



# IMPLEMENTING CISCO DATA OVER CABLE SERVICE INTERFACE SPECIFICATION 3.1 (DOCSIS)

## COURSE OVERVIEW

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.

## WHO WILL BENEFIT FROM THIS COURSE?

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
- Channel partners, resellers

## PREREQUISITES

Following are the strongly recommended prerequisites for this cable training course:

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

## COURSE OBJECTIVES

After completing this course, the student should 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

## COURSE OUTLINE

### RF Primer

### DOCSIS Review

- DOCSIS 1.0 and Best Effort Service
- DOCSIS 1.1 and QoS
- DOCSIS 2.0 and RF Changes
- DOCSIS 3.0 features – focused on channel bonding

### DOCSIS 3.1 Architecture

- Physical layer, Modulation – QPSK, QAM, OFDM
- MAC and Upper Layers
  - Overview and Theory
  - MAC Specification
  - Embedded Security
  - Frame Formats
- MAC Protocol Operation
  - MAC Management Messages
  - UCD, MAP and MDD
  - Timing and SYNC
- Cable Modem Registration
- Data Forwarding
  - 'The Life of a Packet'
  - Upstream Data Transmission
  - Channel Bonding – Upstream and Downstream

### CMTS – Cable Modem Interaction – comparing DOCSIS 3.0 and 3.1 operation

- Dynamic Operations
  - Bandwidth Optimization
  - Load Balancing
  - Dynamic Bonding
  - DS and US Channel Changes



## Other DOCSIS 3.1 Specifications

- Cable Modem Customer Interface
- Proactive Network Maintenance
- IPv6 implementation
- OSSI

## 3.1 Migration Strategies

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