Low Latency VOD Support

The Cisco cBR-8 router supports Low Latency Video on Demand (VOD) sessions for gaming.

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Information About Low Latency VOD Support

Overview of Low Latency VOD Support

Each Cisco cBR-8 RF linecard supports up to 1280 low latency VOD gaming sessions and up to 64 unique low latency QAMs. These numbers are applicable to both Annex A and B.

An output QAM is treated as low latency if it is associated with a virtual carrier group (VCG) that is configured as low-latency.

A table-based input session is treated as low latency if the session jitter <= 50 ms and output QAM is low latency.

A GQI input session is treated as low latency if the session type is gaming and output QAM is low latency.

Low latency VOD gaming, normal VOD, and Switched Digital Video (SDV) can share the same low latency QAM.

Each Cisco cBR-8 RF linecard supports up to 384 unique normal latency Annex B video QAMs (288 Annex A). Each QAM used for low latency reduces the number of remaining available QAMs by two. For example, the linecard can support up to 256 normal latency and 64 low latency Annex B QAMs.

The average latency of a low latency session is approximately 13 ms plus 50% of the jitter buffer size.

How to Configure Low Latency VOD Support

Configuring the Low Latency Virtual Carrier Group

To configure the low latency virtual carrier group, follow the steps below:

```
enable
configure terminal
cable video
virtual-carrier-group id
low-latency
```

If more than 64 low latency QAM channels are being configured, CLI will output the following error:

```
%ERROR: Number of low latency QAM channels configured has reached the linecard limit.
```

If a QAM is configured for low latency, it cannot be configured for broadcast and vice versa, CLI will output the following errors:

```
%ERROR: Failed to set low latency to virtual group.
Reason: Broadcast service type is set and cannot set low latency.

%ERROR: Failed to set_svctype to virtual group.
Reason: Low latency is set and cannot set service type to broadcast.
```

Verifying the Low Latency Virtual Carrier Group Configuration

To verify the configuration of the low latency virtual carrier group, use the **show cable video virtual-carrier-group** command as shown in the example below:

```
Router# show cable video virtual-carrier-group id 1
Name: vcg1
  ID: 1
  Service Distribution Group Name: sdg1
  Service Distribution Group ID: 1
  Logical Edge Device Name: led1
  Logical Edge Device ID: 1
  ServiceType: narrowcast
  Encrypted: N
  Low Latency: Y
  Number of VEIs: 0
  Virtual Edge Input:
  Input Port   VEI                 Bundle
  ID           IP                  ID
  ------------------------------------------------
  Number of RF-Channels: 8
  RF-Channel Range   TSID Range   Output Port Number Range
  ------------------------------------------------------
  0-7                100-107      100-107
```

Verifying the Low Latency in Linecard

To verify the low latency configuration in the linecard, use the **show cable video low-latency linecard** command as shown in the example below:

```
Router# show cable video low-latency linecard all
Line Card: 1
   Virtual-Carrier-Group: vcg1
   Service-Distribution-Group: sdg1
   Logical-Edge-Device: led1
   Number of RF-Channels: 8
   RF-Channel Range   TSID Range   Output Port Number Range
   ---------------------------------------------------------
   0-7                100-107             100-107

 Line Card: 2
   Virtual-Carrier-Group: vcg2
   Service-Distribution-Group: sdg2
   Logical-Edge-Device: led1
   Number of RF-Channels: 8
   RF-Channel Range   TSID Range   Output Port Number Range
   ---------------------------------------------------------
   0-7                200-207             200-207
```

Configuring the Jitter Buffer Size for Table Based Session

To configure the jitter buffer size for table-based session, follow the steps below:

```
enable
configure terminal
cable video
table-based
vcg vcg_name
rf-channel start_rf_channel-end_rf_channel
session session_name input-port input_port_number start-udp-port
unicast_udp_port_number num-sessions-per-qam max_sessions_per_qam_channel
processing-type [data|passthru|remap| remux] start-program program_number
jitter jitter_value
```

The default jitter buffer size for table-based video is 100 ms.

Configuring the Jitter Buffer Size for GQI

To configure the jitter buffer size for GQI session, follow the steps below:

```
enable
configure terminal
cable video
jitter session_type jitter_value
```

Verifying Jitter Buffer Size for GQI

To verify the jitter buffer size for GQI session, use the **show cable video jitter** command as shown in the example below:

```
Router# show cable video jitter
Session jitter:
  VOD: 200
  SDV: 200
  broadcast: 200
```

```
gaming: 5
table-based: 100
```

Verifying the Low Latency Sessions

To verify the configuration of the low latency session, use the **show cable video session logical-edge-device** command as shown in the example below:

```
Router# show cable video session logical-edge-device id 1
Total Sessions = 160

 Session  Output  Streaming   Session Session Source                UDP   Output  Input
   Output Input    Output   Encrypt  Encrypt  Low     Session
 Id       Port    Type        Type    Ucast Dest IP/Mcast IP (S,G)  Port  Program State
   State  Bitrate  Bitrate  Type     Status   Latency Name

-------------------------------------------------------------------------------------------------------

 1048576  100     Remap       UDP     174.101.1.1                  49152 1       ACTIVE-PSI
 ON     1723787  1722987  CLEAR    -         Y       t1.1.0.1.0.49152
 1048577  100     Remap       UDP     174.101.1.1                  49153 2       ACTIVE-PSI
 ON     1724147  1722987  CLEAR    -         Y       t1.1.0.1.0.49153
 1048578  100     Remap       UDP     174.101.1.1                  49154 3       ACTIVE-PSI
 ON     1722807  1722987  CLEAR    -         Y       t1.1.0.1.0.49154
 1048579  100     Remap       UDP     174.101.1.1                  49155 4       ACTIVE-PSI
 ON     1723279  1722987  CLEAR    -         Y       t1.1.0.1.0.49155
 1048580  100     Remap       UDP     174.101.1.1                  49156 5       ACTIVE-PSI
 ON     1723665  1722987  CLEAR    -         Y       t1.1.0.1.0.49156
 1048581  100     Remap       UDP     174.101.1.1                  49157 6       ACTIVE-PSI
 ON     1724096  1722987  CLEAR    -         Y       t1.1.0.1.0.49157
 1048582  100     Remap       UDP     174.101.1.1                  49158 7       ACTIVE-PSI
 ON     1724475  1722987  CLEAR    -         Y       t1.1.0.1.0.49158
 1048583  100     Remap       UDP     174.101.1.1                  49159 8       ACTIVE-PSI
 ON     1723166  1722988  CLEAR    -         Y       t1.1.0.1.0.49159
 1048584  100     Remap       UDP     174.101.1.1                  49160 9       ACTIVE-PSI
 ON     1723595  1722988  CLEAR    -         Y       t1.1.0.1.0.49160
 1048585  100     Remap       UDP     174.101.1.1                  49161 10      ACTIVE-PSI
 ON     1724024  1722988  CLEAR    -         Y       t1.1.0.1.0.49161
 1048586  100     Remap       UDP     174.101.1.1                  49162 11      ACTIVE-PSI
 ON     1724425  1722988  CLEAR    -         Y       t1.1.0.1.0.49162
 1048587  100     Remap       UDP     174.101.1.1                  49163 12      ACTIVE-PSI
 ON     1723547  1722989  CLEAR    -         Y       t1.1.0.1.0.49163
 1048588  100     Remap       UDP     174.101.1.1                  49164 13      ACTIVE-PSI
 ON     1722215  1722988  CLEAR    -         Y       t1.1.0.1.0.49164
 1048589  100     Remap       UDP     174.101.1.1                  49165 14      ACTIVE-PSI
 ON     1722683  1722988  CLEAR    -         Y       t1.1.0.1.0.49165
 1048590  100     Remap       UDP     174.101.1.1                  49166 15      ACTIVE-PSI
 ON     1723060  1723001  CLEAR    -         Y       t1.1.0.1.0.49166
  --More--
```

Feature Information for Low Latency VOD Support

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the https://cfnng.cisco.com/ link. An account on the Cisco.com page is not required.

Note The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1: Feature Information for Low Latency VOD Support

Feature Name	Releases	Feature Information
Low Latency VOD Support	Cisco IOS XE Everest 16.6.1	This feature was integrated on the Cisco cBR Series Converged Broadband Routers.