Introduction

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Cisco Remote-PHY Solution

Cisco Remote-PHY (a.k.a REMOTE-PHY) enables cable operators to deploy DOCSIS-based networks over digital fiber while obtaining all of the benefits of using standards-based equipments. These benefits include the utilization of scalable, cheap and easy to operate digital fiber, standardized and proven QoS for various services, lower cost, and wide availability of both cable modem and set-top box systems. Furthermore, with deep fiber, the optical noise contribution to SNR is eliminated. As a result, the remote QAM modulator runs at higher orders of modulation as compared to a centralized QAM modulator.

Cisco Coaxial Media Converter

Cisco Coaxial Media Converter (CMC) acts as the edge QAM in the Cisco Remote-PHY architecture. It is located between the Cisco CMTS and the cable modem, and controlled by the Cisco CMTS router. Cisco CMC has network interfaces on one side connecting to the fiber (digital and linear) portion of the Hybrid Fiber Coaxial (HFC) plant, and RF interfaces on the other side connecting to the coaxial portion of the HFC plant. Cisco CMC terminates the Ethernet Passive Optical Network EPON protocol with an embedded Optical Network Unit (ONU) and originates the DOCSIS protocol using DOCSIS MAC and PHY layer technology found in Cisco CMTS.

Cisco CMC uses the Linux operating system. Most of the Cisco CMC configurations are performed on the Cisco CMTS router.

This chapter includes the following sections:

System Requirements

These sections describe the system requirements for Cisco CMC:

Memory Requirements

This section describes the memory requirements for Cisco CMC.

Table 1: Memory Recommendations for the Cisco Coaxial Media Converter, on page 2 displays the memory recommendations for the Cisco Remote-PHY solution with Cisco CMC.

Table 1: Memory Recommendations for the Cisco Coaxial Media Converter

Feature Set	Route Processor	Software Image	RecommendedFlash Memory[1]	RecommendedDRAM Memory[2]	RunsFrom
Coaxial Media Converter	None	cmc-16x4-os-1.0.bin	96 MB	256 MB	RAM

[1] Recommended FLASH Memory refers to bootflash memory.

[2] DRAM memory is not configurable on the Cisco uBR10012 router.

Hardware Supported

The section lists the hardware supported on Cisco CMC.

List of Hardware Components Supported on Cisco CMC

The table lists the components supported on the Cisco CMC.

Table 2: Components and Part Numbers

Component	PID
Coaxial Media Converter (CMC)	
RPHY CMC,60V,6DS 4US Ch,42/54MHZ	CMC-L-L-16X4
RPHY CMC,60V,16DS 4US Ch,65/87MHZ	CMC-L-M-16x4
RPHY CMC,60V,16DS 4US Ch,42/54MHZ,w/Node	CMC-L-L-16X4-N
RPHY CMC,60V,16DS 4US Ch,65/87MHZ,w/Node	CMC-L-M-16x4-N

Component	PID
RPHY CMC,110/220V,16DS 4US Ch,42/54MHZ,US PowCord	CMC-M-L-16X4-US
RPHY CMC,110/220V,16DS 4US Ch,42/54MHZ,JP PowCord	CMC-M-L-16X4-JP
RPHY CMC,110/220V,16DS 4US Ch,42/54MHZ,EU PowCord	CMC-M-L-16X4-EU
RPHY CMC,110/220V,16DS 4US Ch,42/54MHZ,UK PowCord	CMC-M-L-16X4-UK
RPHY CMC,110/220V,16DS 4US Ch,42/54MHZ,India PowCord	CMC-M-L-16X4-ID
RPHY CMC,110/220V,16DS 4US Ch,65/87MHZ,CH PowCord	CMC-M-M-16x4-CH
RPHY CMC,110/220V,16DS 4US Ch,65/87MHZ,JP PowCord	CMC-M-M-16x4-JP
RPHY CMC,110/220V,16DS 4US Ch,65/87MHZ,US PowCord	CMC-M-M-16x4-US
RPHY CMC,110/220V,16DS 4US Ch,65/87MHZ,EU PowCord	CMC-M-M-16x4-EU
RPHY CMC,110/220V,16DS 4US Ch,65/87MHZ,UK PowCord	CMC-M-M-16x4-UK
RPHY CMC,110/220V,16DS 4US Ch,65/87MHZ,AU PowCord	CMC-M-M-16x4-AU
RPHY CMC,110/220V,16DS 4US Ch,42/54,US PowCord,w/Node	CMC-M-L-16X4-USN
RPHY CMC,110/220V,16DS 4US Ch,42/54,EU PowCord,w/Node	CMC-M-L-16X4-EUN
RPHY CMC,110/220V,16DS 4US Ch,42/54,JP PowCord,w/Node	CMC-M-L-16X4-JPN
RPHY CMC,110/220V,16DS 4US Ch,42/54,UK PowCord,w/Node	CMC-M-L-16X4-UKN
RPHY CMC,110/220V,16DS 4US Ch,42/54,ID PowCord,w/Node	CMC-M-L-16X4-IDN
RPHY CMC,110/220V,16DS 4US Ch,65/87,CH PowCord,w/Node	CMC-M-M-16x4-CHN
RPHY CMC,110/220V,16DS 4US Ch,65/87,JP PowCord,w/Node	CMC-M-M-16x4-JPN
RPHY CMC,110/220V,16DS 4US Ch,65/87,US PowCord,w/Node	CMC-M-M-16x4-USN
RPHY CMC,110/220V,16DS 4US Ch,65/87,EU PowCord,w/Node	CMC-M-M-16x4-EUN
RPHY CMC,110/220V,16DS 4US Ch,65/87,UK PowCord,w/Node	CMC-M-M-16x4-UKN

The section lists the hardware supported on Cisco CMC.

Component	PID
RPHY CMC,110/220V,16DS 4US Ch,65/87,AU PowCord,w/Node	CMC-M-M-16x4-AUN
RPHY CMC,110/220V,16DS 4US Ch,65/87,ID PowCord,w/Node	CMC-M-M-16x4-IDN
EPON SFP ONU for CMC	
EPON ONU, SFP type, GE throughput, Industrial Grade	SFP-EPON-ONU-GE
Forward Rx for CMC	
Optical Forward Receiver, 1GHz, 50dBmV, 9 dB tilt, w/ SC/APC, w/ AGC, spare	FRX-1G-RF50-T9=
SFP Optics for CMC	
1000Mbps Multi-Mode Rugged SFP	GLC-SX-MM-RGD
1000Mbps Single Mode Rugged SFP	GLC-LX-SM-RGD
1000BASE-ZX Single Mode Rugged SFP	GLC-ZX-SM-RGD
1 GHz Forward Linear EQs	
0 dB	4007228
1.5 dB	4008778
3.0 dB	4008779
4.5 dB	4008780
6.0d B	4008781
7.5 dB	4008782
9.0 dB	4008783
10.5 dB	4008784
12.0 dB	4008785
13.5 dB	4008786
15.0 dB	4008787
16.5 dB	4009258

Component	PID
18.0 dB	4009259
19.5 dB	4009260
21.0 dB	4009261
1 GHz Attenuator Pads	
0 dB	589693
0.5 dB	589694
1.0 dB	589695
1.5 dB	589696
2.0 dB	589697
2.5 dB	589698
3.0 dB	589699
3.5 dB	589700
4.0 dB	589701
4.5 dB	589702
5.0 dB	589703
5.5 dB	589704
6.0 d B	589705
6.5 dB	589706
7.0 dB	589707
7.5 dB	589708
8.0 dB	589709
8.5 dB	589710
9.0 dB	589711
9.5 dB	589712

The section lists the hardware supported on Cisco CMC.

Component	PID
10.0 dB	589713
10.5 dB	589714
11.0 dB	589715
11.5 dB	589716
12.0 dB	589717
12.5 dB	589718
13.0 dB	589719
13.5 dB	589720
EQ Jumper	
Node Signal Director Jumper	4011907
RJ45 Water Proof Connector	
Cable Gland for RJ45, PG16, 1 hole	GLND-PG16-RJ-1H
Cable Gland for RJ45, PG16, 2 holes	GLND-PG16-RJ-2H
Port Plug	
Port Plug w/o-ring 5/8" Brass Nickel Plate	PLUG-CMC-RF=
RF Connectors	
Assy, F-CONN, 5/8", Metric	FCONTOR-CMC-RF-M=
Assy, F-CONN, 5/8", Standard	FCONTOR-CMC-RF-S=
Shunt	
FABPLSTC, Jumper, 0.8"C, Remote-PHY	JUMPER-CMC=
Console Cable	
CMC Console cable, Converter between DB9 and PCB	CAB-CONSOLE-DB9=

Verifying the Software Version

To determine the version of the Cisco CMC OS running on your Cisco CMC, open the Cisco CMC lid and connect the console cable from the computer to the Cisco CMC console port and log in to the Cisco CMC console using telnet. Enter the **show system** command in the normal (>) mode to display the basic system information of the Cisco CMC:

```
CMC> show system
PID                      : DOCSIS-CMC-4P-FN
SN                       : CSJ13152101
MAC                      : 00:02:3d:fe:fe:01
new image                : 1.2(Feb 26 18:49:41 CST 2015)
old image                : T1.1(Sep 11 11:54:06 CST 2014)
running version          : 1.2(Feb 26 18:49:41 CST 2015)
new image location       : bank 1
boot error indication    : NO
remaining reboot count   : 2
rommon version           : 0.0.10
FRx Version              : N/A
CMC reset reason         : System cannot obtain IP address from DHCP server
```

Upgrading to a New Software Release

For information about upgrading the Cisco CMC, see the *Upgrading the Cisco CMC Image* section in the *Cisco Remote-PHY Solution Installation and Configuration Guide* document at the following location:

http://www.cisco.com/c/en/us/td/docs/cable/RemotePhy/InstallConfig/guide/b-remotePHY-install-config-guide.html

New and Changed Information

The following sections list the new and modified hardware and software features:

New Hardware Features in Cisco CMC OS 1.2

Table 3: List of Qualified Cisco SFPs for Cisco CMC 1.2

PID	MPN	Vendor	Distance	Temperature Range
GLC-BX-U	PTB3370553CN0CS1	NEOPHOTONICS CORPORATION	10 km	0-70° C
GLC-SX-MM-RGD	AFBR-5715APZ-CS4	AVAGO	550 m	-40-85°C
	FTLF8519P3BTL-CD	FINISAR	550 m	-40-85°C
GLC-LX-SM-RGD	FTLF1318P3BTL-CD	FINISAR	10 km	-40-85°C
	SCP6G44-C8-BWE	SUMITOMO EDI	10 km	-40-85°C
GLC-EX-SMD	SCP6J54-C8-BMH	SUMITOMO EDI	40 km	-5-85°C

PID	MPN	Vendor	Distance	Temperature Range
GLC-ZX-SM-RGD	SCP6G94-C8-BWE	SUMITOMO EDI	80 km	-40-85°C

New Hardware Features in Cisco CMC OS 1.1

There are no new hardware features in Cisco CMC OS 1.1.

New Hardware Features in Cisco CMC OS 1.0

This section describes the new hardware features in the Cisco CMC OS 1.0.

Cisco Coaxial Media Converter

The Cisco Coaxial Media Converter (CMC) is introduced for the Cisco Remote-PHY solution. Cisco CMC acts as the edge QAM (EQAM) in the Cisco Remote-PHY architecture.

For more information, see the following documents:

- Cisco Remote-PHY Solution Installation and Configuration Guide
- Cisco Coaxial Media Converter Command Reference
- Regulatory Compliance and Safety Information for Cisco Coaxial Media Converter
- Installing the Cisco Coaxial Media Converter

Modified Hardware Features in Cisco CMC OS 1.1

There are no modified hardware features in Cisco CMC OS 1.1.

Modified Hardware Features in Cisco CMC OS 1.0

There are no modified hardware features in Cisco CMC OS 1.0.

New Software Features in Cisco CMC OS 1.2

There are no new software features in Cisco CMC OS 1.2

New Software Features in Cisco CMC OS 1.1

There are no new software features in Cisco CMC OS 1.1.

New Software Features in Cisco CMC OS 1.0

This section describes new software features in Cisco CMC OS 1.0.

DHCP Client

DHCP is a dynamic IP address assignment protocol. The Cisco CMC OS 1.0 gets IP address from remote DHCP server and new firmware data paths using this feature.

GCP Client

GCP (generic control protocol) is a control protocol between the Cisco CMTS and the Cisco CMC. The Cisco CMC OS 1.0 receives GCP packets for commands and configurations from the Cisco CMTS and properly acknowledges itself as a GCP client.

Telnet and SSH

The Cisco CMTS uses Telnet and secure Shell (SSH) to access the Cisco CMC remotely.

TFTP and FTP

Cisco CMC OS 1.0 uses TFTP and FTP to download files for upgrading the CMC OS.

Modified Software Features in Cisco CMC OS 1.1

There are no modified software features in Cisco CMC OS 1.1.

Modified Software Features in Cisco CMC OS 1.0

There are no modified software features in Cisco CMC OS 1.0.

Features Integrated in Cisco CMC OS 1.1

There are no integrated features in Cisco CMC OS 1.1.

Features Integrated in Cisco CMC OS 1.0

There are no integrated features in Cisco CMC OS 1.0.

MIBs

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

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

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

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

New and Changed MIB Information in Cisco CMC OS 1.1

There are no new or modified MIBs in Cisco CMC OS 1.1.

New and Changed MIB Information in Cisco CMC OS 1.0

The following new MIBs are introduced for Cisco CMC OS 1.0:

- CISCO-CDOC-CHGRP-MIB

- CISCO-CMC-MGR-MIB

Limitations and Restrictions

Cisco CMC OS 1.0

While upgrading the software images for the Cisco Remote-PHY solution, upgrade the Cisco CMC first, and then upgrade the Cisco CMTS.

Note   If the Cisco CMTS is upgraded before the Cisco CMC, the Cisco CMC may not come online.

Unsupported Hardware

For a list of unsupported hardware, see the End-of-Life and End-of-Sale Notices at:

http://www.cisco.com/en/US/products/hw/cable/ps2209/prod_eol_notices_list.html

Important Notes

Cisco CMC OS 1.1

The output of the **show hardware** command was modified to display the following information:

- Vendor CPN

- Vendor VID

- Vendor PID

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation* , which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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