Controller Profile Configuration

This document describes how to configure the controller profile on the Cisco cBR Series Converged Broadband Router.

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Hardware Compatibility Matrix for the Cisco cBR Series Routers

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

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

Cisco CMTS Platform	Processor Engine	Interface Cards
Cisco cBR-8 Converged Broadband Router	**Cisco IOS-XE Release 16.5.1 and Later Releases** Cisco cBR-8 Supervisor: • PID—CBR-SUP-250G • PID—CBR-CCAP-SUP-160G	**Cisco IOS-XE Release 16.5.1 and Later Releases** Cisco cBR-8 CCAP Line Cards: • PID—CBR-LC-8D30-16U30 • PID—CBR-LC-8D31-16U30 • PID—CBR-RF-PIC • PID—CBR-RF-PROT-PIC • PID—CBR-CCAP-LC-40G • PID—CBR-CCAP-LC-40G-R • PID—CBR-CCAP-LC-G2-R • PID—CBR-SUP-8X10G-PIC • PID—CBR-2X100G-PIC Digital PICs: • PID—CBR-DPIC-8X10G • PID—CBR-DPIC-2X100G Cisco cBR-8 Downstream PHY Module: • PID—CBR-D31-DS-MOD Cisco cBR-8 Upstream PHY Modules: • PID—CBR-D31-US-MOD

Information about Controller Profile Configuration

As density increases with the merging of CMTS and UEQAM functions in the same device, the current controller configuration method becomes too complex and difficult. There are too many identical lines of configuration.

To simplify the controller configuration, a new concept called controller profile is introduced. A controller profile is a group of configuration parameters that apply to downstream and upstream controller, the benefits include:

- Speed up deployment
- Simplify cBR-8 deployment, configuration and troubleshooting

- Common configurations across nodes/regions
- Consistency across Cisco products for common functions

How to Configure the Controller Profile

User configures I-CMTS controllers using legacy controller configuration commands by default. If user wants to use I-CMTS controller profile, needs to enable it first with **cable controller-profile I-CMTS enable** command.

Note

- If user wants to configure controller using profile, it is recommended to start configuration on a "clean" CMTS without any legacy command configured in Integrated-Cable and Upstream-Cable controllers. Do not switch over between legacy configuration and profile.
- When modifying controller profile, all related controllers will be changed. So if user wants to configure a specific controller, for example, modify the base-channel power of a controller, user should not bind this controller to a profile together with other controllers.
- Legacy controller configuration commands are not supported if I-CMTS controller-profile is enabled.
- Legacy controller configuration cannot be shown in running-config if I-CMTS controller-profile is enabled.

Configuring Downstream Controller Profile

To configure downstream controller profile, use the steps below:

```
enable
configure terminal
cable downstream controller-profile id [RPHY|I-CMTS]
base-channel-power value
max-carrier value
freq-profile id
max-ofdm-spectrum value
ofdm-freq-excl-band start-frequency value widthvalue
rf-chan start_id [end_id]
type value
rf-output value
power-adjust value
qam-profileid
docsis-channel-idid
power-profile id
ofdm channel-profile id start-frequency value width value [plc value]

enable
configure terminal
controller integrated-cable slot/subslot/port
profile id
```

Below is an example:

```
cable downstream controller-profile 0 I-CMTS
 max-carrier 32
 base-channel-power 34
 rf-chan 0 3
  type DOCSIS
  frequency 111000000
  rf-output NORMAL
  qam-profile 1
  docsis-channel-id 1

controller integrated-cable 2/0/0
 profile 0
```

Note

- When configure a new I-CMTS controller profile, keyword I-CMTS is needed. If input RPHY or do not input any keyword, the system will consider it as a RPHY controller profile. Once a profile type (RPHY/I-CMTS) is set, it cannot be modified.
- Updating a profile will affect all the controllers bond with it. To delete a profile that bond with controller, user must unbind all the controllers first. All rf-channel configuration in controller will be deleted after unbind.
- At least 8 QAM channels should be configured to get the right power. Single continuous wave (CW) mode is not supported.

Verifying Downstream Controller Profile Configuration

Use the **show cable downstream controller-profile** command to verify the configuration of the downstream controller profile.

```
Router# show cable downstream controller-profile 0
Downstream controller-profile 0, type I-CMTS
Description:
Downstream controller-profile 0 is being used by controller Integrated-Cable:
  2/0/0,
  Admin:  UP
  MaxOfdmSpectrum: 192000000
  MaxCarrier: 128
  BasePower: 33.0 dBmV
  Mode: normal
  Frequency profile: unconfigured
  DS Splitting: No
  OFDM frequency exclusion bands: None

Configured RF Channels:
Chan Admin Frequency  Type        Annex Mod  srate Qam-profile  dcid  power output
 0    UP   213000000  DOCSIS       B    256   5361  1           1     33.0  NORMAL
 1    UP   219000000  DOCSIS       B    256   5361  1           2     33.0  NORMAL
 2    UP   225000000  DOCSIS       B    256   5361  1           3     33.0  NORMAL
 3    UP   231000000  DOCSIS       B    256   5361  1           4     33.0  NORMAL
 4    UP   237000000  DOCSIS       B    256   5361  1           5     33.0  NORMAL
 5    UP   243000000  DOCSIS       B    256   5361  1           6     33.0  NORMAL
```

In the above output, integrated-cable 2/0/0 is bond to profile 0. So the output of the **show controllers integrated-Cable 2/0/0 rf-channel 0 5** should match the above output. See the example below:

```
Router# show controllers integrated-cable 2/0/0 rf-channel 0-5
...
Chan Admin Frequency  Type        Annex Mod  srate Qam-profile  dcid  power output
 0    UP   213000000  DOCSIS       B    256   5361  1           1     33.0  NORMAL
 1    UP   219000000  DOCSIS       B    256   5361  1           2     33.0  NORMAL
 2    UP   225000000  DOCSIS       B    256   5361  1           3     33.0  NORMAL
 3    UP   231000000  DOCSIS       B    256   5361  1           4     33.0  NORMAL
 4    UP   237000000  DOCSIS       B    256   5361  1           5     33.0  NORMAL
 5    UP   243000000  DOCSIS       B    256   5361  1           6     33.0  NORMAL
```

To check if the parameters in a profile match with the ones configured, use the **show running-config [all] | section cable downstream controller-profile** command as shown in the example below:

```
Router# show running-config | section downstream controller-profile
cable downstream controller-profile 0 I-CMTS
 max-carrier 32
 base-channel-power 34
 rf-chan 0 3
  type DOCSIS
  frequency 111000000
  rf-output NORMAL
  qam-profile 1
  docsis-channel-id 1
```

Configuring Upstream Controller Profile

To configure upstream controller profile, use the steps below:

enable
configure terminal
cable upstream controller-profile *id* **[RPHY|I-CMTS]**
us-channel *id* {**chan-class-id** *id*|**channel-width** {*first-choice-width* [*last-choice-width*]}|**docsis-mode**{**atdma| tdma|**
tdma-atdma}|**equalization-coefficient**|**frequency***value*|**hop-priority**{**frequency modulation channel-width| modulation frequency channel-width| frequency channel-width modulation**}|**ingress-nosie-cancellation** *interval*|**maintain-psd**|**max-logical-chans** *id*|**minislot-size** *value*|**modulation-profile** *primary-profile-number*[*secondary-profile-number*][*tertiary-profile-number*]|**power-level** *value*|**rng-holdoff** *priority*|**specsvl error-adaptive-profile** *id*|**spectrum-group** *id*|**threshold** {**cnr-profiles** *value* [*value*]|**corr-fec** *value*|**hysteresis** *value*|**snr-profiles** *value* [*value*]|**corr-fec** *value*}

enable
configure terminal
controller upstream-cable *slot/subslot/port*
profile *id*

Note

- When configure a new I-CMTS controller profile, keyword I-CMTS is needed. If input RPHY or do not input any keyword, the system will consider it as a RPHY controller profile. Once a profile type (RPHY/I-CMTS) is set, it cannot be modified.
- Updating a profile will affect all the controllers bond with it. To delete a profile that bond with controller, user must unbind all the controllers first.
- OFDMA does not support the use of profile in this release.

Verifying Upstream Controller Profile Configuration

Use the **show cable upstream controller-profile** command to verify the configuration of the upstream controller profile.

```
Router# show cable upstream controller-profile 0
Upstream controller-profile 0, type I-CMTS
Description:
Upstream controller-profile 0 is being used by controller Upstream-Cable:
9/0/0

Controller Upstream-Cable
    ...
  Upstream-channel 0
    chan-class-id                  : 0x0
    channel-width                  : 1600000 1600000
    docsis-mode                    : atdma
    equalization-coefficient       : TRUE
    frequency                      : 5000000
    ...
    modulation-profile             : 221
    ...
    shutdown                       : FALSE
    ...
```

In the above output, upstream-cable 9/0/0 is bond to profile 0. So the output of the **show controllers upstream-Cable 9/0/0 us-channel 0** should match the above output. See the example below:

```
Router# show controllers upstream-Cable 9/0/0 us-channel 0
...
Controller 9/0/0 upstream 0  AdminState:UP OpState: UP
  atdma mode enabled
  Frequency 5.000 MHz, Channel Width 1.600 MHz, Symbol Rate 1.280 Msps
  Modulation Profile Group 221
```

To check if the parameters in a profile match with the ones configured, use the **show running-config [all] | section cable upstream controller-profile** command as shown in the example below:

```
Router# show running-config | s cable upstream controller-profile 0
cable upstream controller-profile 0 I-CMTS
 us-channel 0 channel-width 1600000 1600000
 us-channel 0 docsis-mode atdma
 us-channel 0 minislot-size 4
 us-channel 0 modulation-profile 221
 us-channel 0 shutdown
 ...
```

Feature Information for Controller Profile Configuration

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

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

Table 2: Feature Information for Controller Profile Configuration

Feature Name	Releases	Feature Information
SG Based Config (OpSimp) Phase 2	Cisco IOS XE Fuji 16.7.1	This feature was introduced on Cisco IOS XE Fuji 16.7.1 on the Cisco cBR Series Converged Broadband Routers.