

Implementing Cisco Data Over Cable Service Interface Specification 3.1 (DOCSIS)

Course Summary

Description

This Data Over Cable Service Interface Specification (DOCSIS), Instructor-Led course covers key standards and concepts from DOCSIS 1.x through to 3.1. It provides hands-on DOCSIS experience and establishes important foundational knowledge needed for configuring bi-directional channel bonded services and other advanced-service features. While examples of implementing DOCSIS services on the Cisco cBR-8 may be used in this course, most of the learning experiences also apply to other CMTS platforms. The course includes lab activities and/or demonstrations to reinforce the key learning objectives.

Objectives

After taking this course, students will be able to:

- Describe RF Networking Concepts when applied to the MSO environment
- Explain and observe DOCSIS modem registration
- Describe the components that comprise the DOCSIS 3.1 specification set and explain the primary elements in functional block-diagram form
- Describe DOCSIS 3.1 functionality as it relates to:
- Comparison to DOCSIS 3.0 channel bonding strategies
- High bandwidth support for advanced (multimedia, IP-based) services
- Deployment considerations for modular and integrated CMTS
- Relate channel bonding terms and acronyms to available downstream channel bonding hardware and Cisco cBR-8 software releases
- Identify Cisco cBR-8 features and featurettes for best system performance in mixed DOCSIS 1.x/2.0/3.0 and DOCSIS 3.1 channel-bonded environments
- Identify necessary third-party DOCSIS 3.1 components, such as the Symmetricon DTI server, and gain the knowledge necessary to recognize the role of any third-party components in a customer's design

Topics

- RF Primer
- DOCSIS Review
- DOCSIS 3.1 Architecture
- CMTS – Cable Modem Interaction – comparing DOCSIS 3.0 and 3.1 operation
- Other DOCSIS 3.1 Specifications
- 3.1 Migration Strategies

Audience

This course is designed for technical professionals who need to know how to deploy CMTS platforms and associated equipment. The primary audience for this course includes: Cable Operator Network Operation Center personnel, System Engineer/ Integrator/ Solutions support personnel, and Channel partners, resellers

Prerequisites

Students should have knowledge and experience with the Cisco IOS Command Line Interface (CLI)

Duration

Two days

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Course Outline

I. RF Primer

II. DOCSIS Review

- A. DOCSIS 1.0 and Best Effort Service
- B. DOCSIS 1.1 and QoS
- C. DOCSIS 2.0 and RF Changes
- D. DOCSIS 3.0 features – focused on channel bonding

III. DOCSIS 3.1 Architecture

- A. Physical layer, Modulation – QPSK, QAM, OFDM
- B. MAC and Upper Layers
 - 1. Overview and Theory
 - 2. MAC Specification
 - 3. Embedded Security
 - 4. Frame Formats
- C. MAC Protocol Operation
 - 1. MAC Management Messages
 - 2. UCD, MAP and MDD
 - 3. Timing and SYNC
- D. Cable Modem Registration
- E. Data Forwarding
- F. ‘The Life of a Packet’
 - 1. Upstream Data Transmission
 - 2. Channel Bonding – Upstream and Downstream

IV. CMTS – Cable Modem Interaction – comparing DOCSIS 3.0 and 3.1 operation

- A. Dynamic Operations
 - 1. Bandwidth Optimization
 - 2. Load Balancing
 - 3. Dynamic Bonding
 - 4. DS and US Channel Changes

V. Other DOCSIS 3.1 Specifications

- A. Cable Modem Customer Interface
- B. Proactive Network Maintenance
- C. IPv6 implementation
- D. OSSI

VI. 3.1 Migration Strategies