



# Cisco Remote PHY System Bring Up

## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

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 Cisco Remote PHY Device



**Note** Unless otherwise specified, the hardware components introduced in a given Cisco Remote PHY Device Software Release are supported in all subsequent releases.

*Table 1: Hardware Compatibility Matrix for the Cisco 2x2 Remote PHY Device*

Cisco HFC Platform	Remote PHY Device
Cisco GS7000 BAU	Cisco 2x2 RPD Software 2.x and Later Releases Cisco Remote PHY Device 2x2 PID—RPD-2X2=

## Information about Bring Up

Bring up process is prerequisite to the operation of the remote PHY system, just like the cable modem bring up in a DOCSIS system.

# How to Bring Up

This section describes how to bring up RPD on Cisco cBR-8.

## Configuring DHCP Server

You can choose to configure the DHCP server using any of the following methods.

### Configuring DHCP Server using IPv4

To configure DHCP server using IPv4, follow the steps below:

1. Add option for CCAP-Core. Fill in the name, DHCP type, and vendor option string as shown in the figure below.

Design > DHCPv4 > Options

#### List/Add DHCP Option Definition Sets



The screenshot shows the configuration page for a DHCP Option Definition Set named 'rpd'. The page title is 'Edit DHCP Option Definition Set rpd'. Below the title, there is a table with the following columns: Attribute and Value. The table contains the following rows:

Attribute	Value
Name*	rpd
DHCP Type*	V4
Description	
Vendor Option String	RPD
Vendor Option Regex String	
Vendor Option Enterprise Id	

The page number 366349 is visible in the bottom right corner of the screenshot.

2. Define option. Fill in the option number and name as shown in the figure below.

Design &gt; DHCPv4 &gt; Options

**List/Add DHCP Option Definition Sets**

Edit DHCP Option Definition Set *rpd*

*rpd* Option Definitions

List of Option Definitions for *rpd*

Number	Name
43	rpd-option-43
2	device-type
61	ccap-cores

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- Define suboption. Fill in the name, type and repeat of suboption 61 as shown in the following figure.

Design &gt; DHCPv4 &gt; Options

**List/Add DHCP Option Definition Sets**

Edit DHCP Option Definition Set *rpd*

*rpd* Option Definitions

Attribute	Value
Number*	61
Name*	ccap-cores
Description	
type*	IP address
repeat	1+

- Add the option into policy as shown in the following figure. Replace the IP address 120.102.15.1 in the figure to the DPIC port IP address.

DHCPv4 Vendor Options dhcp-cablelabs-config Select

Name	Number
Configured Options	[43] (rpd) rpd-option-43 (bin)

## Configuring DHCP Server using IPv6 Stateless

The Cisco Remote PHY System supports the Stateless Address Auto Configuration (SLAAC). IPv6 address assignment of the RPD is governed by the configuration bits set in the ICMPv6 Router Advertisement (RA) message and the presence of a valid prefix in the Prefix Information Option (PIO). For more information about RPD IPv6 address assignment, refer to section 6.7 of Remote PHY Specification.

To configure DHCP server using IPv6 Stateless and enable SLAAC, follow the steps below:

1. Configure Prefix Type to “stateless” in CNR prefix.
2. Configure ICMPv6 Router RA message M Bit=0 and O Bit=1.

Attribute	Value
name*	2001:93:3:58::0-RPD
vpn-id	
Prefix Type (dhcp-type)	stateless
address*	2001:93:3:58::/64



### Note

It is recommended that you follow the DHCP options listed in *Table 2 - Router Advertisement M Bit and O Bit Settings For SLAAC* of section 6.7.1 (CM-SP-R-PHY-I10) or 6.6.1 (CM-SP-R-PHY-I11) in the Remote PHY Specification.

To display the RPD get IPv6 address by SLAAC, use the **show dhcp** command.

```
R-PHY#show dhcp
Interface  IP-Address                               Subnet-Mask
vbh0      2001:93:3:58:1204:9fff:fecl:100  ffff:ffff:ffff:ffff::
```

Details:

```
-----
Interface:                vbh0
AddrType:                 IPv6<Stateless>
TimeServers:              2001:20:1:1::33
TimeOffset:               28800
LogServers:               2001:20:1:1::33
CCAPCores:                2001:93:3:58::1
```

## Configuring DHCP Server using IPv6 Stateful

To configure DHCP server using IPv6 Stateful, follow the steps below:

1. Configure Prefix Type to “dhcp” in CNR prefix. See the following image.
2. Configure ICMPv6 Router RA message M Bit=1.

To display the RPD get IPv6 address by Stateful method, use the **show dhcp** command.

```
R-PHY#show dhcp
Interface  IP-Address          Subnet-Mask
vbh0      2001:93:3:58::d8   ffff:ffff:ffff:ffff::
```

Details:

```
-----
Interface:          vbh0
AddrType:           IPv6<Stateful>
TimeServers:        2001:20:1:1::33
TimeOffset:         28800
LogServers:         2001:20:1:1::33
CCAPCores:         2001:93:3:58::1
```

## Configuring PTP

To configure PTP, use the following example as reference:

On cBR-8 router:

```
interface Loopback1588
 ip address 159.159.159.4 255.255.255.255
interface TenGigabitEthernet5/1/3 /* connect to ASR903 */
 ip address 192.104.10.4 255.255.255.0

ip route 10.90.3.93 255.255.255.255 192.104.10.93 /* route to ASR903 loopback ip */

ptp clock ordinary domain 0
 servo tracking-type R-DTI
 clock-port slave-from-903 slave
 delay-req interval -4
 sync interval -5
 sync one-step
 transport ipv4 unicast interface Lo1588 negotiation
 clock source 10.90.3.93 /* ASR903 loopback ip */

ptp r-dti 1
 ptp-domain 0 /* same domain number with ptp server */
 clock-port 1
 ethernet 1 /* default value is same index with clock-port index, for RPD, ethernet
 1=vbh0, ethernet 2=vbh1 */
 clock-source 10.90.3.93 gateway 93.3.10.2 /* clock-source is ASR093 loopback ip,
 gateway is ASR903 BDI ID for node */
```

On ASR903 router as PTP primary clock:

```
ptp clock ordinary domain 0
```

```

clock-port Master-to-all-cBR8 master
  sync interval -5
  sync one-step
  transport ipv4 unicast interface Lo1588 negotiation

interface Loopback1588
  ip address 10.90.3.93 255.255.255.255

interface GigabitEthernet0/3/5
  no ip address
  negotiation auto
  cdp enable
  service instance 31 ethernet /* 31 is vlan id */
  encapsulation dot1q 31
  rewrite ingress tag pop 1 symmetric
  bridge-domain 31
  service instance 32 ethernet
  encapsulation dot1q 32
  rewrite ingress tag pop 1 symmetric
  bridge-domain 32
interface BDI31 /* for cBR, SUP PIC */
  ip address 192.104.10.93 255.255.255.0
  no shut
interface BDI32 /* For RPD */
  ip address 93.3.10.2 255.255.255.0
  no shut

ip route 159.159.159.4 255.255.255.255 192.104.10.48 /* route to cbr-8 loopback ip */

```

## Configuring cBR-8

To configure the cBR-8 to bring up the RPD, use the following example as reference:

```

/* D-PIC TenGiga interface config */
interface TenGigabitEthernet0/1/0
  ip address 93.3.10.1 255.255.255.0
  ip helper-address 20.1.0.33

/* Downstream/Upstream controller profile */
cable downstream controller-profile 101
rf-chan 0 95
  type DOCSIS
  frequency 381000000
  rf-output NORMAL
  qam-profile 1
  docsis-channel-id 1

cable upstream controller 201
  us-channel 0 channel-width 1600000 1600000
  us-channel 0 docsis-mode atdma
  us-channel 0 minislots-size 4
  us-channel 0 modulation-profile 221
  no us-channel 1 shutdown

/* RPD configuration */
cable rpd node1
  identifier 0004.9f03.0061
  core-interface Te0/1/0
  rpd-ds 0 downstream-cable 0/0/0 profile 101
  rpd-us 0 upstream-cable 0/0/0 profile 201
  r-dti 1
  rpd-event profile 0

```

```
rpd-55d1-us-event profile 0

interface Cable0/0/0
  load-interval 30
  downstream Downstream-Cable 0/0/0 rf-channel 0-23
  upstream 0 Upstream-Cable 0/0/0 us-channel 0
  upstream 1 Upstream-Cable 0/0/0 us-channel 1
  upstream 2 Upstream-Cable 0/0/0 us-channel 2
  upstream 3 Upstream-Cable 0/0/0 us-channel 3
  cable upstream bonding-group 1
    upstream 0
    upstream 1
    upstream 2
    upstream 3
    attributes 80000001
    cable bundle 1
  cable ip-init ipv6
interface Wideband-Cable0/0/0:0
  cable bundle 1
  cable rf-channels channel-list 0-7 bandwidth-percent 10
interface Wideband-Cable0/0/0:1
  cable bundle 1
  cable rf-channels channel-list 8-15 bandwidth-percent 10
cable fiber-node 200
  downstream Downstream-Cable 0/0/0
  upstream Upstream-Cable 0/0/0
```

