PSIP and EAS Support for Broadcast QAM

This document provides information on the support for PSIP and EAS and how to configure Cisco cBR series routers to avail the support.

Finding Feature Information

Your software release may not support all the features that are documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. The Feature Information Table at the end of this document provides information about the documented features and lists the releases in which each feature is supported.

Hardware Compatibility Matrix for the Cisco cBR Series Routers

Note The hardware components that are introduced in a given Cisco IOS-XE Release are supported in all subsequent releases unless otherwise specified.

Table 1: Hardware Compatibility Matrix for the Cisco cBR Series Routers

Cisco CMTS Platform	Processor Engine	Interface Cards
Cisco cBR-8 Converged Broadband Router	**Cisco IOS-XE Release 16.5.1 and Later Releases** Cisco cBR-8 Supervisor : • PID—CBR-SUP-250G • PID—CBR-CCAP-SUP-160G • PID—CBR-CCAP-SUP-60G • PID—CBR-SUP-8X10G-PIC	**Cisco IOS-XE Release 16.5.1 and Later Releases** Cisco cBR-8 CCAP Line Cards: • PID—CBR-LC-8D30-16U30 • PID—CBR-LC-8D31-16U30 • PID—CBR-RF-PIC • PID—CBR-RF-PROT-PIC • PID—CBR-CCAP-LC-40G • PID—CBR-CCAP-LC-40G-R Cisco cBR-8 Downstream PHY Modules: • PID—CBR-D30-DS-MOD • PID—CBR-D31-DS-MOD Cisco cBR-8 Upstream PHY Modules: • PID—CBR-D30-US-MOD • PID—CBR-D31-US-MOD

Information About PSIP and EAS Support

The Cisco cBR Series Router provides support for merging of Program and System Information Protocol (PSIP) and Emergency Alert Signaling (EAS) streams. This support allows to merge the PSIP and EAS information for digital terminal adapter (DTA) boxes. Merging these two streams helps in avoiding Continuity Counter (CC) errors and packet drops.

An operator can configure a session as PSIP and EAS when creating a session in a broadcast QAM. Operators can configure Passthru session as psip and data-piping session as eas.

Prerequisites for PSIP and EAS Support

PSIP and EAS are applicable to table based sessions on broadcast QAMs. The following prerequisites are applicable to configuring the PSIP and EAS sessions:

• Service Distribution Group (SDG)

• Virtual Carrier Group (VCG)

• Bind VCG to SDG

- Logical Edge Device (LED)

- Protocol of LED specified as table-based.

- Associate VCG to LED

How to Configure PSIP and EAS Sessions

You should create a Passthru session with PSIP and data session with EAS.

This section contains the following:

Configuring PSIP and EAS Sessions

The following sample commands show how to configure the sessions with PSIP and EAS.

```
cable video
  service-distribution-group service distribution group name id <ID>
    rf-port integrated-cable slot/bay/port
  virtual-carrier-group name [id number]
    service-type narrowcast
    rf-channel start_channel-end_channel tsid start_tsid-end_tsid output-port-number
start_number-end_number
  bind-vcg
    vcg vcg-name sdg <sdg name>
  logical-edge-device name [id] number
    protocol table-based
      virtual-edge-input-ip ip-address [vrf vrf-name] input-port-number port-number
      vcg <vcg name>
      active
  table-based
    vcg <vcg name>
      rf-channel <channel number>
        session SESS_PSIP input-port <id> start-udp-port udp port number processing-type
passthru psip
        session SESS_EAS input-port <id> start-udp-port udp port number processing-type
data eas
```

Verifying the PSIP and EAS Configurations

The following example shows how to verify the configured PSIP and EAS sessions.

```
show cable video session logical-edge-device id 1
Total Sessions = 2

Session  Output Frequency  Streaming  Sess Session Source  UDP   Input    Output    Input Output
   Input    Output  Encrypt  Encrypt  Low PMV  Session
Id       Port   Hz         Type         Type Ucast Dest IP/  Port Program Program State State
    Bitrate Bitrate Type     Status    Lat NUM  Name
                                        Mcast IP (S,G)
_____
1048576  101    93000000   Passthru    UDP 174.102.1.1      49652 -       -         ACTIVE-PSI
 ON 895556  904871    CLEAR    - N - SESS_PSIP.1.0.1.0.49652
1048577  101    93000000   Data-Piping UDP 174.102.1.1      49653 -       -         ACTIVE
 ON 908578  904857    CLEAR     - N - SESS_EAS.1.0.1.0.49653
```

Verifying the PSIP Session Configuration

```
show cable video session logical-edge-device id 1 session-id 1048576
1048576
Session Name       : SESS_PSIP.1.0.1.0.49652
Session Id         : 1048576
Creation Time      : Fri Feb  2 07:30:06 2018

Output Port        : 101
TSID               : 100
ONID               : 0
Number of Sources  : 1
  Destination IP   : 174.102.1.1
  UDP Port         : 49652
Config Bitrate     : not specified
Jitter             : 100 ms
Processing Type    : Passthru
Stream Rate        : VBR
Program Number     : -
Idle Timeout       : 2000 msec
Init Timeout       : 2000 msec
Off Timeout        : 60 sec
Encryption Type    : CLEAR
Encryption Status  : -

Input Session Stats:
====================
  State: ACTIVE-PSI, Uptime: 0 days 00:00:25
  IP Packets: In 5005, RTP 0, Drop 0
  TP Packets: In 28092, PCR 1003, PSI 107, Null 1938
            Unreference 0, Discontinuity 0
  Errors: Sync loss 0, CC error 0, PCR Jump 0,
        Underflow 0, Overflow 0, Block 0
  Bitrate: Measured 1647418 bps, PCR 1836378 bps

Output Session Stats:
=====================
  State: ON, Uptime: 0 days 00:00:25
  TP Packets: In 28074, PCR 1000, PSI 106,
            Drop 0, Forward 27968, Insert 0
  Errors: Info Overrun 0, Info Error 0, Block 0, Overdue 0,
        Invalid Rate 0, Underflow 0, Overflow 0
  Bitrate: Measured 1643931 bps

PSIP Stats:
===========
  Total Packets: in 1905, out 31
  MGT: in 1, out 1, version 8, length 1458, carousel 7160
  RRT: in 1, out 1, version 0, length 901, carousel 5
  STT: in 28, out 28, version 0, length 20, carousel 1
  VCT: in 1, out 1, version 4, length 244, carousel 670

PAT Info:
=========
  Version 1, TSID 1, len 16, section 0/0
  Program 1: PMT 8020

Input PMT Info:
===============
  Program 1, Version 1, PCR 8000, Info len 0
  PID 8000: Type 2, Info len 5, (desc 2 len 3)
  PID 8001: Type 129, Info len 17, (lang eng), (desc 5 len 4), (desc 129 len 3)

Output PMT Info:
```

```
================
  Program 1, Version 1, PCR 8000, Info len 0
  PID 8000: Type 2, Info len 5, (desc 2 len 3)
  PID 8001: Type 129, Info len 17, (lang eng), (desc 5 len 4), (desc 129 len 3)
```

Verifying EAS Session Configuration

```
show cable video session logical-edge-device id 1 session-id 1048577
Session Name        : SESS_EAS.1.0.1.0.49653
Session Id          : 1048577
Creation Time       : Fri Feb  2 07:30:06 2018

Output Port         : 101
TSID                : 100
ONID                : 0
Number of Sources   : 1
  Destination IP    : 174.102.1.1
  UDP Port          : 49653
Config Bitrate      : not specified
Jitter              : 100 ms
Processing Type     : Data-Piping
Stream Rate         : VBR
Program Number      : -
Idle Timeout        : 2000 msec
Init Timeout        : 2000 msec
Off Timeout         : 60 sec
Encryption Type     : CLEAR
Encryption Status   : -

Input Session Stats:
====================
  State: ACTIVE, Uptime: 0 days 00:00:30
  IP Packets: In 6006, RTP 0, Drop 0
  TP Packets: In 33804, PCR 1204, PSI 0, Null 2232
              Unreference 0, Discontinuity 0
  Errors: Sync loss 0, CC error 0, PCR Jump 0,
          Underflow 0, Overflow 0, Block 0
  Bitrate: Measured 1682436 bps, PCR 1816387 bps

Output Session Stats:
=====================
  State: ON, Uptime: 0 days 00:00:30
  TP Packets: In 33669, PCR 1201, PSI 0,
              Drop 0, Forward 33669, Insert 0
  Errors: Info Overrun 0, Info Error 0, Block 0, Overdue 0,
          Invalid Rate 0, Underflow 0, Overflow 0
  Bitrate: Measured 1678854 bps

EAS Stats:
==========
  Total Packets: in 4, out 1
  EAS: in 1, out 1, version 19, length 238, carousel 32
```

Configuration Example

This section provides example of PSIP and EAS configuration.

Example: PSIP and EAS Configuration

```
cable video
  service-distribution-group sdg1 id 1
    rf-port integrated-cable 7/0/0
  virtual-carrier-group vcg1 id 1
    service-type narrowcast
    rf-channel 0 tsid 100 output-port-number 101
  bind-vcg
    vcg vcg1 sdg sdg1
  logical-edge-device led1 id 1
    protocol table-based
      virtual-edge-input-ip 192.168.1.1 input-port-number 1
      vcg vcg1
      active
  table-based
    vcg vcg1
    rf-channel 0
      session SESS_PSIP input-port 1 start-udp-port 49652 processing-type passthru psip
      session SESS_EAS input-port 1 start-udp-port 49653 processing-type data eas
```

Troubleshooting Tips

The following tips help in troubleshooting issues:

- Make sure that PSIP session is configured as processing-type passthru and psip

- Make sure that EAS session is configured as processing-type data and eas

- When the PSIP session becomes ACTIVE-PSI, verify the PSIP Stats under the session details command.

  Similarly, when the EAS session becomes ACTIVE, verify the EAS Stats under the session details command.

  The out-count and carousel-count should increment.

Feature Information for PSIP and EAS 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 2: Feature Information for PSIP and EAS Support

Feature Name	Releases	Feature Information
PSIP and EAS Support	Cisco IOS XE Fuji 16.7.1	This feature was integrated on the Cisco cBR Series Converged Broadband Routers.