Support for 2x100G DPIC

This document provides details of the Cisco cBR support for the Cisco cBR-8 2x100G DPIC and how to configure it on Cisco cBR Series Routers.

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

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to http://tools.cisco.com/ITDIT/CFN/. An account on http://www.cisco.com/ is not required.

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

Note Do not use DPICs (8X10G and 2x100G) to forward IP traffic, as it may cause buffer exhaustion, leading to line card reload.

The only allowed traffic on a DPIC interface is DEPI, UEPI, and GCP traffic from the Cisco cBR-8 router to Remote PHY devices. Other traffic such as DHCP, SSH, and UTSC should flow via another router, since DPICs cannot be used for normal routing.

Information About Cisco cBR 2x100G DPIC

The Cisco cBR-8 2x100G Digital Physical Interface Card (DPIC) fo Remote PHY provides two QSFP ports. The 2x100G DPIC works only with the CBR-CCAP-LC-G2-R line card to transmit DEPI, UEPI, and GCP traffic from the Cisco cBR-8 router to Remote PHY devices.

The 2x100G DPIC has two groups of LEDs mapped to each QSFP port. If you have configured 10GE mode, QSFP0 maps to LEDs 0,2,4, and 6, while QSFP1 maps to LEDs 1,3,5, and 7. If you have configured 100GE mode, QSFP0 maps to LED 0 and QSFP1 maps to LED 1.

This DPIC supports Onboard Failure Logging (OBFL), environment monitoring, and FPD. However, the 2x100G DPIC does not support 8x10G DPIC or RF-PIC card protection.

The product ID (PID) of 2x100G DPIC is CBR-DPIC-2X100G.

Limitations on Downstream Bandwidth

For 2x100G DPIC, each XFI group supports a maximum of 10Gbps bandwidth—9Gbps for data traffic and 1Gbps for control packets. An error message similar to the following is logged in the syslog, when the theoretical maximum bandwidth for all video channels in a group exceeds 9Gbps.

```
%IOSXE-3-PLATFORM: CLC8: cdman: Video channel oversubscribed!! Downstream controller 8/0/0~7
 bandwidth ratio is 100.1040%.
```

For CBR-CCAP-LC-G2-R cards that support 40G DPIC, eight 10GE interfaces are divided into four XFI groups.

For each 10G interface, theoretical bandwidth of all downstream channels configured under **Te <slot>/<subslot>/0** and **Te <slot>/<subslot>/1** must not exceed 9Gbps.

10GE Port	XFI Group
0	0
1	
2	1
3	
4	2
5	
6	3
7	

For CBR-CCAP-LC-G2-R cards supporting 40G DPIC 2x100G mode, only one 100GE interface is active. 32 downstream controllers are divided into four XFI groups.

Since there is only one 100G interface, for each downstream controller, the theoretical bandwidth of all downstream channels configured under **cable downstream controller <slot>/<subslot>/0 | <slot>/<subslot>/7** must not exceed 9Gbps.

Controller	XFI Group
0-7	0
8-15	1
16-23	2
24-31	3

This table shows the theoretical maximum number of SCQAM downstream channels in each XFI group for different annex and QAM modulation.

Annex	QAM Modulation	Theoretical Bandwidth (Mbps)	Maximum Number of Downstream Channels
Annex A	64	38.4	234
Annex A	256	51.3	175
Annex B	64	26.9	334
Annex B	256	38.8	231

Support for Link Redundancy

The 2x100G DPIC supports only active-standby link redundancy mode, where if one interface is active, the other remains on standby. The 2x100G DPIC does not support active-active link redundancy mode. But, if the 2x100G DPIC is configured to work in the 8x10G DPIC mode, then the 2x100G DPIC supports active-standby and active-active link redundancy modes. Run the **sh ip int b | in te slot/subslot** command to view the details.

```
Router#sh ip int b | in Te9/1/
Te9/1/0     90.0.0.1     YES     NVRAM     up                       up
Te9/1/1     91.0.0.1     YES     NVRAM     administratively down    down
Te9/1/2     92.0.0.1     YES     VRAM      up                       up
Te9/1/3     93.0.0.1     YES     NVRAM     administratively down    down
Te9/1/4     94.0.0.1     YES     NVRAM     up                       up
Te9/1/5     95.0.0.1     YES     NVRAM     administratively down    down
Te9/1/6     96.0.0.1     YES     NVRAM     up                       up
Te9/1/7     88.0.97.1     YES     NVRAM    administratively down    down
```

If link redundancy is not enabled, then you cannot use port 1.

The 2x100G DPIC supports both standby-hot and standby-cold redundancy modes.

The 100GE <slot>/1/9 always remains administratively down irrespective of whether QSFP is installed or not. Run the **sh ip int b | in Hu** command to view the 100GE interface details.

```
Router#sh ip int b | in Hu
HundredGigE0/1/8   209.165.200.225   YES   NVRAM  up                       up
HundredGigE0/1/9   unassigned        YES   unset  administratively down   down
```

How to Configure 2x100G DPIC

View 2x100G DPIC Details

To view the 2x100G DPIC details, run the **show platform**

.This is a sample configuration.

```
Chassis type: CBR-8-CCAP-CHASS

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         CBR-CCAP-LC-G2-R    ok                    01:06:50
0/1       CBR-DPIC-2X100G     ok                    01:03:36
1/1       CBR-RF-PROT-PIC     ok                    01:03:35
2/1       CBR-DPIC-8X10G      ok                    01:03:33
3         CBR-CCAP-LC-G2-R    ok                    01:06:50
3/1       CBR-DPIC-2X100G     ok                    01:03:29
…
```

Configure 2x100G DPIC Mode

The 2x100G DPIC supports two modes—10G and 100G modes. To create a DPIC-100G card with 2x100GE interface mode, perform these steps.

```
Router# configure terminal
Router(config)# card <slot>/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
```

To create a DPIC-100G card with 8x10GE interface mode, perform these steps.

```
Router# configure terminal
Router(config)# card 2/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-10GE
```

Verify 2x100G DPIC Mode

To verify the 2x100G DPIC mode configuration, run the **sh run | i card** command.

```
Router# sh run | i card
card 0/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
card 1/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
card 2/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
card 3/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
...
card 6/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
card 7/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
card 8/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
card 9/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-10GE
```

Verify 2x100G Ethernet Interface Status

To verify the 2x100G ethernet interface status, run the **show interfaces HundredGigE <slot>/1/<8-9>**

.This is a sample configuration.

```
Router# show interface HundredGigE 3/1/8
```

```
HundredGigE3/1/8 is up, line protocol is up
  Hardware is CBR-DPIC-2X100G, address is 1ce4.3df59.6e12 (bia 1c6.8df5.1c13)
  Internet address is 209.165.200.225/24
  MTU 2350 bytes, BW 100000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  . . .
  Full Duplex, 100000Mbps, link type is force-up, media type is QSFP_100GE_SR
  . . .
  30 second input rate 10000 bits/sec, 5 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     26487 packets input, 6442316 bytes, 0 no buffer
     Received 3913 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 22571 multicast, 0 pause input
     965 packets output, 152548 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     1375 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

Switch Between 8x10G and 2x100G Modes

To switch between 8x10G and 2x100G modes, perform these steps.

1. Verify the current mode by running **show run**.

```
Router# configure terminal
Router#sh run | in card 9/0
card 9/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-10GE
```

2. Switch modes by running these commands.

```
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hw-module slot 9 shutdown
Router(config)#hw-module subslot 9/1 shutdown
Router(config)#no card 9/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-10GE
Router(config)#card 9/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
Router(config)#no hw-module subslot 9/1 shutdown
Router(config)#no hw-module slot 9 shutdown
Router(config)#end
```

Caution When you run the **no card** command, the console becomes nonresponsive for more than 20 seconds. While the console is nonresponsive, do not run any commands in other sessions to the Cisco cBR.

3. Verify the mode again by running **show run**.

```
Router#sh run | in card 9/0
card 9/0 CBR-CCAP-LC-G2-R r-phy DPIC-G2-100GE
```

4. Run the show platform command to verify the status of the DPIC.

```
Router# show platform

Slot      Type                State     Insert time (ago)
--------- ------------------- -------- -----------------
```

```
0          CBR-CCAP-LC-G2-R   ok         01:06:50
0/1        CBR-DPIC-2X100G    ok         01:03:36
```

Configure RPD

To configure RPD using the 100G interface, use the **cable rpd node** command. This is an example of onfiguring RPD.

```
cable rpd node_313
 identifier badb.ad13.419a
 type shelf
 rpd-ds 0 max-carrier 158
 rpd-ds 0 base-power 32
 rpd-ds 1 max-carrier 158
 rpd-ds 1 base-power 34
 core-interface Hu0/1/8
  principal
  rpd-ds 0 downstream-cable 0/0/19 profile 32
  rpd-us 0 upstream-cable 0/0/38 profile 37
  rpd-us 1 upstream-cable 0/0/39 profile 38
 r-dti 6
 rpd-event profile 0
 rpd-55d1-us-event profile 0
```

Configure RPD Location Attributes Through CLI

Table 2: Feature History

Feature	Release	Description
New RPD location attributes to configure RPD’s description, latitude, and longitude.	Cisco IOS XE Dublin 17.12.1w	You can now configure RPD's description, latitude, and longitude that helps you to track the location attributes of an RPD seamlessly.

You can now configure attributes such as description, latitude, and longitude for an RPD into the cBR8 router using a CLI command. This helps you to track the location attributes of an RPD seamlessly. The RPD location attributes are saved into the database and then sent to RPD.

Note When you receive the location configuration attributes through SNMP, the configured location attributes are updated, received and saved to the database.

- Device Location Description (description)—Allows the RPD to inform the CCAP core about its location. Use the location description command to configure the RPD location description details. The valid range is 1-255. When you configure the description attribute, the RPD stores its value in its nonvolatile configuration. The valid range is 1-255.
- Geo Location Latitude (latitude)—Allows the RPD to inform the CCAP core about the latitude portion of its geographic location. Use the location latitude command to configure the RPD location latitude details. The RPD uses 6-digit notation in the format degree, minute, seconds, ±DDMMSS.S. When you configure the latitude attribute, the RPD stores its value in its nonvolatile configuration.

For example: +123254.7.

- Geo Location Longitude (longitude)—Allows the RPD to inform the CCAP core about the longitude portion of its geographic location. Use the location longitude command to configure the RPD location longitude details. The RPD uses 7-digit notation in the format degree, minute, seconds, ±DDDMMSS.S. When you configure the longitude attribute, the RPD stores its value in its nonvolatile configuration.

  For example: +2340517.1.

When you get the location configuration attributes through SNMP, you must get the same CLI configured values from the database.

The SNMP set command and the CLI configuration is supported for configuring the RPD location values.

Configuring RDP Location Attributes

To configure the RPD location attributes, execute the following commands:

```
router#cable rpd <rpd-name>
router#location { description | latitude | longitude }
```

the device location description for RPD indicates the maximum length which is 255 bytes, geo location latitude +000000.0 for RPD indicates the maximum length that is 9 bytes, and geo location longitude +0000000.0 for RPD indicates the maximum length that is 10 bytes.

The following is the sample output of the **cable rpd rpd-location** command:

```
router(conf)#cable rpd rpd-location-test
router(conf)#location desc rpd-loc
router(conf)#location latitude +123456.7
router(conf)#location longitude +1234567.8
```

The following is the sample output of the **show cable rpd location** command:

```
router#show cable rpd location
RPD ID                          : f4db.e6cd.d838
Location Description    : RPD_dev3-details
Latitude                        : +999999.7
Longitude                     : +8888888.8

RPD ID                          : f4db.e6cd.d8bc
Location Description    : RPD_dev2-details
Latitude                        : +565656.1
Longitude                     : +3245432.5

RPD ID                          : f4db.e6cd.d8c8
Location Description    : RPD_dev1-details
Latitude                        : +123456.7
Longitude                     : +8978564.1
```

Verifying the RPD Location Configuration Attributes

The following is the sample output of the **show running-config | i location** command:

```
router#show running-config | i location
 location description CBR8
 location latitude +908070.1
 location longitude +1236098.5
```

Verify the Values Sent to the RPD

To verify the values sent to the RPD, use the **show cable rpd gcp-transaction verbose** command as shown in the example below:

```
router#show cable rpd <MAC> <I/F> gcp-transaction verbose
```

```
router#show cable rpd gcp-transaction verbose | s  TYPE_DEVICE
{ T = TYPE_DEVICEALIAS(8), L = 0, V = }
{ T = TYPE_DEVICELOCATION(24), L = 40, V =
{ T = TYPE_DEVICE_LOCATION_DESCRIPTION(1), L = 12, V = CBR8 }
{ T = TYPE_GEO_LOCATION_LATITUDE(2), L = 9, V = +908070.1}
{ T = TYPE_GEO_LOCATION_LOGITUDE(3), L = 10, V = +1236098.5
{ T = TYPE_DEVICEALIAS(8), L = 0, V = }
{ T = TYPE_DEVICELOCATION(24), L = 40, V =
{ T = TYPE_DEVICE_LOCATION_DESCRIPTION(1), L = 12, V = CBR8 }
{ T = TYPE_GEO_LOCATION_LATITUDE(2), L = 9, V = +908070.1}
{ T = TYPE_GEO_LOCATION_LOGITUDE(3), L = 10, V = +1236098.5
{ T = TYPE_DEVICEALIAS(8), L = 0, V = }
```

snmp commands

The SNMP get and SNMP walk commands are used to retrieve the CLI configured values.

The following is an example of SNMP walk on the RPD location:

```
server > snmpwalk -v2c -c private 2.24.1.1 1.3.6.1.4.1.4491.2.1.31.1.1.6
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.1.0.4.159.49.8.37 = ""
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.2.0.4.159.49.8.37 = STRING: "RPD1"
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.3.0.4.159.49.8.37 = STRING: "CBR8"
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.4.0.4.159.49.8.37 = STRING: "+908070.1"
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.5.0.4.159.49.8.37 = STRING: "+1236098.5"
```

```
router#scr f86b.d9ff.fd1e location
RPD ID                          : f86b.d9ff.fd1e
Location Description    : CBR8
Latitude                        : +908070.1
Longitude                     : +1236098.5
```

The following example shows SNMP using the community private using SNMP version 2c:

For Location:

```
server > snmpget -v2c -c private 2.24.1.1
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.3.0.4.159.49.8.37
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.3.0.4.159.49.8.37 = STRING: "CBR8"
```

For Latitude

```
server > snmpget -v2c -c private 2.24.1.1
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.4.0.4.159.49.8.37
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.4.0.4.159.49.8.37 = STRING: "+908070.1"
```

For Longitude

```
server > snmpget -v2c -c private 2.24.1.1
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.5.0.4.159.49.8.37
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.5.0.4.159.49.8.37 = STRING: : "+1236098.5"
```

```
server > snmpset -v2c -c private 2.32.1.1
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.3.0.39.144.11.14.20 s "INDIA"
SNMPv2-SMI::enterprises.4491.2.1.31.1.1.6.1.3.0.39.144.11.14.20 = STRING: "INDIA"
```

The following is the sample output of the **do scr location**:

```
router#do scr location
RPD ID                          : 0027.900b.0e14
Location Description            : Valid
```

```
Latitude                        : +123456.7
Longitude                       : +1234567.8
```

The following is the sample output of the **show cable rpd <mac> <i/f> gcp-transaction verbose** location:

```
router#show cable rpd <mac> <i/f> gcp-transaction verbose
router#scr
MAC Address     IP Address       I/F       State        Role HA  Auth Name

0027.900b.0e14  ---              Hu2/1/8   online       Pri  Act N/A  RPD_dev1

0027.900b.0e20  ---              Hu2/1/8   online       Pri  Act N/A  RPD_dev2

0027.900b.0e38  ---              Hu2/1/8   online       Pri  Act N/A  RPD_dev3


! = PTP clock out of phaselock occurred, ^ = Default password in use

router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
router#cable rpd RPD_dev1
router#location description ARMY
router#location latitude +123456.7
router#location longitude -9080786.1
router#do scr location
RPD ID                          : 0027.900b.0e14
Location Description            : ARMY
Latitude                        : +123456.7
Longitude                       : -9080786.1

RPD ID                          : 0027.900b.0e20
Location Description            : RPD_dev2-info
Latitude                        : +123123.7
Longitude                       : +2344321.8

RPD ID                          : 0027.900b.0e38
Location Description            : NA
Latitude                        : +000000.0
Longitude                       : +0000000.0
```

Identifying RPD PTP Clock issues Through SNMP Polling

Table 3: Feature History

Feature Name	Release Information	Feature Description
RPD PTP MIB Update	Cisco IOS XE Dublin 17.12.1x	The following MIB table has been added to the SNMP Polling to identify PTP clock state issues: • docsRphyPtpRpdClockStatusTable

In this release, if RPDs get stuck in init(clock) state for any reason, we can poll the converged broadband routers(cBR) for the RPD PTP MIB(docsRphyPtpRpdClockStatusClockState/ docsRphyPtpRpdClockStatusComputedPhaseOffset) and identify the RPDs having PTP issue after the generic control protocol(GCP) is up even before RPD is online.

Previously, a user needed to log into the cBR and check **show cable rpd** command to determine whether RPDs are stuck in init(clock)/ having any PTP issues.

Support for 2x4 RPD

Table 4: Feature History

Feature Name	Release Information	Feature Description
Support for 2x4 RPD	Cisco IOS XE Dublin 17.12.1x	In this feature, RPD can handle up to 4 upstream ports on the cBR8 core side.

The Range of RPD upstream ports are extended from <0-3> and the commands affected by this are as follows:

To configure

```
rpd-us <0-3> description <decs>
rpd-us <0-3> base-power-rx-level-1_6Mhz <-20 - 40>
rpd-us <0-3> Upstream-Cable <x/0/y> profile <z>
rpd-us <0-3> Upstream-OOB-varpd <1-32> profile <x>
rpd-us <0-3> static-pseudowire <name>
```

Note There is no configuration limitation for MD (Mac Domain) and FN (Fiber Node) on cBR8.

New TLVs RPD Reset Control Operation

Table 5: Feature History

Feature Name	Release Information	Feature Description
New TLVs RPD Reset Control Operation	Cisco IOS XE Dublin 17.12.1w	You can now use the new ResetCtrl TLV option to reset the RPDs on the cBR router. The new TLV with the defined type, length, units, values control the RPD reset operations. Performs hardware reset using TLV40.1.1 on: • All RPDs • Specific RPD using MAC address • Specific RPD interface • Specific RPD slot

The following table lists the new ResetCtrl defined type, length, units, values (TLVs) to control RPD reset.

Table 6: New TLVs RPD Reset Control Operation

TLV Type	Length	Units	Access	Value
40.1.1	1	–	R/W	An enumerated value with the following defined values: • softReset(1)—Resets the software. • hardReset(2)—Performs a power-on reset or an equivalent reset. • nvReset(3)—Clears the non-volatile configuration and performs a hard reset. • factoryReset(4)—Restores the factory configuration and performs a hard reset.

Clearing the RPD Reset Control Operation

You can perform the reset control for all RPDs together, at the slot level, on the interface, using the IP Address for RPD, or for a specific RPD using the MAC address.

For each reset control operation, you can perform the following TLV 40.1.1 operations on the remote PHY device:

- Factory configuration reset
- Hardware reset
- Non-volatile configuration reset
- Software reset

Use the following clear commands to clear the RPD Reset Control configurations:

- router#**clear cable rpd all reset {factory | hard | non-volatile | soft}**
- router#**clear cable rpd slot no reset {factory | hard | non-volatile | soft}**
- router#**clear cable rpd interface reset {factory | hard | non-volatile | soft}**
- router#**clear cable rpd ip address reset {factory | hard | non-volatile | soft}**
- router#**clear cable rpd mac address reset {factory | hard | non-volatile | soft}**

To perform the reset control operation for all RPDs together, use the **clear cable rpd all reset** command as shown in the example below:

Example

```
router#clear cable rpd all reset {factory | hard | non volatile | soft}
```

To perform the reset control operation at the slot level, use the **clear cable rpd slot no reset** command as shown in the example below:

Example

```
router#clear cable rpd slot 6 reset {factory | hard | non volatile | soft}
```

To perform the reset control operation on the interface, use the **clear cable rpd interface reset** command as shown in the example below:

Example

```
router#clear cable rpd interface Te6/1/5 reset {factory | hard | non volatile | soft}
```

To perform the reset control operation for the RPD IP address, use the **clear cable rpd ip address reset** command as shown in the example below:

Example

```
router#clear cable rpd 30.85.65.150 reset {factory | hard | non volatile | soft}
```

To perform the reset control operation for a specific RPD using the MAC address, use the **clear cable rpd** command as shown in the example below:

Example

```
router#clear cable rpd 0018.48fe.e643 reset {factory | hard | non volatile | soft}
```

Verifying the RPD Reset Control Operation

Use the following show command to verify the RPD Reset Control configuration:

router#**show cable rpd**

To verify the RPD ResetCtrl operation, use the **show cable rpd** command as shown in the example below:

Example

```
router#show cable rpd
Load for five secs: 8%/1%; one minute: 7%; five minutes: 7%
Time source is NTP, 13:12:23.636 CST Mon Aug 28 2023

MAC Address IP Address I/F State Role HA Auth Name

0018.48fe.e643 30.85.65.150 Te6/1/5 online Pri Act N/A vecima-rpd

1004.9fb1.1300 30.85.65.153 Te6/1/5 online Pri Act N/A ng13-shelf-node2

! = PTP clock out of phaselock occurred, ^ = Default password in use

router#
```

Configure Link Redundancy

To enable link redundancy, run the **cable rphy link redundancy [hot | cold]** command.

To verify if link redundancy is enabled, run the **show redundancy digi-PIC** command.

```
Router#show redundancy digi-PIC
Load for five secs: 26%/5%; one minute: 49%; five minutes: 45%
Time source is NTP, *13:26:58.020 CST Mon Jul 1 2019
```

```
RPHY Link HA: Cold mode enabled
Core Interface  Port  Mode        Role      Status
--------------  ----  ----------  --------  ------
Hu 0/1/8        8     Primary     Active    Up
Hu 0/1/8        9     Secondary   Standby   Ready
Hu 1/1/8        8     Primary     Active    Up
Hu 1/1/8        9     Secondary   Standby   Ready
```

Feature Information for 2x100G DPIC Support

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

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

Table 7: Feature Information for 2x100G DPIC Support

Feature Name	Releases	Feature Information
Support for 2x100G DPIC	Cisco IOS XE Gibraltar 16.12.1	This feature was introduced in Cisco IOS XE Gibraltar 16.12.1 on Cisco cBR Series Converged Broadband Router.