Low Latency VOD Support

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

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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 www.cisco.com/go/cfn 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.