

Standard QCI Support

- Revision History, on page 1
- Feature Description, on page 1
- Configure QCI, on page 2
- Monitoring and Troubleshooting, on page 3

Revision History

Note Revision history details are not provided for features introduced before release 21.24.

Revision Details	Release
First introduced.	Pre 21.24

Feature Description

The standardized QCI values—65, 66, 67, 69, and 70 support Mission Critical and Push-to-Talk (MC/PTT) applications. The standard QCIs are based on 3GPP TS 23.203 Release 12.

This feature supports the following functionality:

- Creates, deletes, and updates default and dedicated bearers.
- All applicable charging records include the standard QCI values.
- All features related to QCIs work with the standard QCI values.
- Creates, delets, and updates Dynamic rules from PCRF with QCI 67.
- Creates and deletes Pre-defined rules with QCI 67
- Allows WiFi HO for bearer with QCI 67
- Supports S2B/S2A HO with MC QCIs
- Allows LTE to Wi-Fi Handover for Bearer with QCI

- Supprts Bulkstats for APN and SAEGW
- MC-QCI values supports X-header insertion, DSCP marking, and EDR

Important The standard QCIs supported and qualified in the CUPS architecture are 1-9, 65, 66, 67, 69, 70, 80, 82, 83.

Limitations

The following are the known limitations of this feature:

- Does not support the overall eMPS functionality.
- If **require ecs credit-control session-mode per-subscriber** is configured, then URR is treated for entire subscriber session including secondary bearers which can lead to a problem in some applications. In CUPS, use the **credit-control-client override session-mode per-sub-session** command at the APN level to override the session mode configuration.

Configure QCI

Use the **qci-qos-mapping** CLI command to configure the DSCP marking for QCI.

```
config
  qci-qos-mapping name
    qcinum { gbr }  [ { downlink | uplink } [ user-datagram dscp-marking
 dscp-marking-value ][ encaps-header { copy-inner | copy-outer | dscp-marking
 dscp-marking-value ] ]
  end
```

NOTES:

- **qci***num*: Specify standard QoS Class Identifier between 1-9, 65,66,67,69,70,80,82,83 - integer 1..83.
- **gbr**: Specifies that this QCI type is Guaranteed Bit Rate (GBR).
- **downlink**: Configures parameters for downlink traffic.
- **uplink**: Configures parameters for uplink traffic.
- **encaps-header { copy-inner | copy-outer | dscp-marking** *dscp-marking-value***}**: Specifies that the DSCP marking must be set on the encapsulation header for IP-in-IP, GRE, or GTP encapsulation.
  - **copy-inner** : Specifies that the DSCP marking is to be acquired from the UDP headers within the encapsulation.
  - **copy-outer** used to copy the DSCP value coming in the data packet from S1u interface to the data packet sent on the S5 interface and vice-versa.
  - **dscp-marking**dscp-marking-value : Specifies that the DSCP marking is to be defined by this keyword.

    dscp-marking-value is expressed as a hexadecimal number from 0x00 through 0x3F.

- **user-datagram dscp-marking** *dscp-marking-value*: Specifies that the IP DSCP marking is to be defined by this keyword.

  dscp-marking-value is expressed as a hexadecimal number from 0x00 through 0x3F.

Monitoring and Troubleshooting

This section provides information regarding monitoring and troubleshooting the feature.

Show Command(s) and/or Outputs

This section provides information regarding show commands and/or their outputs in support of this feature.

show subscribers saegw-only imsi *<imsi>*

The output of this command includes QCI field under Bearer QOS and PCRF Authorized Bearer QOS as shown in the following example:

```
Bearer QoS        :
   QCI      : 67
   ARP              : 0x054
   PCI              : 1 (Disabled)
   PL               : 5
   PVI              : 0 (Enabled)
   MBR Uplink(bps)  : 0                          MBR Downlink(bps)    : 0
   GBR Uplink(bps)  : 0                          GBR Downlink(bps)    : 0


PCRF Authorized Bearer QoS:
   QCI: 67
   ARP: 0x054
   PCI: 1 (Disabled)
   PL : 5
   PVI: 0 (Enabled)
   MBR uplink (bps): n/a                      MBR downlink (bps): n/a
   GBR uplink (bps): n/a                      GBR downlink (bps): n/a
   Uplink APN AMBR (bps): 200000              Downlink APN AMBR (bps): 300000
```

show apn statistics

The output of this command includes the following fields:

QCI 67:

- Bearer Active
- Bearer setup
- Bearer Released
- Bearer Rehected
- Uplink Bytes forwarded
- Downlink Bytes forwarded
- Uplink pkts forwarded

- Downlink pkts forwarded
- Uplink Bytes dropped
- Downlink Bytes dropped
- Uplink pkts dropped
- Downlink pkts dropped
- Uplink Bytes dropped(MBR Excd)
- Downlink Bytes dropped(MBR Excd)
- Uplink pkts dropped(MBR Excd)
- Downlink pkts dropped(MBR Excd)

```
QCI 67:
    Bearer Active:                          0   Bearer setup:
      0
    Bearer Released:                        0   Bearer Rejected:
      0

    Uplink Bytes forwarded:                 0   Downlink Bytes forwarded:
      0
    Uplink pkts forwarded:                  0   Downlink pkts forwarded:
      0
    Uplink Bytes dropped:                   0   Downlink Bytes dropped:
      0
    Uplink pkts dropped:                    0   Downlink pkts dropped:
      0
    Uplink Bytes dropped(MBR Excd):         0   Downlink Bytes dropped(MBR Excd):
      0
    Uplink pkts dropped(MBR Excd):          0   Downlink pkts dropped(MBR Excd):
      0
```

show active-charging sessions full all

The output of this command includes the following fields:

```
Dynamic Charging Rule Definition(s) Configured:
Name                 Prior Content-Id Chrg-Type Rule Parameters
-------------------- ----- ---------- --------- --------------------------
   mcptt_audio_rule9   129      13009      Both Gate Status:      Allow All
                                                QoS Class Identifier:    67
                                                ARP Priority Level:       2
                                                Reporting Level: Rating Grp
                                                Metering Method: Durn + Vol
                                                Uplink MBR:           49000
                                                Downlink MBR:         49000
                                                Uplink GBR:           49000
                                                Downlink GBR:         49000
```

show qci-qos-mapping table name *name*

The output of this command displays QCI 67 is configured in the **qci-qos-mapping table**.

```
[local]qvpc-si# show qci-qos-mapping table
all       name
[local]qvpc-si# show qci-qos-mapping table name qci-qos1
QCI-QOS Table Name: qci-qos1
```

```
Qci:                  67
  uplink:   user-datagram dscp-marking 0x2e encaps-header dscp-marking 0x2e
  downlink: user-datagram dscp-marking 0x2e  encaps-header dscp-marking 0x2e
  pre-rel8-qos-mapping:  n/a         qci type:              gbr
```

Bulk Statistics

Run the following CLI to check the counters available for APN and SAEGW schema.

show bulkstats variables saegw | grep qci67

The following list of bulkstats variables are added in **saegw** schema.

- sgw-totepsbearact-qci67
- sgw-totepsbearset-qci67
- sgw-totepsbearrel-qci67
- sgw-totepsbearmod-qci67
- sgw-totepsbearrel-dedrsn-pgw-qci67
- sgw-totepsbearrel-dedrsn-slerr-qci67
- sgw-totepsbearrel-dedrsn-s5err-qci67
- sgw-totepsbearrel-dedrsn-s4err-qci67

Example:

```
[local]qvpc-si# show bulkstats variables saegw | grep qci67
189 saegw %sgw-totepsbearact-qci67%               Int32    0   Gauge
204 saegw %sgw-totepsbearset-qci67%               Int32    0   Counter
221 saegw %sgw-totepsbearrel-qci67%               Int32    0   Counter
236 saegw %sgw-totepsbearmod-qci67%               Int32    0   Counter
252 saegw %sgw-totepsbearrel-dedrsn-pgw-qci67%    Int32    0   Counter
269 saegw %sgw-totepsbearrel-dedrsn-slerr-qci67%  Int32    0   Counter
285 saegw %sgw-totepsbearrel-dedrsn-s5err-qci67%  Int32    0   Counter
301 saegw %sgw-totepsbearrel-dedrsn-s4err-qci67%  Int32    0   Counter
```

Similarly, you can use the **show bulkstats variables apn | grep qci67** command to view list of bulkstats variables in **apn** schema.

show bulkstats variables saegw | grep qci67