

Cable DOCSIS 1.1 FAQ

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Questions

Introduction

What version of IOS supports DOCSIS 1.1 on the Cable Modem Termination System (CMTS)?

Which hardware platforms support DOCSIS 1.1?

What are the major differences between DOCSIS 1.0 and DOCSIS 1.1?

What are the new software features in DOCSIS 1.1?

Are there any new Management Information Bases (MIB) supported on DOCSIS 1.1?

Is Telco–Return supported on Cisco IOS Version 12.2(4)BC1?

Can I use the standard DOCSIS Central Processing Element (CPE) Configurator tool to create and maintain DOCSIS configuration files that support DOCSIS 1.1 features?

Can DOCSIS 1.0 compliant cable modems work in a DOCSIS 1.1 environment?

Related Information

Introduction

This document contains frequently asked questions (FAQ) about Data Over Cable System Interface Specification (DOCSIS) 1.1.

Q. What version of IOS supports DOCSIS 1.1 on the Cable Modem Termination System (CMTS)?

A. Cisco released 12.2(4)BC1 as ED release that supports DOCSIS 1.1. Prior to 12.2(4)BC1, Cisco IOS® software Release 12.1(4)CX, 12.1(7)CX and 12.1(7)CX2 were available with restrictions.

The use or deployment of the CX release in any production environment is very limited. You are advised to upgrade to 12.2(4)BC1. The maintenance and enhancement path for this release is the 12.2BC release.

Q. Which hardware platforms support DOCSIS 1.1?

A. This list provides the platforms that are supported in 12.2(4)BC1:

- ◆ uBR7223 Universal Broadband Router
- ◆ uBR7246 Universal Broadband Router
- ◆ uBR7246 VXR Universal Broadband Router (use with NPE 300 and 256MB RAM as a minimum)
- ◆ MC11C, MC12C, MC14C, MC16S, MC16C, and MC28C cable line cards
- ◆ uBR7111 and uBR7114
- ◆ uBR10012 Universal Broadband Router

No hardware upgrade is required to support DOCSIS 1.1. Only a software (Cisco IOS) upgrade is required.

For more information, refer to Release Notes for Cisco uBR7200 Series for Cisco IOS Release 12.2 BC and Release Notes for Cisco uBR10012 Universal Broadband Router for Cisco IOS Release 12.2 BC.

Q. What are the major differences between DOCSIS 1.0 and DOCSIS 1.1?

A. The major difference between DOCSIS 1.0 and DOCSIS 1.1 is that DOCSIS 1.0 uses Service ID (SID) to identify cable modems and the devices behind them, while DOCSIS 1.1 uses service flows. DOCSIS 1.1 also has improved MAC framing features, improved provisioning, and authorization with advanced Baseline Privacy Interface Plus (BPI+) features.

Service flows are the fundamental units in DOCSIS 1.1 for QoS provisioning. DOCSIS 1.1 allows multiple service flows per cable modem. This means that different types of traffic, such as data, voice, and video, can be separately identified on the same cable modem. This separate identity provides specialized QoS treatment as per traffic needs.

Q. What are the new software features in DOCSIS 1.1?

A. The new software features in DOCSIS 1.1 include:

- ◆ **Cable Modem Database Manager** This is a new software module that manages cable modem information on the CMTS.
- ◆ **Service Flow Manager** This is a module that manages different activities related to service flows on a cable interface. Typical events include the creation of new DOCSIS service flows, modification of the attributes of existing service flows, and the deletion of service flows.
- ◆ **Service Template/Class Manager** The Service Template/Class Manager is a software module that controls the creation, updating, and cleanup of various QoS service templates and user-defined service classes on the CMTS.
- ◆ **Type-Length-Value (TLV) Parser/Encoder** The TLV Parser/Encoder is a new module that handles parsing and encoding Type-Length-Values on the CMTS.
- ◆ **Enhanced Registration** The registration module has been enhanced to support multiple registration styles (DOCSIS 1.0/DOCSIS 1.0+/DOCSIS 1.1) seamlessly. Besides using services of new TLV parser/encoder, this module also supports the conditional registration-acknowledgment MAC message state machine.
- ◆ **Dynamic MAC Messages** Digital Signals Cross-connect (DSX) MAC messages allow dynamic signaling of QoS between the cable modem and the CMTS. These messages are DOCSIS link layer equivalents of higher layer create/modify/teardown messages.
- ◆ **Fragmentation/Reassembly** Grant fragmentation allows the upstream MAC scheduler to slice large data requests to fit into the scheduling gaps between Unsolicited Grant Services (UGS) (voice-slots). This reduces the jitter experienced by the UGS slots when large data grants preempt the UGS slots. The grant fragmentation gets triggered in the MAC scheduler, and fragment reassembly happens in the upstream receive driver.
- ◆ **Payload Header Suppression and Restoration** The Payload Header Suppression (PHS) feature is used to suppress repetitive/redundant portions in packet headers before transmission on the DOCSIS link. This is a new feature in the DOCSIS 1.1 MAC driver. The upstream receive driver is now capable of restoring headers suppressed by cable modems, and the downstream driver is capable of suppressing specific fields in packet header before forwarding frame to the cable modem.
- ◆ **Concatenation** This allows the cable modem to make a single time slice request for

multiple packets and send all packets in a single large burst on the upstream. Concatenation was introduced in the upstream receive driver in the DOCSIS 1.0 + releases. Per-SID counters have now been added in IOS Software Release 12.1(4)CX for debugging concatenation activity.

- ◆ **New MAC Scheduler** This controls all time-slot assignments on the shared upstream channel. This block has been redesigned to support several new scheduling disciplines of DOCSIS 1.1
- ◆ **Downstream Packet Classifier** This helps to map packets into DOCSIS service flows. The CMTS supports downstream IP packet classifiers.
- ◆ **Downstream Packet Scheduler** This is a new module that controls all output packet queuing service on the downstream link of each cable interface.
- ◆ **Baseline Privacy Interface Plus** DOCSIS 1.1 enhances these security features with BPI Plus:

- ◇ Digital certificates provide secure user identification and authentication
- ◇ Key encryption uses 168-bit Triple DES (3DES) encryption that is suitable for the most sensitive applications
- ◇ 1024-bit public key with Pkcs#1 Version 2.0 encryption
- ◇ Multicast support
- ◇ Secure software download allows a service provider to upgrade the software of a cable modem remotely, without the threat of interception, interference, or alteration.

For more information, refer to DOCSIS 1.1 for Cisco uBR7200 Series Universal Broadband Routers.

Q. Are there any new Management Information Bases (MIB) supported on DOCSIS 1.1?

A. Yes, DOCSIS 1.1 features support the RF Interface MIB. The new supported MIBs are:

- ◆ DOCS-QOS-MIB (file name draft-ietf-ipcdn-qos-mib-02.txt)
- ◆ DOCS-BPI-PLUS-MIB (file name draft-ietf-ipcdn-bpiplus-mib-03). This MIB replaces the DOCS-BPI-MIB, which is supported only in DOCSIS 1.0.

Q. Is Telco-Return supported on Cisco IOS Version 12.2(4)BC1?

A. IOS Release 12.2(4)BC1 does not include support for Telco-Return images. Only two-way RF communication is supported. For more information, refer to Release Notes for Cisco uBR7200 Series for Cisco IOS Release 12.2 BC and Release Notes for Cisco uBR10012 Universal Broadband Router for Cisco IOS Release 12.2 BC.

Q. Can I use the standard DOCSIS Central Processing Element (CPE) Configurator tool to create and maintain DOCSIS configuration files that support DOCSIS 1.1 features?

A. Standard versions of the DOCSIS CPE configurator tool may not support DOCSIS 1.1. Cisco has developed the DOCSIS CPE Configurator tool Version 3.5 that allows the configuration of DOCSIS 1.1 specific features, such as upstream and downstream service flows, upstream and downstream Packet Classification, and PHS.

Q. Can DOCSIS 1.0 compliant cable modems work in a DOCSIS 1.1 environment?

A. Yes, DOCSIS 1.0 compliant cable modems work in a DOCSIS 1.1 environment, as DOCSIS 1.1 is backwards compatible with DOCSIS 1.0 and DOCSIS 1.0+.

For more information about DOCSIS 1.1, refer to [DOCSIS 1.1 for Cisco uBR7200 Series Universal Broadband Routers](#).

Related Information

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