unalias

To delete a currently-defined alias, use the **unalias** command in ROM monitor mode.

unalias *name* [*name2 name3 . . .*]

Syntax Description

name	Specifies the alias to be deleted.
name2 name3 ...	(Optional) Specifies additional aliases to be deleted.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **unalias** command deletes one or more aliases that you have previously defined for the ROM monitor using the **alias** command.

Examples

The following example shows how to delete one alias:

```
rommon 13 > unalias dird
rommon 14 >
```

The following example shows three aliases being deleted:

```
rommon 20 > unalias alias1 alias2 alias3

rommon 21 >
```

The following example shows the error message that is displayed when you try to delete an alias that does not exist:

```
rommon 11 > unalias gobbledegook
```

```
unalias: "gobbledegook" does not exist
rommon 12>
```

Related Commands

Command	Description
alias	Defines an alias to be used at the ROM monitor prompt.
sync	Writes the current values of aliases and monitor environment variables to Flash memory.

unset

To delete the current contents of a monitor environment variable, use the **unset** command in ROM monitor mode.

unset *name* [*name2 name3* **...**]

Syntax Description

name	Specifies the variable to be cleared.
name2 name3 ...	(Optional) Specifies additional variables to be cleared.

Command Default

No default behavior or values.

Command Modes

ROM monitor (>)

Command History

Release	Modification
11.3 NA	This command was introduced on Cisco uBR7200 series routers.
12.1(5)EC	Support was added for Cisco uBR7100 series routers.
12.2(4)BC1	Support was added for the Cisco uBR10012 router. Changes were also made to the boot procedure after breaking into ROMMON to ensure that all hardware and software registers are in a known state before loading the new image.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **unset** command clears the contents of one or more monitor variables that have been defined in the ROM monitor. Variables are defined at the ROM monitor prompt in a manner similar to that of the Korn shell, by specifying *variable =value* .

Examples

The following example shows how to delete a variable named “temp-var”:

```
rommon 13 > unset temp-var

rommon 14 >
```

The following example shows how to delete two variables:

```
rommon 17 > unset temp-var my-var

rommon 18 >
```

Related Commands

Command	Description
set	Displays the currently-defined monitor environment variables.
sync	Writes the current values of aliases and monitor environment variables to Flash memory.