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show service-module serial

To display the performance report for an integrated CSU/DSU, use the **showservice-moduleserial** command in privileged EXEC mode.

show service-module serial *number* [**performance-statistics** [*interval-range*]]

Syntax Description

number	Interface number 0 or 1.
performance-statistics	(Optional) Displays the CSU/DSU performance statistics for the past 24 hours. This keyword applies only to the fractional T1/T1 module.
interval-range	(Optional) Specifies the number of 15-minute intervals displayed. You can choose a range from 1 to 96, where each value represents the CSU/DSU activity performed in that 15-minute interval. For example, a range of 2-3 displays the performance statistics for the intervals two and three.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command applies to the 2- and 4-wire 56/64-kbps CSU/DSU module and FT1/T1 CSU/DSU module. The **performance-statistics** keyword applies only to the FT1/T1 CSU/DSU module.

Examples

The following sample output shows CSU/DSU performance statistics on a Cisco 2524 or Cisco 2525 router for intervals 30 to 32. Each interval is 15 minutes long. All the data is zero because no errors were discovered on the T1 line:

```
Router#
show service-module serial 1 performance-statistics 30-32
Total Data (last 58 15 minute intervals):
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in current interval (131 seconds elapsed):
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 30:
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 31:
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
```

```
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in Interval 32:
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

The following is sample output from the **showservice-moduleserial**command for a fractional T1 line:

```
Router1# show service-module serial 0
Module type is T1/fractional
    Hardware revision is B, Software revision is 1.1 ,
    Image checksum is 0x2160B7C, Protocol revision is 1.1
Receiver has AIS alarm,
Unit is currently in test mode:
    line loopback is in progress
Framing is ESF, Line Code is B8ZS, Current clock source is line,
Fraction has 24 timeslots (64 Kbits/sec each), Net bandwidth is 1536 Kbits/sec.
Last user loopback performed:
    remote loopback
    Failed to loopup remote
Last module self-test (done at startup): Passed
Last clearing of alarm counters 0:05:50
    loss of signal        :    1, last occurred 0:01:50
    loss of frame         :    0,
    AIS alarm             :    1, current duration 0:00:49
    Remote alarm          :    0,
    Module access errors  :    0,
Total Data (last 0 15 minute intervals):
Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
Data in current interval (351 seconds elapsed):
    1466 Line Code Violations, 0 Path Code Violations
    25 Slip Secs, 49 Fr Loss Secs, 40 Line Err Secs, 1 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 49 Unavail Secs
```

The following sample output from the **showservice-moduleserial**command displays the status of a switched 56-KB line:

```
Router1# show service-module serial 1
Module type is 4-wire Switched 56
    Hardware revision is B, Software revision is 1.00,
    Image checksum is 0x44453634, Protocol revision is 1.0
Connection state: active,
Receiver has loss of signal, loss of sealing current,
Unit is currently in test mode:
    line loopback is in progress
Current line rate is 56 Kbits/sec
Last user loopback performed:
    dte loopback
    duration 00:00:58
Last module self-test (done at startup): Passed
Last clearing of alarm counters 0:13:54
    oos/oof               :    3, last occurred 0:00:24
    loss of signal        :    3, current duration 0:00:24
    loss of sealing curren:    2, current duration 0:04:39
    loss of frame         :    0,
    rate adaption attempts:    0,
```

The following shows sample output from the **showservice-moduleserial**command issued on a Cisco 3640 modular access router:

```
Router# show service-module serial 0/1
Module type is 4-wire Switched 56
    Hardware revision is B, Software revision is 1.00,
    Image checksum is 0x42364436, Protocol revision is 1.0
Connection state: Idle
Receiver has no alarms.
CSU/DSU Alarm mask is 0
Current line rate is 56 Kbits/sec
Last module self-test (done at startup): Passed
Last clearing of alarm counters 4d02h
    oos/oof               :    0,
    loss of signal        :    0,
    loss of sealing curren:    0,
    loss of frame         :    0,
    rate adaptation attemp:    0,
```

The following shows sample output from the **showservice-moduleserial**command issued on a Cisco 1605 router:

```
Router# show service-module serial 0
Module type is 4-wire Switched 56
    Hardware revision is B, Software revision is 1.00,
    Image checksum is 0x42364436, Protocol revision is 1.0
Receiver has oos/oof, loss of signal,
CSU/DSU Alarm mask is 4
Current line rate is 56 Kbits/sec
Last module self-test (done at startup): Passed
Last clearing of alarm counters 1d02h
    oos/oof               :    1, current duration 1d02h
    loss of signal        :    1, current duration 1d02h
    loss of frame         :    0,
    rate adaptation attemp:    0,
```

The table below describes the fields displayed by the **showservice-moduleserial**command.

Table 1: show service-module serial Field Descriptions

Field	Description
Module type	CSU/DSU module installed in the router. The possible modules are T1/fractional, 2-wire switched 56-kbps, and 4-wire 56/64-kbps.

<table>
<tr><th>Field</th><th colspan="3">Description</th></tr>
<tr><td>Receiver has AIS alarm</td><td>Alarms detected by the FT1/T1 CSU/DSU module or 2- and 4-wire 56/64-kbps CSU/DSU modules.
Possible T1 alarms are as follows:
• Transmitter is sending remote alarm.
• Transmitter is sending AIS.
• Receiver has loss of signal.
• Receiver has loss of frame.
• Receiver has remote alarm.
• Receiver has no alarms.
Possible switched 56k alarms are as follows:
• Receiver has loss of signal.
• Receiver has loss of sealing current.
• Receiver has loss of frame.
• Receiver has rate adaptation attempts.</td><td>Unit is currently in test mode
Framing
Line Code
Current clock source
Fraction
Net bandwidth
Last user loopback performed
Last module self-test (done at startup): Passed</td><td>Loopback tests are in progress.
Indicates frame type used on the line. Can be extended super frame or super frame.
Indicated line-code type configured. Can be alternate mark inversion (AMI) or binary 8-zero substitution (B8ZS).
Clock source configured on the line, which can be supplied by the service provider (line) or the integrated CSU/DSU module (internal).
Number of time slots defined for the FT1/T1 module, which can range from 1 to 24.
Total bandwidth of the line (for example, 24 time slots multiplied by 64 kbps equals a bandwidth of 1536 kbps).
Type and outcome of the last performed loopback.
Status of the last self-test performed on an integrated CSU/DSU module.</td></tr>
<tr><td>Last clearing of alarm counters</td><td colspan="3">List of network alarms that were detected and cleared on the CSU/DSU module.</td></tr>
<tr><td>Total Data Data in current interval</td><td colspan="3">Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.</td></tr>
</table>

Field	Description
Line Code Violations	Indicates the occurrence of either a bipolar violation or excessive zeroes error event.
Path Code Violations	Indicates a frame synchronization bit error in the D4 and E1-no cyclic redundancy checksum (CRC) formats or a CRC error in the extended super frame (ESF) and E1-CRC formats.
Slip Secs	Indicates the replication or detection of the payload bits of a DS1 frame. A slip may be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal.
Fr Loss Secs	Indicates the number of seconds an Out-of-Frame error is detected.
Line Err Secs	Line errored seconds is a second in which one or more line code violation errors are detected.
Errored Secs	In ESF and E1-CRC links, an errored second is a second in which one of the following is detected: one or more path code violations; one or more Out-of-Frame defects; one or more controlled slip events; a detected AIS defect. For D4 and E1-no-CRC links, the presence of bipolar violation also triggers an errored second.
Bursty Err Secs	Second with fewer than 320 and more than 1 path coding violation errors. No severely errored frame defects or incoming AIS defects are detected. Controlled slips are not included in this parameter.
Severely Err Secs	For ESF signals, a second with one of the following errors: 320 or more path code violation errors; one or more Out-of-Frame defects; a detected AIS defect. For D4 signals, a count of 1-second intervals with framing errors, or an Out-of-Frame defect, or 1544 line code violations.
Unavail Secs	Total time the line was out of service.

Related Commands

Command	Description
clear service-module serial	Resets an integrated CSU/DSU.

show sip-disk

To display file information on the internal storage disk of the SPA interface processor (SIP), use the **showsip-disk** command in privileged EXEC configuration mode.

show sip *slot-disk0* [**all** | **chips** | **filesys**]

Syntax Description

slot	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide.
all	(Optional) Displays all information on the Flash Disk.
chips	(Optional) Displays information for files on the Flash Disk. This is the default.
filesys	(Optional) Displays file system parameters for the Flash Disk.

Command Default

If no optional keyword is specified, information for files on the Flash Disk is the default display (same as using the **chips** keyword).

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(18)SXE	Thiscommand was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

The following example shows information about eight files stored internally on the SIP located in slot 5 of the router:

```
Router# show sip5-disk0
-#- --length-- -----date/time------ path
 number of file 8
 inode path is 1 idprom-oc12-atm-superspa
 fullpath is disk0:/idprom-oc12-atm-superspa
1         1152 Jun 09 2004 13:03:38 idprom-oc12-atm-superspa
 inode path is 2 idprom-4oc3-atm-superspa
 fullpath is disk0:/idprom-4oc3-atm-superspa
2         1152 Jun 09 2004 05:51:34 idprom-4oc3-atm-superspa
 inode path is 3 bonham_brd_rev2_rev19.hex
 fullpath is disk0:/bonham_brd_rev2_rev19.hex
3      2626407 Aug 24 2004 11:04:42 bonham_brd_rev2_rev19.hex
 inode path is 4 sip2-dw-mz.b2-testt
 fullpath is disk0:/sip2-dw-mz.b2-testt
4      5895640 Aug 26 2004 05:09:08 sip2-dw-mz.b2-testt
 inode path is 5 sip2-dw-mz.hp-depth
 fullpath is disk0:/sip2-dw-mz.hp-depth
5      5897476 Aug 12 2004 04:40:38 sip2-dw-mz.hp-depth
 inode path is 6 viking1.jbc
 fullpath is disk0:/viking1.jbc
```

```
6      2678150 Jun 09 2004 12:48:32 viking1.jbc
 inode path is 7 sip2-dw-mz.hpd
 fullpath is disk0:/sip2-dw-mz.hpd
7      5916716 Aug 25 2004 10:25:14 sip2-dw-mz.hpd
 inode path is 8 sip2iofpga_promlatest_rev78.hex
 fullpath is disk0:/sip2iofpga_promlatest_rev78.hex
8       468975 Aug 24 2004 10:56:54 sip2iofpga_promlatest_rev78.hex
40606720 bytes available (23490560 bytes used)
```

The following example shows information about the SIP flash file system for the SIP located in slot 5 of the router:

```
Router# show sip3-disk0 filesys
******** ATA Flash Card Geometry/Format Info ********
ATA CARD GEOMETRY
   Number of Heads:       4
   Number of Cylinders    978
   Sectors per Cylinder   32
   Sector Size            512
   Total Sectors          125184
ATA CARD FORMAT
   Number of FAT Sectors  62
   Sectors Per Cluster    8
   Number of Clusters     15598
   Number of Data Sectors 125049
   Base Root Sector       227
   Base FAT Sector        103
   Base Data Sector       259
ATA MONLIB INFO
   Image Monlib size = 52216
   Disk monlib size = 52736
   Name = NA
   Monlib end sector = NA
   Monlib Start sector = NA
   Monlib updated by = NA
   Monlib version = NA
RFS VERSION :
Negotiated Version                  : 0
Highest version supported in Server : 0
Highest version supported in Client : 0
```

show slot0:

To display information about the PCMCIA flash memory card's file system located in slot 0, use the **show slot0:**command in user EXEC or privileged EXEC mode.

show slot0:[**all** | **chips** | **detailed** | **err** | **summary**]

Syntax Description

all	(Optional) Displays all possible flash system information for all PCMCIA flash cards in the system.
chips	(Optional) Displays flash chip information.
detailed	(Optional) Displays the flash detailed directory.
err	(Optional) Displays the flash chip erase and write retries.
summary	(Optional) Displays the flash partition summary.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.0	This command was introduced.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use the **show slot0:** command to display details about the files in a particular linear PCMCIA flash memory card of less than 20 MB and some 32 MB linear PCMCIA cards.



Note Use the **show disk** command for ATA PCMCIA cards. Other forms of this commands are **show disk0:** and **show disk1:**.

For more information regarding file systems and flash cards, access the *PCMCIA Filesystem Compatibility Matrix and Filesystem Information* document at the following URL:

http://www.cisco.com/en/US/partner/products/hw/routers/ps341/products_tech_note09186a00800a7515.shtml

To see which flash cards are used in your router, use the **show version** command and look at the bottom portion of the output.

The following display indicates an ATA PCMCIA flash disk.

```
Router# show version
.
.
46976K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
```

The following display indicates a linear PCMCIA flash card with 20480K bytes of flash memory in card at slot 1 with a sector size of 128K.

```
Router# show version
.
.
20480K bytes of Flash PCMCIA card at slot 1 (Sector size 128K).
```



Note In some cases the **show slot** command will not display the file systems, use **show slot0:** or **show slot1:**.

Examples

The following example displays information about slot 0. The output is self-explanatory.

```
Router# show slot0:
PCMCIA Slot0 flash directory:
File  Length   Name/status
  1   11081464  c3660-bin-mz.123-9.3.PI5b
[11081528 bytes used, 9627844 available, 20709372 total]
20480K bytes of processor board PCMCIA Slot0 flash (Read/Write)
Router# show slot0: all
Partition   Size    Used      Free      Bank-Size  State          Copy Mode
  1        20223K  10821K     9402K     4096K      Read/Write     Direct
PCMCIA Slot0 flash directory:
File  Length   Name/status
        addr      fcksum  ccksum
  1   11081464  c3660-bin-mz.123-9.3.PI5b
        0x40      0x5EA3  0x5EA3
[11081528 bytes used, 9627844 available, 20709372 total]
20480K bytes of processor board PCMCIA Slot0 flash (Read/Write)
   Chip    Bank    Code      Size      Name
    1      1       89A0      2048KB    INTEL 28F016SA
    2      1       89A0      2048KB    INTEL 28F016SA
    1      2       89A0      2048KB    INTEL 28F016SA
    2      2       89A0      2048KB    INTEL 28F016SA
    1      3       89A0      2048KB    INTEL 28F016SA
    2      3       89A0      2048KB    INTEL 28F016SA
    1      4       89A0      2048KB    INTEL 28F016SA
    2      4       89A0      2048KB    INTEL 28F016SA
    1      5       89A0      2048KB    INTEL 28F016SA
    2      5       89A0      2048KB    INTEL 28F016SA
The following example shows flash chip information.
Router# show slot0: chips

20480K bytes of processor board PCMCIA Slot0 flash (Read/Write)
   Chip    Bank    Code      Size      Name
    1      1       89A0      2048KB    INTEL 28F016SA
    2      1       89A0      2048KB    INTEL 28F016SA
    1      2       89A0      2048KB    INTEL 28F016SA
    2      2       89A0      2048KB    INTEL 28F016SA
    1      3       89A0      2048KB    INTEL 28F016SA
    2      3       89A0      2048KB    INTEL 28F016SA
    1      4       89A0      2048KB    INTEL 28F016SA
    2      4       89A0      2048KB    INTEL 28F016SA
    1      5       89A0      2048KB    INTEL 28F016SA
    2      5       89A0      2048KB    INTEL 28F016SA
```

The following example show the flash detailed directory.

```
Router# show slot0: detailed
PCMCIA Slot0 flash directory:
File  Length   Name/status
```

```
        addr      fcksum  ccksum
  1   11081464  c3660-bin-mz.123-9.3.PI5b
        0x40      0x5EA3  0x5EA3
[11081528 bytes used, 9627844 available, 20709372 total]
20480K bytes of processor board PCMCIA Slot0 flash (Read/Write)
```

The following example shows the flash chip erase and write retries.

```
Router# show slot0: err

PCMCIA Slot0 flash directory:
File  Length   Name/status
  1   11081464  c3660-bin-mz.123-9.3.PI5b
[11081528 bytes used, 9627844 available, 20709372 total]
20480K bytes of processor board PCMCIA Slot0 flash (Read/Write)
   Chip    Bank    Code      Size      Name                erase  write
    1      1       89A0      2048KB    INTEL 28F016SA      0      0
    2      1       89A0      2048KB    INTEL 28F016SA      0      0
    1      2       89A0      2048KB    INTEL 28F016SA      0      0
    2      2       89A0      2048KB    INTEL 28F016SA      0      0
    1      3       89A0      2048KB    INTEL 28F016SA      0      0
    2      3       89A0      2048KB    INTEL 28F016SA      0      0
    1      4       89A0      2048KB    INTEL 28F016SA      0      0
    2      4       89A0      2048KB    INTEL 28F016SA      0      0
    1      5       89A0      2048KB    INTEL 28F016SA      0      0
    2      5       89A0      2048KB    INTEL 28F016SA      0      0
```

The following example shows the flash partition summary.

```
Router# show
 slot0: summary

Partition   Size    Used      Free      Bank-Size  State          Copy Mode
  1         20223K  10821K    9402K     4096K      Read/Write     Direct
20480K bytes of processor board PCMCIA Slot0 flash (Read/Write)
```

Related Commands

Command	Description
dir slot0:	Directory listing of files on a PCMCIA Flash card located in slot0.
dir slot1:	Directory listing of files on a PCMCIA Flash card located in slot1.
show slot1:	Displays information about the PCMCIA flash memory card's file system located in slot 1.
show slot	Displays information about the PCMCIA flash memory cards.

show smf

To display the configured software MAC address filter (SMF) on various interfaces of a router, use the **showsmf**command in user EXEC or privileged EXEC mode.

show smf [*interface-name*]

Syntax Description

interface-name	(Optional) Displays information about the specified interface. Choices can include **atm**, **ethernet**, **fastethernet**, **null**, **serial**, **tokenring**, and **async**.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced in a release prior to 10.0.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The SMF is active whenever the router is doing bridging or Integrated Routing and Bridging (IRB). MAC address filtering can be used as a security feature in bridging or switching environments.

Examples

The following is sample output from the **showsmf** command:

```
Router# show smf fastethernet
 Software MAC address filter on FastEthernet0/0.2
  Hash Len    Address      Matches  Act      Type
  0x00:  0 ffff.ffff.ffff         0 RCV Physical broadcast
  0x0C:  0 0100.0c00.0000         0 RCV ISL vLAN Multicast
  0x2A:  0 0900.2b01.0001         0 RCV DEC spanning tree
  0xA6:  0 0010.a6ae.6000         0 RCV Interface MAC address
  0xC1:  0 0100.0ccc.cccd         0 RCV SSTP MAC address
  0xC2:  0 0180.c200.0000         0 RCV IEEE spanning tree
  0xC2:  1 0180.c200.0000         0 RCV IBM spanning tree
  0xC2:  2 0100.0ccd.cdce         0 RCV VLAN Bridge STP
```

The table below describes the fields shown in the display.

Table 2: show smf Field Descriptions

Field	Description
Hash	Position in the hash table for this entry.
Len	Length of the entry.
Address	MAC address for the interface.
Matches	Number of hits for the address.

Field	Description
Act	Action taken. Values can be receive (RCV), forward (FWD), or discard (DIS).
Type	Type of MAC address.

show srp

To display Spatial Reuse Protocol (SRP) information, use the **showsrp** command in user EXEC or privileged EXEC mode.

Cisco IOS SR, SX, and XE Trains
show srp [**counters** | **failures** | **ips** | **source-counters** | **srr** | **topology** | **transit**]

Cisco IOS T Train
show srp [**counters** | **ips** | **source-counters** | **topology**]

Syntax Description

counters	(Optional) Displays counters for the packets received and transmitted on both sides of an SRP node.
ips	(Optional) Displays Intrusion Prevention System (IPS) information.
source-counters	(Optional) Displays source counter information.
topology	(Optional) Displays topology map information.
failures	(Optional) Displays self-detected failures.
srr	(Optional) Displays Simple RSS Reader (SRR) information.
transit	(Optional) Displays information about traffic buffer delays.

Command Default

If no keyword is specified, generic information about SRP is displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.4(24)T	This command was introduced in a release earlier than Cisco IOS Release 12.4(24)T.
12.2(33)SRC	This command was modified and integrated into a release earlier than Cisco IOS Release 12.2(33)SRC. The **failures**, **srr**, and **transit** keywords were added.
12.2(33)SXI	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SXI.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Examples

The following is sample output from the **showsrptopology**command:

```
Router# show srp topology
 Topology Map for Interface: SRP2_3
  Topology pkt. sent every 60 sec.  (next pkt. after 13 sec.)
  Last received topology pkt. 00:03:45
  Last topology change was 01:20:21 ago
```

```
  Hops (outer ring)      MAC        IP Address   Wrapped SRR   Name
         0       0005.dd9b.0d05        0.0.0.0   No    found SRP4
         1       0005.dd9b.0105        0.0.0.0   No    found SRP5
RP/0/1/0:SRP4#   0005.dd9b.2505        0.0.0.0   No    found SRP1
```

The table below describes the significant fields shown in the display.

Table 3: show srp topology Field Descriptions

Field	Description
Hops (outer ring)	Total number of hops.
MAC	Displays the MAC address.
IP Address	Displays the IP address.
Wrapped	Indicates if the SRP ring is wrapped at a node or not: Yes or No. If yes, the packet is sent in the reverse direction.
SRR	Status of the SRR, found or not found.
Name	Displays the hostname of the router for the node.

The following is sample output from the **showsrpips**command:

```
Router# show srp ips
 IPS Information for Interface SRP2_3
 MAC Addresses
   Side A (Outer ring RX) neighbor 0005.dd9b.2505
   Side B (Inner ring RX) neighbor 0005.dd9b.0105
   Node MAC address 0005.dd9b.0d05
 IPS State
   Side A not wrapped
   Side B not wrapped
   Side A (Inner ring TX) IPS pkt. sent every 1 sec. (next pkt. after 1 sec.)
   Side B (Outer ring TX) IPS pkt. sent every 1 sec. (next pkt. after 1 sec.)
   IPS WTR period is 60 sec. (timer is inactive)
   Node IPS State: idle
 IPS Self Detected Requests           IPS Remote Requests
   Side A            IDLE              Side A IDLE
   Side B            IDLE              Side B IDLE
 IPS messages received
   Side A (Outer ring RX) { 0005.dd9b.2505,IDLE,SHORT}, TTL 255
   Side B (Inner ring RX) { 0005.dd9b.0105,IDLE,SHORT}, TTL 255
 IPS messages transmitted
   Side A (Inner ring TX) { 0005.dd9b.0d05,IDLE,SHORT}, TTL 255
   Side B (Outer ring TX) { 0005.dd9b.0d05,IDLE,SHORT}, TTL 255
```

The table below describes the significant fields shown in the display.

Table 4: show srp ips Field Descriptions

Field	Description
MAC Addresses	MAC address of the IPS interface.
IPS State	Information about the current IPS states.

Field	Description
IPS Self Detected Requests	Details about the IPS self-detected requests.
IPS Remote Requests	Details about the IPS remote requests.
IPS messages received	Details about the IPS messages received.
IPS messages transmitted	Details about the transmitted IPS messages.

Related Commands

Command	Description
clear counters srp	Clears SRP counters.
show interfaces srp	Displays the configuration on an SRP interface.
show srp counters	Displays counters for the packets received, transmitted, and transited on both sides of an SRP node.
show srp failures	Displays the IPS status.
show srp source-counters	Displays the total number of packets received by a node identified by its unique MAC address.
srp topology-timer	Specifies the frequency of the topology timer.

show storm-control

To display switchport characteristics, including storm-control levels set on the interface, use the **showstorm-control**command in user EXEC or privileged EXEC mode.

show storm-control [*interface-type interface-number*] [**broadcast** | **multicast** | **unicast** | **history**]

Syntax Description

interface-type interface-number	(Optional) Port for which information is to be displayed.
broadcast	(Optional) Displays broadcast storm information. This is the default.
multicast	(Optional) Displays multicast storm information.
unicast	(Optional) Displays unicast storm information.
history	(Optional) Displays storm history on a per-port basis.

Command Default

If the *interface-type* and *interface-number*values are omitted, the **showstorm-control** command displays storm-control settings for all ports on the switch.

You can display broadcast, multicast, or unicast packet-storm information by using the corresponding keyword. When no keyword option is specified, the default is to display broadcast storm-control information.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.2(2)XT	This command was introduced.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T to support switchport creation on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(15)ZJ	This command was modified. The *interface-type* and *interface-number* arguments and the **broadcast**, **multicast**, **unicast**, and **history** keywords were added to support the Ethernet switch network module on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.

Examples

The following is partial sample output from the **showstorm-controlbroadcast**command:

```
Router# show storm-control broadcast
Interface  Filter State   Upper    Lower    Current
---------  -------------  -------  -------  -------
Fa0/1      <inactive>     100.00%  100.00%    0.00%
Fa0/2      <inactive>     100.00%  100.00%    0.00%
Fa0/3      <inactive>     100.00%  100.00%    0.00%
Fa0/4      Forwarding      30.00%   20.00%   20.32%
.
.
.
```

The table below describes the fields shown in the display.

Table 5: show storm-control broadcast Field Descriptions

Field	Description
Interface	Displays the ID of the interface.
Filter State	Displays the status of the filter: • Blocking--Storm control is enabled, a storm has occurred, and the action is filter. • Forwarding--Storm control is enabled, and a storm has not occurred. • Inactive--Storm control is disabled. • Shutdown--Storm control is enabled, a storm has occurred, and the action is to shut down. **Note** If an interface is disabled by a broadcast, multicast, or unicast storm, the filter state for all traffic types is *shutdown* .
Upper	Displays the rising suppression level as a percentage of total available bandwidth.
Lower	Displays the falling suppression level as a percentage of total available bandwidth.
Current	Displays the bandwidth utilization of a specific traffic type as a percentage of total available bandwidth. This field is valid only when storm control is enabled.

The following is sample output from the **showstorm-controlfastethernet0/4history** command, which displays the ten most recent storm events for an interface:

```
Router# show storm-control fastethernet 0/4 history
 Interface Fa0/4 Storm Event History
 Event Type          Event Start Time  Duration (seconds)
 ------------------  ----------------  ------------------
 Unicast             04:58:18          206
 Broadcast           05:01:54          n/a
 Multicast           05:01:54          n/a
 Unicast             05:01:54          108
 Broadcast           05:05:00          n/a
 Multicast           05:05:00          n/a
 Unicast             05:06:00          n/a
 Broadcast           05:09:39          n/a
 Multicast           05:09:39          n/a
 Broadcast           05:11:32          172
```

The table below describes the fields shown in the display.

Table 6: show storm-control history Field Descriptions

Field	Description
Interface	Displays the ID of the interface.

Field	Description
Event Type	Displays the type of storm event. The event type is one of the following: • Broadcast • Multicast • Unicast
Event Start Time	Time when the event started, in hours, minutes, seconds.
Duration (seconds)	Duration time of the event, in seconds. **Note** The duration field could be *n/a* when a storm is still present or when a new storm of a different type occurs before the current storm ends.

Related Commands

Command	Description
show interface counters	Displays the count of discarded packets.
storm control	Enables broadcast, multicast, or unicast storm control on a port.

show sup-bootflash

To display information about the sup-bootflash file system, use the **show sup-bootflash** command in privileged EXEC mode.

show sup-bootflash [**all** | **chips** | **filesys**]

Syntax Description

all	(Optional) Displays all possible Flash information.
chips	(Optional) Displays information about the Flash chip.
filesys	(Optional) Displays information about the file system.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.217d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

This example shows how to display a summary of bootflash information:

```
Router#
show sup-bootflash
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
1   .. image    EBC8FC4D  A7487C    6 10700796 Nov 19 1999 07:07:37 halley
2   .. unknown  C7EB077D  EE2620   25  4644130 Nov 19 1999 07:50:44 cat6000-sup_
5-3-3-CSX.bin
645600 bytes available (15345184 bytes used)
Router#
```

This example shows how to display all bootflash information:

```
Router#
show sup-bootflash all
-#- ED --type-- --crc--- -seek-- nlen -length- -----date/time------ name
1   .. image    EBC8FC4D  A7487C    6 10700796 Nov 19 1999 07:07:37 halley
2   .. unknown  C7EB077D  EE2620   25  4644130 Nov 19 1999 07:50:44 cat6000-sup_
5-3-3-CSX.bin
645600 bytes available (15345184 bytes used)
-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 2
DEVICE INFO BLOCK: bootflash
  Magic Number          = 6887635   File System Vers = 10000    (1.0)
  Length                = 1000000   Sector Size      = 40000
  Programming Algorithm = 19        Erased State     = FFFFFFFF
  File System Offset    = 40000     Length = F40000
  MONLIB Offset         = 100       Length = F568
```

```
  Bad Sector Map Offset = 3FFF8     Length = 8
  Squeeze Log Offset    = F80000    Length = 40000
  Squeeze Buffer Offset = FC0000    Length = 40000
  Num Spare Sectors     = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
  Bytes Used     = EA2620  Bytes Available = 9D9E0
  Bad Sectors    = 0       Spared Sectors  = 0
  OK Files       = 2       Bytes = EA2520
  Deleted Files  = 0       Bytes = 0
  Files w/Errors = 0       Bytes = 0
******** Intel SCS Status/Register Dump ********
COMMON MEMORY REGISTERS: Bank 0
  Intelligent ID Code  : 890089
  Compatible Status Reg: 800080
DEVICE TYPE:
  Layout                : Paired x16 Mode
  Write Queue Size      : 64
  Queued Erase Supported : No
Router#
```

This example shows how to display information about the Flash chip:

```
Router# show sup-bootflash chips
******** Intel SCS Status/Register Dump ********
COMMON MEMORY REGISTERS: Bank 0
  Intelligent ID Code  : 890089
  Compatible Status Reg: 800080
DEVICE TYPE:
  Layout                : Paired x16 Mode
  Write Queue Size      : 64
  Queued Erase Supported : No
Router#
```

This example shows how to display information about the file system:

```
Router# show sup-bootflash filesys
-------- F I L E   S Y S T E M   S T A T U S --------
  Device Number = 2
DEVICE INFO BLOCK: bootflash
  Magic Number          = 6887635   File System Vers = 10000    (1.0)
  Length                = 1000000   Sector Size      = 40000
  Programming Algorithm = 19        Erased State     = FFFFFFFF
  File System Offset    = 40000     Length = F40000
  MONLIB Offset         = 100       Length = F568
  Bad Sector Map Offset = 3FFF8     Length = 8
  Squeeze Log Offset    = F80000    Length = 40000
  Squeeze Buffer Offset = FC0000    Length = 40000
  Num Spare Sectors     = 0
    Spares:
STATUS INFO:
  Writable
  NO File Open for Write
  Complete Stats
  No Unrecovered Errors
  No Squeeze in progress
USAGE INFO:
```

```
  Bytes Used     = EA2620  Bytes Available = 9D9E0
  Bad Sectors    = 0       Spared Sectors  = 0
  OK Files       = 2       Bytes = EA2520
  Deleted Files  = 0       Bytes = 0
  Files w/Errors = 0       Bytes = 0
Router#
```

show syscon sdp

To display information about the Shelf Discovery Protocol (SDP), use the **showsysconsdp**command in privileged EXEC or user EXEC mode.

show syscon sdp

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC User EXEC

Command History

Release	Modification
11.3AA	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the**showsysconsdp** command:

```
Router# show syscon sdp
Current time 10:46:32 PST Jan 28 1998, system controller 172.23.66.100
Last hello packet received at 10:45:38 PST Jan 28 1998
11773 Total SDP packets
    0 packets with bad MD5 hash
    5884 Hello packets received
    5889 Hello packets sent
    0 Command packets received
    0 Command packets sent
```

The table below describes the fields shown in the sample display.

Table 7: show syscon sdp Field Descriptions

Field	Description
Current time	Current time and date.
system controller	IP address of the system controller.
Last hello packet received	Time and date when the last hello packet from the system controller was received by the shelf.
Total SDP packets	Total number of SDP packets sent or received by the shelf.
packets with bad MD5 hash	Number of packets with a bad MD5 hash.
Hello packets received	Number of hello packets received by the shelf from the system controller.
Hello packets sent	Number of hello packets sent from the shelf to the system controller.

Field	Description
Command packets received	Number of packets containing commands received by the shelf.
Command packets sent	Number of commands sent by the shelf.

Related Commands

Command	Description
syscon address	Specifies the system controller for a managed shelf.
syscon source-interface	Specifies the interface to use for the source address in SDP packets.

show system jumbomtu

To display the g lobal maximum transmission unit (MTU) setting, use the **show system jumbomtu** command in privileged EXEC mode.

show system jumbomtu

Syntax Description

This command has no arguments or keywords.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

This example shows how to display the global MTU setting:

```
Router# show system jumbomtu
Global Ethernet MTU is 1550 bytes.
Router#
```

Related Commands

Command	Description
system jumbomtu	Sets the maximum size of the Layer 2 and Layer 3 packets.

show tcam counts

To display the Ternary Content Addressable Memory (TCAM) statistics, use the **showtcamcounts** command in privileged EXEC mode.

show tcam counts [**detail**] [**arp** | **ip** | **ipv6** | **mpls** | **other**] [**module** *number*]

Syntax Description

detail	Displays detailed TCAM statistics.
arp	Displays TCAM statistics for ARP traffic.
ip	Displays TCAM statistics for IP traffic
ipv6	Displays TCAM statistics for IPv6 traffic
mpls	Displays TCAM statistics for MPLS traffic
other	Displays TCAM statistics for other traffic
module *number*	(Optional) Specifies the module number; see the "Usage Guidelines" section for valid values.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The **module***number* keyword and argument designate the module and port number. Valid values for *number* depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 2 to 13 and valid values for the port number are from 1 to 48.

The display includes information about the per-bank TCAM utilization for the ACL/QoS TCAM for Cisco 7600 series routers that are configured with a Supervisor Engine 720 only.

Examples

This example shows how to display the TCAM statistics:

```
Router# show tcam counts
           Used        Free        Percent Used       Reserved
           ----        ----        ------------       --------
 Labels:      8         504            1
ACL_TCAM
--------
  Masks:      6        4090            0                   0
```

```
Entries:      37       32731            0                    0
QOS_TCAM
--------
  Masks:       3        4093            0                    0
Entries:      20       32748            0                    0
    LOU:       0         128            0
  ANDOR:       0          16            0
  ORAND:       0          16            0
    ADJ:       1        2047            0
Router#
```

The table below describes the fields that are shown in the example.

Table 8: show tcam counts Command Output Fields

Field	Description
Labels Used	Number of labels that are used (maximum of 512).
Labels Free	Number of free labels remaining.
Labels Percent Used	Percentage of labels that are used.
Masks Used	Number of masks that are used (maximum of 4096).
Masks Free	Number of free labels remaining.
Masks Percent Used	Percentage of masks that are used.
Entries Used	Number of labels that are used (maximum of 32767).
Entries Free	Number of free labels that are remaining.
Entries Percent Used	Percentage of entries that are used.

Related Commands

Command	Description
show tcam interfaces	Displays information about the interface-based Ternary Content Addressable Memory (TCAM).

show tcam interface

To display information about the interface-based Ternary Content Addressable Memory (TCAM), use the **showtcaminterface** command in privileged EXEC mode.

show tcam interface {*interface interface-number* | **null** *interface-number* | **vlan** *vlan-id* {**acl** {**in** | **out**} | **qos** {**type1** | **type2**} *type* [**detail** | **module** *number*]}}

Syntax Description

interface	(Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**.
interface-number	(Optional) Module and port number; see the "Usage Guidelines" section for valid values.
null *interface-number*	(Optional) Specifies the null interface; the valid value is **0**.
vlan *vlan-id*	(Optional) Specifies the VLAN; see the "Usage Guidelines" section for valid values.
acl in	(Optional) Displays the ACL-based incoming packets.
acl out	(Optional) Displays the ACL-based outgoing packets.
qos type1	(Optional) Displays the QoS-based Type 1 packets.
qos type2	(Optional) Displays the QoS-based Type 2 packets.
type	Specifies the protocol type to display; valid values are **arp**, **ipv4**, **ipv6**, **mpls**, and **other**.
detail	(Optional) Displays detailed information.
module *number*	(Optional) Specifies the module number.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17a)SX	This command was changed to support the **ipv6** keyword.
12.2(17b)SXA	This command was changed as follows: • Support for the **detail** keyword was added to display detailed information. • The output (without the **detail** keyword) was changed to include the match count for supervisor engines and DFCs that support ACL counters.

Release	Modification
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The **pos**, **atm**, and **ge-wan**keywords are supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2 only.

Use the clear mls acl counters command to clear the TCAM ACL match counters.

The match counts display is supported in PFC3BXL or PFC3B mode only.

Examples

This example shows how to display interface-based TCAM information:

```
Router# show tcam interface
 vlan 7 acl in ip
deny ip any any
permit ip 10.20.0.0 0.0.255.255 10.22.0.0 0.0.255.255
redirect ip 10.21.0.0 0.0.255.255 10.23.0.0 0.0.255.255
permit tcp 10.24.0.0 0.0.255.255 10.30.0.0 0.0.255.255
Fragments (1 match)
permit tcp 10.25.0.0 0.0.255.255 10.31.0.0 0.0.255.255
fragments
permit tcp 10.25.0.0 0.0.255.255 range 30000 30020 10.31.0.0
0.0.255.255 range 10000 10010 (102 matches)
permit tcp 10.24.0.0 0.0.255.255 eq 9000 10.30.0.0 0.0.255.255
eq telnet
deny ip any any
deny ip any any
Router#
```

This example shows how to display detailed TCAM information:

```
Router# show tcam interface
 fa5/2 acl in ip detail
---------------------------------------------------------------------------
-----------------------------------
DPort - Destination Port   SPort - Source Port        TCP-F - U -URG
 Pro   - Protocol
I     - Inverted LOU       TOS   - TOS Value                - A -ACK
 rtr   - Router
MRFM  - M -MPLS Packet     TN    - T -Tcp Control           - P -PSH
 COD   - C -Bank Care Flag
      - R -Recirc. Flag          - N -Non-cachable          - R -RST
       - I -OrdIndep. Flag
      - F -Fragment Flag   CAP   - Capture Flag             - S -SYN
       - D -Dynamic Flag
      - M -More Fragments  F-P   - FlowMask-Prior.          - F -FIN
 T     - V(Value)/M(Mask)/R(Result)
X     - XTAG               (*)   - Bank Priority
---------------------------------------------------------------------------
-----------------------------------
Interface: 1018   label: 1   lookup_type: 0
protocol: IP   packet-type: 0
+-+-----+---------------+---------------+---------------+---------------+-------
+---+----+-+---+--+---+---+
|T|Index|  Dest Ip Addr | Source Ip Addr|     DPort     |     SPort     | TCP-F
```

```
|Pro|MRFM|X|TOS|TN|COD|F-P|
+-+-----+---------------+---------------+---------------+---------------+-------
+---+----+-+---+--+---+---+
 V 18396          0.0.0.0         0.0.0.0       P=0             P=0         ------
   0 ---- 0   0 -- --- 0-0
 M 18404          0.0.0.0         0.0.0.0         0               0
   0 ---- 0   0
 R rslt: L3_DENY_RESULT                rtr_rslt: L3_DENY_RESULT
 V 36828          0.0.0.0         0.0.0.0       P=0             P=0         ------
   0 ---- 0   0 -- --- 0-0
 M 36836          0.0.0.0         0.0.0.0         0               0
   0 ---- 0   0
 R rslt: L3_DENY_RESULT (*)            rtr_rslt: L3_DENY_RESULT (*)
Router#
```

Related Commands

Command	Description
clear mls acl counters	Clears the MLS ACL counters.
show tcam counts	Displays the Ternary Content Addressable Memory (TCAM) statistics.

show tcam-mgr subslot

To display ternary content addressable memory (TCAM) manager information for a SPA, use the **showtcam-mgrsubslot**command in privileged EXEC configuration mode.

show tcam-mgr subslot *slot/subslot* **inst-info**
show tcam-mgr subslot *slot/subslot* **region** *region-number* [**config** | **statistics**]
show tcam-mgr subslot *slot/subslot* {**rx-dest-mac** | **rx-vlan**} {**alloc-mbus** [**summary**] | **table**}
show tcam-mgr subslot *slot/subslot* **statistics**

Syntax Description

slot	Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide.
/ *subslot*	Secondary slot number on a SIP where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on a SPA" topic in the platform-specific SPA software configuration guide for subslot information.
inst-info	Specifies the display of Instance Control Block information for the SPA.

region *region-number* **config** | **statistics**	Specifies the display of region-related TCAM manager information, with the following options:
	• **region** *region-number*-- Displays TCAM manager information, where:
	  • **region0**-- Specifies the destination MAC address TCAM region.
	  • **region1**-- Specifies the VLAN ID TCAM region.
	• **config** -- (Optional) Displays TCAM manager configuration information.
	• **statistics** -- (Optional) Displays TCAM manager statistical information.

rx-dest-mac | rx-vlan }{**alloc-mbussummary**] |**table**	Specifies the display of TCAM manager information related to the following areas: • **rx-dest-mac** --Destination MAC address filtering for received frames. • **rx-vlan** --VLAN filtering for received frames. • **alloc-mbus summary**]--Displays allocated Mask Block Unit (MBU) entry information related to the MAC or VLAN TCAM filters. There is no difference between the **alloc-mbus** and **alloc-mbussummary** form of the command. • **table** -- Displays table entries for the MAC or VLAN TCAM filters. **Note** The **label**and**free-mbussummary**] forms of the command are not supported on SPAs.

Command Default No default behavior or values

Command Modes Privileged EXEC

Command History

Release	Modification
12.0(19)S	This command was introduced.
12.2(20)S2	Thiscommand was integrated into Cisco IOS Release 12.2(20)S2 and support for the **subslot**, **rx-dest-mac**, and **rx-vlan** keywords were added for SPAs on the Cisco 7304 router.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines Use the **showtcam-mgrsubslot** command to display TCAM manager information for the destination MAC address and VLAN filter regions supported by the SPAs.

The TCAM manager allocates memory among the applications that it supports, in the form of regions. The SPAs support two TCAM regions, region 0 for destination MAC address filtering and region 1 for VLAN ID filtering of received frames.

Examples The following examples provide sample output for several versions of the **showtcam-mgrsubslot** command for a 4-Port 10/100 Fast Ethernet SPA located in the top subslot (0) of the MSC that is installed in slot 4 on a Cisco 7304 router:

show tcam-mgr subslot inst-info Example

The following shows sample output from the **showtcam-mgrsubslotinst-info**command:

```
Router# show tcam-mgr subslot 4/0 inst-info
Instance Control Block Information :
CAM name                    =  SPA 4xFE/2xGE CAM2
Maximum key length          =  72 bits
TBU (TCAM Base Unit) length =  72 bits
V2M Ratio                   =  8
TCAM Size                   =  8192 TBUs
SRAM Size                   =  0 words
Start index of first VC     =  0
Label table size            =  0
```

show tcam-mgr subslot region Example

The following shows sample output from the **showtcam-mgrsubslotregion**command for the destination MAC address TCAM region (0) for the SPA:

```
Router# show tcam-mgr subslot 4/0 region 0
Region Configuration :
 Region ID                   =  0
 Region name                 =  DA_FILTERING
 Fixed size                  =  no
```

```
 Region type (hash:mask    ) =  Partial_Order_Indep_Order_Dep_At_Bottom
 Application VMR V/M size    =  12
 Application VMR result size =  1
 Vc region size (percentage) =  50
Region Information :
 Region ID                  =   0
 Value cells size           =   4096
 Mask cells size            =   512
 MBUs size                  =   512
 Mask index start TBU       =   0
 Mask index end TBU         =   511
 First dynamic region       =   yes
 Last dynamic region        =   yes
 Size is fixed              =   yes
 Expansion unit MBUs        =   1
 Lower Limit, llimit_p      =   450A6CF0
 Upper Limit, ulimit_p      =   450AE4B4
 Lower limit pointer index  =   0
 Upper limit pointer index  =   511
 Lower next pointer index   =   0
 Upper next pointer index   =   4
 Lower free entries         =   1
 Upper free entries         =   507
 Bottom pointer index       =   510
 Free mask block units      =  508
 Region ID                   =  0
 Region expansion count      =  0
 Region Shifts             =  0
 Region expansion failures   =  0
 Invalid direction hits      =  0
 Invalid parameter hits      =  0
 No free entry failures      =  0
```

show tcam-mgr subslot region statistics Example

The following shows sample output from the **showtcam-mgrsubslotregionstatistics**command for the destination MAC address TCAM region (0) for the SPA:

```
Router# show tcam-mgr subslot 4/0 region 0 statistics
 Region ID                  =  0
 Region expansion count      =  0
 Region Shifts             =  0
 Region expansion failures   =  0
 Invalid direction hits      =  0
 Invalid parameter hits      =  0
 No free entry failures      =  0
```

show tcam-mgr subslot rx-dest-mac table Example

The following shows partial output from the **showtcam-mgrsubslotrx-dest-mactable**command:

```
Router# show tcam-mgr subslot 4/0 rx-dest-mac table
Dest mac filtering Table
-----------
 There are 15 entries in the table
 Entry# 1:
 Application ID             = 1
 Value                      =
                              0 0 0 0 0 4 0 0 0 0 0 0
```

```
 Mask                        =
                               0 0 0 0 0 C 0 0 0 0 0 0
 Result                      =
                               0
 Mask index                  = 511
 Mask Physical Address       = 4088
 Value cell index            = 7
 Value cell Physical address = 4095
 Allocation direction        = bottom
 Entry# 2:
 Application ID              = 1
 Value                       =
                               0 0 0 0 0 4 0 B0 64 FF 44 80
 Mask                        =
                               0 0 0 0 0 F FF FF FF FF FF FF
 Result                      =
                               4
 Mask index                  = 2
 Mask Physical Address       = 16
 Value cell index            = 1
 Value cell Physical address = 17
 Allocation direction        = no direction
 Entry# 3:
 Application ID              = 1
 Value                       =
                               0 0 0 0 0 4 FF FF FF FF FF FF
 Mask                        =
                               0 0 0 0 0 F FF FF FF FF FF FF
 Result                      =
                               4
 Mask index                  = 2
 Mask Physical Address       = 16
 Value cell index            = 2
 Value cell Physical address = 18
 Allocation direction        = no direction
.
.
.
```

show tcam-mgr subslot rx-vlan table Example

The following shows partial output from the **showtcam-mgrsubslotrx-vlantable**command:

```
Router# show tcam-mgr subslot 4/0 rx-vlan table
RX VLAN filtering Table
-----------
 There are 9 entries in the table
 Entry# 1:
 Application ID              = 2
 Value                       =
                               0 0 0 0 0 8 0 0 0 0 0 0
 Mask                        =
                               0 0 0 0 0 C 0 0 0 0 0 0
 Result                      =
                               0
 Mask index                  = 1023
 Mask Physical Address       = 8184
 Value cell index            = 7
 Value cell Physical address = 8191
 Allocation direction        = bottom
 Entry# 2:
```

```
 Application ID              = 2
 Value                       =
                               0 0 0 0 0 0 0 0 0 0 0 0
 Mask                        =
                               0 0 0 0 0 F 0 0 0 0 0 0
 Result                      =
                               4
 Mask index                  = 512
 Mask Physical Address       = 4096
 Value cell index            = 0
 Value cell Physical address = 4096
 Allocation direction        = top
.
.
.
```

show tcam-mgr subslot statisitics Example

The following shows sample output from the **showtcam-mgrsubslotstatisitics**command:

```
Router# show tcam-mgr subslot 4/0 statisitics
 Application entry alloc failures            =  0
 TCAM entry alloc failures                   =  0
 TCAM driver failures                        =  0
 TCAM API invalid parameters                 =  0
 TCAM API application entry lookup failures  =  0
 TCAM API application entry mismatch failures=  0
 TCAM API label table occupied failures      =  0
 TCAM MGR free mbu vc failures               =  0
TCAM Mgr insertion/deletion time
  Insert  time: total:0.0000 num:0     avg:0.0000
    check dupl: total:0.0000 num:0     avg:0.0000
    alloc  mbu: total:0.0000 num:0     avg:0.0000
    queue appl: total:0.0000 num:0     avg:0.0000
    insert drv: total:0.0000 num:0     avg:0.0000
  Delete  time: total:0.0000 num:0     avg:0.0000
    delete drv: total:0.0000 num:0     avg:0.0000
    delete mbu: total:0.0000 num:0     avg:0.0000
    delete appl: total:0.0000 num:0     avg:0.0000
 Region ID                   =  0
 Region name                 =  DA_FILTERING
 Fixed size                  =  no
 Region type (hash:mask    ) =  Partial_Order_Indep_Order_Dep_At_Bottom
 Application VMR V/M size    =  12
 Application VMR result size =  1
 Vc region size (percentage) =  50
```

Related Commands

Command	Description
show controllers fastethernet	Displays Fast Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables.
show controllers gigabitethernet	Displays Gigabit Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables.

show tdm backplane

To display modem and PRI channel assignments with streams and channels on the modem side as assigned to the unit and channels on the PRI side of the time-division multiplexing (TDM) assignment, use the **showtdmbackplane**command in privileged EXEC mode.

show tdm backplane stream [*stream-number*]

Syntax Description

stream	Backplane stream in the range 0 to 7. There are 8 backplane "streams" on the TDM backplane for the Cisco AS5300 access server. Each stream runs at 2 MHz and has 32 channels (running at 64 Hz) on the Cisco AS5300 access server backplane hardware.
stream-number	(Optional) Actual number entered (either 0 to 7 or 0 to 15).

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(2)XD	This command was introduced.
12.0(3)T	This command was integrated into Cisco IOS Release 12.0(3)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **showtdmbackplane**command shows the status of the TDM backplane, related data structure values, and TDM chip memory settings. This commands is generally used only by a Cisco technical support representative during troubleshooting of data continuity problems.

Examples

The following example shows sample output for the **showtdmbackplane**command. When the **debugtdmdetail** command is executed, more detail is shown. The following examples are run with the **debugtdmdetail** command executed:

```
Router# show tdm backplane
Show BackPlane Connections
TDM Backplane Connection for Stream 0
     Modem (St/Ch)<->PRI (Unit/Ch)   xx/xx:Not Used ??/??:Unknown State
0  :  xx/xx<->xx/xx,  xx/xx<->xx/xx,  00/02<->00/30,  00/03<->03/10
4  :  00/04<->00/15,  00/05<->02/02,  00/06<->02/07,  00/07<->02/08
8  :  xx/xx<->xx/xx,  00/09<->03/11,  00/10<->02/09,  xx/xx<->xx/xx
12 :  00/12<->00/17,  00/13<->02/17,  00/14<->02/18,  00/15<->02/10
16 :  xx/xx<->xx/xx,  xx/xx<->xx/xx,  00/18<->00/19,  00/19<->02/19
20 :  00/20<->02/11,  xx/xx<->xx/xx,  xx/xx<->xx/xx,  00/23<->00/07
24 :  xx/xx<->xx/xx,  00/25<->00/01,  00/26<->00/20,  00/27<->02/20
28 :  xx/xx<->xx/xx,  00/29<->00/18,  xx/xx<->xx/xx,  xx/xx<->xx/xx

TDM Backplane Connection for Stream 1
     Modem (St/Ch)<->PRI (Unit/Ch)   xx/xx:Not Used ??/??:Unknown State
0  :  xx/xx<->xx/xx,  xx/xx<->xx/xx,  xx/xx<->xx/xx,  01/03<->03/09
```

```
4  :  01/04<->00/03,  01/05<->02/13,  xx/xx<->xx/xx,  xx/xx<->xx/xx
8  :  xx/xx<->xx/xx,  xx/xx<->xx/xx,  01/10<->02/14,  01/11<->00/04
12 :  01/12<->00/21,  xx/xx<->xx/xx,  01/14<->00/05,  xx/xx<->xx/xx
16 :  xx/xx<->xx/xx,  xx/xx<->xx/xx,  xx/xx<->xx/xx,  01/08<->02/12
20 :  01/20<->00/06,  01/09<->00/02,  xx/xx<->xx/xx,  xx/xx<->xx/xx
24 :  01/24<->03/01,  xx/xx<->xx/xx,  01/26<->02/15,  xx/xx<->xx/xx
28 :  01/28<->03/05,  xx/xx<->xx/xx,  xx/xx<->xx/xx,  xx/xx<->xx/xx
.
.
.
```

Related Commands

Command	Description
debug tdm detail	Displays debugging messages about TDM commands.
show tdm connections	Displays details about a specific TDM channel programmed on the Mitel chip.
show tdm data	Displays information about TDM bus connection memory on Cisco access servers.
show tdm detail	Displays information about the specified TDM device.
show tdm information	Displays TDM resources available for the specified TDM device.
show tdm pool	Displays information about the specified TDM pool.

show tdm connections

To display a snapshot of the time-division multiplexing (TDM) bus connection memory in a Cisco access server or to display information about the connection memory programmed on the Mitel TDM chip in a Cisco AS5800 access server, use the **showtdmconnections** command in privileged EXEC mode.

Standard Syntax
show tdm connections [**motherboard** | **slot** *slot-nu mber*]

Cisco AS5800 Access Server
show tdm connections {**motherboard stream** *stream-number* | **slot** *slot-number* **device** *device-number* **stream** *stream-number*}

Syntax Description

motherboard	(Optional) Displays connection memory for the TDM bus connections on the motherboard in the Cisco access server only. **Cisco AS5800 Access Server** The motherboard in the Cisco AS5800 access server has ethernet and serial interfaces, console port, and aux port. The motherboard has one TDM device (MT8980) for the Cisco 5300 access server.
slot *slot-number*	(Optional) Slot number. **Cisco AS5800 Access Server** There are three slots on the Cisco AS5800 access server. The range of the slots is from 0 to 2. A modem card or a trunk PRI card can be inserted into each slot. Each card in the slot has one or two TDM devices (either MT8980 or MT90820) on them.
stream	Device stream in the range 0 to 7. There are 8 backplane "streams" on the TDM backplane for the Cisco AS5800 access server. Each stream runs at 2 Mhz and has 32 channels (running at 64 Hz) on the Cisco AS5800 access server backplane hardware.
stream-number	Stream number (the range is from 0 to 7 or 0 to 15).
device	TDM device on the motherboard or slot cards. The range for the Cisco AS5800 access server is from 0 to 1. Each card has at least one TDM device (MT8980 or MT80920), and some of the slot cards have two devices (for example, the Octal PRI has two MT90820 TDM devices). The TDM device is also referred to as "TSI Chip Number" in the online help.
device-number	Valid range is from 0 to 1.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.0(3)T	This command was modified to include support for the Cisco AS5800 access server.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Cisco AS5800 Access Server

The **showtdmconnections**command shows the status of the TDM chip memory settings. This command is generally used only by a Cisco technical support representative during troubleshooting of data continuity problems.

Examples

Cisco AS5800 Access Server

The following example shows sample output for the **showtdmconnections**command. When the **debugtdmdetail** command is executed, more detail is shown. The following examples are run with the **debugtdmdetail** executed.

```
Router# show tdm connections slot 0
Slot 0 MT8980 TDM Device 0, Control Register = 0x1E, ODE Register = 0x01
Connection Memory for ST0:
Ch0:  0x00 0xE1, Ch1:  0x00 0xE2, Ch2:  0x01 0xDE, Ch3:  0x00 0x00
Ch4:  0x01 0xCF, Ch5:  0x00 0xE4, Ch6:  0x00 0xE5, Ch7:  0x00 0x00
Ch8:  0x00 0xEB, Ch9:  0x00 0xE6, Ch10: 0x00 0xE7, Ch11: 0x00 0x00
Ch12: 0x01 0xD1, Ch13: 0x00 0xE8, Ch14: 0x00 0x00, Ch15: 0x00 0xE9
Ch16: 0x00 0x00, Ch17: 0x00 0xD2, Ch18: 0x01 0xD3, Ch19: 0x00 0xEA
Ch20: 0x00 0xEB, Ch21: 0x00 0xC1, Ch22: 0x00 0xEC, Ch23: 0x01 0xC7
Ch24: 0x00 0xED, Ch25: 0x01 0xC1, Ch26: 0x01 0xD4, Ch27: 0x00 0xEE
Ch28: 0x00 0xE1, Ch29: 0x01 0xD2, Ch30: 0x00 0x00, Ch31: 0x00 0x00
Connection Memory for ST1:
Ch0:  0x00 0xEF, Ch1:  0x00 0xC2, Ch2:  0x00 0xED, Ch3:  0x00 0xF1
Ch4:  0x01 0xC3, Ch5:  0x00 0xF2, Ch6:  0x00 0xE2, Ch7:  0x00 0x00
Ch8:  0x00 0xF3, Ch9:  0x00 0xFF, Ch10: 0x00 0xF4, Ch11: 0x01 0xC4
Ch12: 0x01 0xD5, Ch13: 0x00 0xF5, Ch14: 0x01 0xC5, Ch15: 0x00 0xEE
Ch16: 0x00 0xF6, Ch17: 0x00 0xE3, Ch18: 0x00 0x00, Ch19: 0x00 0xF7
Ch20: 0x01 0xC6, Ch21: 0x01 0xC2, Ch22: 0x00 0xF8, Ch23: 0x00 0xE4
Ch24: 0x00 0xF9, Ch25: 0x00 0xC7, Ch26: 0x00 0x00, Ch27: 0x00 0xFA
Ch28: 0x00 0xFB, Ch29: 0x00 0xE5, Ch30: 0x00 0x00, Ch31: 0x00 0x00
```

Related Commands

Command	Description
debug tdm detail	Displays debugging messages about TDM commands.
show tdm data	Displays information about TDM bus connection memory on Cisco access servers.

show tdm data

To display a snapshot of the time-division multiplexing (TDM) bus data memory in a Cisco access server or to display data memory that is programmed on the Mitel TDM chip in a Cisco 5800 access server, use the **showtdmdata**command in privilegedEXEC mode.

Standard Syntax
show tdm data [**motherboard** | **slot** *slot-number*]

Cisco AS5800 Access Server
show tdm data {**motherboard stream** *stream-number* | **slot** *slot-number* **device** *device-number* **stream** *stream-number*}

Syntax Description

motherboard	(Optional) Displays bus data memory for the TDM bus connections on the motherboard in the Cisco access server only. **Cisco AS5800 Access Server** The motherboard on the Cisco AS5300 access server has the ethernet I/Fs, serial I/Fs, console port, and aux port. The motherboard has one TDM device (MT8980) for the Cisco AS5300 access server.
slot *slot-number*	(Optional) Slot number. **Cisco AS5800 Access Server** In addition to the motherboard, there are three slots on the Cisco AS5300 access server. The range of the slots is 0 to 2. A modem card or a trunk PRI card can be inserted in each slot. Each card in the slot has one or two TDM devices (either MT8980 or MT90820) on them.
stream	TDM device stream in the range 0 to 15. There are up to 16 streams on a TDM device (Mitel 90820). The TDM device is also known as the TSI chip. The help on the command (by typing **?**) indicates whether the stream is “Stream number within the TSI chip” or “Backplane Stream.”
stream-number	Stream number within the range of either 0 to 7 or 0 to 15.
device	TDM device on the motherboard, or slot cards. Valid range for the Cisco AS5300 access server is 0 to 1. Each card has at least one TDM device (MT8980 or MT80920), and the Octal PRI has two MT90820 TDM devices. Also referred to as TSI Chip Number in the help pages.
device-number	Valid range is from 0 to 1.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.0(3)T	This command was modified to include support for the Cisco AS5800 access server.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The data memory for all TDM bus connections in the access server is displayed if you do not specify a motherboard or slot.

Cisco AS5800 Access Server

The **showtdmdata**command shows the status of the TDM data structure values. This command is generally used only by a Cisco technical support representative during troubleshooting of data continuity problems.

Examples

The following is sample output for the **showtdmdata**command on a Cisco AS5800 access server. When the **debugtdmdetail** command is executed, more detail is shown. The following example is run with the **debugtdmdetail** executed:

```
Router# show tdm data
Motherboard MT8980 TDM Device 0, Control Register = 0x1F, ODE Register = 0xE1
Data Memory for ST0:
Ch0:  0xFF, Ch1:  0xFF, Ch2:  0x98, Ch3:  0x61
Ch4:  0x0C, Ch5:  0xE1, Ch6:  0x8D, Ch7:  0x86
Ch8:  0xFF, Ch9:  0xF3, Ch10: 0xE4, Ch11: 0xFF
Ch12: 0x51, Ch13: 0x02, Ch14: 0x18, Ch15: 0x14
Ch16: 0xFF, Ch17: 0xFF, Ch18: 0x05, Ch19: 0xC7
Ch20: 0x00, Ch21: 0xFF, Ch22: 0xFF, Ch23: 0x98
Ch24: 0xFF, Ch25: 0x15, Ch26: 0x5C, Ch27: 0x15
Ch28: 0xFF, Ch29: 0x80, Ch30: 0xFF, Ch31: 0xFF
Data Memory for ST1:
Ch0:  0xFF, Ch1:  0xFF, Ch2:  0xFF, Ch3:  0x62
Ch4:  0x94, Ch5:  0x88, Ch6:  0xFF, Ch7:  0xFF
Ch8:  0xFF, Ch9:  0xFF, Ch10: 0xFB, Ch11: 0x91
Ch12: 0xF7, Ch13: 0xFF, Ch14: 0x96, Ch15: 0xFF
Ch16: 0xFF, Ch17: 0xFF, Ch18: 0xFF, Ch19: 0x94
Ch20: 0x8F, Ch21: 0x95, Ch22: 0xFF, Ch23: 0xFF
Ch24: 0xE2, Ch25: 0xFF, Ch26: 0xD3, Ch27: 0xFF
Ch28: 0x87, Ch29: 0xFF, Ch30: 0xFF, Ch31: 0xFF
Data Memory for ST2:
.
.
.
```

Related Commands

Command	Description
debug tdm detail	Displays debugging messages about TDM commands.
show tdm connections	Displays details about a specific TDM channel programmed on the Mitel chip.

show tdm detail

To display details about a specific time-division mulltiplexing (TDM) channel programmed on the Mitel chip, use the **showtdmdetail**command in privileged EXEC mode.

show tdm detail *slot-number / device-number source-stream-number / source-channel-number*

Syntax Description

slot-number	There are three slots on the Cisco AS5300 access server. A modem card or a trunk Primary Rate Interface (PRI) card can be inserted in each slot. Each card has one or two TDM devices (either MT8980 or MT90820) on it. The valid range is from 0 to 2.
device-number	TDM device on the motherboard or slot cards. Each card has at least one TDM device (MT8980 or MT80920), and the Octal PRI has two MT90820 TDM devices. Also referred to a TSI Chip Number in the online help. The valid values are 0 to 1.
source-stream-number	Source stream number from the TDM device. The valid range is from 0 to 15.
source-channel-number	Source channel from the TDM device stream. The valid range is from 0 to 31.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
12.0(2)XD	This command was introduced.
12.0(3)T	This command was integrated into Cisco IOS Release 12.0(3)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.

Usage Guidelines

The **showtdmdetail**command shows the status of the TDM backplane, related data structure values, and TDM chip memory settings. This command is generally used only by a Cisco technical support representative during troubleshooting of data continuity problems.

This command indicates connection memory and map, data memory, and whether the channel is enabled or disabled. Specify the slot, TDM device, TDM stream, and TDM channel to view the appropriate details.

Examples

The following is sample output from the **showtdmdetail**command. When the **debugtdmdetail**command is executed, more detail is shown. The following example was run with the **debugtdmdetail** command executed. The fields are self-explanatory.

```
Router# show tdm detail 0/0 1/2
Show Detail TDM device info: slot 0 unit 0
ODE Register: 0x0001
```

```
Connection Memory: 0x00ED, Output is Disable
Connection Map: STi7 CHi13 ----> STo1 CHo2
Data Memory: 0x00FF
```

Related Commands

Command	Description
debug tdm detail	Displays debugging messages about TDM commands.
show tdm backplane	Displays modem and PRI channel assignments with streams and channels on the modem side as assigned to the unit and channels on the PRI side of the TDM assignment.
show tdm connections	Displays details about a specific TDM channel programmed on the Mitel chip.
show tdm data	Displays information about TDM bus connection memory on Cisco access servers.
show tdm information	Displays TDM resources available for the specified TDM device.
show tdm pool	Displays information about the specified TDM pool.

show tdm information

To display information about the specified time-division multiplexing (TDM) device, use the **showtdminformation**command in privileged EXEC mode.

show tdm information {**motherboard** | **slot** *slot-number* **device** *device-number*}

Syntax Description

motherboard	Motherboard on the Cisco AS5300 access server has the Ethernet I/Fs, serial I/Fs, console port, and aux port. The motherboard has one TDM device (MT8980) for the Cisco AS5300 access server.
slot	There are three slots on the Cisco AS5300 access server. The range of the slots is 0 to 2. A modem card or a trunk PRI card can be inserted in each slot. Each card has one or two TDM devices (either MT8980 or MT90820) on it.
slot-number	Slot number. Valid range is from 0 to 2.
device	TDM device on the motherboard or slot cards. The valid range is from 0 to 1. Each card has at least one TDM device (MT8980 or MT80920), and the Octal PRI has two MT90820 TDM devices. Also referred to as TSI Chip Number in the online help.
device-number	Device number. Valid range is from 0 to 1.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(2)XD	This command was introduced.
12.0(3)T	This command was integrated into Cisco IOS Release 12.0(3)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **showtdminformation**command shows the status of the TDM backplane, related data structure values, and TDM chip memory settings. This command is generally used only by a Cisco technical support representative during troubleshooting of data continuity problems.

This command displays the register base address, device type, and capabilities on a per-slot basis.

Examples

The following example shows sample output for the **showtdminformation**command. When the **debugtdmdetail** command is executed, more detail is shown. The following example is run with the **debugtdmdetail** command executed:

```
Router# show tdm information motherboard
TDM Slot Info display for Motherboard:
  Slot Info ptr @0x610D39C0  Feature info ptr @0x60B737E8
  Feature board is MOTHERBOARD, NIM ID: 0x30
```

```
  TSI device is MT8980, 1 on this board. Each TSI device supports 0 DS1s
  First TSI device is at offset: 0x100
  TSI device 0, register base 0x3E801100
    TDM Device Info ptr @0x611AA3EC for slot -1
    TSI device Info ptr @0x60FCC0BC   memory size = 0x100
      This device supports 8 streams with 32 channels per stream
TDM Information display for slot 0:
  Slot Info ptr @0x610D39E4  Feature info ptr @0x60B73818
  Feature board is E1 Quad PRI, NIM ID: 0x43
  TSI device is MT8980, 2 on this board. Each TSI device supports 2 DS1s
  First TSI device is at offset: 0x100, Second TSI device is at Offset: 0x200
  HDLC   Streams start at 4
  Framer Streams start at 6
  TSI device 0, register base 0x3C400100
    TDM Device Info ptr @0x61222054 for slot 0
    TSI device Info ptr @0x60FCC0BC   memory size = 0x100
      This device supports 8 streams with 32 channels per stream
  TSI device 1, register base 0x3C400200
    TDM Device Info ptr @0x61222098 for slot 0
    TSI device Info ptr @0x60FCC0BC   memory size = 0x100
      This device supports 8 streams with 32 channels per stream
TDM Information display for slot 1:
  Slot Info ptr @0x610D3A08  Feature info ptr @0x60B738A8
  Feature board is High Density Modems, NIM ID: 0x47
  TSI device is MT8980, 1 on this board. Each TSI device supports 0 DS1s
  First TSI device is at offset: 0x100
  TSI device 0, register base 0x3C500100
    TDM Device Info ptr @0x612F1B80 for slot 1
    TSI device Info ptr @0x60FCC0BC   memory size = 0x100
      This device supports 8 streams with 32 channels per stream
TDM Information display for slot 2:
  Slot Info ptr @0x610D3A2C  Feature info ptr @0x60B738A8
  Feature board is High Density Modems, NIM ID: 0x47
  TSI device is MT8980, 1 on this board. Each TSI device supports 0 DS1s
  First TSI device is at offset: 0x100
  TSI device 0, register base 0x3C600100
    TDM Device Info ptr @0x613A6F60 for slot 2
    TSI device Info ptr @0x60FCC0BC   memory size = 0x100
      This device supports 8 streams with 32 channels per stream
```

Related Commands

Command	Description
debug tdm detail	Displays debugging messages about TDM commands.
show tdm backplane	Displays modem and PRI channel assignments with streams and channels on the modem side as assigned to the unit and channels on the PRI side of the TDM assignment.
show tdm connections	Displays details about a specific TDM channel programmed on the Mitel chip.
show tdm data	Displays information about TDM bus connection memory on Cisco access servers.
show tdm detail	Displays information about the specified TDM device.
show tdm pool	Displays information about the specified TDM pool.

show tdm pool

To display time-division multiplexing (TDM) resources available for a TDM device, use the **showtdmpool**command in privileged EXEC mode.

show tdm pool [**slot** *slot-number*]

Syntax Description

slot	(Optional) There are three slots on the Cisco AS5300 access server with a range of 0 to 2. A modem card or a trunk PRI card can be inserted in each slot. Each card has one or two TDM devices (either MT8980 or MT90820) on it.
slot-number	(Optional) Slot number. Valid range is from 0 to 2 for the Cisco AS5300 access server.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(2)XD	This command was introduced.
12.0(3)T	This command was integrated into Cisco IOS Release 12.0(3)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **showtdmpool**command shows the status of the TDM backplane, related data structure values, and TDM chip memory settings. This command is generally used only by a Cisco technical support representative during troubleshooting of data continuity problems.

This command displays TDM groups, where group 0 is streams 0 to 3 and group 1 is streams 4 to 7. It also displays register address and capabilities on a per-slot basis.

Examples

The following example shows sample output for the **showtdmpool**command. When the **debugtdmdetail** command is executed, more detail is shown. The following example was run with the **debugtdmdetail** command executed:

```
Router# show tdm pool
Dynamic Backplane Timeslot Pool:
 Grp ST Ttl/Free Req(Cur/Ttl/Fail)       Queues(Free/Used)      Pool Ptr
  0 0-3  120 60    60  361      0        0x61077E28  0x61077E28  0x61077E20
  1 4-7  0   0     0   0        0        0x61077E38  0x61077E28  0x61077E24
```

Related Commands

Command	Description
debug tdm detail	Displays debugging messages about TDM commands.

Command	Description
show tdm backplane	Displays modem and PRI channel assignments with streams and channels on the modem side as assigned to the unit and channels on the PRI side of the TDM assignment.
show tdm connections	Displays details about a specific TDM channel programmed on the Mitel chip.
show tdm data	Displays information about TDM bus connection memory on Cisco access servers.
show tdm detail	Displays information about the specified TDM device.
show tdm information	Displays TDM resources available for the specified TDM device.

show tunnel interface

To display detailed information for a specified tunnel interface or for all tunnel interfaces, use the **show tunnel interface** command in user EXEC or privileged EXEC mode.

show tunnel interface [**tunnel** *tunnel-number*]

Syntax Description

tunnel *tunnel-number*	(Optional) Specifies a tunnel interface identifier.

Command Default

Information about all tunnels on a device is displayed.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.6S	This command was introduced.
15.1(1)SY	This command was modified. The output was enhanced to display information about how a tunnel is created.

Examples

The following is sample output from the **show tunnel interface tunnel** command for a specific tunnel:

```
Device# show tunnel interface tunnel 1

Tunnel1
   Mode:PIM/IPv4, Destination 127.0.102.1, Source Ethernet0/0
   IP transport: output interface unknown next hop 127.0.102.1
   Application ID 3: unspecified
   Tunnel Subblocks:
      src-track:
         Tunnel1 source tracking subblock associated with Ethernet0/0
          Set of tunnels with source Ethernet0/0, 3 members (includes iterators)
, on interface <OK>
   Linestate - current down
   Internal linestate - current down, evaluated down - interface not up
   Tunnel Source Flags: Local  Remote

Tunnel1 is up (if_number 30) ['1]
  Corresponding hwidb fast_if_number 30
  Corresponding hwidb firstsw->if_number 30
  Internet address is 0.0.0.0/0
  Unnumbered interface. Using address of Ethernet0/0 (127.0.102.2)
  ICMP redirects are never sent
  Per packet load-sharing is disabled
  IP unicast RPF check is disabled
  Suppressed input features: MCI Check
  Suppressed output features: IP Post Routing Processing
  Suppressed post encapsulation features: MTU Processing, IP Protocol Output Cou
nter, IP Sendself Check
  IP policy routing is disabled
```

```
  BGP based policy accounting on input is disabled
  BGP based policy accounting on output is disabled
  Interface is marked as point to point interface
  Interface is marked as tunnel interface
  Hardware idb is Tunnel1
  Fast switching type 14, interface type 0
  IP CEF switching enabled
  IP prefix lookup IPv4 mtrie generic
  Flags 0x46049, hardware flags 0x8
  Input fast flags 0x0, Output fast flags 0x0
  ifindex 28(6) ['1]
  Slot unknown Slot unit -1 VC -1
  IP MTU 1472
  Real output interface is Ethernet0/0
 Switching statistics:
  Input: 0 packets, 0 bytes
  Output: 0 packets, 0 bytes
 Subblocks:
  Tunnel1: mode 25, submode 0
  fibhwidb if_number:28 fibidb if_number 30
  Tunnel source UNKNOWN, destination 124.0.102.1
  Tunnel protocol/transport, PIM/IPv4 key disabled
  Tunnel flags: 0x2000480 flags_private 0x0
  Enable sequencing:no, Enable checksum: no
  Carry ipso:no, Fast capable:no
  Tableid: 0 Appid:3
  Tunnel Source Flags:  Remote
  IPv4: Internet address is 0.0.0.0/0
        Unnumbered interface. Using address of Ethernet0/0 (127.0.102.2)
        Broadcast address 255.255.255.255
        Per packet load-sharing is disabled
        ICMP redirects are never sent
        ICMP unreachables are always sent
        IP MTU 1472
  MFIB IPv4 @01C0CD28 wire=01C0F528
        fixup:  UNUSED   (0)
```

The following is sample output from the **show tunnel interface** command:

```
Device# show tunnel interface

Tunnel0
   Mode:multi-GRE/IP, Destination UNKNOWN, Source GigabitEthernet1/1
   Application ID 2: L3VPN : profile : TEST
   Tunnel Subblocks:
      src-track:
         Tunnel0 source tracking subblock associated with GigabitEthernet1/1
          Set of tunnels with source GigabitEthernet1/1, 2 members (includes ite
rators), on interface <OK>
   Linestate - current up
   Internal linestate - current up, evaluated up
   Tunnel Source Flags: Local
   OCE: IP tunnel decap
   Provider: interface Tu0, prot 47
     Performs protocol check [47]
     Protocol Handler: GRE: opt 0x0
       ptype: ipv4 [ipv4 dispatcher: punt]
       ptype: ipv6 [ipv6 dispatcher: punt]
       ptype: mpls [mpls dispatcher: from if Tu0]
Tunnel20
   Mode:GRE/IP, Destination 127.0.38.1, Source GigabitEthernet1/1
   IP transport: output interface GigabitEthernet1/1 next hop 127.0.38.1
   Application ID 1: unspecified
```

```
   Tunnel Subblocks:
      src-track:
         Tunnel20 source tracking subblock associated with GigabitEthernet1/1
          Set of tunnels with source GigabitEthernet1/1, 2 members (includes ite
rators), on interface <OK>
   Linestate - current up
   Internal linestate - current up, evaluated up
   Tunnel Source Flags: Local
   OCE: IP tunnel decap
   Provider: interface Tu20, prot 47
     Performs protocol check [47]
     Protocol Handler: GRE: opt 0x0
       ptype: ipv4 [ipv4 dispatcher: punt]
       ptype: ipv6 [ipv6 dispatcher: punt]
       ptype: mpls [mpls dispatcher: drop]
There are 0 tunnels running over the EON IP protocol
There are 0 tunnels running over the IPinIP protocol
There are 0 tunnels running over the NOSIP protocol
There are 0 tunnels running over the IPv6inIP protocol
```

The table below describes the significant fields shown in the displays.

Table 9: show tunnel interface Field Descriptions

Field	Description
Mode	Tunnel encapsulation method. For example, GRE, IP in IP, IPv6 in IP.
Destination	Destination address of the tunnel packets. This field is relevant for point-to-point tunnels only.
Source	Source of packets in a tunnel.
IP transport	Destination of IP packets.
Application ID	Application that created the tunnel. For example,L3VPN, PIM, and generic applications that use a tunnel created using the CLI.
Tunnel Subblocks	Subset of tunnel information that is accessible through a Forwarding Information Base (FIB) Hardware Interface Descriptor Block (HWIDB) subblock.
src-track	Indicates the interface on which source tracking needs to be enabled in case an attack is suspected on a tunnel. Also indicates the number of tunnels associated with this interface.
Linestate	Indicates the state of the interface.
Tunnel Source Flags	Flag that indicates the set of sources for a tunnel. The value of this flag can be as follows: • Local—Indicates that the tunnel was created locally by an application. Tunnels on an active Route Processor (RP) have only a local source set. • Remote—Indicates that the tunnel was created on receipt of an External Data Representation (XDR) message. Tunnels on a standby RP always have a remote source set. The tunnels may also have a local source set if the application created a tunnel on the standby.

Field	Description
Corresponding hwidb	Corresponding HWIDB. This is the system-wide representation of an interface. There is one HWIDB per interface.
OCE	Output chain elements (OCEs) applied to tunnel packets after an adjacency. This is an object that is used to decapsulate traffic received on a tunnel and dispatch the payload. There is only one decapsulation OCE associated with a tunnel.
Provider	IP protocol type number of the tunneling protocol used. For example, GRE packets that are encapsulated within IP use IP protocol type 47.
ptype	Each tunnel endpoint can receive packets of different payload types. Each payload type has an adjacency associated with it. The payload type can include the Layer 2 next-hop address to which the tunnel packet has to be forwarded or special adjacency type information such as Drop (drop the packets) or Punt (forward the packets to a higher switching layer such as fast switching).
Switching statistics	Number of packets that have been received by the tunnel, forwarded through the tunnel, or dropped by the tunnel.
Subblocks	Subset of tunnel information that is accessible via a FIB HWIDB subblock.
Enable sequencing	Indicates whether sequencing of packets is enabled.
Carry ipso	Indicates whether IP Security Option (IPSO) or Commercial IP Security Option (CIPSO) labels are acquired from parent.
Fast capable	Indicates whether fast tunneling is possible.
Tableid	Indicates the table ID associated with the transport Virtual routing and forwarding (VRF).
Appid	Tunnel application identity.

Related Commands

Command	Description
show cef interface	Displays detailed Cisco Express Forwarding information for a specified interface or for all interfaces.

show tunnel keys-database tunnel

To display all transmit and receive generic routing encapsulation (GRE) key pairs associated with traffic flows in a tunnel, use the **show tunnel keys-database tunnel** command in privileged EXEC mode.

show tunnel keys-database tunnel *tunnel-number*

Syntax Description

tunnel-number	Tunnel number. The range is from 0 to 2147483647.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.8S	This command was introduced.

Usage Guidelines

A key can be optionally added to a GRE tunnel and used to identify a traffic flow within the tunnel, as defined in RFC 2890, *Key and Sequence Number Extensions to GRE*.

GRE keys can be used in various ways in a network, and one such use case is in the Proxy Mobile IPv6 (PMIPv6) application. To facilitate seamless movement of mobile users from one access network to another, PMIPv6 as described in RFC 5213, *Proxy Mobile IPv6*, defines network-based mobility protocols that allow mobile users to communicate without disruption while roaming. The solution requires IP tunneling of packets of mobile nodes from a Mobile Access Gateway (MAG) to a Local Mobility Anchor (LMA). A mobile node is an IP host or a device whose mobility is managed by the network. The LMA is the home agent for a mobile node in a PMIPv6 domain. The MAG is an access router function that manages mobility-related signaling for a mobile node, tracks the mobile node's movements, and signals the LMA. RFC 5845, *GRE Key Option for Proxy Mobile IPv6* further explains the scenario in which multiple GRE keys can be used to differentiate packets of a specific mobile session in a tunnel between an LMA and a MAG.

Tunnel endpoints are added by applications. For example, Next Hop Resolution Protocol (NHRP) adds the endpoint for Dynamic Multipoint Virtual Private Network (DMVPN) application. An endpoint is associated with a transport address and in many cases with an overlay address. The transport address corresponds to the egress point of a tunnel, which is where the tunnel terminates, and an overlay address can be any address reachable on or beyond the tunnel's egress point in the network.

Applications can add an endpoint with an overlay address and a corresponding transport address. In case applications do not need an overlay address or just need to forward packets to an endpoint based on a policy, they can add an endpoint with just a transport address.

In the context of PMIPv6, the overlay address corresponds to the mobile node address, and the transport address corresponds to either the Proxy Care-of Address (global address configured on the egress interface of the MAG) or the LMA address depending on where the endpoint is being added. When an endpoint is added on an LMA, the transport address is the Proxy Care-of Address of the MAG. When an endpoint is added on the MAG, the transport address is the LMA address.

The tunnel maintains a GRE key database, that is accessed by the forwarding plane using a receive GRE key that is unique for a tunnel. The receive GRE key database is populated on the request of an application when the application is associated with a tunnel. The receive key database also has other data such as the list of operations to be done before forwarding the payload. One of these operations is the setting of virtual routing and forwarding (VRF)-ID.

VRF-ID is an optional parameter that is used by applications to set the egress of the tunnel before forwarding packets. This can be used in case there are overlapping mobile node IP addresses belonging to different VRFs. At the egress of a tunnel, the forwarding plane can look up the GRE key database based on the received GRE Key and get the corresponding VRF-ID. If the VRF-ID is not set, the forwarding plane sets the VRF-ID based on the VRF of the tunnel interface.

Examples

The following is sample output from **show tunnel keys-database tunnel 0**, which shows all transmit and receive GRE key pairs associated with various traffic flows in a tunnel:

```
Device# show tunnel keys-database tunnel 0

Remote address 10.1.1.2, RefCount 2
Transmit Key 16, Receive Key 15, Association 1.1.1.2
Connection-ID 16, VRF-Override enabled, VRF-ID 65535
Transmit Key 161, Receive Key 151, Association 1.1.1.3
Connection-ID 161, VRF-Override enabled, VRF-ID 65535
```

The table below describes the significant fields shown in the display.

Table 10: show tunnel keys-database tunnel Field Descriptions

Field	Description
Remote address	Overlay address or a remote IPv4 or IPv6 address, reachable beyond the tunnel endpoint in the network.
RefCount	Reference count used for debugging.
Transmit Key	Transmit key associated with a flow.
Receive Key	Receive key associated with a flow.
Association	Associated flow identifier. For example, IP address in the payload.
Connection-ID	Locally stored connection identifier used for key insertion in a packet.
VRF-Override enabled	Flag that indicates which VRF to forward the received packets. If the flag is enabled, the received packets are forwarded to the VRF with a given VRF-ID. If the flag is disabled, the received packets are forwarded to the tunnel interface VRF.
VRF-ID	VRF identifier associated with a key.

show top counters interface report

To display TopN reports and information, use the **showtopcountersinterfacereport** command in user EXEC or privileged EXEC mode.

show top counters interface report [*number*]

Syntax Description

number	(Optional) Number of the report to be displayed; valid values are from 1 to 5.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(18)SXE	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is supported on Ethernet, Fast Ethernet, Gigabit Ethernet, and 10-Gigabit Ethernet ports only. LAN ports on the OSMs are also supported.

When you enter a TopN request, a round of polling is performed, the counters for all the applicable ports in the Cisco 7600 series router are read, and the information is saved. The TopN process then sleeps for the specified interval. After wakeup, another round of polling is performed and the counter information from the ports is read. The difference between the two sets of data is stored. The ports are then sorted, the ports choose from one of the seven types of statistics information, and a TopN report is generated.

The port statistics will not be displayed in the following cases:

- If a port is not present during the first poll.
- If a port is not present during the second poll.
- If a port's speed or duplex changes during the polling interval.
- If a port's type changes from Layer 2 to Layer 3 or Layer 3 to Layer 2 during the polling interval.

Note For the report display format, due to the 80 characters per line limitation, only 10 spaces are reserved for the Tx/Rx-okts, Tx/Rx-bcst, and Tx/Rx-mcst columns. When these columns are larger than 10 digits, the display wraps around to the next line.

When you start the TopN processes from a Telnet session and the Telnet session is terminated before the TopN processes are completed, all the backgound TopN processes continue and generate the TopN reports, but the foreground TopN processes are terminated once the Telnet session is terminated.

When the TopN report is being generated against a large number of ports (for example, 13 slot x 96 ports/slot) in a very short interval (10 seconds), the actual interval time between the first and second polling may be longer than the specified interval time because polling takes time.

Examples

This example shows how to display TopN reports and information:

```
Router# show top counters interface report
Id Start Time                    Int N   Sort-By   Status  Owner
-- ----------------------------- --- --- --------- ------- ----------------------
1  08:18:25 UTC Tue Nov 23 2004 76  20  util      done    console
2  08:19:54 UTC Tue Nov 23 2004 76  20  util      done    console
3  08:21:34 UTC Tue Nov 23 2004 76  20  util      done    console
4  08:26:50 UTC Tue Nov 23 2004 90  20  util      done    bambam onvty0 (9.10.69.13)
Router#
```

This example shows how to display TopN reports and information for a specific report:

```
Router# show top counters interface report
 1
Started By        : console
Start Time        : 08:18:25 UTC Tue Nov 23 2004
End Time          : 08:19:42 UTC Tue Nov 23 2004
Port Type         : All
Sort By           : util
Interval          : 76 seconds
Port    Band  Util Bytes       Packets     Broadcast  Multicast  In-  Buf-
        width      (Tx + Rx)   (Tx + Rx)   (Tx + Rx)  (Tx + Rx)  err  ovflw
------- ----- ---- ----------- ----------- ---------- ---------- ---- -----
Fa2/5   100   50   726047564   11344488    11344487   1          0    0
Fa2/48  100   35   508018905   7937789     0          43         0    0
Fa2/46  100   25   362860697   5669693     0          43         0    0
Fa2/47  100   22   323852889   4762539     4762495    43         0    0
Fa2/6   100   15   217815835   3403372     0          39         21   0
Fa2/44  100   10   145146009   2267900     0          43         0    0
Gi4/15  1000  0    0           0           0          0          0    0
Gi4/14  1000  0    0           0           0          0          0    0
Gi4/13  1000  0    0           0           0          0          0    0
Gi4/12  1000  0    0           0           0          0          0    0
Gi4/11  1000  0    0           0           0          0          0    0
Gi4/10  1000  0    0           0           0          0          0    0
Gi4/9   1000  0    0           0           0          0          0    0
Gi4/8   1000  0    776         2           0          2          0    0
Gi4/7   1000  0    0           0           0          0          0    0
Gi4/6   1000  0    0           0           0          0          0    0
Gi4/5   1000  0    0           0           0          0          0    0
Gi4/4   1000  0    0           0           0          0          0    0
Gi4/3   1000  0    776         2           0          2          0    0
Gi4/2   1000  0    0           0           0          0          0    0
Router#
```

This example shows the display if you request a TopN report that is still in pending status:

```
Router# show top counters interface report
 4
Id   Start time          Int N   Sort-by     Status   Owner (type/machine/user)
---  ------------------- --- --- ----------- -------- -------------------------
  4  1/24/2004,11:34:26  30  20  In-Errors   pending  Console//
Router#
```

Related Commands

Command	Description
clear top counters interface report	Clears the TopN reports.
collect top counters interface	Lists the TopN processes and specific TopN reports.

show ucse imc download progress

To display the status of the CIMC firmware download, use the **show ucse imc download progress** command in EXEC mode.

show ucse *slot* **imc download progress**

Syntax Description

slot	Router slot number in which the Cisco E-Series Server is installed.

Command Modes

Privileged EXEC mode.

Command History

Release	Modification
15.2(4)M	This command was introduced.

Usage Guidelines

When the CIMC firmware is downloading, this command displays the percentage complete. After the download is complete, this command displays the last known download status.

Examples

The following examples show how to display the status of the CIMC firmware download:

```
Router# show ucse 2 imc download progress

Download is in progress (1% - 9894k/679M - 1kB/s)
Router# show ucse 2 imc download progress

No Download is not currently in process
Last download status: Downloaded successfully : ubuntu-server.iso
```

show ucse imc files

To display the CIMC installable images that are available on the local file system, use the **show ucse imc files** command in EXEC mode.

show ucse *slot* **imc files**

Syntax Description

slot	Router slot number in which the Cisco E-Series Server is installed.

Command Modes

Privileged EXEC mode.

Command History

Release	Modification
15.2(4)M	This command was introduced.

Usage Guidelines

Use this command to determine which images can be used to boot the server, or which files can be deleted to free up space.

Examples

The following example shows how to display the CIMC firmware files:

```
Router# show ucse 2 imc files

Directory of UCSE slot 2 imc filesystem
 -rw-  1697952   May 5 2010 16:55:04 +00.00 debian.iso
```

show ucse server boot

To display the device types from which the Cisco E-Series Server can boot, the order in which the boot is attempted, or the progress of boot initialization, use the **show ucse server boot** command from EXEC mode.

show ucse *slot* **server boot** [**devices** | **order** | **progress**]

Syntax Description

slot	Router slot number in which the Cisco E-Series Server is installed.
devices	The device types available to the module from which the Cisco E-Series Server can boot. It can be one of the following: • HDD—Hard disk drive • FDD—Floppy disk drive • CDROM—Bootable CD-ROM • PXE—PXE boot • EFI—Extensible Firmware Interface
order	The current order in which the boot configuration will be attempted.
progress	The status of the image boot and image download.

Command Modes

Privileged EXEC mode.

Command History

Release	Modification
15.2(4)M	This command was introduced.

Usage Guidelines

Use the output of this command to see the boot options.

Examples

The following example displays the list of all devices that can be used to boot the module:

```
Router# show ucse 1 server boot devices

PXE
FDD
HDD:HDD3
HDD:RAID-MD0
HDD:USB-FF5D6CC3DAA67F12-1
CDROM:USB-CD
```

The following example shows how to display the boot order:

```
Router# show ucse 1 server boot order

Currently booted from CDROM:USB-CD
Boot order:
```

```
1) PXE
2) CDROM:USB-CD
3) FDD
4) HDD:RAID-MD0
```

show ucse server erase device status

To display the status of devices that have been erased, use the **show ucs server erase device status** command in EXEC mode.

show ucse *slot* **server erase device status**

Syntax Description

slot	Router slot number in which the Cisco E-Series Server is installed.

Command Modes

Privileged EXEC mode.

Command History

Release	Modification
15.2(4)M	This command was introduced.

Usage Guidelines

Use this command after you have erased HDDs using the **ucse** *slot* **server erase device hh [all | use***device_list***]**command.

Examples

The following example shows how to display the details after erasing HDDs:

```
Router# ucse 2 server erase device hdd use hdd2

You are about to erase all data on the selected hard drives.
Proceed with drive erasure? y

Erasing HDD2 started
Router#
Router# show ucse 2 server erase device status

HDD2 erased 0%
```

show ucse server raid level

To display the current RAID configuration, use the **show ucse server raid level** command in EXEC mode.

show ucse *slot* **server raid level**

Syntax Description

slot	Router slot number in which the Cisco E-Series Server is installed.

Command Modes

Privileged EXEC mode.

Command History

Release	Modification
15.2(4)M	This command was introduced.

Usage Guidelines

Use this command after you have configured the RAID levels by using the **ucse** *slot* **server raid level** {**0** | **1** | **5** | **NONE**} [**use** *HDD_list*] command.

Examples

The following example shows how to display RAID details:

```
Router# ucse 2 server raid level 1

You are about to change RAID configuration.
It will destroy all data on the hard drives.

Are you sure [y/n] y
RAID reconfigured
Router# show ucse 2 server raid level

RAID 0 (Ctrl:SLOT-5 ID:0 Size:1905440 MB State:Optimal)
        HDD1 :              953869 MB online (0 errors)
      HDD255 :              953869 MB online (0 errors)
HDDs not in the RAID:
        HDD2 :              286102 MB system (0 errors)
```

show upgrade file

The show upgrade file command is replaced by the **show upgrade fpd file** command. See the **show upgrade fpd file** command for more information.

show upgrade fpd file

To display the contents of an FPD image package file, enter the **showupgradefpdfile** command in privileged EXEC mode.

show upgrade fpd file *file-url* [**detail**]

Syntax Description

file-url	Specifies the location of the FPD image package file, beginning with the location or type of storage device (examples include **disk0**, **slot0**, **tftp**, or **ftp**) and followed by the path to the FPD image package file.
detail	(Optional) Displays detailed information about the contents of the FPD image package file. This option is intended for use by Cisco customer support personnel only.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(20)S6	This command was introduced and replaced the **showupgradefile** command on the Cisco 7304 router.
12.2(25)S3	The output of the **showupgradefpdfile***file-url* command was changed to display only brief versioning information. The output generated from this command in previous Cisco IOS releases can still be generated in this release by entering the **showupgradefpd***file-url***detail** command. The **detail** option is also new in this release.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.

Usage Guidelines

This command provides information related to the FPD image package file. Most of the information in this command output is useful for Cisco customer support purposes only.

In Cisco IOS Releases 12.2(20)S2 through 12.2(20)S5, the output generated by entering this command can be generated by entering the **showupgradefile** command.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide.

Examples

Cisco 7200 VXR

The following example shows that the router is able to generate FPD image package information for the FPD image package on the TFTP server:

```
Router# show upgrade fpd file tftp://mytftpserver/myname/myfpdpkg/c7200-fpd-pkg.124-4.XD.pkg
Loading /auto/tftpboot-users/jsmith/c7200-fpd-pkg.124-4.XD.pkg from 223.255.254.254 (via
GigabitEthernet0/1):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 1419264 bytes]
Cisco Field Programmable Device Image Package for IOS
C7200 FPD Image Package (c7200-fpd-pkg.124-4.XD.pkg), Version 12.4(20060105:195420)
Copyright (c) 2005-2006 by cisco Systems, Inc.
Built Thu 05-Jan-2006 11:54 by abcdef
=============================== ================================================
                                        Bundled FPD Image Version Matrix
                                ================================================
                                                                       Min. Req.
Supported Card Types            ID  Image Name                Version  H/W Ver.
=============================== == ========================= ========= =========
NPEG2 IOFPGA                     1 NPEG2 IOFPGA                 0.7       0.0
------------------------------- -- ------------------------- --------- ---------
VSA                              1 VSA                          0.8       0.0
=============================== ================================================
```

Cisco 7304

The output in the following example displays information about the FPD image package file stored in the disk0: Flash card memory:

```
Router# show upgrade fpd file disk0:spa-fpd.122-20.S6.pkg
% Extracting compressed bundle spa_4fe2ge-fpd.bndl.zip ...
Content for the "spa_4fe2ge-fpd.bndl" bundle file:
                     Bundle Name:4xFE/2xGE SPA FPD Bundle
                  Bundle Version:0.5
       Number of Supported Cards:2
          Supported Card Type(s):SPA-4FE-7304 (0x435)
                                  SPA-2GE-7304 (0x436)
    Bundle Header Format Version:4
            Bundle Header Length:128 bytes
              Bundle Data Length:4951592 bytes
             Bundle Magic Number:0xC5C0FBC0
               Bundle 32-Bit CRC:0x3B53C5C0
               Bundle Build Date:10/12/2004 (MM/DD/YYYY)
        Number of Images Bundled:1
              Bundle Name Prefix:spa_4fe2ge
Image #1:
         Name                   :Data & I/O FPGA
         ID                     :1
         Version                :4.17
         Minimal H/W Version    :0.0
         Order in Bundle        :1
         Header Length          :128 bytes
         Data Length            :4951464 bytes
         Total Length           :4951464 bytes (Data + Padding)
         Magic Number           :0xC5C0FDC0
         32-Bit CRC             :0x14613280
         Build Date             :10/12/2004 (MM/DD/YYYY)
```

```
          Image Format          :XSVF
          Upgrade Path          :By Host
          Upgrade Path Info     :0
          Control Flag Value    :0x1
          Estimated Upgrade Time:420 seconds
```

The output in the following example displays information about the FPD image package file stored at a TFTP server location:

```
Router# show upgrade fpd file tftp://mytftpserver/myfpdpkgd/spa-fpd.122-20.S6.pkg
Loading myfpdpkgd/spa-fpd.122-20.S6.pkg from 223.255.254.254 (via FastEthernet0):!
% Extracting compressed bundle spa_4fe2ge-fpd.bndl.zip
...!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Content for the "spa_4fe2ge-fpd.bndl" bundle file:
                     Bundle Name:4xFE/2xGE SPA FPD Bundle
                  Bundle Version:0.5
       Number of Supported Cards:2
          Supported Card Type(s):SPA-4FE-7304 (0x435)
                                  SPA-2GE-7304 (0x436)
    Bundle Header Format Version:4
            Bundle Header Length:128 bytes
              Bundle Data Length:4951592 bytes
             Bundle Magic Number:0xC5C0FBC0
               Bundle 32-Bit CRC:0x3B53C5C0
               Bundle Build Date:10/12/2004 (MM/DD/YYYY)
        Number of Images Bundled:1
              Bundle Name Prefix:spa_4fe2ge
Image #1:
         Name                  :Data & I/O FPGA
         ID                    :1
         Version               :4.17
         Minimal H/W Version   :0.0
         Order in Bundle       :1
         Header Length         :128 bytes
         Data Length           :4951464 bytes
         Total Length          :4951464 bytes (Data + Padding)
         Magic Number          :0xC5C0FDC0
         32-Bit CRC            :0x14613280
         Build Date            :10/12/2004 (MM/DD/YYYY)
         Image Format          :XSVF
         Upgrade Path          :By Host
         Upgrade Path Info     :0
         Control Flag Value    :0x1
         Estimated Upgrade Time:420 seconds
[OK - 703488 bytes]
```

Cisco 7600 Series, Catalyst 6500 Series

The output in the following example shows the show upgrade fpd file command on a Cisco 7600 series router and Catalyst 6500 series switch:

```
Router# show upgrade fpd file tftp://mytftpserver/myname/myfpdpkg/c7600-fpd-pkg.122-18.SXE.pkg
Loading myname/myfpdpkg/c7600-fpd-pkg.122-18.SXE.pkg from 124.0.0.0 (via FastEthernet0):
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK]
Cisco Field Programmable Device Image Package for IOS
C7600 Family FPD Image Package (c7600-fpd-pkg.122-18.SXE.pkg), Version 12.2(SXE)
Copyright (c) 2004-2005 by cisco Systems, Inc.
Built Fri 25-Mar-2005 09:12 by abcdef
=============================== ================================================
```

Bundled FPD Image Version Matrix

Supported Card Types	ID	Image Name	Version	Min. Req. H/W Ver.
2-port T3/E3 Serial SPA	1	T3E3 SPA ROMMON	2.12	0.0
	2	T3E3 SPA I/O FPGA	0.24	0.0
	3	T3E3 SPA E3 FPGA	0.6	0.0
	4	T3E3 SPA T3 FPGA	0.14	0.0
4-port T3/E3 Serial SPA	1	T3E3 SPA ROMMON	2.12	0.0
	2	T3E3 SPA I/O FPGA	0.24	0.0
	3	T3E3 SPA E3 FPGA	0.6	0.0
	4	T3E3 SPA T3 FPGA	0.14	0.0
8-port Channelized T1/E1 SPA	1	CTE1 SPA ROMMON	2.12	0.140
	1	CTE1 SPA ROMMON NP	2.12	0.0
	2	CTE1 SPA I/O FPGA	1.2	0.0
2-port Channelized T3 SPA	1	CT3 SPA ROMMON	2.12	0.100
	2	CT3 SPA I/O FPGA	1.1	0.100
	3	CT3 SPA T3 FPGA R1	0.11	0.100
	3	CT3 SPA T3 FPGA R2	0.15	0.200
4-port Channelized T3 SPA	1	CT3 SPA ROMMON	2.12	0.100
	2	CT3 SPA I/O FPGA	1.1	0.100
	3	CT3 SPA T3 FPGA R1	0.11	0.100
	3	CT3 SPA T3 FPGA R2	0.15	0.200
2-port OC3 POS SPA	1	POS SPA IOFPGA P1	3.4	0.0
	1	POS SPA IOFPGA P2	3.4	0.200
4-port OC3 POS SPA	1	POS SPA IOFPGA P1	3.4	0.0
	1	POS SPA IOFPGA P2	3.4	0.200
1-port OC12 POS SPA	1	POS SPA IOFPGA P1	3.4	0.0
	1	POS SPA IOFPGA P2	3.4	0.200
2-port OC3 ATM SPA	1	KATM SPA IOFPGA	1.24	0.0
4-port OC3 ATM SPA	1	KATM SPA IOFPGA	1.24	0.0
1-port OC12 ATM SPA	1	KATM SPA IOFPGA	1.24	0.0
SIP-200	1	SIP-200 I/O FPGA P1	1.1	0.100
	1	SIP-200 I/O FPGA P4	1.1	0.400
	1	SIP-200 I/O FPGA P6	1.1	0.600
	2	SIP-200 EOS FPGA P1	0.27	0.100
	2	SIP-200 EOS FPGA P450	1.211	0.450
	2	SIP-200 EOS FPGA P5	0.27	0.500
	2	SIP-200 EOS FPGA P550	1.211	0.550
	2	SIP-200 EOS FPGA P6	1.211	0.600
	3	SIP-200 PEG TX FPGA P1	1.129	0.100
	3	SIP-200 PEG TX FPGA P6	1.129	0.600
	4	SIP-200 PEG RX FPGA P1	1.3	0.100
	4	SIP-200 PEG RX FPGA P4	1.3	0.400
	4	SIP-200 PEG RX FPGA P6	1.3	0.600
	5	SIP-200 ROMMON	1.2	0.100
SIP-400	1	SIP-400 ROMMON	1.1	0.1
	2	SIP-400 I/O FPGA	0.82	0.1
	3	SIP-400 SWITCH FPGA	0.25	0.1
CWPA2	1	CWPA2 I/O FPGA P1	0.37	0.1

```
                                  2 CWPA2 EOS FPGA P1            0.28      0.1
                                  3 CWPA2 ROMMON                 1.1       0.1
================================ ================================================
```

Cisco uBR10012 Universal Broadband Router

The output in the following example displays information about the FPD image package file stored at a TFTP server location:

```
Router# show upgrade fpd file
 tftp://mytftpserver/myname/myfpdpkg/ubr10k-fpd-pkg.122-122_33_SCB_20081123.pkg

Cisco Field Programmable Device Image Package for IOS
UBR10k Family FPD Image Package (ubr10k-fpd-pkg.122-test.pkg), Version 12.2(20080609:181737)
Copyright (c) 2007-2008 by cisco Systems, Inc.
Built Tue 10-Jun-2008 08:42 by dapoirie
================================ ================================================
                                         Bundled FPD Image Version Matrix
                                 ================================================
                                                                        Min. Req.
Supported Card Types             ID  Image Name                Version  H/W Ver.
================================ == ======================== ========= =========
Modena SPA                        1 MODENA BLAZE FPGA         1285.1444    1.0
-------------------------------- -- ------------------------ --------- ---------
5-port GE V2 SPA                  1 GE SPA FPGA                  1.10      0.0
-------------------------------- -- ------------------------ --------- ---------
1-port 10GE V2 SPA                1 10GE SPA FPGA                1.9       0.0
================================ ================================================
```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.

Command	Description
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

show upgrade fpd package default

To display which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards for the running Cisco IOS release, enter the **showupgradefpdpackagedefault** command in privileged EXEC mode.

show upgrade fpd package default

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(20)S6	This command was introduced and replaced the **showupgradepackagedefault**command on the Cisco 7304 router.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.

Usage Guidelines

It is important to note that the output from this command is generated from the Cisco IOS image and provides information regarding the default FPD image package file that is needed for your particular Cisco IOS release. This command output also lists the SPAs or other cards supported by the default FPD image package file for the running Cisco IOS image.

In Cisco IOS Releases 12.2(20)S2 through 12.2(20)S5, the output generated by entering this command can be generated by entering the **showupgradepackagedefault**command.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide.

Examples

Cisco 7200 VXR

The following example shows which cards are supported with your current Cisco IOS release and which FPD image package you need:

```
Router# show upgrade fpd package default
```

```
*********************************************************************
This IOS release requires the following default FPD Image Package for
the automatic upgrade of FPD images:
*********************************************************************
Version: 12.4(4)XD
Package Filename: c7200-fpd-pkg.124-4.XD.pkg
        List of card type supported in this package:
                                      Minimal
                 No. Card Type        HW Ver.
                ---- ---------------- -------
                  1) VSA                 0.0
                  2) NPE-G2              0.0
                ---- ---------------- -------
*********************************************************************
```

Cisco 7304

In the following example, the **showupgradefpdpackagedefault** command output shows that the spa_fpd.122-20-S6.pkg FPD image package file is required if you install the SPA-4FE-7304 or the SPA-2GE-7304 on this particular router with this particular Cisco IOS software release:

```
Router# show upgrade fpd package default
*********************************************************************
This IOS release supports the following default FPD Image Package(s) for
automatic upgrade:
*********************************************************************
SPA FPD Image Package:spa_fpd.122-20.S6.pkg
        List of SPAs supported in this package:
                                      Minimal
                 No. SPA Name         HW Ver.
                ---- ---------------- -------
                  1) SPA-4FE-7304       0.0
                  2) SPA-2GE-7304       0.0
                ---- ---------------- -------
```

Cisco uBR10012 Universal Broadband Router

In the following example, the **showupgradefpdpackagedefault** command output shows that the ubr10k-fpd-pkg.122-122_33_SCB_20081123.pkg FPD image package file is required for the SPAs on this particular router with this particular Cisco IOS software release:

```
Router# show upgrade fpd package default
*********************************************************************************
This Cisco IOS software image requires the following default FPD Image
Package for the automatic upgrade of FPD images (the package is available
from Cisco.com and is accessible from the Cisco Software Center page where
this IOS software image can be downloaded):
*********************************************************************************

Version: 12.2(20080919:205903)

Package Filename: ubr10k-fpd-pkg.122-122_33_SCB_20081123.pkg

        List of card type supported in this package:

                                                          Minimal
                 No. Card Type                            HW Ver.
                ---- ---------------------------------- -------
```

```
  1) 5xGE SPA                                 0.0
  2) 1x10GE XFP SPA                           0.0
  4) WIDEBAND DOCSIS SPA                      0.0
---- ---------------------------------------- -------
```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

show upgrade fpd progress

To view the progress of an FPD upgrade while an FPD upgrade is taking place, enter the **showupgradefpdprogress** command in privileged EXEC mode.

show upgrade fpd progress

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(20)S6	This command was introduced and replaced the **showupgradeprogress** command on the Cisco 7304 router.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(4)XD	This command was integrated into Cisco IOS Release 12.4(4)XD.
12.4(11)T	This command was integrated into Cisco IOS Release 12.4(11)T.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.

Usage Guidelines

In Cisco IOS Releases 12.2(20)S2 through 12.2(20)S5, the output generated by entering this command can be generated by entering the **showupgradeprogress**command.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), refer to the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide.

Examples

Cisco 7200 VXR

The following example shows that the FPD image is being updated, the approximate amount of time needed to perform the update, and the amount of time the FPD update has taken so far:

```
Router# show upgrade fpd progress
FPD Image Upgrade Progress Table:
 ==== ================== ================================================
                                          Approx.
                         Field Programmable    Time     Elapsed
 Slot Card Type          Device : "ID-Name"   Needed      Time    State
 ==== ================== ================== ========== ========== ===========
```

```
 npe NPE-G2 IOFPGA       1-NPEG2 I/O FPGA    00:01:00   00:00:23  Updating...
==== ================== ==================================================
```

Cisco 7304

The following example shows the status of FPD updates on the SPAs located in subslots 0 and 1:

```
Router# show upgrade fpd progress
FPD Image Upgrade Progress Table:
 ==== ================== ================================================
                         Field Programmable    Time
 Slot Card Description   Device :"ID-Name"    Needed   Time Left  State
 ==== ================== ================== ========== ========== ===========
  2/0 SPA-2GE-7304        1-4FE/2GE FPGA      00:06:00   00:05:17  Updating...
 ---- ------------------ ------------------ ---------- --------- -----------
  2/1 SPA-4FE-7304        1-4FE/2GE FPGA      --:--:--   --:--:--  Waiting...
 ==== ================== ================================================
```

Cisco uBR10012 Universal Broadband Router

The following example shows the status of FPD updates on a Cisco uBR10012 router:

```
Router# show upgrade fpd progress
FPD Image Upgrade Progress Table:
==== ================== ========================================================
                                          Approx.
                         Field Programmable    Time     Elapsed
 Slot Card Type          Device : "ID-Name"   Needed      Time    State
 ==== ================== ================== ========== ========== ===========
  3/2 SPA-24XDS-SFP       1-Modena BLAZE FPG  00:10:00   00:05:07  Updating...
 ==== ================== ========================================================
```

Related Commands

Command	Description
show hw-module all fpd	Displays the current versions of all FPDs for all of the supported card types on a router.
show hw-module slot fpd	Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards.
show hw-module subslot fpd	Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs or other FPD-capable cards.
show upgrade fpd table	Displays various information used by the Cisco IOS software to manage the FPD image package file.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatibility is detected.

Command	Description
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
upgrade hw-module slot	Manually upgrades the current FPD image package on a SIP or any FPD-capable cards.
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.

show upgrade fpd table

To view various information used by the Cisco IOS software to manage the FPD image package file, use the **showupgradefpdtable** command in privileged EXEC mode.

show upgrade fpd table

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(20)S6	This command was introduced and replaced the **showupgradetable**command on the Cisco 7304 router.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB.

Usage Guidelines

This command provides version information used by the Cisco IOS image to manage the FPD image package file and to locate the correct FPD image within the FPD image package file to perform an FPD upgrade. Most of the information provided by this command is useful for customer support purposes.

In Cisco IOS Releases 12.2(20)S2 through 12.2(20)S5, the output generated by entering this command can be generated by entering the **showupgradetable**command.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), refer to the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide.

Examples

The following example displays various FPD information for Cisco IOS Release 12.2(20)S5:

```
Router# show upgrade fpd table

Field Programmable Devices (FPD) Bundle Information Table:
============================================================

Table Entry #1:

       Bundle Card Type:SPA-4FE-7304 (0x435)
         Platform Family:0x0
     Bundle Name Prefix:spa_4fe2ge
          Bundle Version:0.5
    Minimal H/W Version:0.0
        FPD Image Count:1
     FPD Image Required:
                                                        Min. Required
```

```
                        FPD ID FPD Name                    Version
                        ------ ------------------------ -------------
                           1   Data & I/O FPGA              4.17
                        ------ ------------------------ -------------

Table Entry #2:

       Bundle Card Type:SPA-2GE-7304 (0x436)
        Platform Family:0x0
     Bundle Name Prefix:spa_4fe2ge
         Bundle Version:0.5
    Minimal H/W Version:0.0
        FPD Image Count:1
     FPD Image Required:
                                                  Min. Required
                        FPD ID FPD Name                Version
                        ------ ------------------------ -------------
                           1   Data & I/O FPGA              4.17
                        ------ ------------------------ -------------
```

Cisco uBR10012 Universal Broadband Router

The following example displays various FPD information for Cisco IOS Release 12.2(33)SCB:

```
Router# show upgrade fpd table
```

Field Programmable Devices (FPD) Bundle Information Table:

```
============================================================
Table Entry #1:
       Bundle Card Type: 5xGE SPA (0x50A)
            Card Family: SPA
        Platform Family: 0x0
     Bundle Name Prefix: spa_ge_eth
         Bundle Version: 0.1
    Minimal H/W Version: 0.0
        FPD Image Count: 1
     FPD Image Required:
                                                  Min. Required
                        FPD ID FPD Name                Version
                        ------ ------------------------ -------------
                           1   5xGE V2 I/O FPGA             1.10
                        ------ ------------------------ -------------

Table Entry #2:

       Bundle Card Type: 1x10GE XFP SPA (0x50C)
            Card Family: SPA
        Platform Family: 0x0
     Bundle Name Prefix: spa_10ge_eth
         Bundle Version: 0.1
    Minimal H/W Version: 0.0
        FPD Image Count: 1
     FPD Image Required:
                                                  Min. Required
                        FPD ID FPD Name                Version
                        ------ ------------------------ -------------
                           1   10GE V2 I/O FPGA             1.9
                        ------ ------------------------ -------------
Table Entry #3:
```

```
Bundle Card Type: WIDEBAND DOCSIS SPA (0x4AE)
            Card Family: SPA
        Platform Family: 0x0
     Bundle Name Prefix: spa_modena
         Bundle Version: 0.5
    Minimal H/W Version: 0.0
        FPD Image Count: 1
     FPD Image Required:
                                                 Min. Required
                         FPD ID FPD Name             Version
                         ------ ------------------------ -------------
                            1   Modena BLAZE FPGA         1285.1444
                         ------ ------------------------ -------------
```

Related Commands

Command	Description
upgrade hw-module subslot	Manually upgrades the current FPD image on the specified SPA.
upgrade fpd auto	Configures the router to automatically upgrade the FPD image when an FPD version incompatability is detected.
upgrade fpd path	Specifies the location from where the FPD image package should be loaded when an automatic FPD upgrade is initiated by the router.
show hw-module slot fpd	Displays the current versions of FPD image files for all of the active SIPs on a router.
show hw-module subslot fpd	Displays the FPD version on each SPA in the router.
show upgrade fpd file	Displays the contents of an FPD image package file.
show upgrade fpd package default	Displays which FPD image package is needed for the router to properly support the SPAs.
show upgrade fpd progress	Displays the progress of the FPD upgrade while an FPD upgrade is taking place.

show upgrade fpga progress

To display the progress of an FPGA upgrade on a Cisco 7304 router, use the **showupgradefpgaprogress**command in privileged EXEC mode.

show upgrade fpga progress

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(20)S6	This command was introduced.

Usage Guidelines

This command will only provide useful output during an FPGA upgrade.

This command provides information regarding FPGA upgrades, including the approximate amount of time a particular FPGA upgrade would take and the amount of time the in-progress FPGA upgrade has taken.

Because the console where you began the FPGA upgrade becomes unusable during the FPGA upgrade, this command can only be entered from a connection that was not used to initiate the FPGA upgrade.

Examples

The following example displays information about an in-progress FPGA update. Note that the example shows the FPGA mismatch and provides the user with the approximate time needed to complete the upgrade and the amount of time the current upgrade has taken.

```
Router# show upgrade fpga progress
FPGA image update progress information:
  Slot 0, FPGA name = NPEG100
  Hardware version = 01.00
  Current FPGA version = 02.04
  New FPGA version = 02.05
  Time needed to update = 00:12:00 (approximate)
  Actual time taken so far = 00:01:47
```

Related Commands

Command	Description
show c7300	Displays the types of hardware installed in a Cisco 7304 router, including the current FPGA version and the bundled FPGA version.
show diag	Displays hardware information for any slot or the chassis.
upgrade fpga	Specifies router response when an FPGA mismatch is detected.
upgrade fpga all	Manually upgrades all of the FPGAs for all of the installed hardware on the Cisco 7304 router.

show upgrade hw-programmable file

To display the names and versions of individual files in the hw-programmable package file in a Cisco ASR 1000 Series Router, use the **showupgradehw-programmablefile**command in Privileged EXEC configuration mode.

show upgrade hw-programmable file filename

Syntax Description

filename	Specifies the hw-programmable upgrade package file and its file system location. For filename, specify one of the following system locations and a package file name: • bootflash: RP-relative HW programmable package name • flash: RP-relative HW programmable package name • harddisk: RP-relative HW programmable package name This is the hw-programmable upgrade package file that contains a new version of the CPLD and FPGA code, used for performing the CPLD on a Cisco ASR 1013 Router or FPGA upgade on a Cisco ASR 1000 Series Router. The package file name is typically named asr1000-hw-programmables.<release_name>.pkg

Command Default

The names and versions of individual files in the hw-programmable package file is not displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.1S	This command was introduced in Cisco IOS XE Release 3.1S.

Usage Guidelines

For procedures on performing a CPLD upgrade, see the Upgrading Field Programmable Hardware Devices for Cisco ASR 1000 Series Routers document.

Examples

The following example displays the names of the card types and version numbers in the package file:

```
Router# show upgrade hw-programmable file harddisk:asr1000-hw-programmables.xe31.100616.pkg

  List of card type, hw-programmable device and version in this package:
  No.  Card Type           hw-programmable device  Version
-------------------------------------------------------------
   0   ASR1000-SIP10       CPLD                    09111601
   1   ASR1000-RP2         CPLD                    10021901
```

Related Commands

Command	Description
upgrade hw-programmable	Performs a Complex Programmable Logic Device (CPLD) or Field-Programmable Gate Array (FPGA) upgrade on a Cisco ASR 1000 Series Router.
show hw-programmable	Displays the current CPLD and FPGA versions on a Cisco ASR 1000 Series Router.
show upgrade hw-programmable progress	Displays the upgrade progress of the line card-field upgradeable device (LC-FPD) on a Cisco ASR 1000 Series Router.

show upgrade hw-programmable progress

To display the upgrade progress of the line card-field upgradeable device (LC-FPD) on a Cisco ASR 1000 Series Router, use the **showupgradehw-programmableprogress**command in Privileged EXEC configuration mode.

show upgrade hw-programmable progress

Syntax Description

This command has no arguments or keywords.

Command Default

The upgrade progress of the line card-field upgradeable device is not displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE Release 3.1S	This command was introduced in Cisco IOS XE Release 3.1S.

Usage Guidelines

The line card may be an RP, ESP, or SIP card.

This command only displays the hardware programmable upgrades that are in progress.

For procedures on performing a CPLD upgrade, see the Upgrading Field Programmable Hardware Devices for Cisco ASR 1000 Series Routers document.

Examples

The following example displays the upgrade progress of the CPLD upgrade in the RP slot 1:

```
Router# show upgrade hw-programmable progress

Upgrade hw-programmable progress

Slot              Hw-programmable device    Upgrade status
-----------------------------------------------------------
R1                CPLD                      in progress
```

Related Commands

Command	Description
upgrade hw-programmable	Performs a Complex Programmable Logic Device (CPLD) or Field-Programmable Gate Array (FPGA) upgrade on a Cisco ASR 1000 Series Router.
show hw-programmable	Displays the current CPLD and FPGA version on a Cisco ASR 1000 Series Router.
show upgrade hw-programmable	Displays the names and versions of individual files in the hw_programmable package file.

show upgrade package default

The show upgrade package default command is replaced by the **show upgrade fpd package default** command. See the **show upgrade fpd package default** command for more information.

show upgrade progress

The show upgrade progress command is replaced by the **show upgrade fpd progress** command. See the **show upgrade fpd progress** command for more information.

show upgrade table

The show upgrade table command is replaced by the **show upgrade fpd table** command. See the **show upgrade fpd table** command for more information.

show vmi neighbors

To display information about neighbor connections to the Virtual Multipoint Interface (VMI), use the **showvmineighbors** command in User EXEC mode.

show vmi neighbors [**detail**] [*vmi-interface*]

Syntax Description

detail	(Optional) Displays details about the VMI neighbors.
vmi-interface	(Optional) Number of the VMI interface

Command Default

If no arguments are specified, information about all neighbors for all VMI interfaces is displayed.

Command Modes

User EXEC

Command History

Release	Modification
12.4(15)XF	This command was introduced.
12.3(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

If no arguments are specified, information about all neighbors for all VMI interfaces is displayed.

The **showvmineighbors**command provides a list of devices that have been dynamically discovered by the connected radio devices in a router-to-radio network, and for which connectivity has been achieved through PPPoE and the radio network.

Examples

The following is sample output from the **showvmineighbors** command used to display dynamically created neighbors on a VMI interface.

```
Router# show vmi neighbors vmi1
1 vmi1 Neighbors
           IPV6       IPV4                      Transmit    Receive
Interface  Address    Address       Uptime      Packets     Packets
vmi1       ::         10.3.3.2      00:02:11    0000000008  0000000073
```

The table below describes the significant fields shown in the **showvmineighbors** command display.

Table 11: show vmi neighbors Field Descriptions

Field	Description
Interface	The interface number.
IPv6 Address	IPv6 address of the neighbor.
IPv4 Address	IPv4 address of the neighbor.
Uptime	How long the interface has been up. Time shown in hh:mm:ss format.
Transmit Packets	Number of packets transmitted from the interface during the monitored up time.

Field	Description
Received Packets	Number of packets received on the interface during the monitored up time.

show vmi neighbors command with detail keyword: Example

The following example shows the details about the known VMI neighbors.

```
Router# show vmi neighbors detail

1 vmi1 Neighbors
vmi1   IPV6 Address=::
       IPV4 Address=10.3.3.2, Uptime=00:02:16
       Output pkts=8, Input pkts=75
       No Session Metrics have been received for this neighbor.
       Transport PPPoE, Session ID=79
       INTERFACE STATS:
          VMI Interface=vmi1,
             Input qcount=0, drops=0, Output qcount=0, drops=0
          V-Access intf=Virtual-Access3,
             Input qcount=0, drops=0, Output qcount=0, drops=0
          Physical intf=FastEthernet0/0,
             Input qcount=0, drops=0, Output qcount=0, drops=0
PPPoE Flow Control Stats
 Local Credits: 65442   Peer Credits: 65443
 Credit Grant Threshold: 28000    Max Credits per grant: 65534
 PADG Seq Num: 133     PADG Timer index: 0
 PADG last rcvd Seq Num: 133
 PADG last nonzero Seq Num: 0
 PADG last nonzero rcvd amount: 0
 PADG Timers:    [0]-1000    [1]-2000    [2]-3000    [3]-4000
 PADG xmit: 133  rcvd: 133
 PADC xmit: 133  rcvd: 133
 PADQ xmit: 0  rcvd: 0
```

The table below describes the significant fields shown in the **showvmineighborsdetail**command display.

Table 12: show vmi neighbors detail Field Descriptions

Field	Description
Interface	The interface number.
IPv6 Address	IPv6 address of the neighbor.
IPv4 Address	IPv4 address of the neighbor.
Uptime	How long the interface has been up. Time shown in hh:mm:ss format.
Output pkts	Number of outgoing packets during the recorded up time.
Input pkts	Number of incoming packets during the recorded up time.
Transmitted packets	Number of packets transmitted from the interface.
Received Packets	Number of packets received on the interface.

Field	Description
Transport	The routing protocol, in this case-PPPoE.
Session ID	The identifier of the VMI session.
INTERFACE STATS	A series of statistics collected on the interface and shows for each of the VMI interface, virtual access interface, and the physical interface. For each interface, statistics are displayed indicating the number of packets in the input and output queues and the number of packets dropped from each queue.
PPPoE Flow Control Stats	The statistics collected for PPPoE credit flow. **Local Credits** : The amount of credits belonging to this node.**PeerCredits**: The amount of credits belonging to the peer.**CreditGrantThreshold**: The number of credits below which the peer needs to dip before this node sends an inband or out-of-band grant.**MaxCreditspergrant**: 65534**PADGSeqNum**: 133 **PADGTimerindex**: 0**PADGlastrcvdSeqNum**: 133**PADGlastnonzeroSeqNum**: 0**PADGlastnonzerorcvdamount**: 0**PADGTimers**: [0]-1000 [1]-2000 [2]-3000 [3]-4000**PADGxmit**:*numeric***rcvd**: *numeric* **PADCxmit**:**133rcvd:133 PADQxmit**:**0rcvd**: 0

Related Commands

Command	Description
debug vmi	Displays debugging output for virtual multipoint interfaces (VMIs)
interface vmi	Creates a virtual multipoint interface (VMI) that can be configured and applied dynamically.

show wedged-interfaces

To display input and output queue wedged interfaces, use the **showwedged-interfaces** command in user EXEC or privileged EXEC mode.

show wedged-interfaces {**input** | **output**}

Syntax Description

input	Displays input the queue wedged interface list.
output	Displays output the queue wedged interface list.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced in a release earlier than Cisco IOS Release 15.0(1)M on the Cisco AS 5400 series routers.

Usage Guidelines

Interface queue wedged monitoring is disabled by default. You can use the **interface-monitorenable** command to enable the queue wedged monitoring. Once the monitoring is switched on, a background process is created, which monitors all the existing input and output queue wedged interfaces.

Examples

The following is sample output from the **showwedged-interfaces** command:

```
Router# show wedged-interfaces output
Interface Name             Time Since Wedge
Async4/00                  00:23:33
Async4/01                  00:23:26
Async4/02                  00:23:21
Async4/03                  00:23:15
FastEthernet0/0            00:24:35
FastEthernet0/1            00:24:50
Virtual-Access2            00:38:19
Virtual-Access3            00:38:19
```

The table below describes the fields shown in the display.

Table 13: show wedged-interfaces output Field Descriptions

Field	Description
Interface Name	Lists the name of the interface.
Time Since Wedge	Time since a problem was detected in the interface.

Related Commands

Command	Description
interface-monitor enable	Enables interface queue wedge monitoring.

shutdown (controller)

To disable the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 or Cisco 10000 series routers, use the **shutdown**command in controller configuration mode. To restart a disabled CT3IP, use the **no** form of this command.

shutdown
no shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

Using this command assumes that the controller is already enabled. By default, if this command is not issued, the controller remains enabled.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Cisco 7500 Series Routers

Shutting down the CT3IP disables all functions on the interface and sends a blue alarm to the network. The **shutdown** command marks the interface as unavailable. To check if the CT3IP is disabled, use the **showcontrollerst3** command.

Cisco 10000 Series Router

Alarms are cleared automatically 10 seconds after a no shutdown command is issued on a T3 port. Shutting down a controller causes a T3 port to transmit:

- A blue alarm for m13 framing
- An idle signal for c-bit framing

There is no delay for alarms to clear after issuing a no shutdown command on an E3 port.

Examples

Cisco 7500 Series Router

The following example shuts down the CT3IP:

```
Router(config
)
# controller t3 9/0/0
```

```
Router(config
-controller)
# shutdown
```

Cisco 10000 Series Router

The following example shuts down the controller on port 0:

```
Router(config
)
# dsx3 1/0/0
Router(config
-controller)
# shutdown
```

Related Commands

Command	Description
show controllers j1	Displays information about the J1 link.
show controllers t1	Displays the total number of calls and call durations on a T1 controller.
show controllers t3	Displays the hardware and software driver information for a T3 controller.

shutdown (dwdm)

To disable DWDM controller processing, use the **shutdown** command in controller configuration mode. To bring a DWDM controller back up and enable DWDM controller processing, use the**no** form of this command.

shutdown
no shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

This command is disabled by default.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
12.2(33)SRD1	This command was introduced on the Cisco 7600 series router.

Usage Guidelines

The DWDM controller is enabled by default. You must use the shutdown command to disable the controller.

Examples

The following example disables the DWDM controller :

```
Router(config)# controller dwdm 1/1
Router(config-controller)# shutdown
```

Related Commands

Command	Description
show controller dwdm	Displays ITU-T G.709 alarms, alerts, and counters.

shutdown (hub)

To shut down a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router, use the **shutdown**command in hub configuration mode. To restart the disabled hub, use the **no** form of this command.

shutdown
no shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

Using this command assumes that the hub is already enabled. By default, if this command is not issued, the hub remains enabled.

Command Modes

Hub configuration

Command History

Release	Modification
10.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example shuts down hub 0, ports 1 through 3:

```
Router(config)#
 hub ethernet 0 1 3
Router(config-hub)#
 shutdown
```

Related Commands

Command	Description
hub	Enables and configures a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router.

shutdown (interface)

To disable an interface, use the **shutdown** command in interface configuration mode. To restart a disabled interface, use the **no**form of this command.

shutdown
no shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

Using this command assumes that the interface is already enabled. By default, if this command is not issued, the interface remains enabled.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **shutdown** command disables all functions on the specified interface. On serial interfaces, this command causes the data terminal ready (DTR) signal to be dropped. On Token Ring interfaces, this command causes the interface to be removed from the ring. On FDDI interfaces, this command causes the optical bypass switch, if present, to go into bypass mode.

This command also marks the interface as unavailable. To check whether an interface is disabled, use the **showinterfaces** user EXEC command; an interface that has been shut down is shown as administratively down in the display from this command.

Examples

The following example turns off Ethernet interface 0:

```
Router(config
)
# interface ethernet 0
Router(config-if
)
# shutdown
08:32:03:%LINK-5-CHANGED:Interface Ethernet 0, changed state to administratively down
```

The following example turns the interface back on:

```
Router(config
)
# interface ethernet 0
Router(config
-if)
```

```
# no shutdown
08:32:16:%LINK-3-UPDOWN:Interface Ethernet 0, changed state to up
08:32:17:%LINEPROTO-5-UPDOWN:Line protocol on Interface Ethernet 0, changed state to up
```

Related Commands

Command	Description
interface	Configures an interface type and enters interface configuration mode.
show interfaces	Displays the statistical information specific to a serial interface.

signaling

To enable channel-associated signaling (CAS), use the **signaling**command in CEM configuration mode. To disable signaling, use the **no** form of this command.

signaling [*on-hook-pattern*] [*off-hook-pattern*] [*msec*]
no signaling [*on-hook-pattern*] [*off-hook-pattern*] [*msec*]

Syntax Description

on-hook-pattern	(Optional) Specifies the ABCD signaling bits sent to the attached device (typically a PBX) to simulate the remote PBX sending notification that any call in progress has been terminated or is on-hook. The T1 default is 5 hex. The E1 default is D hex.
off-hook-pattern	(Optional) Specifies the ABCD signaling bits sent to the attached device (typically a PBX) to simulate the remote PBX sending notification that a channel is already in use, or is off-hook. The T1 default is F hex. The E1 default is 5 hex.
msec	(Optional) Specifies the time, in milliseconds, between the onhook and offhook patterns. Values are in the range from 50 to 5000. Default is 2000. Any value entered is rounded up to the next multiple of 50 milliseconds.

Command Default

CAS is disabled.

Command Modes

CEM configuration

Command History

Release	Modification
12.3(7)T	This command was introduced.
12.3(7)T1	The *on-hook-pattern*, *off-hook-pattern*, and *msec* arguments were added.

Usage Guidelines

When a T1/E1 channel with signaling enabled is placed in the failed state, the on-hook pattern is sent to the attached device for a duration specified by the *msec* attribute. After the time specified by the *msec*attribute, the off-hook pattern is sent to the attached device for as long as the CEM connection remains failed.

The on-hook pattern parameter specifies, as a single hexadecimal character, the ABCD signaling bits sent to the attached device (typically a PBX) to simulate the remote PBX sending notification that any call in progress has been terminated or is on-hook. This provides a forced disconnect of any calls when the CEM connection fails.

The off-hook pattern parameter specifies, as a single hexadecimal character, the ABCD signaling bits sent to the attached device (typically a PBX) to simulate the remote PBX sending notification that a channel is already in use, or is off-hook. This prevents the attached PBX from trying to use the failed channel to place a new call while the CEM connection remains failed.

Examples

The following example shows how to enable signaling.

```
Router(config-cem)# signaling
```

The following example shows how to enable signaling with onhook and offhook parameters:

```
Router(config-cem)# signalling 0x0 0x1 101
Delay will be set to 150 ms
```

Related Commands

Command	Description
cem	Enters circuit emulation configuration mode.
failure	Specifies a time period before a CEM connection enters, or recovers from, a failed state.
show cem	Displays CEM channel statistics.

smt-queue-threshold

To set the maximum number of unprocessed FDDI station management (SMT) frames that will be held for processing, use the **smt-queue-threshold** command in global configuration mode. To restore the queue to the default, use the **no** form of this command.

smt-queue-threshold *number*
no smt-queue-threshold

Syntax Description

number	Number of buffers used to store unprocessed SMT messages that are to be queued for processing. Acceptable values are positive integers. The default value is equal to the number of FDDI interfaces installed in the router.

Command Default

The default threshold value is equal to the number of FDDI interfaces installed in the router.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command helps ensure that routers keep track of FDDI *upstream* and *downstream* neighbors, particularly when a router includes more than one FDDI interface.

In FDDI, upstream and downstream neighbors are determined by transmitting and receiving SMT Neighbor Information Frames (NIFs). The router can appear to lose track of neighbors when it receives an SMT frame and the queue currently contains an unprocessed frame. This occurs because the router discards incoming SMT frames if the queue is full. Discarding SMT NIF frames can cause the router to lose its upstream or downstream neighbor.



Caution Use this command carefully because the SMT buffer is charged to the inbound interface (input hold queue) until the frame is completely processed by the system. Setting this value to a high limit can impact buffer usage and the ability of the router to receive routable packets or routing updates.

Examples

The following example specifies that the SMT queue can hold ten messages. As SMT frames are processed by the system, the queue is decreased by one:

```
Router(config)# smt-queue-threshold 10
```

snmp ifmib ifindex persist

To globally enable ifIndex values to persist , which will remain constant across reboots, for use by the Simple Network Management Protocol (SNMP), use the **snmpifmibifindexpersist**command in global configuration mode. To globally disable ifIndex persistence, use the **no** form of this command.

snmp ifmib ifindex persist
no snmp ifmib ifindex persist

Syntax Description

This command has no arguments or keywords.

Command Default

The ifIndex persistence on a router is disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SRA	This command was introduced. This command replaces the **snmp-serverifindexpersist**command.
12.2(31)SG	This command was integrated into Cisco IOS Release 12.2(31)SG.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The **snmpifmibifindexpersist** command does not override an interface-specific configuration. The interface-specific configuration of ifIndex persistence is configured with the **snmpifindexpersist** and **snmpifindexclear** commands in interface configuration mode.

The **snmpifmibifindexpersist** command enables ifIndex persistence for all interfaces on a routing device by using the ifDescr and ifIndex entries in the ifIndex table of interface MIB (IF-MIB).

ifIndex persistence means that the ifIndex values in the IF-MIB persist across reboots, allowing for the consistent identification of specific interfaces that use SNMP.

If ifIndex persistence was previously disabled for a specific interface by using the **nosnmpifindexpersist** command, ifIndex persistence will remain disabled for that interface.

Examples

The following example shows how to enable ifIndex persistence for all interfaces:

```
Router(config)# snmp ifmib ifindex persist
```

Related Commands

Command	Description
snmp ifindex clear	Clears any previously configured **snmpifIndex** commands issued in interface configuration mode for a specific interface.
snmp ifindex persist	Enables ifIndex values that persist across reboots (ifIndex persistence) in the IF-MIB.

snmp ifindex clear

To clear previously configured Simple Network Management Protocol (SNMP) ifIndex commands issued for a specific interface or a specific service instance, use the **snmpifindexclear** command in either interface configuration mode or service instance configuration mode. This command does not have a **no** form.

snmp ifindex clear

Syntax Description

This command has no arguments or keywords.

Command Default

ifIndex values are not cleared.

Command Modes

Interface configuration (config-if) Service instance configuration (config-if-srv)

Command History

Release	Modification
12.0(11)S	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command was introduced on the Supervisor Engine 2.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRD1	Support for this command was extended to service instance configuration mode in Cisco IOS Release 12.2(33)SRD1.

Usage Guidelines

Interface Index Persistence means that ifIndex values in the IF-MIB persist across reboots, allowing for consistent identification of specific interfaces using SNMP.

Use the**snmpifindexclear** command on a specific interface when you want that interface to use the global configuration setting for ifIndex persistence. This command clears all ifIndex configuration commands previously entered for that specific interface.

When you clear the ifIndex configuration, the ifIndex persistence is enabled for all interfaces as specified by the **snmp-serverifindexpersist** command in global configuration mode.

Examples

The following example shows how to enable ifIndex persistence for all interfaces:

```
Router(config)# snmp-server ifindex persist
```

The following example shows how to disable IfIndex persistence for Ethernet interface 0/1:

```
Router(config)# interface ethernet 0/1
Router(config-if)# no snmp ifindex persist
Router(config-if)# exit
```

The following example shows how to clear ifIndex persistence for service instance 100 on Ethernet interface 0/1:

```
Router(config)# interface ethernet 0/1
Router(config-if)# service instance 100 ethernet

Router(config-if-srv)# snmp ifindex clear
```

Router(config-if-srv)# **exit**

The following example shows how to clear the ifIndex configuration from Ethernet interface 0/1:

```
Router(config)# interface ethernet 0/1
Router(config-if)# snmp ifindex clear
Router(config-if)# exit
```

The ifIndex persistence configuration is now enabled for all interfaces, as specified by the **snmp-serverifindexpersist** global configuration command.

Related Commands

Command	Description
snmp ifindex persist	Enables ifIndex values in the Interfaces MIB (IF-MIB) that persist across reboots (ifIndex persistence) only on a specific interface.
snmp-server ifindex persist	Enables ifIndex values that will remain constant across reboots for use by SNMP.

snmp-server enable traps netsync

To configure the Simple Network Management Protocol (SNMP) SyncE trap, use the**snmp-serverenabletrapsnetsync**command in global configuration mode. To disable the SNMP SyncE trap, use the **no** form of this command.

snmp-server enable traps netsync
no snmp-server enable traps netsync

Syntax Description

This command has no arguments or keywords.

Command Default

SNMP traps are not configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.1(2)S	This command was introduced.
Cisco IOS XE Release 3.8S	This command was integrated into Cisco IOS XE Release 3.8S.

Usage Guidelines

The **showrunning-config**command when used with the **trap** keyword displays the SNMP traps that are enabled on a device.

Examples

The following example shows how to enable the SNMP traps on the SyncE event:

```
Device# configure terminal
Device(config)# snmp-server enable traps netsync
Device(config)# end
```

Related Commands

Command	Description
show running-config	Displays the running configuration of the device.

snmp ifindex persist

To enable ifIndex values in the Interfaces MIB (IF-MIB) that persist across reboots (ifIndex persistence) on a specific interface or service instance, use the **snmpifindexpersist**command in either interface configuration mode or service instance configuration mode. To disable ifIndex persistence on a specific interface or service instance, use the **no** form of this command.

snmp ifindex persist
no snmp ifindex persist

Syntax Description

This command has no arguments or keywords.

Command Default

This command is disabled.

Command Modes

Interface configuration (config-if) Service instance configuration (config-if-srv)

Command History

Release	Modification
12.0(11)S	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRD1	Support for this command was extended to service instance configuration mode in Cisco IOS Release 12.2(33)SRD1.

Usage Guidelines

Interface Index Persistence means that ifIndex values in the IF-MIB persist across reboots, allowing for consistent identification of specific interfaces using Simple Network Management Protocol (SNMP).

The **snmpifindexpersist** command in interface configuration mode enables and disables ifIndex persistence for individual entries (corresponding to individual interfaces) in the ifIndex table of the IF-MIB.

The **snmpifindexpersist** command in service instance configuration mode enables and disables ifIndex persistence for individual service instances (Layer 2 VLAN interfaces) in the ifIndex table of the IF-MIB.

The **snmp-serverifindexpersist** command in global configuration mode enables and disables ifIndex persistence for all interfaces on the routing device that have ifDescr and ifIndex entries in the ifIndex table of the IF-MIB.

IfIndex commands configured for an interface apply to all subinterfaces on that interface.

Examples

In the following example, ifIndex persistence is enabled for Ethernet interface 0/1 only:

```
Router(config)# interface ethernet 0/1
Router(config-if)# snmp ifindex persist
Router(config-if)# exit
```

In the following example, ifIndex persistence is enabled for all interfaces and then disabled for Ethernet interface 0/1 only:

```
Router(config)# snmp-server ifindex persist
Router(config)# interface ethernet 0/1
Router(config-if)# no snmp ifindex persist
Router(config-if)# exit
```

In the following example, ifIndex persistence is enabled for service instance 100 on Ethernet interface 0/1:

```
Router(config)# interface ethernet 0/1
Router(config-if)# service instance 100 ethernet
Router(config-if-srv)# snmp ifindex persist
```

Router(config-if-srv)# **exit**

Related Commands

Command	Description
snmp ifindex clear	Clears previously configured SNMP ifIndex commands for a specific interface or service instance.
snmp-server ifindex persist	Enables ifIndex values that will remain constant across reboots for use by SNMP.

snmp trap illegal-address

To issue a Simple Network Management Protocol (SNMP) trap when a MAC address violation is detected on an Ethernet hub port of a Cisco 2505, Cisco 2507, or Cisco 2516 router, use the **snmptrapillegal-address** command in hub configuration mode. To disable this function, use the **no** form of this command.

snmp trap illegal-address
no snmp trap illegal-address

Syntax Description

This command has no arguments or keywords.

Command Default

No SNMP trap is issued.

Command Modes

Hub configuration

Command History

Release	Modification
11.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

In addition to setting the **snmptrapillegal-address**command on the Ethernet hub, you can set the frequency that the trap is sent to the network management station (NMS). This is done on the NMS via the Cisco Repeater MIB. The frequency of the trap can be configured for once only or at a decaying rate (the default). If the decaying rate is used, the first trap is sent immediately, the second trap is sent after one minute, the third trap is sent after two minutes, and so on until 32 minutes, at which time the trap is sent every 32 minutes. If you use a decaying rate, you can also set the trap acknowledgment so that the trap will be acknowledged after it is received and will no longer be sent to the network management station.

Because traps are not reliable, additional information on a port basis is provided by the Cisco Repeater MIB. The network management function can query the following information: the last illegal MAC source address, the illegal address trap acknowledgment, the illegal address trap enabled, the illegal address first heard (timestamp), the illegal address last heard (timestamp), the last illegal address trap count for the port, and the illegal address trap total count for the port.

In addition to issuing a trap when a MAC address violation is detected, the port is also disabled as long as the MAC address is invalid. The port is enabled and the trap is no longer sent when the MAC address is valid (that is, either the address was configured correctly or learned).

Examples

The following example enables an SNMP trap to be issued when a MAC address violation is detected on hub ports 2, 3, or 4. SNMP support must already be configured on the router.

```
Router(config)#
 hub ethernet 0 2 4
Router(config-hub)#
 snmp trap illegal-address
```

Related Commands

Command	Description
hub	Enables and configures a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router.

snmp-server ifindex persist

Note This command is not supported in Cisco IOS Release 12.2SR. For Cisco IOS Release 12.2SR, use the **snmpifmibifindexpersist** command.

To globally enable ifIndex values that will remain constant across reboots for use by Simple Network Management Protocol (SNMP), use the **snmp-serverifindexpersist** command in global configuration mode. To globally disable ifIndex persistence, use the **no** form of this command.

snmp-server ifindex persist
no snmp-server ifindex persist

Syntax Description

This command has no arguments or keywords.

Command Default

This command is disabled.

Command Modes

Global configuration

Command History

Release	Modification
12.0(11)S	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was replaced by the **snmpifmibifindexpersist**command in Cisco IOS Release 12.2SR.

Usage Guidelines

Interface Index Persistence means that ifIndex values in the IF-MIB persist across reboots, allowing for consistent identification of specific interfaces using SNMP.

The **snmp-serverifindexpersist** global configuration command will not override interface-specific configuration. Interface-specific configuration of ifIndex persistence is performed with the **[no]snmpifindexpersist** and **snmpifindexclear** interface configuration commands.

The **[no]snmp-serverifindexpersist** global configuration command enables and disables ifIndex persistence for all interfaces on the routing device using ifDescr and ifIndex entries in the ifIndex table of the IF-MIB.

Examples

In the following example, ifIndex persistence is enabled for all interfaces:

```
Router(config)# snmp-server ifindex persist
```

Note that in this example if ifIndex persistence was previously disabled for a specific interface using the **nosnmpifindexpersist** interface configuration command, ifIndex persistence will remain disabled for that interface. The global ifIndex command does not override the interface-specific commands.

Related Commands

Command	Description
snmp ifindex clear	Clears any previously configured snmp ifIndex commands issued in interface configuration mode for a specific interface.
snmp ifindex persist	Enables ifIndex values in the Interfaces MIB (IF-MIB) that persist across reboots (ifIndex persistence) only on a specific interface.

snr margin

To set the signal-to-noise ratio (SNR) on the controller to improve the line stability, use the **snrmargin** command in controller configuration mode. To reset the SNR to default settings, use the **no** form of this command.

snr margin {**current** [*snr-value* | **disable**] | **snext** [*snr-value* | **disable**]}
no snr margin {**current** | **snext**}

Syntax Description

current	Sets the current signal-to-noise ratio on the controller. To disable the current SNR, set **current** to **disable**.
snext	Sets the Self Near End Cross Talk (SNEXT) signal-to-noise ratio. To disable the SNEXT, set **snext** to **disable**.
snr-value	(Optional) Value, in decibels (dB), for the signal-to-noise ratio on the controller or the SNEXT. Range is from -10 to 10 . The default value is 0.
disable	(Optional) Disables the **snrmargin** command.

Command Default

The default value for both **current** and **snext** is 0.

Command Modes

Controller configuration

Command History

Release	Modification
12.3(4)XD	This command was introduced on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.3(4)XG	This command was integrated into Cisco IOS Release 12.3(4)XG on the Cisco 1700 series routers.
12.3(7)T	This command was integrated into Cisco IOS Release 12.3(7)T on Cisco 2600 series, Cisco 3631, and Cisco 3700 series routers.
12.3(11)T	This command was integrated into Cisco IOS Release 12.3(11)T on Cisco 2800 series and Cisco 3800 series routers.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T on Cisco 1800 series routers.

Usage Guidelines

The **snrmargincurrent**command can create a more stable line by making the line train more than the current noise margin plus signal-to-noise ratio threshold during training time. If any external noise is applied that is less than the set SNR margin, the line will be stable.

The **snrmarginsnext**command can create a more stable line by making the line train more than the Self Near End Cross Talk (SNEXT) threshold during training time. If any external noise is applied that is less than the set SNEXT margin, the line will be stable.

Examples

SNR with SNEXT Disabled

The following example configures the signal-to-noise ratio to 5 dB on the DSL controller in slot 3 and port 0 and disables the SNEXT signal-to-ratio.

```
Router(config)# controller
 dsl
 3/0
Router(config-controller)# snr margin
current

5
Router(config)# controller
 dsl
 3/0
Router(config-controller)# snr margin
snext

disable
```

SNR Margin set on CPE Router

The following example shows the **snrmarginsnext5** command issued on the customer premises equipment (CPE) router.

```
Router_CPE(config)# controller dsl
 1/0
Router_CPE(config-controller)# snr margin
 snext
 5
Router_CPE(config-controller)#
*Jun 15 18:29:38.511: %CONTROLLER-5-UPDOWN: Controller DSL 1/0, changed state tn
*Jun 15 18:29:40.511: %LINK-3-UPDOWN: Interface ATM1/0, changed state to down
*Jun 15 18:29:41.511: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM1/0, cn
*Jun 15 18:30:04.579:  DSL 1/0 controller Link up! line rate: 4608 Kbps
*Jun 15 18:30:04.579: %CONTROLLER-5-UPDOWN: Controller DSL 1/0, changed state tp
*Jun 15 18:30:12.351: %LINK-3-UPDOWN: Interface ATM1/0, changed state to up
*Jun 15 18:30:13.351: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM1/0, cp
```

Status on CO Side with SNR Margin set on CPE Router

The following example is the resulting output on the router that is configured as the central office (CO) side after the **snrmarginsnext5** command is entered on the CPE side.

```
Router_CO#
Jun 15 18:29:42.781: %CONTROLLER-5-UPDOWN: Controller DSL 0/0, changed state ton
Jun 15 18:29:44.784: %LINK-3-UPDOWN: Interface ATM0/0, changed state to down
Jun 15 18:29:45.786: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM0/0, chn
Jun 15 18:30:03.122:  DSL 0/0 controller Link up! line rate: 4608 Kbps
Jun 15 18:30:03.122: %CONTROLLER-5-UPDOWN: Controller DSL 0/0, changed state top
Jun 15 18:30:11.456: %LINK-3-UPDOWN: Interface ATM0/0, changed state to up
Jun 15 18:30:12.458: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM0/0, chp
```

source-address

To configure source address control on a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router, use the **source-address** command in hub configuration mode. To remove a previously defined source address, use the **no** form of this command.

source-address [*mac-address*]
no source-address

Syntax Description

mac-address	(Optional) MAC address in the packets that the hub will allow to access the network.

Command Default

Source address control is disabled.

Command Modes

Hub configuration

Command History

Release	Modification
10.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

If you omit the MAC address, the hub uses the value in the last source address register, and if the address register is invalid, it will remember the first MAC address it receives on the previously specified port and allow only packets from that MAC address onto that port.

Examples

The following example configures the hub to allow only packets from MAC address 1111.2222.3333 on port 2 of hub 0:

```
Router(config)#
 hub ethernet 0 2
Router(config-hub)#
 source-address 1111.2222.3333
```

The following example configures the hub to use the value of the last source address register. If the address register is invalid, it will remember the first MAC address it receives on port 2 and allow only packets from the learned MAC address on port 2:

```
Router(config)#
 hub ethernet 0 2
Router(config-hub)#
 source-address
```

Related Commands

Command	Description
hub	Enables and configures a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router.

speed

To configure the speed for a Fast Ethernet or Gigabit Ethernet interface, use the **speed** command in interface configuration mode. To return to the default configuration, use the **no** form of this command.

speed {**10** | **100** | **1000** [**negotiate**] | **auto** [*speed-list*]}
no speed

Syntax Description

10	Configures the interface to transmit at 10 Mbps.
100	Configures the interface to transmit at 100 Mbps.
1000	Configures the interface to transmit at 1000 Mbps. This keyword is valid only for interfaces that support Gigabit Ethernet.
auto	Enables Fast Ethernet autonegotiation. The interface automatically operates at 10 Mbps or 100 Mbps depending on environmental factors, such as the type of media and transmission speeds for the peer routers, hubs, and switches used in the network configuration. Autonegotiation is the default.
negotiate	(Optional) Enables or disables the link-negotiation protocol on Gigabit Ethernet ports.
speed-list	(Optional) Speed autonegotiation capability for a specific speed; see the "Usage Guidelines" section for valid values.

Command Default

Autonegotiation is enabled. The command is set to **auto**.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
11.2(10)P	This command was introduced.
12.1(7)E	This command was modified. The **1000** keyword was added for Gigabit Ethernet interfaces.
12.2S	This command was integrated into Cisco IOS Release 12.2 S.
12.2(20)S2	This command was implemented on the 4-port 10/100 Fast Ethernet SPA and the 2-port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 router.
12.2(14)SX	This command was implemented on the Supervisor Engine 720.
12.2(17a)SX	This command was modified. The *speed-list* argument was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 3.9S	This command was integrated into Cisco IOS XE Release 3.9S.

Release	Modification
15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

Usage Guidelines

Use the **speed** {**10** | **100**} command for 10/100 ports, the **speed auto 10 100 1000** command for 10/100/1000 ports, and the **speed 1000** [**negotiate**] command for Gigabit Ethernet ports.

Cisco Cloud Services Router 1000V Series

Cisco Cloud Services Router 1000V Series does not support the **speed** command.

Cisco 7600 Series Routers

Cisco 7600 Series Routers cannot automatically negotiate interface speed and duplex mode if either of the connecting interfaces is configured to a value other than **auto**.

Ethernet Interfaces

If you set the Ethernet interface speed to **auto** on a 10/100-Mbps or 10/100/1000-Mbps Ethernet interface, both duplex operation and speed are autonegotiated.

Gigabit Ethernet Interfaces

The Gigabit Ethernet interfaces are full duplex only. You cannot change the duplex mode on Gigabit Ethernet interfaces or on a 10/100/1000-Mbps interface that is configured for Gigabit Ethernet.

SPA Interfaces

The **speed** command applies to Shared Port Adapter (SPA) interfaces that use RJ-45 media. Gigabit Ethernet interfaces using fiber media support 1000-Mbps speed only and use the **negotiation** command to enable and disable autonegotiation.

See also “Flow Control” in the “Usage Guidelines” section.

Speed Command Syntax Combinations

The table below lists the supported command options by interface.

Table 14: Supported speed Command Options

Interface Type	Supported Syntax	Default Settings	Usage Guidelines
10/100-Mbps module	**speed** {**10** | **100**} **speed auto 10 100**	**auto**	If the speed is set to **auto**, you cannot set **duplex**. If the speed is set to **10** or **100**, without configuring the duplex setting, the duplex is set to **half** by default.

Interface Type	Supported Syntax	Default Settings	Usage Guidelines
10/100/1000-Mbps interface	**speed auto 10 100 1000**	**auto**	If the speed is set to **auto**, you cannot set **duplex**. If the speed is set to **10** or **100**, without configuring the duplex setting, the duplex is set to **half** by default. If the speed is set to **10** or **100**, the interface is not forced to half duplex by default.
100-Mbps fiber modules	Factory set	Not applicable.	
Gigabit Ethernet module	**speed 1000** [**negotiate**]	Speed is 1000 or negotiation is enabled.	Speed, duplex, flow control, and clocking negotiations are enabled.
10-Mbps ports	Factory set	Not applicable.	

Autonegotiation

To enable the autonegotiation capability on an RJ-45 interface, you must set either the **speed** command or the **duplex** command to **auto**. The default configuration is that both commands are set to **auto**.

If you need to force an interface port to operate with certain settings and, therefore, disable autonegotiation, you must be sure that the remote link is configured for compatible link settings for proper transmission including support of flow control on the link.

When you enable link negotiation, the speed, duplex, flow control, and clocking negotiations between two Gigabit Ethernet ports are automatically enabled.

Flow Control

Flow control support is always advertised when autonegotiation is enabled.

Every interface on a 4-port 10/100 Fast Ethernet SPA supports transmission of pause frames to stop packet flow when the Modular Services Card (MSC) is full. You cannot disable flow control for an interface on the 4-port 10/100 Fast Ethernet SPA. Therefore, flow control support is not configurable, but it is advertised during autonegotiation.

If you disable autonegotiation, then you must be sure that the remote device is configured to support flow control because flow control is automatically enabled for all interfaces on the 4-port 10/100 Fast Ethernet SPA.

Speed Settings

Separate the *speed-list* entries with a space.

When manually configuring the interface speed to either 10 or 100 Mbps, the switch prompts you to configure duplex mode on the interface.

The following *speed-list* configurations are supported:

- **speed auto**—Negotiate all speeds.
- **speed auto 10 100**—Negotiate 10 and 100 speeds only.
- **speed auto 10 100 1000**—Negotiate all speeds.

Speed and Duplex Combinations

The table below describes the interface behavior for various combinations of the **duplex** and **speed** command settings. The specified **duplex** command configured with the specified **speed** command produces the resulting system action.

If you decide to configure the interface speed and duplex commands manually, and enter a value other than **speed auto** (for example, 10 or 100 Mbps), ensure that you configure a connected interface with a matching speed using the speed command without using the **auto** keyword.

If you specify both a **duplex** and **speed** setting other than **auto** on an RJ-45 interface, then autonegotiation is disabled for the interface.

You cannot set the duplex mode to **half** when the port speed is set to **1000**, and similarly, you cannot set the port speed to **1000** when the mode is set to **half duplex**. In addition, if the port speed is set to **auto**, the **duplex** command is rejected.



Caution Changing the interface speed and duplex mode might shut down and reenable the interface during reconfiguration.

Table 15: Relationship Between duplex and speed Commands

duplex Command	speed Command	Resulting System Action
duplex auto	**speed auto**	Autonegotiates both speed and duplex settings. The interface advertises the capability for the following link settings: • 10 Mbps and half duplex • 10 Mbps and full duplex • 100 Mbps and half duplex • 100 Mbps and full duplex • 1000 Mbps and half duplex (Gigabit Ethernet only) • 1000 Mbps and full duplex (Gigabit Ethernet only)

duplex Command	speed Command	Resulting System Action
duplex auto	**speed 10** or **speed 100** or **speed 1000**	Autonegotiates the duplex mode. The interface advertises the capability for both half-duplex and full-duplex modes at the configured speed. For example, if the **speed 100** command is configured with **duplex auto**, then the interface advertises the following capability: • 100 Mbps and half duplex • 100 Mbps and full duplex
duplex half or **duplex full**	**speed auto**	Autonegotiates the speed. The interface advertises the capability for duplex mode for Fast Ethernet interfaces at a speed of 10-Mbps and 100-Mbps, and Gigabit interfaces at 10-Mbps, 100-Mbps, and 1000-Mbps. For example, if the **duplex full** command is configured with the **speed auto** command, then the interface advertises the following capability: • 10 Mbps and full duplex • 100 Mbps and full duplex • 1000 Mbps and full duplex (Gigabit Ethernet interfaces only)
duplex half	**speed 10**	Forces a speed of 10-Mbps and the half-duplex operation, and disables autonegotiation on the interface.
duplex full	**speed 10**	Forces a speed of10-Mbps and the full-duplex operation, and disables autonegotiation on the interface.
duplex half	**speed 100**	Forces a speed of 100-Mbps and the half-duplex operation, and disables autonegotiation on the interface.
duplex full	**speed 100**	Forces a speed of 100-Mbps and the full-duplex operation, and disables autonegotiation on the interface.
duplex half	**speed 1000**	Forces a speed of 1000-Mbps and the half-duplex operation, and disables autonegotiation on the interface (Gigabit Ethernet only).
duplex full	**speed 1000**	Forces a speed of 1000-Mbps and the full-duplex operation, and disables autonegotiation on the interface (Gigabit Ethernet only).

Examples

The following example specifies the advertisement of only the 10 Mbps operation and either the full-duplex or half-duplex capability during autonegotiation for the second interface (port 1) on the SPA located in the bottom subslot (1) of the MSC that is installed in slot 2 of the Cisco 7304 router:

```
Device# configure terminal
Device(config)# interface fastethernet 2/1/1
Device(config-if)# speed 10
Device(config-if)# duplex auto
```

With this configuration, the interface advertises the following capabilities during autonegotiation:

- 10 Mbps and half duplex
- 10 Mbps and full duplex

Related Commands

Command	Description
duplex	Configures the duplex operation on an interface.
interface fastethernet	Selects a particular Fast Ethernet interface for configuration.
interface gigabitethernet	Selects a particular Gigabit Ethernet interface for configuration.
show controllers fastethernet	Displays Fast Ethernet interface information, transmission statistics and errors, and the applicable MAC destination address and VLAN filtering tables.
show controllers gigabitethernet	Displays Gigabit Ethernet interface information, transmission statistics and errors, and the applicable MAC destination address and VLAN filtering tables.
show interfaces fastethernet	Displays information about the Fast Ethernet interfaces.
show interfaces gigabitethernet	Displays information about the Gigabit Ethernet interfaces.

squelch

To extend the Ethernet twisted-pair 10BASE-T capability beyond the standard 100 meters on the Cisco 4000 platform, use the **squelch** command in interface configuration mode. To restore the default, use the **no** form of this command.

squelch {**normal** | **reduced**}
no squelch

Syntax Description

normal	Allows normal capability. This is the default.
reduced	Allows extended 10BASE-T capability.

Command Default

Normal range

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example extends the twisted-pair 10BASE-T capability on the cable attached to Ethernet interface 2:

```
Router(config
)
# interface ethernet 2
Router(config
-if)
# squelch reduced
```

sra line

To accommodate changes to the total link capacity with the least amount of disruption to communications, use the **sra line** command in controller configuration mode. To disable seamless rate adaptation, use the **no** form of this command.

sra [line *line-number***]**
no sra [line *line-number***]**

Syntax Description

line-number	Line number. Valid values are either 0 or 1.

Command Default

Seamless rate adaptation is disabled.

Command Modes

Controller configuration (config-controller)#

Command History

Release	Modification
15.4(4)T	This command was introduced.

Usage Guidelines

If you specify the line-number, seamless rate adaptation will be enabled only on that line. If you do not specify the line-number, SRA will be enabled on both the lines.

Examples

The following example shows how to enable seamless rate adaptation on line 0:

```
Router(config-controller)# sra line 0
```

The following example shows how to disable seamless rate adaptation:

```
Router(config-controller)# no sra
```

Related Commands

Command	Description
bitswap line	Diverts the data of a disturbed transmission channel to other channels.

standby port

To defer the activation of a port on the standby chassis during standby recovery, use the **standbyport** virtual switching system (VSS) mode command. To disable port deferral activation, use the **no** form of this command.

standby port {**bringup** *num duration* | **delay** *seconds*}

Syntax Description

bringup	Configures the number of ports to be activated per cycle and the waiting time between cycles. Note: You must configure the standby port delay time before you can configure the standby port bringup time.
num	Number of ports to be activated per cycle. Range: 1 to 100. Default: 1.
duration	Period of time in seconds between cycles. Range: 1 to 10. Default: 1.
delay *seconds*	Specifies the period in seconds before port activation is performed. Range: 30 to 3600. Default: 0.

Command Default

Port deferral activation is disabled if standby port delay is not configured. If port deferral activation is enabled, the default number of ports activated in one cycle is one and the duration of the cycle is one second.

Command Modes

Virtual switch configuration submode (config-vs-domain)

Command History

Release	Modification
12.2(33)SXH2	Support for this command was introduced.

Usage Guidelines

Note We recommend that enter you this command under TAC supervision.

Note You must configure the standby port delay command before you can configure the standby port bringup command.

If the you configure the standby port bringup without configuring the standby port delay, a message is displayed asking you to configure the standby port delay first and then the standby port bringup. If you remove the standby port delay configuration, the standby port bringup is automatically removed.

In default configuration, all ports are activated simultaneously when a failed chassis is restarted as the standby chassis. You can enter the **standbyport** command to defer the activation of ports that are not virtual switch link (VSL) ports and then activate the ports in groups over a period of time.

You can enter the **standbyport** command to defer the activation of ports that are not virtual switch link (VSL) ports and then activate the ports in groups over a period of time. This can help in reducing traffic loss on the

standby ports and alleviate the high CPU utilization on the active switch and route processors during system initialization of the standby chassis.

Examples

The following example shows how to configure the period in seconds before port activation is performed:

```
Router(config)# switch virtual domain 22
Router (config-vs-domain)# standby port delay 400
Router (config-vs-domain)#
```

The following example shows how to configure the bringup delay for a port's activation during a standby recovery:

```
Router(config)# switch virtual domain 22
Router (config-vs-domain)# standby port bringup 2 30
Router (config-vs-domain)#
```

Related Commands

Command	Description
switch virtual domain	Assigns a switch number and enters virtual switch domain configuration submode.

sts-1

To configure the Synchronous Transport Signal (STS) (level)-1 in the SONET hierarchy, use the **sts-1** command in controller configuration mode.

sts-1 *number*

Syntax Description

number	Specifies the sts-1 number. The range is 1 to 3.

Command Default

None

Command Modes

Controller configuration

Command History

Release	Modification
15.1(01)S	This command was introduced on the Cisco 7600 routers.
Cisco IOS XE Everest 16.5.1	This command was introduced on the Cisco ASR 920 Routers and Cisco NCS 4200 Series.

Examples

This example shows how to configure the (STS) (level)-1:

```
Router(config)# controller sonet-acr 1
Router(config-controller)#
sts-1 2
```

Related Commands

Command	Description
vtg	Configures the (CESoPSN) CEM group.
mode vt-15	Configures the path operation mode.
controller sonet-acr	Configures the SONET Access Circuit Redundancy (ACR) virtual controller.