



## Support for 2x100G DPIC

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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.

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## Hardware Compatibility Matrix for the Cisco cBR Series Routers



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

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

Cisco CMTS Platform	Processor Engine	Interface Cards
Cisco cBR-8 Converged Broadband Router	<p><b>Cisco IOS-XE Release 16.5.1 and Later Releases</b></p> <p>Cisco cBR-8 Supervisor:</p> <ul style="list-style-type: none"> <li>• PID—CBR-SUP-250G</li> <li>• PID—CBR-CCAP-SUP-160G</li> </ul>	<p><b>Cisco IOS-XE Release 16.5.1 and Later Releases</b></p> <p>Cisco cBR-8 CCAP Line Cards:</p> <ul style="list-style-type: none"> <li>• PID—CBR-LC-8D30-16U30</li> <li>• PID—CBR-LC-8D31-16U30</li> <li>• PID—CBR-RF-PIC</li> <li>• PID—CBR-RF-PROT-PIC</li> <li>• PID—CBR-CCAP-LC-40G</li> <li>• PID—CBR-CCAP-LC-40G-R</li> <li>• PID—CBR-CCAP-LC-G2-R</li> <li>• PID—CBR-SUP-8X10G-PIC</li> <li>• PID—CBR-2X100G-PIC</li> </ul> <p>Digital PICs:</p> <ul style="list-style-type: none"> <li>• PID—CBR-DPIC-8X10G</li> <li>• PID—CBR-DPIC-2X100G</li> </ul> <p>Cisco cBR-8 Downstream PHY Module:</p> <ul style="list-style-type: none"> <li>• PID—CBR-D31-DS-MOD</li> </ul> <p>Cisco cBR-8 Upstream PHY Modules:</p> <ul style="list-style-type: none"> <li>• PID—CBR-D31-US-MOD</li> </ul>

## 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

```




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**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.

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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 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://cfmng.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 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.

