Introduction

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This Release Notes contain information about downloading and installing Cisco 1x2 / Compact Shelf RPD Software 6.3 and its maintenance releases. It also provides new and changed information, hardware support, limitations and restrictions, and caveats for Cisco 1x2 / Compact Shelf RPD Software 6.3 and its maintenance releases.

We recommend that you view the field notices for this release to see if your software or hardware platforms are affected. If you have an account at Cisco.com, you can find the field notices at http://www.cisco.com/en/US/customer/support/tsd_products_field_notice_summary.html.

If you do not have an account at Cisco.com, you can find the field notices at http://www.cisco.com/en/US/support/tsd_products_field_notice_summary.html.

Note Cisco 1x2 / Compact Shelf RPD Software 6.3 is generally available for field deployment. To ensure a smoother, faster, and successful field deployment, we recommend that you validate and qualify the software in a limited field trial.

This chapter includes the following sections:

System Requirements

These sections describe the system requirements for Cisco 1x2 / Compact Shelf RPD Software and its maintenance releases:

Memory Requirements for Cisco 1x2 / Compact Shelf RPD Software 6.3

Note Memory is not configurable for the Cisco Remote PHY device.

Table 1: Memory Recommendations for the Cisco Remote PHY Device

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 6.3	NXP LS1043A	RPD-V6-3.itb.SSA	1G Bytes	Bootflash:

Hardware Supported

For detailed information about the hardware supported in Cisco 1x2 / Compact Shelf RPD Software and its maintenance releases, see:

http://www.cisco.com/c/en/us/td/docs/cable/cbr/installation/guide/b_cbr_how_and_what_to_order.html.

Determining the Software Version of Cisco 1x2 / Compact Shelf RPD Software 6.3

To determine the version of the Cisco 1x2 RPD software running on your Cisco Remote PHY Device, log in and enter the **show version** EXEC command:

```
R-PHY#show version
Cisco RPD Software, version v6.3, build by rpd-release, on 2019-02-27 02:32:32
Branch information:
        RPD branch: (detached from RPD_V6_3_20190227)
        OpenRPD branch: (detached from RPD_V6_3_20190227)
        SeresRPD branch: (detached from RPD_V6_3_20190227)
```

Note The system image file name of the factory installed image is */bootflash/RPD-V6.3_hardware_certificate.itb.rel.sign.SSA*. The system image file name of the Secure Software Download (SSD) from the Cisco software download page is */bootflash/RPD-V6-3.itb.SSA.act*.

New and Changed Information

The following sections list the new hardware and software features supported on the Cisco cBR Series Converged Broadband Routers in this release:

New Software Features in Cisco 1x2 / Compact Shelf RPD Software 6.3

The new software feature for Cisco 1x2 / Compact Shelf RPD Software 6.3 release is:

OOB Support on Compact Shelf

This release enables support for OOB 55-1 and 55-2 functionality for Cisco Remote PHY Compact Shelf 6 x 12 and Cisco Remote PHY Compact Shelf 3 x 6.

New Software Features in Cisco 1x2 / Compact Shelf RPD Software 6.2

The new software features for Cisco 1x2 / Compact Shelf RPD Software 6.2 release are:

SFP support for 1RU shelf

The following SFPs are supported:

- SFP-10G-AOC3M(10-2847-01)
- SFP-10G-LR-S(10-3107-01)
- DWDM-SFP10G-C(10-3036-01)

You can change DWDM-SFP10G-C's Wavelength by using the RPD config CLI:

```
R-PHY(config)#sfp itu [port_no] [channel_no]
```

For more information on the mapping relationship between channel_no with wavelength, go through Cisco 10GBASE Dense Wavelength-Division Multiplexing SFP+ Modules Data Sheet.

Read count TLV 100.21/22/23/17 support

Read count TLV 100.21 HostResourcesSystem, TLV 100.22 HostResourcesStorage, TLV 100.23 HostResourcesSwRun and TLV 100.17 IpDefaultRouter is supported in RPD V6.2 Release.

Read count TLV 74/75 support

Read count TLV 100.74 DsOob551Perf and TLV 100.75 DsOob552Perf is supported in RPD V6.2 Release

Analog Tx/Rx modules alarm threshold setting

You can set Analog Tx/Rx modules alarm threshold by TLV 21 VendorSpecificExtension sub TLV 21.13 AnalogTxPower and TLV 21.14 AnalogRxPower.

- TLV definition:

Table 2: AnalogTxPower Object

Attribute Name	Type	Access	Type constraints	Units	TLV Type
TxIndex	UnsignedByte	Key			21.13.1
MajorLowTH	UnsignedShort	Write-only			21.13.2
MinorLowTH	UnsignedShort	Write-only			21.13.3
NormalTH	UnsignedShort	Write-only			21.13.4
MinorHighTH	UnsignedShort	Write-only			21.13.5

Table 3: AnalogRxPower Object

Attribute Name	Type	Access	Type constraints	Units	TLV Type
RxIndex	UnsignedByte	Key			21.14.1
MajorLowTH	UnsignedShort	Write-only			21.14.2
MinorLowTH	UnsignedShort	Write-only			21.14.3
NormalTH	UnsignedShort	Write-only			21.14.4
MinorHighTH	UnsignedShort	Write-only			21.14.5

- You can verify Analog Tx/Rx modules alarm threshold setting on RPD by below CLI:

```
R-PHY#show environment table 49
sensor_id: 49
name: TX1_OPT_PWR_MON
type: power
unit: mW
state            low            high
-------------------------------------
MAJOR-LOW        N/A            0.00
MINOR-LOW        0.00           0.49
NORMAL           0.50           0.99
MINOR-HIGH       1.00           1.49
MAJOR-HIGH       1.50           N/A
poll_interval: 2
sensor_state: N/A
sensor_value: N/A

Configured Values (Currently Used Values):

state            low            high
-------------------------------------
MAJOR-LOW        N/A            0.00
MINOR-LOW        0.00           0.49
NORMAL           0.50           0.99
MINOR-HIGH       1.00           1.49
MAJOR-HIGH       1.50           N/A
sensor_state: N/A
R-PHY#show environment table 50
```

```
sensor_id: 50
name: RX1_OPT_PWR_MON
type: power
unit: mW
state            low            high
-------------------------------------
MAJOR-LOW        N/A            0.00
MINOR-LOW        0.00           0.49
NORMAL           0.50           1.49
MINOR-HIGH       1.50           1.99
MAJOR-HIGH       2.00           N/A
poll_interval: 2
sensor_state: N/A
sensor_value: N/A

Configured Values (Currently Used Values):
state            low            high
-------------------------------------
MAJOR-LOW        N/A            0.00
MINOR-LOW        0.00           0.49
NORMAL           0.50           1.49
MINOR-HIGH       1.50           1.99
MAJOR-HIGH       2.00           N/A
sensor_state: N/A
```

New Software Features in Cisco 1x2 / Compact Shelf RPD Software 6.1

The new software features for Cisco 1x2 / Compact Shelf RPD Software 6.1 release are:

Disable LLDP by TLV

In Cisco 1x2 / Compact Shelf RPD Software 6.1, LldpEnable TLV is introduced to enable or disable the LLDP protocol. The RPD which supports this attribute MUST preserve the value of this attribute in it non-volatile configuration store.

Value is defined as the boolean value to enable/disable LLDP operation on the RPD. The values are:

- 0 – LLDP is disabled.
- 1 – LLDP is enabled.

The selection of a default value is left to vendor’s choice.

New added events

New events are supported for DHCPv6 and supported networks.

Table 4: Supported events for DHCPv6

Process	Sub-Process	RPD Priority	Event Message	Message Notes and Detail	Error Code Set	Event ID
DHCP		Error	DHCP RENEW sent - No response for <P1><P2><TAGS>	• P1= IPv4 or IPv6 • P2 = RPD interface number (EnetPortIndex)	B703.0	66070300
DHCP		Error	DHCP REBIND sent - No response for <P1><P2><TAGS>	• P1=IPv4 or IPv6 • P2 = RPD interface number (EnetPortIndex)	B703.1	66070301
DHCP		Error	DHCP RENEW WARNING - Field invalid in response <P1> option field<P2><TAGS>	• P1=v4 or IPv6 • P2 = RPD interface number (EnetPortIndex)	B703.2	66070302
DHCP		Critical	DHCP RENEW FAILED - Critical field invalid in response<P1><TAGS>	P1 = RPD interface number (EnetPortIndex)	B703.3	66070303
DHCP		Error	DHCP REBIND WARNING - Field invalid in response<P1><TAGS>	P1 = RPD interface number (EnetPortIndex)	B703.4	66070304
DHCP		Critical	DHCP REBIND FAILED - Critical field invalid in response<P1><TAGS>	P1 = RPD interface number (EnetPortIndex)	B703.5	66070305

Table 5: Supported network events

Process	Sub-Process	RPD Priority	Event Message	Message Notes and Detail	Error Code Set	Event ID
Init	Network Authentication	Error	Network Authentication Error; Descr: <P1>; <TAGS>;	P1 = Authentication error description	B701.0	66070104

Process	Sub-Process	RPD Priority	Event Message	Message Notes and Detail	Error Code Set	Event ID
Init	Network Authentication	Notice	Network Authentication Success; <TAGS>;		B701.4	66070105
Connectivity	CCAP Core	Notice	Successfully connected to Core; Core ID: <P1>; <TAGS>;	P1 = CCAP Core ID to which the connection was completed	B702.19	66070219
Connectivity	CCAP Core	Warning	Connection lost - Auxiliary CCAP Core. Reconnect attempted; Core ID: <P1>; <TAGS>;	P1 = Auxiliary CCAP Core ID to which the connection was lost.	B702.20	66070220
Connectivity	CCAP Core	Warning	Connection lost – Principal CCAP Core. Reconnect attempted; Core ID: <P1>; <TAGS>;	P1 = Principal CCAP Core ID to which the connection was lost.	B702.21	66070221
Connectivity	CCAP Core	Notice	Successfully reconnected to Core; Core ID: <P1>; <TAGS>;	P1 = CCAP Core ID to which the connection was completed	B702.22	66070222
Init	IPv4 Address Acquisition	Notice	Successfully obtained IPv4 address; <TAGS>;		B703.24	66070324
Init	IPv6 Address Acquisition	Notice	Successfully obtained IPv6 address; <TAGS>;		B703.25	66070325
Init	TOD	Notice	Successfully obtained ToD; <TAGS>;		B703.26	66070326
Init	Config	Error	Received unknown RCP message from Core; Core ID: <P1>; Descr: <P2>; <TAGS>;	P1 = CCAP Core ID P2 = Error description	B703.27	66070327
Init	Config	Error	Received RCP message from Core, not allowed in current state; Message: <P1>; Core ID: <P2>; State: <P3>; <TAGS>;	P1 = RCP message P2 = CCAP Core ID P3 = Current TopLevelRPDState	B703.28	66070328

Process	Sub-Process	RPD Priority	Event Message	Message Notes and Detail	Error Code Set	Event ID
Init	IRA	Error	No IRA received after Notify message to Core; Core IP: <P1>; <TAGS>;	P1 = CCAP Core IP address	B703.29	66070329
Init	IRA	Error	No REX received after IRA from Core; Core ID: <P1>; Core IP: <P2>; <TAGS>;	P1 = CCAP Core ID P2 = CCAP Core IP address	B703.30	66070330
Init	Initialization	Critical	Failure occurred during local RPD initialization process. RPD reset; Descr: <P1>; <TAGS>;	P1 is optional P1 = Vendor Specific Event or Text	B708.0	66070800

Factory reset support

Starting from Cisco 1x2 / Compact Shelf RPD Software 6.1, factory reset and NVRAM reset via TLV and CLI are supported.

- factoryReset: The device restores the factory configuration and performs a hard reset. You can perform a factoryReset by running the following:

```
R-PHY>enable
R-PHY#reboot factory-reset
```

- nvReset: The device clears non-volatile configuration and performs a hard reset. You can perform a nvReset by running the following:

```
R-PHY>enable
R-PHY#reboot nvreset
```

Support for Narrowband Digital Forward And Narrowband Digital Return

Narrowband Digital Forward (NDF) refers to the digitizing of an analog portion of the downstream spectrum at the headend, sending the digital samples as payload in [DEPI] packets to the RPD, and then re-creating the original analog stream at the RPD. NDF supports services such as FM Broadcast, DAB+ Broadcast, and OOB signals for Forward Sweep, DS Leakage, and Element management.

Narrowband Digital Return (NDR) refers to the digitizing of an analog portion of the upstream spectrum at the RPD, sending the digital samples as payload in [R-UEPI] packets to the CMTS, and then re-creating the original analog stream at the headend. NDR supports legacy OOB signals for Reverse Sweep, Return Path Monitoring, FSK based HMS, and other FSK based telemetry signals.

The following commands are introduced on the Cisco 1x2 / Compact Shelf RPD Software 6.1 release:

- **show downstream oob configuration ndf** – Provides the NDF configuration in RPD for each NDF channel configured. It displays PHY information for the NDF session.
- **show upstream oob configuration ndr** – Provides the NDR configuration in RPD for each of NDR channel configured. It displays PHY and L2TP information.

- **show downstream oob counter ndf** – Provides the NDF packet counter from BCM for each NDF channel configured. It is a clear on read counter.
- **show upstream oob counter ndr** – Provides the internal mapping of RPD channels and its corresponding channel configured in core.
- **show oob fpga ndf-status** – Provides the NDF FPGA status for each NDF channel configured.
- **show oob ds-mapping** – Provides the internal mapping of RPD channels and its corresponding channel configured in the core.

For more information, see the Cisco cBR Series Converged Broadband Routers Quality of Services Configuration Guide for Cisco IOS XE Fuji 16.10.x and the Cisco CMTS Cable Command Reference Guide.

Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 6.3

The modified software features for Cisco 1x2 / Compact Shelf RPD Software 6.3 release are:

Support Leakage Detection Meter

The leakage detection tone's power adjust range is updated from -36.0 ~ -24.0 dBmV to -36.0 ~ -21.0 dBmV.

Enhance output of "show sfp info 0"

Enhance the output of CLI **show sfp info 0**, so that the raw data which is presented is also interpreted in a human readable form. See the following example:

```
R-PHY#show sfp info 0
== SFP A0 EEPROM CONTENT ==
Reg 0x0000: 03 04 07 10 00 00 00 00  00 00 00 06 67 00 00 00
Reg 0x0010: 08 02 00 1e 43 49 53 43  4f 2d 46 49 4e 49 53 41
Reg 0x0020: 52 20 20 20 00 00 90 65  46 54 4c 58 38 35 37 34
Reg 0x0030: 44 33 42 43 4c 2d 43 53  41 20 20 20 03 52 00 c9
Reg 0x0040: 00 1a 00 00 46 4e 53 32  31 31 37 30 35 4e 33 20
Reg 0x0050: 20 20 20 20 31 37 30 34  32 33 20 20 68 80 05 b0
Reg 0x0060: 00 00 02 f1 56 b3 87 75  7d 68 08 b3 35 21 09 66
Reg 0x0070: f4 da 7e 00 00 00 00 00  00 00 00 00 ba a3 f6 f2
Base ID Fields:
 Identifier              :0x03
 Ext.Identifier          :0x04
 Connector               :0x07
 Compliance Code         :0x10
 Transceiver Codes       :0x10 0x0 0x0 0x0 0x0 0x0 0x0 0x0
 Encoding                :0x06
 BR,Nominal              :10300 Mbps
 Rate Identifier         :0x00
 Length(9um)-km          :0x00
 Length(9um)             :0x00
 Length(50 um OM2)       :0x08
 Length(62.5 um OM1)     :0x02
 Length(Copper)          :0x00
 Length(OM3)             :0x1e
 Vendor name             :CISCO-FINISAR
 Vendor OUI              :0x0 0x90 0x65
 Vendor PN               :FTLX8574D3BCL-CS
 Vendor Rev              :0x41 0x20 0x20 0x20
 Wavelength              :850 nM
 CC Base                 :0xc9
Extended ID Fields:
```

```
 Options                 :0x0 0x1a
 BR, max                 :0x00
 BR, min                 :0x00
 Vendor SN               :FNS211705N3
 Date                    :2017-04-23
 Diagnostic Type         :0x68
 Enhanced Options        :0x80
 SFP-8472 Compliance     :0x05
 CC EXT                  :0xb0
 Vendor Specific         :0x0 0x0 0x2 0xf1 0x56 0xb3 0x87 0x75 0x7d 0x68 0x8 0xb3 0x35 0x21
 0x9 0x66
                         :0xf4 0xda 0x7e 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0xba 0xa3 0xf6
 0xf2
== SFP A2 EEPROM CONTENT ==
Reg 0x0000: 4b 00 fb 00 46 00 00 00  8d cc 74 04 87 5a 7a 76
Reg 0x0010: 19 64 07 d0 18 6a 09 c4  39 c7 02 e5 1c f5 07 46
Reg 0x0020: 3d e9 01 97 1f 07 03 ff  00 00 00 00 00 00 00 00
Reg 0x0030: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
Reg 0x0040: 00 00 00 00 3f 80 00 00  00 00 00 00 01 00 00 00
Reg 0x0050: 01 00 00 00 01 00 00 00  01 00 00 00 00 00 00 bf
Reg 0x0060: 26 88 80 8a 11 4f 14 70  16 f6 00 00 00 00 00 00
Reg 0x0070: 00 40 00 00 00 40 00 00  ff ff ff ff ff ff ff 01
Reg 0x0080: 43 4f 55 49 41 38 4e 43  41 41 31 30 2d 32 34 31
Reg 0x0090: 35 2d 30 33 56 30 33 20  01 00 46 00 00 00 00 c6
Reg 0x00a0: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
Reg 0x00b0: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 aa aa
Reg 0x00c0: 53 46 50 2d 31 30 47 2d  53 52 20 20 20 20 20 20
Reg 0x00d0: 20 20 20 20 34 38 00 00  00 00 00 00 00 00 00 3c
Reg 0x00e0: 1e 20 2a 2a 31 34 29 36  00 00 00 00 00 00 00 00
Reg 0x00f0: 00 00 00 00 00 56 00 00  ff ff ff ff 00 00 00 00

SFP Detail Diagnostic Information (Internal Calibration):
                Measured    High Alarm  High Warning  Low Alarm   Low Warning:
 Temperature:       38 C         75 C         70 C         -5 C         0 C
 Voltage    :     3.29 V       3.63 V       3.46 V       2.97 V       3.13 V
 BiasCurrent:     8.86 mA     13.00 mA     12.50 mA      4.00 mA      5.00 mA
 Tx Power   :    -2.81 dBm     1.70 dBm    -1.30 dBm   -11.30 dBm   -7.30 dBm
 Rx Power   :    -2.31 dBm     2.00 dBm    -1.00 dBm   -13.90 dBm   -9.90 dBm

Checking for Alarms and Warnings:
Done Checking for Alarms and Warnings

Diag & Control/Status:
 Alarm & Warning         :0x4b 0x0 0xfb 0x0 0x46 0x0 0x0 0x0 0x8d 0xcc 0x74 0x4 0x87 0x5a
0x7a 0x76
                         :0x19 0x64 0x7 0xd0 0x18 0x6a 0x9 0xc4 0x39 0xc7 0x2 0xe5 0x1c
0xf5 0x7 0x46
                         :0x3d 0xe9 0x1 0x97 0x1f 0x7 0x3 0xff
 Calibration Constants   :0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x0 0x3f 0x80 0x0 0x0

                         :0x0 0x0 0x0 0x0 0x1 0x0 0x0 0x0 0x1 0x0 0x0 0x0 0x1 0x0 0x0 0x0
                         :0x1 0x0 0x0 0x0
 CC_DMI                  :0xbf
 Diag Monitor Data       :0x26 0x88 0x80 0x8a 0x11 0x4f 0x14 0x70 0x16 0xf6
 Status & Control        :0x00
 Reserved SFF-8079       :0x00
 Alarm Flags             :0x00 0x40
 Warning Flags           :0x00 0x40
 Ext Status/Control      :0x00 0x00
```

Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 6.3

There are no integrated features in Cisco 1x2 / Compact Shelf RPD Software 6.3 release.

New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 6.3

There are no new hardware feature for Cisco 1x2 / Compact Shelf RPD Software 6.3 release.

MIBs

To locate and download MIBs for selected platforms, Cisco IOS XE releases, and feature sets, use Cisco MIB Locator found at the following URL:

http://tools.cisco.com/ITDIT/MIBS/servlet/index

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check verifies that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password is e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

http://tools.cisco.com/RPF/register/register.do

MIBs in Cisco 1x2 / Compact Shelf RPD Software 6.3

There are no new MIBs in Cisco 1x2 / Compact Shelf RPD Software 6.3.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

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