



# Introduction



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This Release Notes contain information about downloading and installing Cisco 1x2 / Compact Shelf RPD Software 8.x. It also provides new and changed information, hardware support, limitations and restrictions, and caveats for Cisco 1x2 / Compact Shelf RPD Software 8.x.

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](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](http://www.cisco.com/en/US/support/tsd_products_field_notice_summary.html).



- Note** Cisco 1x2 / Compact Shelf RPD Software 8.x 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.

The versions of Cisco cBR-8 router and RPD must be compatible. If the versions are not compatible, the RPD remains in the **init(gcp)** state. The following table provides information on the compatible Cisco cBR-8 and RPD versions:

Cisco RPD Software Version	Compatible Cisco cBR-8 software Version
Cisco 1x2 / Compact Shelf RPD Software 8.6.3 and 8.6.4	Cisco IOS XE Gibraltar 16.12.1z1 Cisco IOS XE Gibraltar 16.12.1z2

Cisco RPD Software Version	Compatible Cisco cBR-8 software Version
Cisco 1x2 / Compact Shelf RPD Software 8.5, 8.6, 8.6.1, and 8.6.2	Cisco IOS XE Amsterdam 17.2.1 Cisco IOS XE Gibraltar 16.12.1z
Cisco 1x2 / Compact Shelf RPD Software 8.4	Cisco IOS XE Gibraltar 16.12.1z
Cisco 1x2 / Compact Shelf RPD Software 8.3	Cisco IOS XE Amsterdam 17.2.1
Cisco 1x2 / Compact Shelf RPD Software 8.2	Cisco IOS XE Gibraltar 16.12.1y Cisco IOS XE Amsterdam 17.2.1
Cisco 1x2 / Compact Shelf RPD Software 8.1	Cisco IOS XE Amsterdam 17.2.1

This chapter includes the following sections:

- [System Requirements, on page 2](#)
- [New and Changed Information, on page 8](#)
- [Obtaining Documentation and Submitting a Service Request, on page 21](#)

## System Requirements

These sections describe the system requirements for Cisco 1x2 / Compact Shelf RPD Software 8.x:

## Memory Requirements



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

*Table 1: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.6.4*

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.6.4	NXP LS1043A	RPD-V8-6-4.itb.SSA	1G Bytes	Bootflash:

*Table 2: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.6.3*

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.6.3	NXP LS1043A	RPD-V8-6-3.itb.SSA	1G Bytes	Bootflash:

**Table 3: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.6.2**

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.6.2	NXP LS1043A	RPD-V8-6-2.itb.SSA	1G Bytes	Bootflash:

**Table 4: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.6.1**

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.6.1	NXP LS1043A	RPD-V8-6-1.itb.SSA	1G Bytes	Bootflash:

**Table 5: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.6**

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.6	NXP LS1043A	RPD-V8-6.itb.SSA	1G Bytes	Bootflash:

**Table 6: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.5**

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.5	NXP LS1043A	RPD-V8-5.itb.SSA	1G Bytes	Bootflash:

**Table 7: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.4**

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.4	NXP LS1043A	RPD-V8-4.itb.SSA	1G Bytes	Bootflash:

**Table 8: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.3**

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.3	NXP LS1043A	RPD-V8-3.itb.SSA	1G Bytes	Bootflash:

**Table 9: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.2**

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.2	NXP LS1043A	RPD-V8-2.itb.SSA	1G Bytes	Bootflash:

Table 10: Memory Recommendations for the Cisco Remote PHY Device, Cisco 1x2 / Compact Shelf RPD Software 8.1

Feature Set	Cisco RPHY Processor	Software Image	Fixed Memory	Runs From
CISCO RPHY 8.1	NXP LS1043A	RPD-V8-1.itb.SSA	1G Bytes	Bootflash:

## Supported Hardware

For detailed information about the hardware supported in Cisco 1x2 / Compact Shelf RPD Software 8.x, see: [http://www.cisco.com/c/en/us/td/docs/cable/cbr/installation/guide/b\\_cbr\\_how\\_and\\_what\\_to\\_order.html](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

### Cisco 1x2 / Compact Shelf RPD Software 8.6.4

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 v8.6.4, build by rpd-release, on 2021-10-26 00:24:14
Branch information:
  RPD branch: (HEAD detached at RPD_V8_6_4_20211026)
  OpenRPD branch: (HEAD detached at RPD_V8_6_4_20211026)
  SeresRPD branch: (HEAD detached at RPD_V8_6_4_20211026)
```




---

**Note** The system image file name of the factory installed image is `/bootflash/RPD-V8.6.4_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-V8-6-4.itb.SSA.act`.

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### Cisco 1x2 / Compact Shelf RPD Software 8.6.3

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 v8.6.3, build by rpd-release, on 2021-09-23 22:52:28
Branch information:
  RPD branch: (HEAD detached at RPD_V8_6_3_20210924)
  OpenRPD branch: (HEAD detached at RPD_V8_6_3_20210924)
  SeresRPD branch: (HEAD detached at RPD_V8_6_3_20210924)
```



---

**Note** The system image file name of the factory installed image is /bootflash/RPD-V8.6.3\_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-V8-6-3.itb.SSA.act.

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## Cisco 1x2 / Compact Shelf RPD Software 8.6.2

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 v8.6.2, build by rpd-release, on 2021-08-17 04:11:15
Branch information:
  RPD branch: (HEAD detached at RPD_V8_6_2_20210817)
  OpenRPD branch: (HEAD detached at RPD_V8_6_2_20210817)
  SeresRPD branch: (HEAD detached at RPD_V8_6_2_20210817)
```



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**Note** The system image file name of the factory installed image is /bootflash/RPD-V8.6.2\_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-V8-6-2.itb.SSA.act.

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## Cisco 1x2 / Compact Shelf RPD Software 8.6.1

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 v8.6.1, build by rpd-release, on 2020-09-24 07:55:23
Branch information:
  RPD branch: (HEAD detached at RPD_V8_6_1_20200924)
  OpenRPD branch: (HEAD detached at RPD_V8_6_1_20200924)
  SeresRPD branch: (HEAD detached at RPD_V8_6_1_20200924)
```



---

**Note** The system image file name of the factory installed image is /bootflash/RPD-V8.6.1\_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-V8-6-1.itb.SSA.act.

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## Cisco 1x2 / Compact Shelf RPD Software 8.6

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 v8.6, build by rpd-release, on 2020-08-26 01:51:38
Branch information:
  RPD branch: (HEAD detached at RPD_V8_6_20200826)
  OpenRPD branch: (HEAD detached at RPD_V8_6_20200826)
  SeresRPD branch: (HEAD detached at RPD_V8_6_20200826)
```




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**Note** The system image file name of the factory installed image is /bootflash/RPD-V8.6\_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-V8-6.itb.SSA.act.

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## Cisco 1x2 / Compact Shelf RPD Software 8.5

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 v8.5, build by rpd-release, on 2020-07-30 01:45:07
Branch information:
  RPD branch: (HEAD detached at RPD_V8_5_20200730)
  OpenRPD branch: (HEAD detached at RPD_V8_5_20200730)
  SeresRPD branch: (HEAD detached at RPD_V8_5_20200730)
```




---

**Note** The system image file name of the factory installed image is /bootflash/RPD-V8.5\_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-V8-5.itb.SSA.act.

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## Cisco 1x2 / Compact Shelf RPD Software 8.4

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 v8.4, build by rpd-release, on 2020-06-24 01:29:54
Branch information:
  RPD branch: (HEAD detached at RPD_V8_4_20200624)
  OpenRPD branch: (HEAD detached at RPD_V8_4_20200624)
  SeresRPD branch: (HEAD detached at RPD_V8_4_20200624)
  SeresRPD branch: (detached from RPD_V7_1_20190627)
```




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**Note** The system image file name of the factory installed image is /bootflash/RPD-V8.4\_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-V8-4.itb.SSA.act.

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## Cisco 1x2 / Compact Shelf RPD Software 8.3

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 v8.3, build by rpd-release, on 2020-05-27 01:35:39
Branch information:
  RPD branch: (HEAD detached at RPD_V8_3_20200527)
  OpenRPD branch: (HEAD detached at RPD_V8_3_20200527)
  SeresRPD branch: (HEAD detached at RPD_V8_3_20200527)
```



---

**Note** The system image file name of the factory installed image is */bootflash/RPD-V8.3\_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-V8-3.itb.SSA.act*.

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## Cisco 1x2 / Compact Shelf RPD Software 8.2

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 v8.2, build by rpd-release, on 2020-04-29 00:45:49
Branch information:
  RPD branch: (HEAD detached at RPD_V8_2_20200429)
  OpenRPD branch: (HEAD detached at RPD_V8_2_20200429)
  SeresRPD branch: (HEAD detached at RPD_V8_2_20200429)
```



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**Note** The system image file name of the factory installed image is */bootflash/RPD-V8.2\_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-V8-2.itb.SSA.act*.

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## Cisco 1x2 / Compact Shelf RPD Software 8.1

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 v8.1, build by rpd-release, on 2020-03-25 07:29:53
Branch information:
  RPD branch: (HEAD detached at RPD_V8_1_20200325)
  OpenRPD branch: (HEAD detached at RPD_V8_1_20200325)
  SeresRPD branch: (HEAD detached at RPD_V8_1_20200325)
```



---

**Note** The system image file name of the factory installed image is */bootflash/RPD-V8.1\_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-V8-1.itb.SSA.act*.

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## New and Changed Information

The following sections list the hardware and software features supported on the Cisco Remote PHY Device for Cisco 1x2 / Compact Shelf RPD Software 8.x.

### New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.4

There are no new software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.4 release.

### New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.3

There are no new software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.3 release.

### New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.2

There are no new software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.2 release.

### New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.1

There are no new software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.1 release.

### New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6

The new software feature for Cisco 1x2 / Compact Shelf RPD 8.6 release is:

#### Support for TLV88.1 Configured Core Table

Cisco RPD supports TLV 88.1 Configured Core Table. You can read, configure, or delete Cores of a specific RPD by this TLV.

The Core lists configured using the TLV88.1 and the DHCP option differs in the following respects:

- The Core list that is configured using the TLV88.1 and the Core list that is configured using the DHCP option are two separate Core configuration methods.
- You cannot get the Core information that is configured using the DHCP option through TLV88.1.
- You cannot delete an existing Core configured using the DHCP option through TLV 88.1 if this Core is not configured by TLV 88.1.
- When you modify the Core using the TLV88.1 method, it does not affect the Core list that is configured in the DHCP/CNR server. Similarly, when you modify the Core using the DHCP option, it does not affect the Core list that is configured using the TLV 88.1 method.
- The Core list that is configured using the TLV 88.1 method is cleared after an RPD reboot, whether it is a soft reboot or a hard reboot.

You can check the Configured Core list information on the RPD using the command, `show multicore config`.



```
R-PHY#show multicore config
Index  ConfiguredCoreIp
0      11.1.1.10
```

## New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.5

The new software features for Cisco 1x2 / Compact Shelf RPD Software 8.5 release are:

### Faster Boot Time

RPD boot time is improved by approximately 80 sec. The improved boot time depends on the Core which the RPD is connected to, associated servers including PTP and CNR, and the topology and configurations of the RPD.

### Support TLV66 OFDMA Configuration Read

When the RPD receives a TLV66 read-request for the configured OFDMA channels, it sends a TLV66 read-response message for the following OFDMA attributes.

If the OFDMA channel that is specified in the read-request is invalid or not configured, the RPD sends a read-response with error code and error message.

- AdminState(66.1)
- SubcarrierZeroFreq(66.3)
- FirstActiveSubcarrierNum(66.4)
- LastActiveSubcarrierNum(66.5)
- RollOffPeriod(66.6)
- CyclicPrefix(66.7)
- SubcarrierSpacing(66.8)
- NumSymbolsPerFrame(66.9)
- NumActiveSubcarriers(66.10)
- StartingMinislot(66.11)
- PreambleString(66.12)
- TargetRxPowerAdjust(66.13)
- EnableFlowTags(66.14)
- ScramblerSeed(66.15)
- ConfigMultiSectionTimingMer(66.16)
- BwReqAggrControlOfdma(66.17)
- UsChanId(66.18)
- ConfigChangeCount(66.19)
- DsChanId(66.20)

- BroadcastImRegionDuration(66.21)
- UnicastImRegionDuration(66.22)

Check the OFDMA configuration by running the following command: `show ofdma config` For example:

```
R-PHY#show ofdma config
OFDMA Channel Configuration
RF Port : 0
RF channel : 0
State : UP
Starting Minislot : 2212398931
Target Rx Power Adjust : 0
Enable Flow Tags : 1
Max Req Block Enq Timeout : 0
Max Req Block Enq Number : 0
Broadcast Im Region Duration : 6
Unicast Im Region Duration : 6
UCD Message
  UCD fields
    UCID : 8
    CCC : 78
    DSID : 0
    TLV 24 Change Bitmask : 0x0000
    TLV 25 Timestamp Snapshot : 08 3d e8 75 32 25 b7 b2 24
    TLV 26 Cyclic Prefix : 96
    TLV 27 Rolloff Period : 64 samples
    TLV 28 Subcarrier Spacing : 25 KHz
    TLV 29 Subcarrier Zero Freq : 36800000 Hz
    TLV 32 Symbols in Frame : 9
    TLV 33 Randomization Seed : 8153946
    TLV 3 Preamble String : Preamble Superstring
      ff d7 d5 21 26 ec e5 e7 00 78 7f 63 6b 35 2e 29
      00 88 81 a5 bd 5f 72 7b 01 99 82 ee c7 e1 96 8d
      02 aa 87 33 48 22 bb 97 07 ff 89 55 d8 67 cc b9
      00 80 9b fe 68 a8 55 cb 00 18 1a c2 b9 f8 fe 5d
    TLV 6 Preamble String Extension : Preamble Superstring Extension
    TLV 30 Subcarrier Exclusion Band: Excluded Subcarriers
      [0000 - 0147] [1908 - 4095]
    TLV 30 Subcarrier Unused Band : Unused Subcarriers
    TLV 23 Burst Descriptor : Burst Descriptor
      03 03 02 01 00 04 02 00 00 13 02 00 40
    TLV 23 Burst Descriptor : Burst Descriptor
      04 03 02 01 00 04 02 00 00 14 02 01 00
    TLV 23 Burst Descriptor : Burst Descriptor
      05 15 02 a8 6d
    TLV 23 Burst Descriptor : Burst Descriptor
      09 15 02 98 6d
    TLV 23 Burst Descriptor : Burst Descriptor
      0d 15 02 88 6d

OFDMA Channel Configuration
RF Port : 1
RF channel : 0
State : UP
Starting Minislot : 2212522598
Target Rx Power Adjust : 0
Enable Flow Tags : 1
Max Req Block Enq Timeout : 0
Max Req Block Enq Number : 0
Broadcast Im Region Duration : 5
Unicast Im Region Duration : 5
UCD Message
  UCD fields
```

```

UCID : 9
CCC : 82
DSID : 0
TLV 24 Change Bitmask : 0x0000
TLV 25 Timestamp Snapshot : 08 3e 06 a6 64 87 a8 59 d4
TLV 26 Cyclic Prefix : 512
TLV 27 Rolloff Period : 224 samples
TLV 28 Subcarrier Spacing : 25 KHz
TLV 29 Subcarrier Zero Freq : 1800000 Hz
TLV 32 Symbols in Frame : 9
TLV 33 Randomization Seed : 8153946
TLV 3 Preamble String : Preamble Superstring
ff d7 d5 21 26 ec e5 e7 00 78 7f 63 6b 35 2e 29
00 88 81 a5 bd 5f 72 7b 01 99 82 ee c7 e1 96 8d
02 aa 87 33 48 22 bb 97 07 ff 89 55 d8 67 cc b9
00 80 9b fe 68 a8 55 cb 00 18 1a c2 b9 f8 fe 5d
TLV 6 Preamble String Extension : Preamble Superstring Extension
TLV 30 Subcarrier Exclusion Band: Excluded Subcarriers
[0000 - 0147] [0688 - 1768] [3308 - 4095]
TLV 30 Subcarrier Unused Band : Unused Subcarriers
[0676 - 0687] [3305 - 3307]
TLV 23 Burst Descriptor : Burst Descriptor
03 03 02 00 80 04 02 00 00 13 02 00 20
TLV 23 Burst Descriptor : Burst Descriptor
04 03 02 00 c0 04 02 00 00 14 02 00 c0
TLV 23 Burst Descriptor : Burst Descriptor
05 15 02 b8 80
TLV 23 Burst Descriptor : Burst Descriptor
06 15 02 a8 80
TLV 23 Burst Descriptor : Burst Descriptor
09 15 02 98 80
TLV 23 Burst Descriptor : Burst Descriptor
0a 15 02 88 80
TLV 23 Burst Descriptor : Burst Descriptor
0b 15 02 78 80
TLV 23 Burst Descriptor : Burst Descriptor
0c 15 02 68 80
TLV 23 Burst Descriptor : Burst Descriptor
0d 15 02 48 80

```

### Date and Time Range in Logging Command

You can specify a date-range for archiving logs using the `logging` command. This command helps in controlling the size of the log archive if you specify logging only in the specific date range.

Configure logging by running the following commands:

```

logging provision-archive <from_date> <to_date> [scp|tftp|local]
logging 1588-archive <from_date> <to_date> [scp|tftp|local]
logging core-file archive <from_date> <to_date> [scp|tftp|local]

```

### Usage

Enter the date range in the logging command and verify the logs locally or through SCP, TFTP. For example:

```

R-PHY#logging provision-archive 2020-07-10 2020-07-20 local
R-PHY#logging 1588-archive 2020-07-10 2020-07-20 local

```

### Support for TLV 79.2.9 UsOfdmaHighlucPerfStats.AverageMer

TLV 79.2.9 allows the CCAP Core to read the average RXMER value for the selected IUC of an OFDMA channel. The attribute units are in 10th of a DB. If the OFDMA channel that is specified in the read-request is invalid or not configured, the RPD sends a read-response with error code and error message.

Though the RPD supports the query for TLV 79, currently only the `AverageMer UnsignedShort (79.2.9)` value is supported. The `sub-tlv` attribute returns `0xffffffffffffffff`

```
"RfChannelSelector": [
  {
    "RfPortIndex": 0,
    "RfChannelType": "UsOfdma",
    "RfChannelIndex": 0
  }
]
```

## New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.4

The new software features for Cisco 1x2 / Compact Shelf RPD Software 8.4 release are:

### Dying Gasp

Cisco RPD 8.4 supports the Dying Gasp feature, allowing you to receive a UDP syslog message notification when a Node RPD loses power.

Complete the following steps to configure Dying Gasp:

1. Configure the Node RPD syslog server information through the DHCP server.
2. Update Node RPD power controller firmware to version V2.05. The following CLI need to be run on the RPD to update the power controller firmware:

```
firmware power-controller [update|version|verify]
```

For example:

```
R-PHY#firmware power-controller
update          update adm1260 firmware
verify         verify the firmware in chip
version        show adm1260 firmware version
R-PHY#firmware power-controller version
chip 0: version:V2.03
chip 1: version:V2.03
chip 2: version:V2.03
R-PHY#firmware power-controller verify
Verify input Ihex file for chip 0: OK
Verify input Ihex file for chip 1: OK
Verify input Ihex file for chip 2: OK
Successful verification of /firmware/Adm1260_v2_05.hex, checking firmware version next
chip 0: version:V2.03   file 0: version:V2.05
chip 1: version:V2.03   file 1: version:V2.05
chip 2: version:V2.03   file 2: version:V2.05
ADM1260 firmware version does not match firmware file version.
```

```
R-PHY#firmware power-controller update
Verify input Ihex file for chip 0: OK
Verify input Ihex file for chip 1: OK
Verify input Ihex file for chip 2: OK
Successful verification of /firmware/Adm1260_v2_05.hex, checking firmware version next
chip 0: version:V2.03   file 0: version:V2.05
chip 1: version:V2.03   file 1: version:V2.05
chip 2: version:V2.03   file 2: version:V2.05
Warning, if you choose to continue, you must maintain power on for at least 30 seconds
Are you sure to continue with firmware update? [No/Yes]yes
chip 0, erasing eeprom
chip 0, programming eeprom
chip 1, erasing eeprom
```

```

chip 1, programming eeprom
chip 2, erasing eeprom
chip 2, programming eeprom
chip 0, verifying eeprom: OK
chip 1, verifying eeprom: OK
chip 2, verifying eeprom: OK
all done

```

```
R-PHY#
```

### Last option added to show logging CLI

Cisco RPD 8.4 supports the Last option feature. Last option is added to show logging CLI to show the last lines of log which are from tail of log. This command is useful in seeing the most recent log updates without having to open the log explicitly.

Following is the enhancement introduced to the **show logging** CLI:

```
show logging [resetlog|ds-ofdm|ikev2|onboard|seres|traceback] | last <number>
```

For example:

```

R-PHY#show logging seres | last 5
<133>2020-06-20T00:07:00.001208+00:00 RPDBADBAD135E02 NOTICE
bcm316x_avs_ingress_read_resp:get avs phase step 255.
<133>2020-06-20T00:06:00.001622+00:00 RPDBADBAD135E02 NOTICE
bcm316x_avs_ingress_read_resp:get avs phase step 255.
<133>2020-06-20T00:05:00.001209+00:00 RPDBADBAD135E02 NOTICE
bcm316x_avs_ingress_read_resp:get avs phase step 255.
<133>2020-06-20T00:04:00.002181+00:00 RPDBADBAD135E02 NOTICE
bcm316x_avs_ingress_read_resp:get avs phase step 255.
<133>2020-06-20T00:03:00.001796+00:00 RPDBADBAD135E02 NOTICE
bcm316x_avs_ingress_read_resp:get avs phase step 255.

```

### UTSC configurable parameters and TimeIQ support

RPD 8.4 release supports Time IQ WBFFT Data on PNM upstream. You can now configure the poll interval and other parameter for free-run mode instead of fixed values in previous releases. All parameters can be configured by TLV41: UsSpectrumCapture.

You can check WBFFT configuration by CLI: **show bcm-register wbfft config**:

```

R-PHY#show bcm-register wbfft config
WBFFT Trigger Mode : N/A
Enable UTSC       : False
Samples Num       : 0
Low Bin SesID     : 00001000
PNM Dest IP       : 0.0.0.0
PNM Dest Mac      : 0000.0000.0000

```

You can check the WBFFT status by using the **show bcm-register wbfft all [port]** CLI:

```

R-PHY#show bcm-register wbfft all 0
WBFFT Start Ctrl [cc000000] : 00000000
In Control       [cc000004] : 00472F04
Out Control      [cc00000c] : 00000000
Timing Ctrl     [cc000010] : 00000000
WBFFT FIRST WDW CF [cc000024] : 00000920
WBFFT SCND WDW CF [cc000028] : 0000C660

```

```

WBFFT MIDL WDW CF [cc00002c] : 000061E0
WBFFT MAX CTL [d0000048] : 00000000
WBFFT Status [cc000034] : 00000080

WBFFTS In Ctrl [d0000044] : 00000000
WBFFT PKT BYTE : 00000000
WBFFT PKT COUNT : 00000000

```

## New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.3

The new software features for Cisco 1x2 / Compact Shelf RPD Software 8.3 release are:

### TLV Support

Cisco RPD 8.3 supports the following TLVs:

- RpdConnectionStatus—TLV 105. This table provides the status of the GCP connection to the Core as seen by the RPD.
- RpdBackupCoreStatus—TLV 107. This table provides the RPD view of the current status for all the Cores.
- ExtendedRemoteEndId—TLV 100.2.22. This attribute provides an ASCII string constructed with the form: RemoteEndId= (pp:mmm:ccc), (repeated for multiple channels) where
  - pp is the zero-based port number signaled in the RemoteEndId AVP
  - mmm is the channel-type Enum value from the RemoteEndId AVP
  - ccc is the channel number from the RemoteEndId AVP
- AllocatedBdrs—TLV 50.22.7. The object allows the RPD to inform the CCAP Core how many BDRs have been allocated by the RPD.
- ConfiguredBcgs—TLV 50.22.8. The object allows the RPD to inform the CCAP Core how many BCGs have been configured on the RPD.
- InReceives—TLV 100.14.3. This attribute reports the total number of input IP datagrams received, including those received in error.
- SupportsFlowTagIncrement—TLV 50.63. This TLV reports support for the FlowTagIncrement TLV.
- MaxUcastFwdStaticPws—TLV 50.50.7. This attribute is used to report the maximum number of unicast forward static pseudowires supported by the RPD.
- SupportsPspNdfUcastPw—TLV 50.50.8. This attribute is used to report whether the RPD supports configuration of unicast forward static pseudowires of PSP NDF (PSP-NDF) subtype.
- SupportsPspPnmPw—TLV 50.50.9. This attribute is used to report whether the RPD supports configuration of static pseudowires of PSP-PNM subtype.
- SupportsPspSpecmanPw—TLV 50.50.10. This attribute is used to report whether the RPD supports configuration of static pseudowires of PSP-SPECMAN subtype.
- NumBdrs: TLV 50.51.4—This object represents the maximum number of BDRs supported by the RPD.
- NumBcgs: TLV 50.51.5—This object represents the maximum number of BCGs supported by the RPD.

- **SupportedPilotPatterns**—TLV 50.54.2. This capability allows the RPD to communicate the set of supported OFDMA optional pilot patterns.
- **NumDsOfdmProfiles**—TLV 50.54.4. This attribute is used to report how many OFDM profiles is supported by the RPD.
- **OptionalOfdmModulations**—TLV 50.54.5. This attribute reports whether the RPD supports optional OFDM modulation orders defined in [PHYv4.0].
- **OptionalOfdmaModulations**—TLV 50.54.6 This attribute reports whether the RPD supports optional OFDMA modulation orders defined in [PHYv4.0].
- **MeasuredTxBiasCurrent**—TLV 100.18.35. This attribute, which is optional for SFP+ pluggable transceivers, reports measured transmit bias current in units of 2 micro Amps.
- **MeasuredTemperature**—TLV 100.18.36. This attribute, which is optional for SFP+ pluggable transceivers, reports internally measured transceiver temperature as a signed two's complement value in increments of 1/256 degrees Celsius.
- **MeasuredSupplyVoltage**—TLV 100.18.37. This attribute, which is optional for SFP+ pluggable transceivers, reports internally measured transceiver supply voltage in units of 100 micro Volts.
- **ChannelSnr**—TLV 78.7. This attribute reports the average SNR for the selected SC-QAM channel.
- **IpInterfaceGrp**—TLV 100.11. This object is a collection of attributes that describe IP forwarding versions supported and provide status details.
- **IcmpMsgStats**—TLV 100.19. This object provides system-wide per-version, per-message type ICMP counters. It is based on the icmpMsgStatsTable object specified in [RFC 4293].

## New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.2

The new software features for Cisco 1x2 / Compact Shelf RPD Software 8.2 release are:

### • IP Statistics TLV Support

RPD V8.2 supports following IP Statistics TLVs:

- **IpInterfaceGrp**: TLV 100.11. This object is a collection of attributes that describe IP forwarding versions supported and provide status details.
- **IcmpMsgStats**: TLV 100.19. This object provides system-wide per-version, per-message type ICMP counters. It is based on the icmpMsgStatsTable object specified in [RFC 4293].

### • Link Redundancy Support

Starting from RPD V8.2, Link Redundancy is supported on RPD. RPD backhaul working modes include:

- **Link-redundancy mode**: there is only one virtual backhaul interface which always binds to active 10GE port.
- **Daisy-chain mode**: works for daisy-chain topology RPD, that is each RPD is daisy-chained with the next RPD, and the last RPD connects to the CIN.



- 
- Note**
- Daisy-chain mode is the RPD default backhaul mode. If you upgrade RPD from V8.1 or lower version without mode configuration, RPD backhaul will working in daisy-chain mode.
  - To change the RPD backhaul mode, you need to hard-reset the RPD for it to take effect.
- 

For more information, refer to [Link Redundancy Support](#).

#### • Video: Dual Symbol rate support for Annex A and Annex C

In RPD V8.1 and earlier releases, symbol rate on the RPD can only be one type for a particular Annex. Starting from V8.2 release, RPD supports two symbol rates for annex A and Annex C (video only). You can have downstream qam-profile in one symbol rate for one Video Core and downstream qam-profile in another symbol rate for the other Video Core.



- 
- Note**
- For a particular RPD, the qam-profiles provisioned for video should be in the same Annex.
  - Variable symbol rate is not applicable for Annex B.
- 

#### • Support for TLV 63.5, 63.6 and 63.7

RPD V8.2 supports TLV 63.5, 63.6 and 63.7:

- **FirstActiveSubcarrier:** TLV 63.5. This TLV specifies the first active subcarrier of the OFDM channel.
- **LastActiveSubcarrier:** TLV 63.6. This TLV specifies the highest numbered active subcarrier of the OFDM channel.
- **NumActiveSubcarriers:** TLV 63.7. This TLV specifies the number of active data subcarriers of the OFDM channel.

#### • Support for CLI show logging ds-ofdm

RPD V8.2 support **show logging ds-ofdm** command to display downstream OFDM logs, including detailed information about processing and error handling of DS OFDM OCD and DPD messages.

```
R-PHY#show logging ds-ofdm
<22>2020-03-24T08:43:10.387131+00:00 RPD78725DEDA524 INFO
<22>2020-03-24T08:43:10.387145+00:00 RPD78725DEDA524 INFO   +++ Validate docsis msg +++
<22>2020-03-24T08:43:10.387159+00:00 RPD78725DEDA524 INFO   OFDM Docsis Msg
<22>2020-03-24T08:43:10.387187+00:00 RPD78725DEDA524 INFO   c2 00 00 87 c6 0e 01 e0 2f
00 00 01 2c ab eb 27
<22>2020-03-24T08:43:10.387213+00:00 RPD78725DEDA524 INFO   4f 8f 00 75 00 00 03 05 31
00 9f 04 00 01 00 01
<22>2020-03-24T08:43:10.387239+00:00 RPD78725DEDA524 INFO   01 00 02 01 02 03 04 0c 22
b0 80 04 01 10 05 41
<22>2020-03-24T08:43:10.387266+00:00 RPD78725DEDA524 INFO   81 04 79 04 c2 05 0b 05 54
05 9d 05 e6 06 2f 06
<22>2020-03-24T08:43:10.387291+00:00 RPD78725DEDA524 INFO   78 06 c1 07 0a 07 53 07 9c
07 cd 07 d9 07 e4 07
```



```

<22>2020-03-24T08:43:10.387320+00:00 RPD78725DEDA524 INFO  ed 08 12 08 1b 08 26 08 32
08 5d 08 a6 08 ef 09
<22>2020-03-24T08:43:10.387345+00:00 RPD78725DEDA524 INFO  38 09 81 09 ca 0a 13 0a 5c
0a a5 0a ee 0b 37 0b
<22>2020-03-24T08:43:10.387370+00:00 RPD78725DEDA524 INFO  80 05 05 10 00 00 04 53 05
05 10 0b ac 0f ff 05
<22>2020-03-24T08:43:10.387390+00:00 RPD78725DEDA524 INFO  05 14 07 fc 08 03 06 01 00
...

```

## New Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.1

The new software features for Cisco 1x2 / Compact Shelf RPD Software 8.1 release are:

### • RPD Capability TLV Support

RPD V8.1 support following Capability TLVs:

- **DsMaxDocsisScQamChannels:** TLV 50.51.2. This attribute reports the maximum number of downstream DOCSIS SC-QAM channels the RPD can be configured to support on each downstream RF port.
- **DsMaxMultipleScQamPspSessions:** TLV 50.51.3. This attribute reports the maximum number of PSP sessions with more than one SC-QAM channel that the RPD can support per downstream RF port.
- **SupportsReset:** TLV 50.55. This attribute is a bitmask indicating whether the RPD supports SoftReset, NvReset, or FactoryReset as indicated below:
 

The RPD reports '0' for the bit corresponding to a reset type if the RPD does not support the reset type.

The RPD reports '1' for the bit corresponding to a reset type if the RPD supports the reset type.
- **SupportsRedundancy:** TLV 50.56. This attribute is a bit mask indicating whether the RPD supports HandoverToBackup, ConnectionStatus, and/or ReconnectFromCore features as indicated below.
 

The RPD reports '0' for the bit corresponding to a CCAP Core redundancy capability if the RPD does not support the redundancy capability.

The RPD reports '1' for the bit corresponding to a CCAP Core redundancy capability if the RPD supports the redundancy capability.
- **SupportsFdx:** TLV 50.57.1. This attribute reports the RPD's capability to support FDX operation.
 

The RPD reports a value of false(0) if the RPD does not support FDX operation.

The RPD reports a value of true(1) if the RPD supports FDX operation.
- **SupportsZblInsertion:** TLV 50.57.2. This attribute reports the RPD's capability to receive the Zero Bit Loading (ZBL) Insertion message and insert ZBL as directed by the message.
 

The RPD reports a value of false(0) if the RPD does not support ZBL insertion.

The RPD reports a value of true(1) if the RPD supports ZBL insertion.
- **ZblInsMsgLeadTime:** TLV 50.57.3. This attribute reports the minimum lead time required by the RPD to receive the ZBL Insertion message ahead of the starting timestamp.

- **SupportsUsProfileQuery:** TLV 50.58. This attribute reports whether the RPD supports UsScQamProfileQuery (TLV 150) and UsOfdmaConfigQuery (TLV 151) via UsScQamProfileResponse (TLV 152) and UsOfdmaConfigResponse (TLV 153). These TLVs allow the RPD to report various unique upstream burst receiver parameters to the CCAP Core.

The RPD reports a value of false(0) when it does not support the upstream profile query TLVs.

The RPD reports a value of true(1) when it supports the upstream profile query TLVs.

- **Events Support for 66070232 and 66070703**

The RPD V8.1 release provides event support for 66070232 and 66070703. Information on these events is listed in the following table:

Process	Sub-Process	RPD Priority	Event Message	Message Notes and Detail	Error Code Set	Event ID
PTP	Synchronization State	Error	PTP failure to primary; clock IP: <P1>; <TAGS>;	P1 = primary clock IP address	B707.03	66070703
Connectivity	Handover	Error	No backup Core found; Failed Core IP: <P1>; <TAGS>;	P1 = IP address of Failed Core	B702.32	66070232

## Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.4

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.4 release.

## Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.3

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.3 release.

## Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.2

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.2 release.

## Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.1

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.1 release.

## Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.6 release.

## **Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.5**

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.5 release.

## **Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.4**

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.4 release.

## **Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.3**

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.3 release.

## **Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.2**

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.2 release.

## **Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.1**

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 8.1 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.4**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.4 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.3**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.3 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.2**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.2 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.1**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.6.1 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.6**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.6 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.5**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.5 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.4**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.4 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.3**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.3 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.2**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.2 release.

## **Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 8.1**

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 8.1 release.

## **New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.4**

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.6.4 release.

## **New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.3**

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.6.3 release.

## **New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.2**

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.6.2 release.

## **New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.6.1**

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.6.1 release.

## **New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.6**

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.6 release.

## **New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.5**

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.5 release.

## **New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.4**

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.4 release.

## New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.3

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.3 release.

## New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.2

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.2 release.

## New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 8.1

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 8.1 release.

## 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](#).

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the [What's New in Cisco Product Documentation RSS feed](#). The RSS feeds are a free service.

