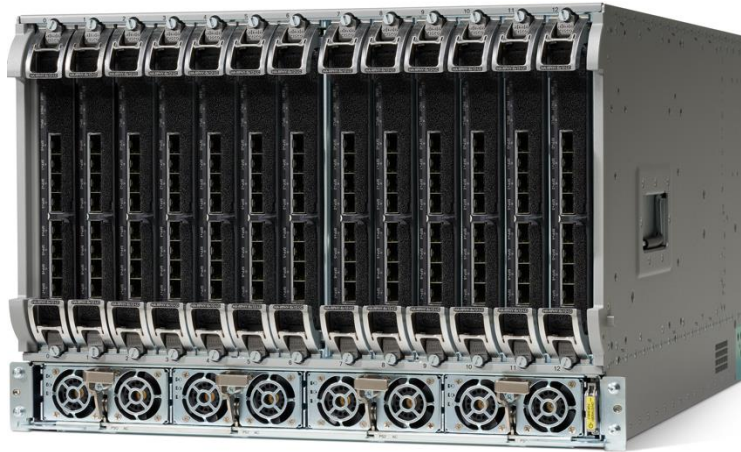# Cisco Remote PHY Shelf 7200

Product description

As an extension of the Modular Headend Architecture (MHA), MHA version 2 splits Cable Modem Termination System (CMTS) functions so that Converged Cable Access Platform (CCAP) core and physical-layer functions can run separately, and in different locations. CCAP core routing can run out of larger hubs, or even cloud CMTS instances in a data center, while Quadrature Amplitude Modulation (QAM) and Orthogonal Frequency-Division Multiplexing (OFDM) modulation are pushed out to remote PHY shelves located in hubs or remote PHY nodes near the subscribers.

Remote PHY is the product of cable operators asking the industry to help them overcome the limitations of analog fiber and break through the Hybrid-Fiber-Coaxial (HFC) bottleneck. In its most basic form, Remote PHY unlocks major bandwidth increases in existing access networks. But it also enables fiber-deep architectures that push digital fiber out much closer to homes. Ultimately, Remote PHY helps cable operators deliver capacity and multiple Gigabit service tiers on parity with any pure-fiber competitor, at a fraction of the cost of ripping and replacing the existing HFC plant.

The Cisco® Remote PHY Shelf 7200 enables service providers to deploy cBR-8 CCAP services to medium-to-large hubs in a cost-effective manner while preparing their networks for future cloud CMTS. This 7-Rack-Unit (RU) Remote PHY shelf works in conjunction with a CCAP core (either physical or virtual) to create a distributed CMTS architecture. It provides cable operators with unprecedented port density and power efficiency in a redundant way.

With Cisco Remote PHY Shelves, you can deploy fewer sophisticated CCAP routing platforms, connected to many smaller-footprint, less expensive shelves. You don't have to run a large number of full-featured I-CMTS platforms at every hub, consuming huge amounts of space and power as you scale, and requiring advanced onsite expertise to deploy and maintain. You can consolidate CCAP core functions in headends or data centers and leverage existing IP technologies and deploy DOCSIS PHY in remote fields over digital fiber to enable two-way broadband service over cable.

The Cisco Remote PHY Shelf 7200 has been integrated with the Cisco Smart PHY deployment automation software. Cisco Smart PHY deployment automation software is a micro-service-based software tool that enables full automation for provisioning, configuration, and maintenance of standards based on Remote PHY Devices (RPD), shelves, and Cisco CCAP cores. Figure 1 displays the MHAv2 reference architecture.

Figure 1.   MHAv2 reference architecture
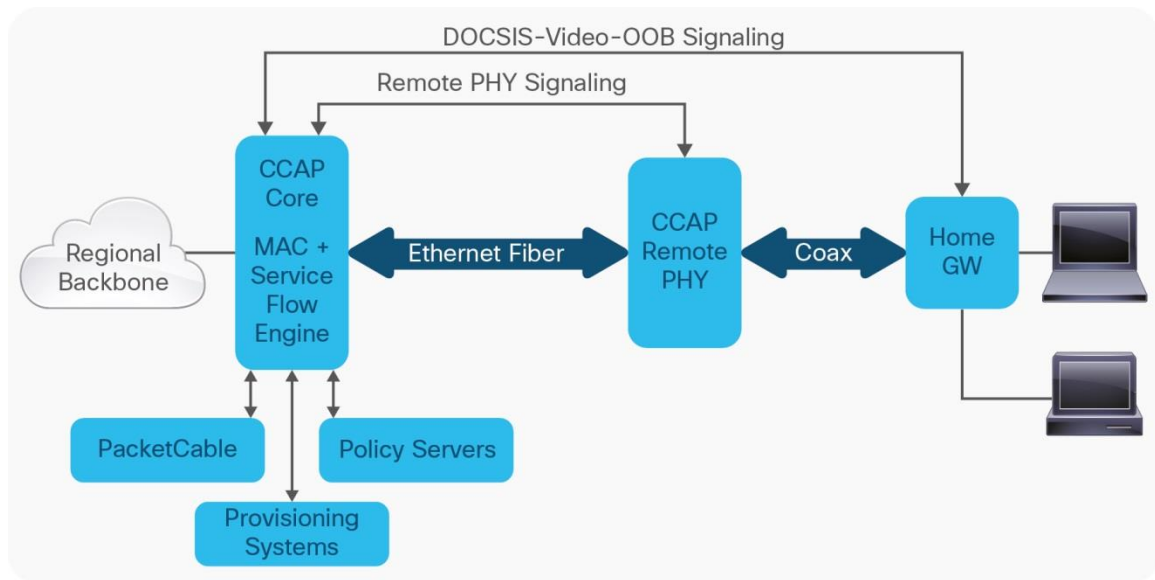
Features and benefits

The Cisco Remote PHY Shelf 7200 offers the following features and benefits:

- High port density and power efficiency
- High availability - RPD line card redundancy, power entry modules redundancy, and fan modules redundancy
- Up to 13 RPD line cards (configured as 12+1 redundant); each contains six 1x2 RPD modules
- Support link redundancy on each RPD line card
- Facilitation of hub site consolidation to reduce costs, including capital and operational expenditures
- Future-proof architecture that is easy to migrate as the hardware and control functions are decoupled and deployed in different locations
- Remote PHY compliance, which paves the way for cloud-native CMTS
- DOCSIS3.1 compliance
- Spectrum management (FFT) support

Table 1 lists the features of the Cisco Remote PHY shelf 7200. Table 2 lists the product's specifications.

Table 1. Features

Remote PHY Shelf 7200	72 Service Groups (12+1 redundancy)
RPD line card downstream / upstream configurations	6 x 12 (downstream x upstream)
Downstream capacity (54 MHz - 1.218 GHz)	160 narrowcast QAMs or six OFDM 192-MHz Orthogonal Frequency-Division Multiplexing (OFDM) blocks per port
Upstream capacity (5MHz - 204 MHz)	12 upstream channels per port or 2 OFDMA blocks (96 MHz) per port
Channel assignment	Flexibility QAM channel frequency placement
Video	Broadcast, VOD, and SDV
Video encryption	PowerKEY VPME and DVB (future)
CIN connectivity (each RPD line card) and link redundancy	8 SFP+ interfaces, which can be configured as: 4 + 4 mode (1+1 redundant) 6 + 2 mode (2 ports protect 6 ports)
Fans	5 (4+1 redundant) modular field-replaceable fan modules
Operation and maintenance	Upstream monitoring Supported by Cisco Smart PHY RPD deployment automation application

Table 2. Specifications

Description	Specification
Designed to be compliant with Cablelabs Remote Phy specifications	• CM-SP-R-PHY-I06-170111 Remote PHY Specification • CM-SP-R-DEPI-I06-170111 Remote Downstream External PHY Interface Specification • CM-SP-R-UEPI-I05-170111 Remote Upstream External PHY Interface Specification • CM-SP-GCP-I02-160512 Generic Control Plane Specification • CM-SP-R-DTI-I04-170111 Remote DOCSIS Timing Interface Specification • CM-SP-R-OOB-I05-170111 Remote Out-of-Band Specification • CM-SP-R-OSSI-I05-170111 Remote PHY OSS Interface Specification • CM-SP-DRFI-I16-170111
Power requirements	
Redundant power supply	
Power input	**AC power:** 2+2 redundancy; input: 200-240V; 16A max; 50/60 Hz **DC power:** 2+2 redundancy; input: -40 to -72V; 60A max
Power consumption	4200W (maximum, facility power)
Environmental specifications	
Operating temperature range	32° to 104°F (0° to 40°C) nominal 32° to 122°F (0° to 50°C) short-term
Operating humidity range	5 to 85% (non-condensing) 5 to 90% (short-term)
Operating altitude	-60 to 4000 m
Storage temperature	-40° to 158ºF (-40° to 70ºC)

Description	Specification
Mechanical specifications	
Dimensions	Height: 7 RU 12.25 in (31.12 cm)
	Width: 17.45 in (44.32 cm) without rack mounts installed; 17.65 in (44.83 cm) with rack mounts installed
	Depth: 27.83 in (70.69 cm) excluding cables
Weight	226 lbs (102.5 Kg): Fully configured shelf with DC PEM
RF connectors	MCX RF connector

Optical Small Form-Factor Pluggable Plus (SFP+) options

Table 3. Optical SFP+ module options

SFP-10G-SR=
SFP-10G-LR=
SFP-10G-ER=
SFP-10G-ZR=

Ordering information

PID	Description
HA-RPHY	Container (Top Level) PID for configuring the RPHY HA shelf
HA-RPHY-6X12-LC	RPD Line Card for Remote PHY Shelf 7200
HA-RPHY-CHASSIS	Cisco Remote PHY Shelf 7200 Chassis
HA-RPHY-FAN-MOD	Fan Module for Remote PHY Shelf 7200
HA-RPHY-FAN-TRAY	Fan Tray for Remote PHY Shelf 7200
HA-RPHY-PIC	RF-PIC for RPHY RPD Line card
HA-RPHY-AC-SHLF	AC Power Shelf for Remote PHY Shelf 7200
HA-RPHY-DC-SHLF	DC Power Shelf for Remote PHY Shelf 7200
HA-RPHY-LC-BLANK	RPD Line Card Blank for Remote PHY Shelf 7200
CBR-AC-PS	AC Power Supply for the cBR - CCAP Router
CBR-DC-PS	DC Power Supply for the cBR - CCAP Router
HA-RPHY-CBLMG-KIT	Rear cable management kit for Remote PHY Shelf 7200
HA-RPHY-OCMG-KIT	Front optical cable management kit for Remote PHY Shelf 7200
HA-RPHY-PS-BLANK	Power supply blank for HA shelf
HA-RPHY-ACC-KIT	Accessory kit for Remote PHY Shelf 7200
HA-RPHY-CABLE-RF	RF cable for Remote PHY Shelf 7200
PWR-CAB-AC-EU	Power Cord for AC V2 Power Module (Europe)
PWR-CAB-AC-BLK	Power Cord, 20A, C20-C21, BLK
PWR-CAB-AC-ISRL	Power Cord for AC V2 Power Module (Israel)
PWR-CAB-AC-SUI	Power Cord for AC V2 Power Module (Swiss)
PWR-CAB-AC-AUS	Power Cord for AC V2 Power Module (Australia)
PWR-CAB-AC-ITA	Power Cord for AC V2 Power Module (Italy)
PWR-CAB-AC-USA	Power Cord for AC V2 Power Module (USA)
PWR-CAB-AC-UK	Power Cord for AC V2 Power Module (UK)

PID	Description
PWR-CAB-AC-CHN	Power Cord for AC V2 Power Module (China)
PWR-CAB-AC-SA	Power Cord for AC V2 Power Module (South Africa)
PWR-CAB-AC-ARG	Power Cord for AC Power Module (Argentina)
PWR-CAB-AC-BRA	Power Cord for AC V2 Power Module (Brazil)
PWR-CAB-AC-JPN	Power Cord for AC V2 Power Module (Japan)

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