Cable Commands: snmp through w

snmp manager

To create a DOCSIS configuration file that specifies the IP address for the Simple Network Management Protocol (SNMP) manager, use the **snmp manager** command in cable config-file configuration mode. To disable this function, use the **no** form of this command.

snmp manager *ip-address*

no snmp manager

Syntax Description

ip-address	Specifies an IP address for the SNMP manager.

Command Default

No SNMP manager is defined.

Command Modes

Cable config-file configuration

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For SNMP commands that affect the operation of the CMTS, see the Cisco IOS Configuration Fundamentals Command Reference Guide.

Examples

The following example shows how to specify the IP address of the SNMP manager in a DOCSIS configuration file:

```
router(config)# cable config-file snmp.cm
router(config-file)# snmp manager 10.10.1.1
router(config-file)# exit

router(config)#
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.

Command	Description
access-denied	Disables access to the network.
channel-id	Specifies upstream channel ID.
cpe max	Specifies CPE information.
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.
option	Provides config-file options.
privacy	Specifies privacy options for baseline privacy images.
service-class	Specifies service class definitions for the configuration file.
timestamp	Enables time-stamp generation.

snmp-server enable traps cable

To enable the sending of Simple Network Management Protocol (SNMP) traps for cable related events, use the **snmp-server enable traps cable** command in global configuration mode. To disable the sending of traps, use the **no** form of this command.

Cisco uBR10012 Universal Broadband Router and Cisco cBR-8 Converged Broadband Router

snmp-server enable traps cable [admission_control] [cm-chover] [cm-onoff] [cm-remote-query] [dmic-lock] [enfrule-violation] [hccp-failover] [hopping] [metering] [rfswitch-polling] [sfp-link]

no snmp-server enable traps cable [admission_control] [cm-chover] [cm-onoff] [cm-remote-query] [dmic-lock] [enfrule-violation] [hccp-failover] [hopping] [metering] [rfswitch-polling] [sfp-link]

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers

snmp-server enable traps cable [admission_control] [cm-chover] [cm-onoff] [cm-remote-query] [dmic-lock] [enfrule-violation] [hccp-failover] [hopping] [metering]

no snmp-server enable traps cable [admission_control] [cm-chover] [cm-onoff] [cm-remote-query] [dmic-lock] [enfrule-violation] [hccp-failover] [hopping] [metering]

Syntax Description

admission_control	Enables traps for Service Flow Admission Control (SFAC), as defined in CISCO-CABLE-ADMISSION-CTRL-MIB.
cm-chover	Enables traps that are sent upon completion of CMTS channel override operations, as defined in CISCO-DOCS-EXT-MIB.
cm-onoff	Enables traps for CM online/offline status changes, as defined in CISCO-DOCS-EXT-MIB.
cm-remote-query	Enables traps that are sent when the remote polling of CMs has been completed, as defined in CISCO-DOCS-REMOTE-QUERY-MIB.
dmic-lock	Enables traps that are sent when a cable modem fails the dynamic shared-secret security checks, as defined in CISCO-DOCS-EXT-MIB.
enfrule-violation	Enables traps that are sent when a user violates their quality of service (QoS) profile, as defined in the CISCO-CABLE-QOS-MONITOR-MIB.
hccp-failover	Enables traps for Hot Standby Connection-to-Connection Protocol (HCCP) redundancy switchover events, as defined in CISCO-CABLE-AVAILABILITY-MIB.

hopping	Enables traps for spectrum hopping events, as defined in CISCO-CABLE-SPECTRUM-MIB.
metering	Enables traps that are sent to indicate success or failure in creating the metering record file or streaming it to the collection server, as defined in CISCO-CABLE-METERING-MIB.
rfswitch-polling	Enables traps that are sent when the connectivity between the Cisco CMTS and the Cisco RF Switch is lost, as defined in CISCO-CABLE-AVAILABILITY-MIB.
sfp-link	Enables the traps that are sent when the SFP port link status changes on the Cisco Wideband SPA, and on the Cisco uBR-MC3GX60V line card, as defined in CISCO-CABLE-WIDEBAND-MIB.

Command Default

No SNMP traps for cable-related events are enabled. You can specify one type of trap or any combination of traps. When the **snmp-server enable traps cable** command is given without any options, all cable-related traps are enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(5)T	This command, with the **cm-chover** and **cm-onoff** options, was added.
12.0(7)XR2, 12.1(1)T	The **cm-remote-query** option, along with the CISCO-DOCS-REMOTE-QUERY-MIB MIB, was introduced.
12.1(2)EC1	This command was supported on the 12.1 EC train.
12.1(7)CX1	The **hopping** and **cmts-event** options were introduced.
12.2(4)BC1	This command was supported on the Cisco uBR10012 universal broadband router. The **cmts-event** option was also removed as redundant.
12.2(8)BC1	The **hccp-failover** option was supported on the Cisco uBR10012 router.
12.2(11)BC1	The **hccp-failover** option was supported on the Cisco uBR7200 series router.
12.2(15)BC1	The **enforce-rule** option was added to generate traps for subscribers who violate their enforce-rule QoS profile.
12.2(15)BC21	The **dmic-lock** and **usage** options were added.

Release	Modification
12.3BC	The **admission_control**, **metering**, and **rfswitch-polling** options were added.
12.2(33)SCG	The **sfp-link** option was added to generate traps when the SFP port link status changed on the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

For other SNMP commands that affect the operation of the CMTS, see the Cisco CMTS Universal Broadband Router Series MIB Specifications Guide.

Examples

The following example shows how to enable all traps for cable-related events except HCCP switchover on the CMTS:

```
Router# configure terminal
Router(config)# snmp-server enable traps cable cm-chover cm-onoff cm-remote-query hopping
Router(config)#
```

The following example shows how to enable traps for any HCCP switchovers that occur on the CMTS:

```
Router# configure terminal
Router(config)# snmp-server enable traps cable hccp-failover
Router(config)#
```

The following example shows how to enable traps for when a user violates the maximum bandwidth for the quality of service (QoS) profile specified by their enforce-rule.

```
Router# configure terminal
Router(config)# snmp-server enable traps cable enforce-rule
Router(config)#
```

The following example shows how to enable traps for to see the SFP port link status on the Cisco uBR10012 router and Cisco cBR-8 router.

```
Router# configure terminal
Router(config)# snmp-server enable traps cable sfp-link
Router(config)#
```

Related Commands

Command	Description
cable modem remote-query	Enables and configures the remote-query feature to gather CM performance statistics on the CMTS.
debug cable remote-query	Turns on debugging to gather information from remote CMs.
show cable modem remote-query	Displays the statistics accumulated by the remote-query feature.

snmp-server enable traps docsis-cm

To enable one or more Simple Network Management Protocol (SNMP) traps for DOCSIS 1.1 events, use the **snmp-server enable traps docsis-cm** command in global configuration mode. To disable the SNMP traps, use the **no** form of this command.

Cisco uBR905 and Cisco uBR925 cable access routers, and Cisco CVA122 Cable Voice Adapter

snmp-server enable traps docsis-cm [**bpi**| **bpkm**| **dccack**| **dccreq**| **dccrsp**| **dhcp**| **dsack**| **dsreq**| **dsrsp**| **dynsa**| **swupcvc**| **swupfail**| **swupinit**| **swupsucc**| **tlv**]

no snmp-server enable traps docsis-cm [**bpi**| **bpkm**| **dccack**| **dccreq**| **dccrsp**| **dhcp**| **dsack**| **dsreq**| **dsrsp**| **dynsa**| **swupcvc**| **swupfail**| **swupinit**| **swupsucc**| **tlv**]

Syntax Description

bpi	(Optional) Enables Baseline Privacy Interface (BPI) initialization failure traps.
bpkm	(Optional) Enables Baseline Privacy Key Management (BPKM) initialization failure traps.
dccack	(Optional) Enables dynamic channel change acknowledgement failure traps.
dccreq	(Optional) Enables dynamic channel change request failure traps.
dccrsp	(Optional) Enables dynamic channel change response failure traps.
dhcp	(Optional) Enables DHCP failure traps.
dsack	(Optional) Enables dynamic service acknowledgement failure traps.
dsreq	(Optional) Enables dynamic service request failure traps.
dsrsp	(Optional) Enables dynamic service response failure traps.
dynsa	(Optional) Enables dynamic SA failure traps.
swupcvc	(Optional) Enables secure software upgrade code verification certificate (CVC) failure traps.
swupfail	(Optional) Enables secure software upgrade failure traps.

swupinit	(Optional) Enables secure software upgrade initialization failure traps.
swupsucc	(Optional) Enables secure software upgrade success traps.
tlv	(Optional) Enables unknown Type/Length/Value (TLV) traps.

Command Default

No traps are enabled. If no options are specified, all DOCSIS-related traps are enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.2(15)CZ	This command was introduced on the Cisco uBR905 and Cisco uBR925 cable access routers, and the Cisco CVA122 Cable Voice Adapter.

Usage Guidelines

This command enables the sending of SNMP traps when DOCSIS-related events occur. Multiple traps can be enabled at the same time.

Note The traps are described in the DOCS-CABLE-DEVICE-TRAP-MIB. MIB, which is an extension of the CABLE DEVICE MIB that is defined in RFC 2669.

Examples

The following example shows the BPI+ and secure software download traps being enabled:

```
Router# config terminal
Router(config)# snmp-server enable traps docsis-cm bpi bpkm swupcvc swupfail swupinit
swupsucc
Router(config)#
```

Related Commands

Command	Description
show snmp	Checks the status of SNMP communications.
snmp-server manager	Starts the SNMP manager process.

snmp-server enable traps docsis-cmts

To enable the sending of Simple Network Management Protocol (SNMP) traps for DOCSIS-related events, use the **snmp-server enable traps docsis-cmts** command in global configuration mode. To disable the sending of traps, use the **no** form of this command.

snmp-server enable traps docsis-cmts [*docsis-events*]

no snmp-server enable traps docsis-cmts [*docsis-events*]

Syntax Description

docsis-events	Specifies one or more of the following DOCSIS event types: • **bpi—**Enables traps for BPI initialization failure events. • **bpkm—**Enables traps for BPKM failure events. • **dccack—**Enables traps for the failure of Dynamic Channel Change Acknowledgement (DCC-ACK) requests. • **dccreq—**Enables traps for the failure of Dynamic Channel Change Request (DCC-REQ) requests. • **dccrsp—**Enables traps for the failure of Dynamic Channel Change Response (DCC-RSP) requests. • **dsac—**Enables traps for the failure of Dynamic Service Acknowledgement (DSx-ACK) requests. • **dsreq—**Enables traps for the failure of Dynamic Service Request (DSx-REQ) requests. • **dsrsp—**Enables traps for the failure of Dynamic Service Response (DSx-RSP) requests. • **dynsa—**Enables traps for the failure of Dynamic Service Addition (DSA-ACK) requests. • **regack—**Enables traps for the failure of Registration Acknowledgement (REG-ACK) requests. • **regreq—**Enables traps for the failure of Registration Request (REG-REQ) requests. • **regrsp—**Enables traps for the failure of Registration Response (REG-RSP) requests.

Command Default

No SNMP traps for DOCSIS-related events are enabled. When the **snmp-server enable traps docsis-cmts** command is given without any options, all DOCSIS-related traps are enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.1(7)CX1, 12.2(4)BC1	This command, along with the DOCS-CABLE-DEVICE-TRAP-MIB MIB, was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables traps that are defined in the DOCS-CABLE-DEVICE-TRAP-MIB MIB.

For other SNMP commands that affect the operation of the CMTS, see the Cisco IOS Configuration Fundamentals Command Reference Guide.

Examples

The following example shows how to enable traps for the failure of DOCSIS registration-related events on the CMTS:

```
router(config)# snmp-server enable traps docsis-cmts reqack reqreq regrsp
router(config)#
```

Related Commands

Command	Description
snmp-server enable traps cable	Enables traps for cable-related events.

snmp-server enable traps docsis-resil

To enable Simple Network Management Protocol (SNMP) traps for Wideband Resiliency specific events on the Cisco CMTS, use the **snmp-server enable traps docsis-resil** command in global configuration mode. To disable SNMP traps, use the **no** form of this command.

snmp-server enable traps docsis-resil [*resil-events*]

no snmp-server enable traps docsis-resil [*resil-events*]

Syntax Description

resil -events	Specifies one or more of the following wideband resiliency specific event types: • **cm-pmode—**Enables the wideband resiliency cable modem partial service trap. • **cm-recover—**Enables the wideband resiliency cable modem full service trap. • **event—**Enables the wideband resiliency event trap. • **rf-down—**Enables the wideband resiliency RF channel down status trap. • **rf-up—**Enables the wideband resiliency RF channel up status trap.

Command Default

No SNMP traps for wideband resiliency specific events are enabled. When the **snmp-server enable traps docsis-resil** command is given without any options, all wideband resiliency specific traps are enabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

This command enables traps that are defined in the CISCO-DOCS-EXT-MIB.my MIB.

For other SNMP commands that affect the operation of the Cisco CMTS, see the Cisco IOS Configuration Fundamentals Command Reference Guide.

Examples

The following example shows how to enable traps when the RF channel logical status changes to DOWN on the Cisco CMTS:

```
router(config)# snmp-server enable traps docsis-resil rf-down
router(config)#
```

Associated Features

The **snmp-server enable traps docsis-resil** command is associated with the Wideband Modem Resiliency feature.

Related Commands

Command	Description
cableresiliencytraps-interval	Sets the interval at which traps must be sent for Wideband Resiliency related events for each cable modem on the Cisco CMTS.
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.
snmp-server enable traps cable	Enables traps for cable-related events on the Cisco CMTS.

snmp-server host traps docsis-resil

To enable Wideband Resiliency trap notifications to a specific Simple Network Management Protocol (SNMP) host on the Cisco CMTS, use the **snmp-server host traps docsis-resil** command in global configuration mode. To disable Wideband Resiliency trap notifications to a specific SNMP host, use the **no** form of this command.

snmp-server host *ipaddr* **traps** *string* **docsis-resil**

no snmp-server host *ipaddr* **traps** *string*

Syntax Description

ipaddr	IPv4 or IPv6 address of the SNMP notification host.
string	SNMPv1 community string, SNMPv2c community string, or SNMPv3 username.

Command Default

Wideband Resiliency trap notifications are not sent to an SNMP host.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.2(33)SCG2	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to start or stop sending Wideband Resiliency traps to a specific SNMP host.

Examples

The following example shows how to enable Wideband Resiliency trap notifications to an SNMP host:

```
Router# configure terminal
Router(config)# snmp-server host 172.17.2.0 traps snmphost01 docsis-resil
```

Associated Features

The **snmp-server host trapsdocsis-resil** command is associated with the Wideband Modem Resiliency feature.

Related Commands

cable resiliency traps-interval	Sets the interval at which traps must be sent for Wideband Resiliency related events for each cable modem on the Cisco CMTS.
show cable modem resiliency	Displays resiliency status of the cable modem in resiliency mode on the Cisco CMTS router.
snmp-server enable traps docsis-resil	Enables SNMP Wideband Resiliency traps for Wideband Resiliency specific events on the Cisco CMTS.

spectrum-inversion

To enable or disable the spectrum-inversion for a specific QAM profile, use the **spectrum-inversion** command in QAM profile configuration mode.

spectrum-inversion {**off**| **on**}

Command Default

None

Command Modes

QAM profile configuration (config-qam-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to enable or disable the spectrum-inversion for a specific QAM profile.

Examples

The following example shows how to enable the spectrum-inversion for a specific QAM profile:

```
Router# configure terminal
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)# spectrum-inversion on
```

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.
interleaver-depth	Set the interleaver-depth.
modulation	Set the QAM modulation format.
annex	Set the MPEG framing format.
symbol-rate	Set the symbol rate.

switchover pxf restart

To configure the maximum number of PXF crashes that are allowed within a specified time period, use the **switchover pxf restart** command in redundancy configuration (main-cpu) mode. To reset the router to its default values, use the **no** form of this command.

switchover pxf restart *number-of-crashes time-period*

no switchover pxf restart

Syntax Description

number-of-crashes	Maximum number of PXF crashes that are allowed within the specified time period. If the PXF processors crash this many times within the given time period, the router switches over to the redundant PRE1 module. The valid range is 1 to 25, with a default of 2.
time-period	Time period, in hours, that PXF crashes are monitored. The valid range is 0 to 120 hours, with a default of 5.

Command Default

2 PXF crashes within 5 hours are allowed (**switchover pxf restart 2 5**)

Command Modes

Redundancy configuration, main-cpu mode

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The PXF processors that are onboard the PRE1 module automatically restart themselves if a crash occurs. Occasional crashes could be expected, but repeated crashes could indicate a hardware problem.

The **switchover pxf restart** command specifies the maximum number of times that a PXF processor can crash during a specified time period before the router switches over to the redundant PRE1 module. If the PXF processors crash this number of times, the router assumes a hardware problem and initiates a switchover to the redundant PRE1 module.

Note When a switchover occurs because of repeated PXF crashes, the router displays the following system message: C10KEVENTMGR-3-PXF_FAIL_SWITCHOVER: Multiple PXF failures, switchover to redundant PRE initiated.

Examples

The following example shows how to configure the router so that if five PXF crashes occur within a one-hour period, the router should initiate a switchover to the redundant PRE1 module.

```
Router# config t

Router(config)# redundancy

Router(config-r)# main-cpu

Router(config-r-mc)# switchover pxf restart 5 1
Router(config-r-mc)# exit

Router(config-f)# exit

Router(config)#
```

Related Commands

Command	Description
main-cpu	Enters main-CPU redundancy configuration mode, so that you can configure the synchronization of the active and standby Performance Routing Engine (PRE1) modules.
redundancy	Configures the synchronization of system files between the active and standby PRE1 modules.
redundancy force-failover main-cpu	Forces a manual switchover between the active and standby PRE1 modules.

switchover timeout

To configure the switchover timeout period of the PRE1 module, use the **switchover timeout** command in redundancy configuration (main-cpu) mode. To reset the timeout period to its default value, use the **no** form of this command.

switchover timeout *timeout-period*

no switchover timeout

Syntax Description

timeout-period	Specifies the timeout, in milliseconds. The range is 0 to 25000 milliseconds (25 seconds), where 0 specifies no timeout period.

Command Default

0

Command Modes

Redundancy configuration, main-cpu mode

Command History

Release	Modification
12.2(11)BC3	This command was introduced for the Cisco uBR10012 router.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **switchover timeout** command specifies how long the standby PRE module should wait when it does not detect a heartbeat from the active PRE module before initiating a switchover and assuming responsibility as the active PRE module. If set to 0, the standby PRE module initiates a switchover immediately when the active PRE module misses a scheduled heartbeat.

Examples

The following example shows how to set the timeout period to 60 milliseconds:

```
Router# config t
Router(config)# redundancy
Router(config-r)# main-cpu
Router(config-r-mc)# switchover timeout 60
Router(config-r-mc)# exit
Router(config-f)# exit
```

```
Router(config)#
```

Related Commands

Command	Description
main-cpu	Enters main-CPU redundancy configuration mode, so that you can configure the synchronization of the active and standby Performance Routing Engine (PRE1) modules.
redundancy	Configures the synchronization of system files between the active and standby PRE1 modules.
redundancy force-failover main-cpu	Forces a manual switchover between the active and standby PRE1 modules.

symbol-rate

To set the symbol rate for a specific QAM profile, use the **symbol-rate** command in QAM profile configuration mode.

symbol-rate *symbol-rate*

Syntax Description

symbol-rate	Specifies the symbol rate value in kilo-symbol/sec.

Command Default

None

Command Modes

QAM profile configuration (config-qam-prof)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to set the symbol rate for a specific QAM profile.

Examples

The following example shows how to set the symbol rate for a specific QAM profile:

```
Router# configure terminal
Router(config)# cable downstream qam-profile 4
Router(config-qam-prof)# symbol-rate 5361
```

Related Commands

Command	Description
cable downstream qam-profile	Set the QAM profile for the cable interface line card.
interleaver-depth	Set the interleaver-depth.
modulation	Set the QAM modulation format.
spectrum-inversion	Set the spectrum-inversion on or off.
annex	Set the MPEG framing format.

tag

To add a tag to a restricted load balancing group (RLBG), use the **tag** command in the config-lb-group configuration mode. To remove the tag, use the **no** form of this command.

tag *tag-name*

no tag *tag-name*

Syntax Description

tag-name	The name of the tag that has been created and configured for the load balancing group.

Command Default

No default behavior or values.

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

You can use the **tag** command to add a tag to a RLBG, only if the tag is already created using the **cable tag** command for the DOCSIS load balancing group on the CMTS.

Examples

The following example shows how to add a tag to a RLBG using the **tag** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# restricted
Router(config-lb-group)# tag CSCO
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.

Command	Description
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.
cable tag	Configures a tag for a DOCSIS load balancing group on the CMTS.

test cable dcc (Supporting Dynamic Channel Change)

To move a specified cable modem or a group of cable modems to another channel, or to test Dynamic Channel Change (DCC) for load balancing on the Cisco CMTS, use the following command in privileged EXEC mode.

test cable dcc {*source-interface* [**cable** *slot*/*subslot*/*cable-interface-index* | **integrated-cable** *slot*/*subslot*/*cable-interface-index* | **modular-cable** *slot*/*subslot*/*cable-interface-index*] | **sid** | **ip-addr** | **mac-addr** | **frequency** *frequency*} {**destination-interface** [**cable** *slot*/*subslot*/*cable-interface-index* | **integrated-cable** *slot*/*subslot*/*cable-interface-index* | **modular-cable** *slot*/*subslot*/*cable-interface-index*] **upstream-port**} {*init-tech* | *force* | *tlv*}

Cisco cBR Series Converged Broadband Routers

test cable dcc { **source-interface** [**integrated-cable** *slot/subslot/cable-interface-index* | **ip-addr** | **mac-addr** } {**destination-interface** [**integrated-cable** *slot/subslot/cable-interface-index*] **upstream-port**} {*init-tech*}

Syntax Description

source-interface	Source interface of the cable modem. Use any one of the following options: • (Not applicable for Cisco cBR Series Converged Broadband Routers) **cable—**Specifies the name of the source downstream interface for the DCC transaction. • (For Cisco cBR Series Converged Broadband Routers) **integrated-cable—**Specifies the name of the integrated-cable interface to which the cable modem belongs. • (Not applicable for Cisco cBR Series Converged Broadband Routers) **modular-cable—**Specifies the name of the modular-cable interface to which the cable modem belongs. • *slot*/*subslot*/*cable-interface-index***—**Slot, subslot, and downstream controller number assigned to the cable modem.
sid	(Optional) Specifies the primary Service ID (sid) value of the cable modem for that interface.
ip-addr	Specifies the IP address of the cable modem to be moved for DCC test.
mac-addr	Specifies the MAC address of the cable modem to be moved for DCC test.

frequency *frequency*	Specifies the DCC downstream frequency parameter. (Not applicable for Cisco cBR Series Converged Broadband Routers) *frequency*—New downstream frequency in Hz. The valid range is between 55000000 to 1050000000 Hz.
destination-interface	Destination interface of the cable modem. Use any one of the following options: • **cable**—Specifies the name of the target or destination downstream interface to which the cable modem should be moved. • **integrated-cable**—Specifies the name of the integrated-cable interface to which the cable modem should be moved. • **modular-cable**—Specifies the name of the modular-cable interface to which the cable modem should be moved. • *slot*/*subslot*/*cable-interface-index*—Slot, subslot, and downstream controller number assigned to the cable modem.
upstream-port	Specifies the upstream port of the destination interface.
init-tech	(Optional) DOCSIS 3.0 GLBG DCC initialization techniques. The valid range is from 1 to 4. For Cisco cBR Series Converged Broadband Routers, the valid range is from 0 to 4. **Note** If *init-tech* is not specified, its value is taken as 0.
force	(Optional) (Not for Cisco cBR Series Routers) Target modem or group of modems that are forced to move to the specified downstream interface or upstream channel. **Note** This option is available only when init-tech is set to 0 and is used to move cable modems with Internet Group Management Protocol (IGMP) or Resource-reservation protocol (RSVP) configuration. **Note** This option cannot be used with the *tlv* option.
tlv	(Optional) (Not for Cisco cBR Series Routers) Specifies the type-length-value (TLV) in a DCC request message. This is represented as HEX data. **Note** *force* option is not available if the *tlv* option is used.

Command Default Test functions are disabled by default.

Command Modes Privileged EXEC (#)

Command History

Release	Modification
12.3(17a)BC	This command was introduced on the Cisco uBR10012 router and the Cisco uBR7246VXR router, with supporting broadband processing engines (BPEs) or cable interface line cards on the respective routers.
12.2(33)SCF2	The *force* argument was introduced.
IOS-XE 3.15.OS	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples The following examples illustrate DCC verification, using the **test cable dcc** command.

The following example shows how to move a target cable modem, specified by MAC address, IP address, or the primary SID value on the source interface to a target downstream with the specified frequency using DCC intialization technique 0:

```
Router# test cable dcc [<mac-addr>|<ip-addr>|<cable-if-src><sid>] frequency <freq-value>
Frequency-value: <55000000-858000000>  New Downstream Frequency in HZ.
```

The following example shows how to move a target cable modem, specified by MAC address, IP address, or the primary SID value on the source interface to a upstream channel on a target downstream with the DCC-REQ TLV given in the specified HEX data.

```
Router# test cable dcc [<mac-addr>|<ip-addr>|<cable-if-src><sid>] TLV<Hex-data>
```

The following example shows how to move all cable modems on a source interface to a target downstream with the specified frequency using DCC intialization technique 0.

```
Router# test cable dcc <cable-if-src> frequency<frequency-value>
Frequency-value: <55000000-858000000>  New Downstream Frequency in HZ.
```

The following example shows how to force a cable modem to move to a modular-cable interface 7/0/0:2 with init-tech set to 0:

```
Router# test cable dcc 0023.4ed0.db25 modular-Cable 7/0/0:0 0 0 force
Router# show cable modem 0023.4ed0.db25
Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *10:00:48.167 SGT Wed Nov 16 2011
                                                                      D
MAC Address    IP Address     I/F           MAC           Prim RxPwr  Timing Num I
                                            State         Sid  (dBmv) Offset CPE P
0023.4ed0.db25 30.11.2.118    C7/0/0/U0     offline       19   0.50   1862   0   N
```

The following example illustrates using **test cable dcc**command on Cisco cBR Series Converged Broadband Routers:

```
Router# test cable dcc 0025.2e2d.77c8 integrated-Cable 3/0/0:0 1 0
Router# show cable modem 0025.2e2d.77c8
DMAC Address IP Address I/F MAC Prim RxPwr Timing Num I
```

```
State Sid (dBmv) Offset CPE P
0025.2e2d.77c8 100.1.0.2 C3/0/0/U1 online 1 -1.00 1796 0 N

test dcc integrated-Cable 3/0/0:0 1 integrated-Cable 3/0/0:0 0 1


Router# show cable modem 0025.2e2d.77c8
MAC Address IP Address I/F MAC Prim RxPwr Timing Num I
State Sid (dBmv) Offset CPE P
0025.2e2d.77c8 100.1.0.2 C3/0/0/U0 online 1 -1.00 1796 0 N
```

Usage Guidelines

This command is subject to the restrictions and prerequisites described in Load Balancing, Dynamic Channel Change, and Dynamic Bonding Change on the Cisco CMTS Routers .

The Cisco CMTS does not support the *force* option for **test cable dcc tlv** command where *tlv* is a HEXDATA node.

Related Commands

Command	Description
cable load-balance group (Supporting Dynamic Channel Change)	Sets multiple parameters for load balancing with DCC.
cable load-balance group dcc-init-technique (Supporting Dynamic Channel Change)	Sets the initialization technique for Dynamic Channel Change (DCC) for load balancing.
cable load-balance group policy (Supporting Dynamic Channel Change)	Sets the type of service flow policy (PacketCable MultiMedia (PCMM) or Unsolicited Grant Service (UGS)) for use with load balancing and DCC.
cable load-balance group threshold (Supporting Dynamic Channel Change)	Sets the threshold levels for corresponding service flow types for the specified load balancing group, supporting Dynamic Channel Change (DCC).
show controllers cable	Displays statistics for Dynamic Channel Change (DCC) for load balancing.
show cable modem	Displays the information about registered and unregistered cable modems.

test cable voice

To manually set voice tag of a cable modem, use the test cable voice command in privileged EXEC mode.

test cable voice {*mac-addr*| *ip-addr*}

Syntax Description

mac-addr	Specifies the MAC address of an individual CM, or of any CPE devices or hosts behind that CM.
ip-addr	Specifies the IP address of an individual CM, or of any CPE devices or hosts behind that CM.

Command Default

No voice tags are enabled

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(23)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA. Support for the Cisco uBR7225VXR router was added.

Usage Guidelines

The **test cable voice**command is intended for use by Cisco Systems technical support personnel.

Examples

The following example shows how to enable the voice tag of a cable modem:

```
Router# test cable voice 209.165.200.225
```

Related Commands

Commands	Description
show cable modem voice	Displays the detected voice-enabled modems.
clear cable modem voice	Clears the voice tag that is set for a cable modem.

threshold

To specify the load limit beyond which load balancing occurs, use the **threshold** command in the config-lb-group configuration mode. To remove the specified load limit, use the **no** form of this command.

threshold{**load**| {**minimum***1-100*| **1-100**}| **pcmm***1-100*| **stability***0-100*| **ugs***1-100*}

nothreshold{**load**| {**minimum***1-100*| **1-100**}| **pcmm***1-100*| **stability***0-100*| **ugs***1-100*}

Syntax Description

load {**minimum**}	Specifies interface load threshold settings as a percentage value. You can also set minimum number of modems/flows difference ranging from 1 to 100 before load balancing starts.
pcmm	Specifies PCMM service flow threshold as a percentage value.
stability	Specifies stability condition detection threshold as a percentage value.
ugs	Specifies stability detection threshold as a percentage value.
1-100	Interface utilization threshold in percentage of the interface capacity. **Note** When utilization method is used, the *1-100* utilization threshold is a percentage of the interface capacity. When modem method is used, the *1-100* utilization threshold is a percentage difference of number of modems between the two interfaces.

Command Default

None

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the threshold of the DOCSIS LBG using the **threshold** command.

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# threshold load minimum 10
Router(config-lb-group)#
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configuration, statistical, and operational information for load balancing operations on the router.

timestamp

To create a DOCSIS configuration file that enables timestamp generation, use the **timestamp** command in cable config-file configuration mode. To disable this function, use the **no** form of this command.

timestamp

no timestamp

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Cable config-file configuration

Command History

Release	Modification
12.1(2)EC1	This command was introduced.
12.2(4)BC1	Support was added to the Release 12.2 BC train.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The DOCSIS specification supports the optional time-stamping of DOCSIS configuration files by adding a field to the file that shows the time that the file was sent to the CM. This prevents someone from trying to subvert DOCSIS security by replaying a valid DOCSIS configuration file to another CM. The timestamp is expressed as the number of seconds since midnight on January 1, 1900.

Examples

The following example shows how to enable timestamp generation for the DOCSIS configuration file.

```
router(config)# cable config-file upgrade.cm
router(config-file)# timestamp
router(config-file)# exit

router(config)#
```

Related Commands

Command	Description
cable config-file	Creates a DOCSIS configuration file and enters configuration file mode.
access-denied	Disables access to the network.

Command	Description
channel-id	Specifies upstream channel ID.
cpe max	Specifies CPE information.
download	Specifies download information for the configuration file.
frequency	Specifies downstream frequency.
option	Provides config-file options.
privacy	Specifies privacy options for baseline privacy images.
service-class	Specifies service class definitions for the configuration file.
snmp manager	Specifies Simple Network Management Protocol (SNMP) options.

tlv

To configure a TLV type tag matching rule, use the **tlv** command in CMTS-tag configuration mode.

tlv *type value*

Syntax Description

type	Specifies the type identifier. It can be one of the following: • **mrcs** - Multiple Receive Channel Support. • **mtcs** - Multiple Transmit Channel Support. • **ufrs** - Upstream Frequency Range Support.
value	Specifies a decimal number value for the type tag. The range is 0 to 255.

Command Default

None

Command Modes

CMTS tag configuration mode (config-cmts-tag).

Command History

Release	Modification
12.2(33)SCH	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure the **tlv** command:

```
Router# configure terminal
Router(config)# cable tag 1
Router(config-cmts-tag)# tlv mrcs 3
```

Related Commands

Command	Description
cable tag	To configure a tag for a DOCSIS load balancing group on the CMTS.

tos

To configure the Type of Service (ToS) byte in the header of Layer 2 tunneled packets, use the **tos** command in DEPI tunnel configuration mode. To disable a configured ToS value, use the **no** form of this command.

tos value

no tos value

Syntax Description

value	Value of the ToS byte for IP packets in a Layer 2 Tunnel Protocol version 3 (L2TPv3) data session. The valid values range from 0 to 255. The default value is 0.

Command Default

None

Command Modes

DEPI tunnel configuration

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The **tos** command allows you to manually configure the value of the ToS byte used in the headers of Layer 2 tunneled packets.

Examples

The following example shows how to assign a ToS value of 100:

```
Router# configure terminal
Router(config)# depi-tunnel rf6
Router(config-depi-tunnel)# tos 100
```

Related Commands

Command	Description
depi-tunnel	Specifies the name of the depi-tunnel and enters the DEPI tunnel configuration mode.

tos (multicast qos)

To set type of service (ToS) low byte, high byte, and mask values within a multicast QoS group, use the **tos** command in multicast QoS configuration mode. To disable the type of service, use the **no** form of this command.

tos *low-byte high-byte mask*

no tos *low-byte high-byte mask*

Syntax Description

low-byte	Specifies the minimum ToS data bytes for a multicast QoS group. The valid range is 0–255.
high-byte	Specifies the maximum ToS data bytes for a multicast QoS group. The valid range is 0–255.
mask	Specifies the ToS mask for a multicast QoS group. The valid range is 0–255.

Command Default

ToS parameters are not defined for a specific multicast QoS group.

Command Modes

Multicast QoS configuration (config-mqos)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The three precedence bits in the ToS byte in the IP header specifies a class of service assignment for each packet. Those packets with the precedence bit set in the ToS field are given higher priority.

Examples

The following example defines the low and high ToS rates and the mask value using the **tos** command:

```
Router(config)# cable multicast qos group 20 priority 55 global
Router(config-mqos)# tos 1 6 15
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface bundle multicast-sessions	Displays multicast session information for a specific virtual cable bundle.
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

upgrade fpd auto

To enable automatic upgrade of the Field Programmable Device (FPD) image on the Cisco cBR-8 router, use the **upgrade fpd auto** command in privileged EXEC mode.

upgrade fpd auto

no upgrade fpd auto

Command Default

FPD auto upgrade is enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **upgrade fpga auto-upgrade** command.

Usage Guidelines

The FPD auto upgrade feature enables automatic upgrade of the FPD image on the Cisco cBR-8 router. To disable auto upgrade of the FPD, use the **no upgrade fpd auto** command.

Examples

The following example shows how to enable automatic upgrade of the FPD firmware on the Cisco cBR-8 router:

```
Router# upgrade fpd auto
```

The following example shows how to disable automatic upgrade of the FPD firmware on the Cisco cBR-8 router:

```
Router# no upgrade fpd auto
```

The following example shows how to display the FPD version:

```
Router# show upgrade fpd table
Field Programmable Devices (FPD) Bundle Information Table:
============================================================

For IOS version 15.5(20150412:160914)


Entry #1: RF Switch PIC (0xB86), Minimal H/W Version: 0.0
FPD ID FPD Name Min. Req. Version
------ ------------------------ -----------------
34 CBR RFSW PIC 7.35

Entry #2: RF Switch PIC (0xB87), Minimal H/W Version: 0.0
FPD ID FPD Name Min. Req. Version
------ ------------------------ -----------------
35 CBR STEALTHSTAR 7.13
```

```
Entry #3: 8x10GE Supervisor PIC (0xB82), Minimal H/W Version: 0.0
FPD ID FPD Name Min. Req. Version
------ ----------------------- -----------------
36 CBR SUP PIC 0.130
```

Related Commands

Command	Description
upgrade fpd file	Upgrades the FPD on the PRE4 module on the Cisco uBR10012 router.

upgrade fpd file

To upgrade the Field-Programmable Device (FPD) image on the Cisco cBR-8 router, use the **upgrade fpd file** command in privileged EXEC mode.

upgrade hw-module subslot *slot/subslot* **fpd bundled**

Syntax Description

slot	The slot where a SIP resides. On the Cisco cBR-8 router, slots 0 to 9 can be used for a SIP.
subslot	The subslot where the Wideband SIP resides. On the Cisco cBR-8 router, subslot 1 is always specified.

Command Default

FPD is disabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **upgrade fpga file** command.

Usage Guidelines

Use this command to upgrade the FPD image on the Cisco cBR-8 router.

Examples

The following example shows how to upgrade the FPD on the Cisco cBR-8 router:

```
Router# upgrade hw-module subslot 4/1 fpd bundled
```

Related Commands

Command	Description
show upgrade fpd progress	Display in progress FPD image upgrade.

upgrade fpga auto-upgrade

To perform a firmware Field-Programmable Gate Array (FPGA) automatic upgrade on the PRE4 module on the Cisco uBR10012 router, use the **upgrade fpga auto-upgrade** command in privileged EXEC mode.

upgrade fpga auto-upgrade {**debug-off**| **debug-on**| **disable**| **enable**| **show**}

Syntax Description

debug-off	Turns off debugging of the firmware FPGA auto upgrade of the PRE4 module.
debug-on	Turns on debugging of the firmware FPGA auto upgrade of the PRE4 module.
disable	Disables auto upgrade of the FPGA.
enable	Enables auto upgrade of the FPGA.
show	Displays information on the FPGA upgrade on the Cisco uBR10012 router.

Command Default

FPGA auto upgrade is enabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCG	This command was introduced.
IOS-XE 3.15.0S	This command was replaced by the **upgrade fpd auto** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

The FPGA auto upgrade feature enables automatic upgrade of the FPGA image on the PRE4 module on the Cisco uBR10012 router. To disable auto upgrade of the FPGA, use the **upgrade fpga auto-upgrade disable** command.

Examples

The following example shows how to activate the FPGA debugging on the Cisco uBR10012 router:

```
Router# upgrade fpga auto-upgrade debug-on
Router#
```

The following example shows how to disable automatic upgrade of the FPGA firmware on the Cisco uBR10012 router:

```
Router# upgrade fpga auto-upgrade disable
```

The following example shows how to display the FPGA version, which is the FPGA in the flash on the PRE4 module:

```
Router# upgrade fpga auto-upgrade show
Alternative IOFPGA Running, version - 0x05111800
Default IOFPGA version - 0x00000000
Alternative IOFPGA version - 0x00000000
Bundle IOFPGA version - 0x0A0A0D01
IOFPGA auto-upgrade enabled - No
IOFPGA auto-upgrade debug - No
IOFPGA auto-upgrade test mode - (Default IOFPGA:flash image verify error)
```

Table below describes the significant fields shown in the display.

Table 1: upgrade fpga auto-upgrade show Field Descriptions

Field	Description
Alternative IOFPGA Running, version	Alternative IOFPGA image that is running, and its version.
Default IOFPGA version	Default IOFPGA version.
Alternative IOFPGA version	Alternative IOFPGA version.
Bundled IOFPGA version	Bundled IOFPGA version.
IOFPGA auto-upgrade enabled	IOFPGA auto-upgrade is enabled.
IOFPGA auto-upgrade debug	IOFPGA debug is turned on.
IOFPGA auto-upgrade test mode	IOFPGA test mode is turned on.

Associated Features

The **upgrade fpga auto-upgrade** command is used to automatically upgrade of the FPGA on the PRE4 module on the Cisco uBR10012 router.

- Cisco uBR10012 Universal Broadband Router Performance Routing Engine Module

Related Commands

Command	Description
upgrade fpga file	Upgrades the FPGA on the PRE4 module on the Cisco uBR10012 router.

upgrade fpga file

To upgrade the Field-Programmable Gate Array (FPGA) image on the Performance Routing Engine 4 (PRE4) module on the Cisco uBR10012 router, use the **upgrade fpga file** command in privileged EXEC mode.

upgrade fpga {**alt**| **def**} **file**{*url*| *version* }

Syntax Description

alt	Specifies the alternative IOFPGA version.
def	Specifies the default IOFPGA version.
url	URL of the IOFPGA file.
version	Version of the IOFPGA file.

Command Default

FPGA is disabled by default.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SCB	This command was introduced.
12.2(33)SCG	This command is modified. The argument *version* is added to the command.
IOS-XE 3.15.0S	This command was replaced by the **upgrade fpd file** command on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use this command to upgrade the FPGA image on the PRE4 module on the Cisco uBR10012 router.

In Cisco IOS Releases 12.2(33)SCG, you must specify the version of the IOFPGA file to manually upgrade the PRE4 module.

If you are using a PRE4 VE board and running Cisco IOS Release 12.2(33)SCG, use the **upgrade fpga** {**alt | def**} **file** {*url* }command upgrade the PRE4 module.

Examples

The following example shows how to upgrade the FPGA on the Cisco uBR10012 router:

```
Router# upgrade fpga alt file disk0:pre4_iofpga.bin 0x0A0A0D01
```

Associated Features

The **upgrade fpga file** command is used to manually upgrade the FPGA on the PRE4 module on the Cisco uBR10012 router. For more information, see

- Cisco uBR10012 Universal Broadband Router Performance Routing Engine Module

Related Commands

Command	Description
upgrade fpga auto-upgrade	Performs automatic upgrade of the IOFPGA on the PRE4 module on the Cisco uBR10012 router.

upstream

To add upstream channels to an upstream bonding group, use the **upstream** command in upstream bonding configuration submode. To disable this configuration, use the **no** form of this command.

upstream *number*

no upstream *number*

Syntax Description

number	Upstream channel number. The valid range is from 0 to 7.

Command Default

None

Command Modes

Upstream bonding configuration submode (config-upstream-bonding)

Command History

Release	Modification
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

DOCSIS 3.0-certified cable modems can support only four upstream channels on an upstream bonding group. These cable modems cannot accept additional upstream channels that you have added to an upstream bonding group.

Examples

The following example shows how to add upstream channels to an upstream bonding group on a cable interface line card on a Cisco uBR10012 router:

```
Router# configure terminal
Router(config)# interface cable7/1/0
Router(config-if)# cable upstream bonding-group 20
Router(config-upstream-bonding)# upstream 0
Router(config-upstream-bonding)# upstream 1
Router(config-upstream-bonding)# upstream 2
Router(config-upstream-bonding)# upstream 3
```

Related Commands

Command	Description
cable upstream bonding-group	Creates an upstream bonding group on a cable interface.
cable fiber-node	Creates a fiber node and enters cable fiber-node configuration mode.

upstream (config-lb-group)

To set upstream channels in a DOCSIS load balancing group, use the **upstream** command in the config-lb-group configuration mode. To disable the upstream channel configuration, use the **no** form of this command.

Cisco cBR Series Router

upstream Upstream-Cable *slot /card /port* **us-channel** *grouplist*

no upstream Upstream-Cable *slot /card /port* **us-channel** *grouplist*

Cisco uBR10012 Router

upstream cable *slot /subslot /port* **upstream-list**

no upstream cable *slot /subslot /port* **upstream-list**

upstream

Cisco uBR7225VXR and Cisco uBR7246VXR Routers

upstream cable *slot /port* **upstream-list**

no upstream cable *slot /port* **upstream-list**

Syntax Description

cable *slot/card/port*	Specifies the CMTS interface slot, subslot, and port number parameters on the Cisco cBR series router. • *slot*—Slot where the line card resides. The permitted range is from 0 to 9. • *card*—Subslot where the line card resides. The available slots is 0. • *port*—The downstream controller number on the line card. The permitted range is from 0 to 7.
cable *slot/subslot/port*	Specifies the CMTS interface slot, subslot, and port number parameters on the Cisco uBR10002 router. • *slot*—Slot where the line card resides. The permitted range is from 5 to 8. • *subslot*—Subslot where the line card resides. The available slots are 0 or 1. • *port*—The downstream controller number on the line card. The permitted *port* range is from 0 to 4.

cable *slot/port*	Specifies the CMTS interface slot and port number parameters on the Cisco uBR7246VXR or Cisco uBR7225VXR router. • *slot*—Slot where the line card resides. ◦ Cisco uBR7225VXR router—The range is from 1 to 2. ◦ Cisco uBR7246VXR router—The range is from 3 to 6. • *port*—Downstream controller number on the line card. The permitted *port* values are 0 or 1.
upstream-list	Upstream channel list ranging from 0 to 7.
grouplist	Upstream channel number ranging from .

Command Default

None

Command Modes

DOCSIS load balancing group mode (config-lb-group)

Command History

Release	Modification
12.2(33)SCC	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. The value ranges for the *slot/card/port* variables were changed.

Examples

The following example shows how to set upstream channels in a DOCSIS LBG using the upstream command on the Cisco uBR series router.

```
Router# configure terminal
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# upstream cable 1/0/1 2
```

The following example shows how to set upstream channels in a DOCSIS LBG using the upstream command on the Cisco cBR series router.

```
Router# configure terminal
Router(config)# cable load-balance docsis-group 1
Router(config-lb-group)# upstream Upstream-Cable 3/0/1 us-channel 1
```

Related Commands

Command	Description
cable load-balance docsis-group	Configures a DOCSIS load balancing group on the CMTS.
show cable load-balance docsis-group	Displays real-time configurational, statistical, and operational information of load balancing operations on the router.

upstream cable channel

To configure upstream channels, use the **upstream cable channel** command in channel group or fiber node configuration modes. To disable the configuration, use the **no** form of the command.

upstream cable *slot/subslot/port* **channel** *grouplist*

no upstream cable *slot/subslot/port* **channel** *grouplist*

Syntax Description

cable *slot/subslot/port*	Specifies the cable interface. • *slot*—Chassis slot number of the cable interface line card. The valid range is from 5 to 8. • *subslot*—Secondary slot number of the cable interface line card. The valid range is from 0 to 1. • *port*—Port number on the line card. The valid range is from 0 to 14.
channel *grouplist*	Specifies the list of upstream channels. • *grouplist*—List or range of upstream channel numbers. The value can be one or more upstream channel numbers, a range of channel numbers separated by a hyphen, or a combination of both. The valid range is from 0 to 7 for the channel group configuration and 0 to 3 for the fiber node configuration.

Command Default

Upstream channel is not configured.

Command Modes

Channel group configuration (config-ch-group)

Fiber node configuration (config-fiber-node)

Command History

Release	Modification
Cisco IOS Release 12.2(33)CX	This command was introduced.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

All the upstream channels in a channel group must be associated with the same connector.

Examples

The following example shows how to configure upstream channels for a channel group:

```
Router# configure terminal
Router(config)# cable channel-group 1
Router(config-ch-group)# upstream Cable 7/1/0 channel 0-3
```

Related Commands

Command	Description
cable channel-group	Configures channel group.
show cable channel-group	Displays the channel group information.
show cable fiber-node	Displays the fiber node information.

upstream cable connector

To configure an upstream cable connector for a fiber node, use the **upstream cable connector** command in cable fiber node configuration mode. To disable the configuration, use the **no** form of this command.

Cisco uBR10012 Router

upstream cable *slot /subslot* **connector** *port-number*

no upstream cable *slot /subslot* **connector** *port-number*

Cisco uBR7225VXR and Cisco uBR7246VXR Routers

upstream cable *slot* **connector** *port-number*

no **upstream cable** *slot* **connector** *port-number*

Syntax Description

cable *slot/ subslot*	Identifies the cable interface on the Cisco uBR10012 router. • *slot* —Chassis slot number of the cable interface line card. The valid range is from 5 to 8. *subslot* —Secondary slot number of the cable interface line card. The valid range is from 0 or 1.
cable *slot*	Identifies the cable interface on the Cisco uBR7246VXR or Cisco uBR7225VXR router. • *slot* —Slot where the line card resides. ◦ Cisco uBR7246VXR router: The valid range is from 3 to 6. ◦ Cisco uBR7225VXR router: The valid range is from 1 to 2.
connector	Specifies the physical upstream port connector on the cable interface line card.

port-number	A range of physical port numbers on the cable interface line card. The *port-number* can be one or more port numbers or a range of port numbers separated by a hyphen or combinations of both. • Cisco uBR10012 router—The range for port numbers is from 0 to 19. • Cisco uBR7246VXR or Cisco uBR7225VXR router—The range for port numbers is from 0 to 7.

Command Default

None

Command Modes

Cable fiber node configuration (config-fiber-node)

Command History

Release	Modification
12.3(21)BC	This command was introduced for the Cisco uBR10012 router.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
12.2(33)SCC	This command was introduced in Cisco IOS Release 12.2(33)SCC.
12.2(33)SCD	This command was modified. Added support for Cisco uBR7246VXR and Cisco uBR7225VXR routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Examples

The following example shows how to configure upstream channels for fiber node 1. Notice that the list of port numbers (connectors) can be a single port number, a range of port numbers, or some combination of the two.

```
Router(config)# cable fiber-node 1

Router(config-fiber-node)# upstream cable 5/0 connector 0
Router(config-fiber-node)# upstream cable 5/0 connector 1-2
Router(config-fiber-node)# upstream cable 6/0 connector 0 1-2 3
```

Related Commands

Command	Description
cable fiber-node	Enters cable fiber-node configuration mode to configure a fiber node.

Command	Description
cable upstream bonding-group	Creates an upstream bonding group on a cable interface line card.
description (cable fiber-node)	Specifies a description for a fiber node.
downstream cable	Assigns a primary downstream channel for a fiber node.
downstream modular-cable rf-channel	Specifies the RF channels that are available for wideband channels on a fiber node.

upstream freq-range

To configure the Cisco CMTS router for the range of frequencies that are acceptable on upstreams, use the **upstream freq-range** command in global configuration mode. To restore the default value of North American ranges, use the **no** form of this command.

upstream freq-range [**european**| **japanese**| **north american**]

no upstream freq-range

Syntax Description

european	Configures the Cisco CMTS router to accept upstream frequency ranges that conform with the EuroDOCSIS specifications (5 MHz to 65 MHz).
japanese	Configures the Cisco CMTS router to accept upstream frequency ranges that conform to the expanded range used in Japan (5 MHz to 55 MHz).
north american	Configures the Cisco CMTS router to accept upstream frequency ranges that conform to the DOCSIS specifications (5 MHz to 42 MHz).

Command Default

North American (DOCSIS, 5 MHz to 42 MHz)

Command Modes

Global configuration

Command History

Release	Modification
12.2(15)BC2	This command was introduced for the Cisco uBR7246VXR and Cisco uBR10012 universal broadband routers.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

In Cisco IOS Release 12.2(15)BC2 and later, the Cisco CMTS router supports three different modes of operation, depending on the cable interface line cards being used. The range of frequencies that are allowed in each mode are as follows:

- North American DOCSIS (Annex B)—Upstreams use frequencies between 5 MHz and 42 MHz.
- European EuroDOCSIS (Annex A)—Upstreams use frequencies between 5 MHz and 65 MHz.
- Japanese Expanded Range (Annex B)—Upstreams use frequencies between 5 MHz and 55 MHz.

To configure the router so that it supports the proper range of upstream frequencies, use the **upstream freq-range** command. After you have configured the router with the **upstream freq-range** command, the **cable upstream frequency** command then accepts only frequencies that are in the configured range.

Note This command configures only the range of frequencies that can be configured on an upstream. It does not configure the upstreams for the DOCSIS (Annex B) or EuroDOCSIS (Annex A) modes of operation, which is done using the **cable downstream annex** interface command. (Annex C mode is not supported.)

The allowable range for the upstream channel frequency depends on the cable interface line card and Cisco IOS software release being used. See Table 2-12 for the currently supported values.

Examples

The following example shows how to configure the Cisco CMTS router to support the EuroDOCSIS upstream frequency range of 5 MHz to 65 MHz:

```
Router# configure terminal
Router(config)# upstream freq-range european
Router(config)#
```

The following example shows how to configure the Cisco CMTS router to support the expanded Japanese upstream frequency range of 5 MHz to 55 MHz:

```
Router# configure terminal
Router(config)# upstream freq-range japanese
Router(config)#
```

The following example shows how to configure the Cisco CMTS router for its default configuration (DOCSIS upstream frequency range of 5 MHz to 42 MHz):

```
Router# configure terminal
Router(config)# upstream freq-range north american
Router(config)#
```

The following example shows all of the commands that are needed to configure the cable interface and upstream on a Cisco uBR-MC28U/X cable interface line card to support a frequency in the EuroDOCSIS upstream frequency range of 5 MHz to 65 MHz:

```
Router# configure terminal
Router(config)# upstream freq-range european
Router(config)# interface 3/0
Router(config-if)# cable downstream annex a
Router(config-if)# cable upstream 0 frequency 62500000
Router(config-if)#
```

Related Commands

Command	Description
cable spectrum-group (global configuration)	Creates spectrum groups, which contain one or more upstream frequencies.

Command	Description
cable upstream frequency	Configures a fixed frequency of the upstream radio frequency (RF) carrier for an upstream port.
show controllers cable	Displays information about the cable interface, including the upstream center frequency.

upstream upstream-cable

To configure upstream port, use the **upstream upstream-cable** command in fiber node configuration modes. To disable the configuration, use the **no** form of the command.

upstream upstream-cable *slot/subslot/port*

no upstream upstream-cable *slot/subslot/port*

Syntax Description

slot/subslot/port	Specifies the cable interface. • *slot*—Chassis slot number of the cable interface line card. The valid range is from 0 to 3 and 6 to 9. • *subslot*—Subslot number of the cable interface line card. The valid range is 0. • *port*—Port number on the line card. The valid range is from 0 to 15.

Command Default

Upstream port is not configured.

Command Modes

Fiber node configuration (config-fiber-node)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was introduced on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

All the upstream channels in a port must be associated with the same fiber node.

Examples

The following example shows how to configure upstream port for a fiber node:

```
Router# configure terminal
Router(config)# cable fiber-node 1
Router(config-fiber-node)# upstream Upstream-Cable 6/0/0
```

Related Commands

Command	Description
cable fiber-node	Configures fiber node.
show cable fiber-node	Displays the fiber node information.

us-channel channel-width

To set the channel-width in upstream channel configuration, use the **us-channel channel-width** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **channel-width** {*first-choice-width* [*last-choice-width*]}

no us-channel *n* **channel-width**

Syntax Description

n	Specifies the upstream port number. The valid range is from 0 to 11.
first-choice-width	Specifies the upstream channel width in hertz. The valid values are 1600000, 3200000 and 6400000.
last-choice-width	(Optional) Specifies the upstream channel width in hertz. The valid values are 1600000, 3200000 and 6400000.

Command Default

The default channel width is 1600000 Hz.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream channel-width** command.

Usage Guidelines

When you specify both channel width values, the smaller value is taken as the last-choice-width parameter and the larger value is taken as the first-choice-width parameter. In the event of noise in the channel, the symbol rate automatically steps down to a value that is lower than the first-choice-width and greater or equal to the last-choice-width to maintain a stable channel.

Refer to the **cable upstream channel-width** command for more information.

Examples

The following example shows how to set the channel-width using **us-channel channel-width** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 channel-width 1600000
Router(config-controller)#
```

Related Commands

Command	Description
cable upstream hopping blind	Disables optimum frequency hopping on the Cisco uBR-MC16S and Cisco uBR-MC5X20S cable interface line cards.
cable upstream minislot-size	Specifies the minislot size for a specific upstream interface.
cable upstream modulation-profile	Overrides modulation types specified in the modulation profile for the specified upstream channel.
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.

us-channel description

To assign a label to an upstream, use the **us-channel description** command in controller configuration mode. To remove the label from the upstream, use the **no** form of this command.

us-channel *n* **description** *label*

Syntax Description

n	Upstream channel number. The range is from 0 to 11 on the Cisco cBR-8 router.
label	An arbitrary string, up to 80 characters long, that describes this upstream for management and tracking purposes. If the string contains any spaces, enclose the string within quotes.

Command Default

No description is assigned to upstreams.

Command Modes

Controller configuration—upstream-cable only (config-controller)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream description** command.

Usage Guidelines

Use the **us-channel description** command to assign arbitrary labels to the upstreams. These labels can contain any information that identifies the upstream and that could aid in network management or troubleshooting.

Examples

The following example shows how to assign descriptions to the first two upstreams for upstream-cable 3/0/1 on the Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# controller upstream-Cable 3/0/1
Router(config-controller)# us-channel 0 description  "SJ-Node1-Uupstream channel 0"
Router(config-controller)# us-channel 1 description  "SJ-Node1-Upstream channel 1 (Unused)"
Router(config-controller)#
```

Related Commands

Command	Description
show interfaces cable	Displays the current configuration and status of the cable interface.

us-channel docsis-mode

To configure an upstream to use DOCSIS modulation profiles, use the **us-channel docsis-mode** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **docsis-mode** {**atdma**| **tdma**| **tdma-atdma**}

no us-channel *n* **docsis-mode** {**atdma**| **tdma**| **tdma-atdma**}

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
atdma	Configures the upstream only for DOCSIS 2.0 Advanced Time Division Multiple Access (A-TDMA) modulation profiles.
tdma	Configures the upstream only for DOCSIS 1.0/DOCSIS 1.1 Time Division Multiple Access (TDMA) modulation profiles.
tdma-atdma	Configures the upstream for both A-TDMA and TDMA operations (mixed mode).

Command Default

All upstreams are configured ATDMA-only mode

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream docsis-mode** command.

Usage Guidelines

The DOCSIS 2.0 specification builds on the existing TDMA to support advanced modulation profiles that increase potential upstream bandwidth. The A-TDMA profiles support higher QAM rates of up to 64-QAM and wider channel widths of up to 6.4 MHz (5.12 Msymbols).

Refer to the **cable upstream docsis-mode** command for more information .

Examples

The following example shows how configure an upstream to use DOCSIS TDMA mode using **us-channel docsis-mode** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 docsis-mode tdma
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for use on the router.
cable modulation-profile global-scheme	Defines a global modulation profile for use on the router.
cable upstream channel-width	Specifies an upstream channel width for an upstream port.
cable upstream equalization-coefficient	Enables the use of a DOCSIS 1.1 pre-equalization coefficient on an upstream.
cable upstream maintain-psd	Requires DOCSIS 2.0 CMs on an A-TDMA-only upstream to maintain a constant power spectral density after a modulation rate change.
cable upstream modulation-profile	Assigns one or two modulation profiles to an upstream port.
show cable modulation-profile	Displays the modulation profile information for a Cisco CMTS.
show interface cable mac-scheduler	Displays the current time-slot scheduling state and statistics.

us-channel equalization-coefficient

To enable equalization-coefficient in upstream channel configuration, use the **us-channel equalization-coefficient** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **equalization-coefficient**

no us-channel *n* **equalization-coefficient**

Syntax Description

n	Specifies the upstream port number. The valid range is from 0 to 11.

Command Default

None.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream equalization-coefficient** command.

Usage Guidelines

The DOCSIS 1.1 and 2.0 specifications allow a CMTS to specify a pre-equalization coefficient in the DOCSIS ranging response (RNG-RSP) MAC management messages it forwards to the cable modems (CM)s. When this is enabled, a CM can engage in transmit-side equalization (pre-equalization) to mitigate the effects of certain impairments in the cable plant, such as in-channel tilt, and group delay.

Refer to the **cable upstream equalization-coefficient** command for more information.

Examples

The following example shows how to enable equalization-coefficient in controller configuration mode using **us-channel equalization-coefficient** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 equalization-coefficient
Router(config-controller)#
```

Related Commands

Command	Description
show cable modem phy	Displays the physical layer RF parameters of the cable modem, including USSNR estimate (MER).
show cable modem docsis version	Displays the DOCSIS version of a cable modem, and the upstream DOCSIS mode— TDMA or ATDMA.
show cable modem [verbose]	Displays detailed information about the cable modem. Lines with the string Equalizer describe modem specific equalizer data.
debug cable range	Debugging commands to display the equalizer coefficients being sent by the CMTS to the cable modem in the DOCSIS RNG-RSP MAC management messages.
debug cable interface *{interface} {cm-mac-address}* **[verbose]**	Debugging commands to display the equalizer coefficients being sent by the CMTS to the cable modem in the DOCSIS RNG-RSP MAC management messages. **Caution** Certain debug settings can produce a very large amount of data on a production router, and should be used with caution. Specifying the CM mac-address will dramatically reduce the amount of data produced.

us-channel frequency

To enter a fixed frequency of the upstream radio frequency (RF) carrier for an upstream port, use the **us-channel frequency** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n***frequency** {*up-freq-hz* }

no us-channel *n* **frequency** {*up-freq-hz* }

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
up-freq-hz	The upstream center frequency configured to a fixed Hertz (Hz) value. The valid range is from 5000000 Hz to 85000000 Hz

Command Default

The default upstream channel number is 0. The default frequency is 0 Hz.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream frequency** command.

Usage Guidelines

The upstream channel frequency of your RF output must be set to comply with the expected input frequency of your cable interface line card. To configure an upstream channel frequency, you may:

- Configure a fixed frequency between the allowable ranges and enable the upstream port, or
- Create a global spectrum group, assign the interface to it, and enable the upstream port.

Refer to the **cable upstream frequency** command for more information.

Examples

The following example shows how configure how to configure the upstream center frequency using **us-channel frequency** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 frequency 5700000
```

Related Commands

Command	Description
cable spectrum-group (global configuration)	Creates spectrum groups, which contain one or more upstream frequencies.
show controllers cable	Displays information about the cable interface, including the upstream center frequency.
upstream freq-range	Configures the Cisco CMTS router for the range of frequencies that are acceptable on upstreams.

us-channel hop-priority

To configure the priority of the corrective actions to be taken when a frequency hop is necessary due to ingress noise on the upstream, use the **us-channel hop** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **hop-priority frequency modulation channel-width**

us-channel *n* **hop-priority modulation frequency channel-width**

us-channel *n* **hop-priority frequency channel-width modulation**

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
frequency, modulation, channel-width	Specifies the priority of corrective actions to be taken when ingress noise occurs on a downstream.

Command Default

The default priority is **frequency**,**modulation**, and **channel-width**.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream hop-priority** command.

Usage Guidelines

This command specifies the priority of the corrective actions that should be taken when a frequency hop is necessary to correct excessive ingress noise on an upstream.

Refer to the **cable upstream hop-priority** command for more information.

Examples

The following example shows the usage of **us-channel hop-priority** command when ingress noise on the upstream exceeds the threshold allowed for the primary modulation profile:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 hop-priority modulation frequency channel-width
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable upstream channel-width	Configures an upstream for a range of allowable channel widths.
cable upstream modulation-profile	Configures an upstream for one modulation profile (static profile) or two modulation profiles (Dynamic Upstream Modulation).
show cable hop	Displays the current hop period and threshold for an upstream, along with other statistics.
show cable modulation-profile	Displays the cable modulation profiles that have been created.

us-channel ingress-noise-cancellation

To configure how often a cable interface line card should train its noise-cancellation circuitry so as to adjust to noise levels on the upstream, use the **us-channel ingress-nosie-cancellation** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **ingress-nosie-cancellation** [*interval*]

no us-channel *n* **ingress-nosie-cancellation** [*interval*]

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
interval	(Optional) Triggering interval in milliseconds. The valid range is from 40 to 300.

Command Default

Enabled.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream hop-prioingress-nosie-cancellation** command.

Usage Guidelines

The **us-channel ingress-nosie-cancellation** command is used to configure how often these line cards should train their noise cancellation circuity so as adapt to changes in the noise types and levels.

Examples

The following example shows how to perform ingress noise cancellation every 200 milliseconds using **us-channel ingress-nosie-cancellation** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 ingress-nosie-cancellation 200
```

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for use on the router.

Command	Description
cable upstream channel-width	Specifies an upstream channel width for an upstream port.

us-channel maintain-psd

To maintain a constant power spectral density (PSD) after a modulation rate change, use the **us-channel maintain-psd** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **maintain-psd**

no us-channel *n* **maintain-psd**

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.

Command Default

Enabled.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream maintain-psd** command.

Usage Guidelines

Use this command to specify whether DOCSIS 2.0 CMs should maintain their power spectral density when the Cisco CMTS changes their upstream modulation rate in an upstream channel descriptor (UCD) message.

Refer to **cable upstream maintain-psd** command for more information.

Examples

The following example shows how to maintain a constant power spectral density after a modulation rate change using **us-channel maintain-psd** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 maintain-psd
```

Related Commands

Command	Description
cable upstream docsis-mode	Configures an upstream to use either DOCSIS 1.x or DOCSIS 2.0 modulation profiles.

us-channel minislot-size

To specify the minislot size (in ticks) for a specific upstream interface, use the **us-channel minislot-size** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **minislot-size** *size*

no us-channel *n* **minislot-size**

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
size	Specifies the minislot size in time ticks. valid minislot sizes are: • 1 • 2 • 4 • 8 • 16 • 32 • 64

Command Default

The default minislot size is 4.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream minislot-size**command.

Usage Guidelines

The minislot size determines the minimum amount of information that can be transmitted on the upstream. How much a particular minislot size can contain depends on the modulation profile and channel width being used, with higher-bandwidth settings allowing larger amounts of data.

Refer to **cable upstream minislot-size**command for more information.

Examples

The following example shows how to set the minislot size using **us-channel minislot-size** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 minislot-size 64
```

Related Commands

Command	Description
cable upstream modulation-profile	Assigns one or two modulation profiles to an upstream port.
show cable hop	Displays CM configuration settings.
show cable modulation-profile	Displays the modulation profile information for a Cisco CMTS.
show interface cable mac-schedule	Displays the current time-slot scheduling state and statistics.
show interface cable sid	Displays cable interface information.

us-channel modulation-profile

To assign modulation profiles to an upstream port, use the **us-channel modulation-profile** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *n* **modulation-profile** *primary-profile number* [*secondary-profile-number*] [*tertiary-profile-number*]

no us-channel *n* **modulation-profile** *primary-profile number* [*secondary-profile-number*] [*tertiary-profile-number*]

Syntax Description

n	The upstream channel number. The valid range is from 0 to 11.
primary-profile number	Specifies the primary modulation profile. The valid range is from 1 to 400.
secondary-profile-number	(Optional) Specifies the secondary modulation profile. The valid range is from 1 to 400.
tertiary-profile-number	(Optional) Specifies the tertiary modulation profile. The valid range is from 1 to 400.

Command Default

The default value is 221.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream modulation-profile**command.

Usage Guidelines

The **us-channel modulation-profile** command assigns up to three modulation profiles to an upstream port, depending on the type of cable interface and Cisco IOS software release being used.

Refer to the **cable upstream modulation-profile**command for more information.

Examples

The following example shows how assign modulation profiles using **us-channel modulation-profile** command:

```
Router# configure terminal
```

```
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 modulation-profile 2 1
```

Related Commands

Command	Description
cable modulation-profile	Creates a cable modulation profile.
cable modulation-profile global-scheme	Defines a global modulation profile for use on the router.
cable upstream hop-priority	Determines the order of the corrective actions to be taken when ingress noise exceeds the allowable value for an upstream. This command is related to the **cable upstream modulation-profile** command only when using advanced dynamic modulation configuration, that is, when spectrum group is defined for the upstream channel.
show cable modulation-profile	Displays the cable modulation profiles that have been created.

us-channel power-level

To set the input power level for the upstream radio frequency (RF) carrier in decibels per millivolt (dBmV), use the **us-channel power-level** command in controller configuration mode. To restore the input power level to its default value, use the **no** form of this command.

us-channel *n* **power-level** *dbmv*

Syntax Description

n	Upstream channel number. The range is from 0 to 11 on the Cisco cBR-8 router.
dbmv	Decibels per millivolt designating the upstream signal input power level. The range is from –13 to 23 on the Cisco cBR-8 router depending on the upstream symbol rate (channel width).

Command Default

0 dBmV

Command Modes

Controller configuration—upstream-cable only (config-controller)

Command History

Release	Modification
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream power-level** command.

Usage Guidelines

The Cisco CMTS controls the output power levels of the CMs to meet the desired upstream input power level. The nominal input power level for the upstream RF carrier is specified in decibels per millivolt (dBmV). The default setting of 0 dBmV is the optimal setting for the upstream power level.

The valid range for the input power level depends on the data rate, as expressed as the symbol rate and channel width. The table below shows the valid power levels for each allowable rate, as given in the DOCSIS specification. Higher (more positive) values cause the CMs to increase their transmit power, achieving a greater carrier-to-noise ratio (CNR).

Table 2: Allowable DOCSIS Power Levels

Symbol Rate (Symbols per second)	Channel Width (Hz)	Allowable Power Range (dBmV)
160,000	200,000	–16 to +14 (minimum valid value for DOCSIS is –13)
320,000	400,000	–13 to +17

Symbol Rate (Symbols per second)	Channel Width (Hz)	Allowable Power Range (dBmV)
640,000	800,000	–10 to +20
1,280,000	1,600,000	–7 to +23
2,560,000	3,200,000	–4 to +26 (maximum valid value for DOCSIS is +23)
5,120,000[1]	6,400,000	–1 to +29 (maximum valid value for DOCSIS is +23)

1 The 5.12 MSymbols/sec symbol rate and 6.4 MHz channel width are supported only on upstreams that are configured for DOCSIS 2.0 A-TDMA-only operation.

Tip You can use inline attenuators to force CMs to transmit at higher power levels and to achieve a higher CNR value on the network.

Caution If you increase the input power level or add inline attenuators before the Cisco CMTS, the CMs on your HFC network increase their transmit power level. Be careful if you adjust this parameter. You might violate the upstream return laser design parameters or exceed the CM's maximum transmit power level.

Note Do not adjust your input power level by more than 5 dB in a 30-second interval. If you increase the power level by more than 5 dB within 30 seconds, you will disrupt CM service on your network. If you decrease the power level by more than 5 dB within 30 seconds, the CMs on your network will be forced to re-range.

Tip When setting upstream power levels, we recommend that the adjacent channels of equal bandwidth do not have a large variation. The recommended maximum input power variance is 5 to 6 dB.

Examples

The following example shows how to input power level for upstream channel 10 on the Cisco cBR-8 router:

```
Router# configure terminal
Router(config)# controller upstream-Cable 3/0/1
Router(config-controller)# us-channel 10 power-level 22
Router(config-controller)#
```

Related Commands

Command	Description
show interfaces cable	Displays the current configuration and status of the cable interface.

us-channel spectrum-group

To set up spectrum group in upstream channel configuration, use the **us-channel spectrum-group** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *upstream channel number* **spectrum-group** {*spectrum group number* }

no us-channel *upstream channel number* **spectrum-group**

Syntax Description

upstream channel number	The upstream channel number. The valid range is from 0 to 11.
spectrum-group	Specifies spectrum group set up.
spectrum group number	The spectrum group number. The valid range is from 1 to 40.

Command Default

None.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream spectrum-group** command.

Usage Guidelines

This command assigns a spectrum group to a single us-channel in the upstream-controller. To configure the spectrum groups, use the set of **cable spectrum-group** commands in global configuration mode.

In addition, you can also spectrum groups to all of the us-channels for one specific upstream-controller, use the **cable spectrum-group** (upstream-cable controller configuration) command.

Examples

The following example shows how to assign spectrum group 12 to the first us-channel of the upstream-cable controller 0 in slot 9/0:

```
Router(config)# controller upstream-cable 9/0/0

Router(config-controller)# us-channel 0 spectrum-group 12

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

Related Commands

Command	Description
cable modulation-profile	Defines a modulation profile for using on the router.
cable spectrum-group(global configuration)	Create and configure a spectrum-group.
cable spectrum-group hop period	Changes the minimum time between frequency hops.
cable spectrum-group hop threshold	Specifies a frequency hop threshold for a spectrum group.

us-channel threshold

To set spectrum management thresholds in upstream channel configuration, use the **us-channel threshold** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *upstream channel number* **threshold** { {**cnr-profile1 cnr-profile2** {*bypass CNR threshold* | *CNR threshold in DB* }} | {**corr-fec** {*corrected FEC threshold in percentage*}} | {**snr-profile1 snr-profile2** {*bypass SNR threshold* | *SNR threshold in DB* }} | {**uncorr-fec** {*uncorrected FEC threshold in percentage* }}}

us-channel *upstream channel number* **threshold** { {**cnr-profile1 cnr-profile2** } | {**corr-fec** } | {**snr-profile1 snr-profile2**} | {**uncorr-fec** }}

Syntax Description

upstream channel number	The upstream channel number. The valid range is from 0 to 11.
cnr-profiles	Specifies CNR thresholds.
bypass CNR threshold	Bypasses CNR threshold for modulation profile1 and profile2. The valid value is 0.
CNR threshold in DB	The CNR threshold in Decibel for the modulation profile1 and profile2. The valid range is from 5 to 35.
corr-fec	Specifies corrected FEC threshold.
corrected FEC threshold in percentage	The corrected FEC threshold in percentage. The valid range is from 0 to 30 where 0 denotes the bypass threshold.
snr-profiles	Specifies SNR thresholds .
bypass SNR threshold	Bypasses SNR threshold for modulation profile1 and profile2. The valid value is 0.
SNR threshold in DB	The SNR threshold in Decibel for the modulation profile1 and profile2. The valid range is from 5 to 35.
uncorr-fec	Specifies uncorrected FEC threshold.
uncorrected FEC threshold in percentage	The uncorrected FEC threshold in percentage. The valid range is from 0 to 30 where 0 denotes the bypass threshold.

Command Default

The default value for:

- **cnr-profile1** is 25.

- **cnr-profile2** is 13.
- **corr-fec** is 3
- **uncorr-fec** is 1.
- **snr-profile1** is 25.
- **snr-profile2** is 13.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream threshold** command.

Usage Guidelines

The **us-channel threshold** command allows setting the of spectrum management thresholds in upstream channel configuration.

Examples

The following example shows how to set spectrum management thresholds in upstream channel configuration using **us-channel threshold** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 threshold ?
Router(config-controller)# cnr-profiles  CNR thresholds in dB
  corr-fec      Corrected FEC threshold
  hysteresis    CNR/SNR upgrade threshold hysteresis value
  snr-profiles  SNR thresholds in dB
  uncorr-fec    Uncorrected FEC threshold
```

Related Commands

Command	Description
show cable hop thresholds	Displays all the thresholds of the active line card.

us-channel threshold hysteresis

To upgrade CNR/SNR threshold hysteresis value, use the **us-channel threshold hysteresis** command in controller configuration mode. To restore the default value, use the **no** form of this command.

us-channel *upstream channel number* **threshold hysteresis** *CNR/SNR upgrade threshold hysteresis in DB*

us-channel *upstream channel number* **threshold hysteresis**

Syntax Description

upstream channel number	The upstream channel number. The valid range is from 0 to 11.
CNR/SNR upgrade threshold hysteresis in DB	The CNR/SNR upgrade threshold hysteresis in Decibel. The valid range is from 0 to 10.

Command Default

The default value for **thershold hystersis** is 3.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
IOS-XE 3.15.OS	This command was introduced on the Cisco cBR Series Converged Broadband Routers. This command replaces the **cable upstream threshold hysteresis** command.

Usage Guidelines

The **us-channel threshold hysteresis** command allows upgrading the CNR/SNR threshold hysteresis value in the controller configuration mode.

Examples

The following example shows how to upgrade CNR/SNR threshold hysteresis value using **us-channel threshold hysteresis** command:

```
Router# configure terminal
Router(config)# controller Upstream-Cable 3/0/0
Router(config-controller)# us-channel 1 threshold hysteresis 1
Router(config-controller)#
```

vrf (multicast qos)

To specify the name for a virtual routing and forwarding (VRF) instance, use the **vrf** command in multicast QoS configuration mode. To disable the VRF instance, use the **no** form of this command.

vrf *name*

no vrf *name*

Syntax Description

name	Specifies the routing and forwarding instance that is populated with multicast Virtual Private Network (MVPN) routes.

Command Default

A VRF name is not defined for the multicast QoS group.

Command Modes

Multicast QoS configuration (config-mqos)

Command History

Release	Modification
12.2(33)SCA	This command was introduced.
IOS-XE 3.15.0S	This command was implemented on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

If a multicast QoS (MQoS) group is not defined for the named VRF instance, you will see an error message. You must either define a specific MQoS group for each VRF instance, or define a default MQoS that can be assigned in those situations where no matching MQoS group is found.

Examples

The following example identifies a multicast QoS group VRF name using the **vrf** command:

```
Router(config)# cable multicast qos group 20 priority 55 global
Router(config-mqos)# vrf name1
```

Related Commands

Command	Description
cable multicast qos group	Specifies and configures a cable multicast QoS group.
show interface bundle multicast-sessions	Displays multicast session information for a specific virtual cable bundle.

Command	Description
show interface cable multicast-sessions	Displays multicast session information for a specific cable interface.

weekend duration

To configure different subscriber monitoring options over weekends on a Cisco CMTS router, use the **weekend duration** command in enforce-rule configuration mode. To remove the weekend monitoring configuration and to return to the same monitoring conditions for all days of the week, use the **no weekend** form of this command.

weekend duration *minutes* **avg-rate** *rate* **sample-interval** *interval* [**penalty** *duration*] {**downstream**| **upstream**} **[enforce]**

no weekend duration *minutes* **avg-rate** *rate* **sample-interval** *interval* [**penalty** *duration*] {**downstream**| **upstream**} **[enforce]**

no weekend

Syntax Description

minutes	Specifies the size of the sliding window (in minutes) during which subscriber usage is monitored. The range is 10 to 44640 with a default of 360 minutes (6 hours).
avg-rate *rate*	Specifies the average sampling rate in kilobits per second for the specified duration. The range is 1 to 400000 kilobits with no default.
sample-interval *interval*	Specifies how often (in minutes) the CMTS router should sample a service flow to get an estimate of subscriber usage. The range is 1 to 30, with a default value of 15.
penalty*minutes*	(Optional) Specifies the period (in minutes) during which a cable modem (CM) can be under penalty. The range is 1 to 10080.
downstream	Specifies monitoring of traffic in the downstream direction.
upstream	Specifies monitoring of traffic in the upstream direction.
enforce	(Optional) Specifies that the enforce-rule QoS profile should be applied automatically if a user violates their registered QoS profile.

Command Default

Weekend monitoring is disabled.

Command Modes Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD2	The **penalty** keyword option was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelin

Note This command is applicable only after the **monitoring-basics** command is configured with the keyword legacy.

The **weekend duration** command works similarly to the **duration** command for subscriber traffic monitoring. Use the **weekend duration** command when you want to configure different monitoring parameters for subscribers on weekends.

This command can only be used when you have already configured the **duration** or **peak-time1** commands as weekday monitoring conditions for an enforce-rule.

If you still want to monitor traffic over the weekend, but want to return to the same monitoring conditions for every day of the week, use the **no weekend** command. This command removes the weekend monitoring conditions, but still performs monitoring over the weekends according to the other monitoring options that you have configured in the enforce-rule.

If you want to disable monitoring entirely over the weekend, use the **weekend off** command.

The **penalty** duration, which is configured using the **weekend duration** command, is unique to weekends, and takes precedence over the global penalty duration configured using the **penalty-period** command.

Examples The following example specifies automatic monitoring of upstream traffic over the weekend if a subscriber is identified as violating their QoS profile. The monitoring will take place every 10 minutes and last for 5 minutes, with traffic sampled at an average rate of 2 kb/s:

```
Router(enforce-rule)# weekend duration 5 avg-rate 2 sample-interval 10 penalty 11 upstream
 enforce
```

Related Commands

Command	Description
duration	Specifies the time period and sample rate to be used for monitoring subscribers.

Command	Description
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
penalty-period	Specifies the period during which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile.
weekend off	Disables peak and offpeak monitoring on weekends on a Cisco CMTS router.
weekend peak-time1	Configures peak and offpeak subscriber monitoring over weekends on a Cisco CMTS router.

weekend off

To disable peak and offpeak monitoring on weekends on a Cisco CMTS router, use the **weekend off** command in enforce-rule configuration mode. To re-enable the configuration for weekend monitoring, use the **no** form of this command.

weekend off

no weekend off

Syntax Description

This command has no arguments or keywords.

Command Default

Weekend monitoring is enabled once you configure the **weekend duration** or **weekend peak-time1** commands.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelines

Use the **weekend off** command to disable previously configured weekend monitoring and stop the CMTS router from monitoring cable modems (CMs) with that enforce-rule over the weekend. This command allows you to retain or modify your weekend monitoring configuration without enabling it for actual monitoring use on the CMTS router.

To perform weekend monitoring according to the same parameters used for weekday monitoring, use the **no weekend** command.

Examples

The following example shows how to disable weekend monitoring when weekend peak-time monitoring has previously been configured on a Cisco CMTS router:

```
Router(config)# cable qos enforce-rule test
Router(enforce-rule)# weekend peak-time1 8 duration 60 avg-rate 100 peak-time2 20 duration
 60 avg-rate 10000 duration 90 avg-rate 20000 sample-interval 20 downstream enforce
Router(enforce-rule)# weekend off
```

Related Commands

Command	Description
weekend duration	Configures different subscriber monitoring options over weekends on a Cisco CMTS router.
weekend peak-time1	Configures peak and offpeak subscriber monitoring over weekends on a Cisco CMTS router.

weekend peak-time1

To configure peak and offpeak subscriber monitoring over weekends on a Cisco CMTS router, use the **weekend peak-time1** command in enforce-rule configuration mode. To remove the peak and offpeak weekend monitoring configuration, use the **no** form of this command.

weekend peak-time1 {*hour*| *hour:minutes*} **duration** *minutes* **avg-rate***rate* **peak-time2** {*hour*| *hour:minutes*} **duration** *minutes* **avg-rate rateduration** *offpeak-minutes* **avg-rate** *offpeak-rate* **sample-interval** *minutes* **penalty** *minutes***downstream| upstreamenforce**

no weekend peak-time1 {*hour*| *hour : minutes*} **duration** *minutes* **avg-rate***rate* **peak-time2** {*hour*| *hour:minutes*} **duration** *minutes* **avg-rate rateduration** *offpeak-minutes* **avg-rate** *offpeak-rate* **sample-interval** *minutes* **penalty** *minutes***downstream| upstreamenforce**

Syntax Description

hour | *hour:minutes*	Specifies the time of day, in either hh or hh:mm format, during which monitoring occurs for the peak time. If the time is specified in hour (hh), the valid range is 1 to 23 using a 24-hour clock. If the time is specified in hour:minutes (hh:mm), the valid range for hour is 1 to 23 using a 24-hour clock, and the valid range for minutes is 0 to 59.
duration *minutes*	Specifies the size of the sliding window (in minutes) during which the subscriber usage is monitored for the first peak time, and optionally for a second peak time when used with the **peak-time2** keyword. The valid range is 60 to 1440.
avg-rate *rate*	Specifies the average sampling rate in kilobits per second for the specified duration. The valid range is 1 to 400000 kilobits with no default.
duration *offpeak-minutes*	(Optional) Specifies the size of the sliding window during which the subscriber usage is monitored for the remaining offpeak time (time not specified for peak monitoring). Valid range is 60 to 1440 minutes.
avg-rate *offpeak-rate*	Specifies the average sampling rate in kilobits per second for the specified offpeak duration. The valid range is 1 to 400000 kilobits with no default.
peak-time2	(Optional) Specifies the time of day during which monitoring occurs for a second peak time. The time can be specified either in hours or hour:minutes format.

sample-interval *minutes*	Specifies how often (in minutes) the CMTS router should sample a service flow to get an estimate of subscriber usage. The valid range is 1 to 30, with a default value of 15.
penalty *minutes*	(Optional) Specifies the period (in minutes) during which a cable modem can be under penalty. The range is 1 to 10080.
downstream	Specifies monitoring of traffic in the downstream direction.
upstream	Specifies monitoring of traffic in the upstream direction.
enforce	(Optional) Specifies that the enforce-rule QoS profile should be applied automatically if a user violates their registered QoS profile.

Command Default

Weekend monitoring is disabled. The only default value for the **weekend peak-time1** command is the 15-minute sample interval.

Command Modes

Enforce-rule configuration (enforce-rule)

Command History

Release	Modification
12.3(23)BC2	This command was introduced.
12.2(33)SCB	This command was integrated into Cisco IOS Release 12.2(33)SCB. Support for the Cisco uBR7225VXR router was added.
12.2(33)SCD2	The **minute-level granularity (hh:mm) for weekend peak-time1 and peak-time2 duration, and the penalty** keyword option were added.
IOS-XE 3.15.0S	This command is not supported on the Cisco cBR Series Converged Broadband Routers.

Usage Guidelin

Note This command is applicable only after the monitoring-basics command is configured with the keyword **peak-offpeak**.

The **weekend peak-time1** command is similar to the **peak-time1** command for subscriber traffic monitoring. Use the **weekend peak-time1** command when you want to configure different peak and offpeak monitoring parameters for subscribers on weekends.

This command can only be used when you have already configured the **duration** or **peak-time1** commands as weekday monitoring conditions for an enforce-rule.

The **penalty** duration, which is configured using the **weekend peak-time1** command, is unique to weekends, and takes precedence over the global penalty duration configured using the penalty-period command.

Examples

The following example shows configuration of two peak monitoring windows on the weekend, with the first monitoring period beginning at 8:00 A.M. for one hour and the second monitoring period beginning at 8:00 P.M. for one hour, and monitoring at all other times of the weekend for 1-1/2 hours (90 minutes) for downstream traffic. The unique penalty period for both **weekend peaktime1** and **peaktime2** is configured as 60 minutes:

```
Router(enforce-rule)# weekend peak-time1 8 duration 60 avg-rate 10000 peak-time2 20 duration
 60 avg-rate 100 duration 90 avg-rate 20000 sample-interval 20 penalty 60 downstream enforce
```

Related Commands

Command	Description
peak-time1	Specifies peak and offpeak monitoring times on a Cisco CMTS router.
weekend duration	Configures different subscriber monitoring options over weekends on a Cisco CMTS router.
penalty-period	Specifies the period for which an enforced quality of service (QoS) profile should be in force for subscribers who violate their registered QoS profile.
weekend off	Disables peak and offpeak monitoring on weekends on a Cisco CMTS router.