What's New in Cisco 1x2/Compact Shelf RPD 9.x

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Cisco is continuously enhancing the product with every release and this section covers a brief description of key features and enhancements that were added. It also includes links to detailed documentation, where available.

New Software Features in Cisco 1x2/Compact Shelf RPD Software 9.5

The new software features for Cisco 1x2 / Compact Shelf RPD Software 9.5 release are:

Support for TLV 50.58

Cisco RPD 9.5 supports TLV 50.58 UsProfileQuerySupported. TLV 50.58 value has been changed from 0 to 1. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints
UsProfileQuerySupported	Boolean	50.58	1	R

Support for TLV 71

Cisco RPD 9.5 supports TLV 71 DsRfPortPerf. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints
DsRfPortPerf	Complex TLV	71	variable	R
operStatusDsRfPort	UnsignedByte	71.1	1	R

You can use the **show downstream port status** command to obtain the downstream port status:

```
R-PHY#show downstream port status
Port ID  Port Type Oper Status
0        DS        UP
```

Support for TLV 77

Cisco RPD 9.5 supports TLV 77 UsRfPortPerf. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints
UsRfPortPerf	Complex TLV	77	variable	R
operStatusUsRfPort	UnsignedByte	71.1	1	

You can use the **show upstream port status** command to obtain the upstream port status:

```
R-PHY#show upstream port status
Port ID  Port Type  Oper Status
0        US         UP
1        US         UP
```

Support for TLV 79.1.*, 79.2.*, 79.9, 79.10

Cisco RPD 9.5 supports multiple sub-TLV of TLV 79 UsOfdmaChannelPerf. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints	Comments
UsOfdmaChanLowIucStats	Complex TLV	79	variable		
UsIuc	UnsignedByte	79.1.1	1		IUCs 1, 2, 3
UnicastOpportunities	UnsignedLong	79.1.2	8	R	
UnicastOpNoEnergy	UnsignedLong	79.1.4	8	R	
NumPredecodePass	UnsignedLong	79.1.10	8	R	
NumPostdecodePass	UnsignedLong	79.1.11	8	R	
NumPostdecodeFail	UnsignedLong	79.1.12	8	R	
UsOfdmaChanHiIucStats	Complex TLC	79.2	variable		
UsIuc	UnsignedByte	79.2.1	1		IUCs 4, 5, 6, 9, 10, 11, 12, 13
ScheduledGrants	UnsignedLong	79.2.2	8	R	
NoEnergyBursts	UnsignedLong	79.2.3	8	R	
NumPredecodePass	UnsignedLong	79.2.6	8	R	
NumPostdecodePass	UnsignedByte	79.2.7	8	R	
NumPostdecodeFail	UnsignedLong	79.2.8	8	R	
AverageMer	UnsignedShort	79.2.9		R	
operStatusUsOfdma	UnsignedByte	79.9	2	R	
UcdRefreshStatusOfdma	Complex TLV	79.10	variable		
UcdRefreshRequestOfdma	Boolean	79.10.1	1	R	
UcdRefreshReasonOfdma	String	79.10.2	0..32	R	

Support for TLV 150

Cisco RPD 9.5 supports TLV 150 UsScQamProfileQuery. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints	Comments
UsScQamProfileQuery	Complex TLV	150			
QueryScQamChannelType	UpstreamChanType	150.1	1	R/W	
QueryScQamWidth	UnsignedInt	150.2	4	R/W	

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints	Comments
QueryScQamIuc	Complex TLV	150.3			
QueryScQamCode	UnsignedByte	150.3.1	1	R/W	key
QueryScQamPreambleLen	UnsignedShort	150.3.2	2	R/W	
QueryScQamPreambleModType	PreambleType	150.3.3	1	R/W	
QueryScQamModulationType	UnsignedByte	150.3.4	1	R/W	
QueryScQamGuardTime	UnsignedByte	150.3.5	1	R/W	
QueryScQamValid	UnsignedByte	150.3.6	1	R/W	

You can use the **show upstream scqam-profile query** command to obtain the upstream scqam-profile query configuration:

```
R-PHY#show upstream scqam-profile query
Channel-type:  TDMA
Width:  200000
Code  Valid  ModType  PreMod  PreLen  GuardTime
1     Yes    qam16    QPSK1   0       0
2     Yes    qpsk     QPSK0   0       0
3     No     qpsk     QPSK0   0       0
4     No     qpsk     QPSK0   0       0
5     No     qpsk     QPSK0   0       0
6     No     qpsk     QPSK0   0       0
7     No     qpsk     QPSK0   0       0
8     No     qpsk     QPSK0   0       0
9     No     qpsk     QPSK0   0       0
10    No     qpsk     QPSK0   0       0
11    No     qpsk     QPSK0   0       0
12    No     qpsk     QPSK0   0       0
13    No     qpsk     QPSK0   0       0
14    No     qpsk     QPSK0   0       0
```

Support for TLV 151

Cisco RPD 9.5 supports TLV 151 UsScQamProfileResponse. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints	Comments
UsScQamProfileResponse	Complex TLV	151			
ResponseScQamPreambleString	HexBinary	151.1	variable	R	
ResponseScQamIuc	Complex TLV	151.2			
ResponseScQamCode	UnsignedByte	151.2.1	1	R	key
ResponseScQamPreambleLen	UnsignedShort	151.2.2	2	R	key

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints	Comments
ResponseScQamPreambleOffset	UnsignedShort	151.2.3	2	R	
ResponseScQamPreambleModType	PreambleType	151.2.4	1	R	
ResponseScQamScramblerSeed	UnsignedShort	151.2.5	2	R	
ResponseScQamGuardTime	UnsignedByte	151.2.6	1	R	

You can use the **show upstream scqam-profile response** command to obtain the upstream scqam-profile response:

```
R-PHY#show upstream scqam-profile response
PreambleString:03f02833ebf02833ebf02833ebf02833ebf1642892a9974767da0417bbc2758f36ff5739350dc1871988d3d22b603f296b0df3dec0ed
f3dec0edf3dec0edf3dec0edf1642892a9974767da0417bbc2758f36ff5739350dc1871988d3d22b603f296b0000000000000000000000000000000000000
000000000000000000000000000
Code    PreLen  PreMod  PreOffset   ScrSeed   GuardTime
1       36      QPSK1   396         338       8
2       0       QPSK0   8           338       8
```

Read function support

RPD 9.5 supports below TLVs readcount, read by index, read by leaf, including:

- TLV40 RpdCtrl
- TLV41 UsSpectrumCapture
- TLV50 RpdCapabilities
- TLV71 DsRfPortPerf
- TLV77 UsRfPortPerf
- TLV79 UsOfdmaChannelPerf
- TLV150 UsScQamProfileQuery
- TLV151 UsScQamProfileResponse

RPD 9.5 supports below TLVs read by index, including:

- TLV91 DsOob55d1
- TLV92 UsOob55d1
- TLV94 NdfConfig
- TLV95 NdrConfig

The CCAP Core can select, for a read request, a Singleton TLV representing a portion of the tree in the hierarchy, down to a leaf. For example, the CCAP Core can issue a read request for UsScQamProfileQuery.QueryScQamChannelType (TLV 150.1), and, as the result, the RPD needs to return just this one leaf sub-TLV value.

The CCAP Core can also select, for a read request, a Singleton TLV representing a portion of the tree in the hierarchy, by index. For example, the CCAP Core can issue a read request for index UsScQamProfileQuery. QueryScQamIuc .QueryScQamCode (TLV 150.3.1), and, as the result, the RPD needs to return the object with this index.

A top-level "ReadCount" (TLV 26) is defined to specify how many instances (i.e., index sets) of the ROT are to be returned in a read response, beginning with the starting index set. For example, uses ReadCount(26) TLV to read the first three objects from the Array ROT UsScQamProfileQuery. QueryScQamIuc (150.3), ReadCount is 3, and the starting index is "QueryScQamCode": 3, and the existing objects is indexed from 1 to 14. The read response will include three objects with index "QueryScQamCode": 3,"QueryScQamCode": 4, "QueryScQamCode": 5.

Note   For detail information, go through the *Reading of Interface and Array ROTs* section in the document *Data-Over-Cable Service Interface Specifications, CM-SP-R-PHY*.

New Software Features in Cisco 1x2/Compact Shelf RPD Software 9.4

The following new software features are available in Cisco 1x2 / Compact Shelf RPD 9.4.

Support for TLV 86.2, 86.3, 86.15, 86.16, 86.17, and 86.18

Cisco RPD 9.4 supports multiple sub-TLVs of the TLV 86 GeneralNotification. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints
RpdRedirectResult	UnsignedByte	86.2	1	R
RpdRedirectIpAddress	IpAddress	86.3	4 or 16	R
SsdFailureType	UnsignedInt	86.15	4	R
RpdIpAddress	IpAddress	86.16	4 or 16	R
EnetPortIndex	UnsignedByte	86.17	1	R
AddressValid	UnsignedByte	86.18	1	R

Support for TLV65.10

Cisco RPD 9.4 supports TLV 65.10 IntervalUsageCode. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints
IntervalUsageCode	Complex TLV	65.10		

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints
Code	UnsignedByte	65.10.1	1	1..14
DifferentialEncoding	Boolean	65.10.2	1	R
FecErrorCorrectionT	UnsignedByte	65.10.3	1	R
FecCodewordLength	UnsignedByte	65.10.4	1	R
PreambleLen	UnsignedShort	65.10.5	2	R
PreambleOffsett	UnsignedShort	65.10.6	2	R
PreambleModType	PreambleType	65.10.7	1	R
Scrambler	Boolean	65.10.8	1	R
ScrambleSeed	UnsignedShort	65.10.9	2	R
MaxBurstSize	UnsignedByte	65.10.10	1	R
LasCodewordShortened	Boolean	65.10.11	1	R
ByteInterleaverDepth	UnsignedByte	65.10.12	1	R
ByteInterleaverBlockSize	UnsignedShort	65.10.13	2	R
ModulationType	UnsignedByte	65.10.14	1	R
GuardTime	UnsignedByte	65.10.15	1	R

Support for TLV 100.6.11

Cisco RPD 9.4 supports TLV 100.6.11 SerialNum. For details, see the following table:

Attribute/TLV Name	Object Type	TLV Type	TLV Value Field Length	Constraints
SerialNum	AdminString	100.6.11	0..255	R

New Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.3

The following new software feature is available in Cisco 1x2 / Compact Shelf RPD 9.3:

TLV 64 DsOfdmProfile support

RPD 9.3 supports TLV 64 DsOfdmProfile, including:

- **ProfileId TLV64.1**: The ProfileID TLV selects a profile ID of the downstream OFDM channel.

- **DsOfdmSubcarrierModulation TLV64.2**: This TLV specifies modulation level for a range of data subcarriers for a particular profile.

- **StartSubcarrierId TLV64.2.1**: This TLV specifies the first subcarrier ID in a subcarrier range or subcarrier IDs.

- **EndSubcarrierId TLV64.2.2**: This TLV specifies the last subcarrier ID in a range of subcarrier IDs.

- **Modulation TLV64.2.3**: This TLV describes the modulation level assigned to a range of data subcarriers.

New Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.2

The following new software features are available in Cisco 1x2 / Compact Shelf RPD 9.2:

Compact Shelf Chassis Serial Number Support

You can get the Compact Shelf Chassis Serial Number through Cisco RPD or Cisco cBR-8 CLI.

Note   You can obtain the Compact Shelf Chassis serial number only from the primary RPD in the Compact Shelf Group.

Run the following commands to get the Compact Shelf Chassis serial number:

- RPD CLI: `show group environment eeprom-psio`

  Example

  ```
  R-PHY#show group environment eeprom-psio
  Eeprom format version: 04
  …
  System MAC Address - Type: C3
  System MAC Address - Length: 06
  System MAC Address: 00:04:9f:30:a0:78
  System MAC Address Block Size - Type: 43
  System MAC Address Block Size: 00 05 FF FF
  Chassis Serial Number - Type Field: C2
  Chassis Serial Number - Length Field: 8B
  Chassis Serial Number: CAT2223E15D
  ```

  Cisco cBR-8 CLI: `show cable rpd group eeprom-psio`

  Example

  ```
  cBR-8#show cable rpd group eeprom-psio
  ---------- Group Id 0004.9f30.a078 -----------
  Eeprom format version: 04
  …
  System MAC Address - Type: C3
  System MAC Address - Length: 06
  System MAC Address: 00:04:9f:30:a0:78
  System MAC Address Block Size - Type: 43
  System MAC Address Block Size: 00 05 FF FF
  Chassis Serial Number - Type Field: C2
  ```

```
Chassis Serial Number - Length Field: 8B
Chassis Serial Number: CAT2223E15D
```

TLV 78.4 LateMaps and TLV 78.5 IllegalMaps Support

LateMaps This attribute allows the CCAP Core to read the number of late MAP messages for the selected channel.

IllegalMaps: This attribute allows the CCAP Core to read the number of MAP messages with detected errors, other than the late errors, for a selected channel.

Note   Based on the CableLabs specification, the unit must be `packets`, but due to an RPD limitation, the unit is called as the `minislot`.

New Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.1

There following new software features are available in Cisco 1x2 / Compact Shelf RPD 9.1:

Supports Sub TLVs in PtpPortMasterClockStatus-TLV 100.24.4.6

Cisco RPD supports the following sub TLVs under PtpPortMasterClockStatus-TLV 100.24.4.6:

Attribute Name	Type	Access	Type Constraints	TLV Type	TLV Value Field Length
GmClockIdentity	HexBinary	Read-only	SIZE(8)	100.24.4.6.12	8
GmPriority1	UnsignedByte	Read-only		100.24.4.6.13	1
GmPriority2	UnsignedByte	Read-only		100.24.4.6.14	1
GMQualityClass	UnsignedByte	Read-only	Table 5 in [IEEE 1588]	100.24.4.6.15	1
GMQualityAccuracy	UnsignedByte	Read-only	Table 5 in [IEEE 1588]	100.24.4.6.16	1
GMQualityOffset	UnsignedShort	Read-only		100.24.4.6.17	2
GmStepsRemoved	UnsignedInt	Read-only		100.24.4.6.18	4

Supports TLV100.4 DiagnosticStatus

Supports the following sub TLVs under DiagnosticStatus -TLV 100.4. Currently, RPD supports CPU and memory utilization diagnostics.

Attribute Name	Type	Access	Units	TLV Type	TLV Value Field Length
ProbableCause	AdminString	Read-only	N/A	100.4.1	0..255
AdditionalText	AdminString	Read-only	N/A	100.4.2	0..255
SeverityLevel	EvPriorityType	Read-only	N/A	100.4.3	1

New Hardware Features in Cisco 1x2/Compact Shelf RPD Software 9.5

There are no new hardware features for Cisco 1x2/Compact Shelf RPD Software 9.5 release.

New Hardware Features in Cisco 1x2/Compact Shelf RPD Software 9.4

There are no new hardware features for Cisco 1x2/Compact Shelf RPD Software 9.4 release.

New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 9.3

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 9.3 release.

New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 9.2

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 9.2 release.

New Hardware Features in Cisco 1x2 / Compact Shelf RPD Software 9.1

There are no new hardware features for Cisco 1x2 / Compact Shelf RPD Software 9.1 release.

Behaviour Changes Introduced Features

Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.5

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 9.5 release.

Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.4

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 9.4 release.

Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.3

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 9.3 release.

Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.2

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 9.2 release.

Modified Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.1

There are no modified software features for Cisco 1x2 / Compact Shelf RPD Software 9.1 release.

Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.5

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 9.5 release.

Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.4

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 9.4 release.

Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.3

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 9.3 release.

Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.2

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 9.2 release.

Integrated Software Features in Cisco 1x2 / Compact Shelf RPD Software 9.1

There are no new integrated software features for Cisco 1x2 / Compact Shelf RPD Software 9.1 release.