

Implementing Cisco Quality of Service (QoS)

Course Summary

Description

This course provides students with in-depth knowledge of IP QoS requirements, conceptual models using DiffServ, IntServ, and Best Effort (over provisioning), and the implementation of IP QoS on Cisco IOS switch and router platforms. The curriculum covers the theory of IP QoS, design issues, and configuration of various QoS mechanisms to facilitate the creation of effective administrative policies providing QoS. The course gives students design and usage rules for various advanced IP QoS features and the integration of IP QoS with underlying Layer 2 QoS mechanisms, allowing them to design and implement efficient, optimized, trouble-free multi-service networks. Mandatory prerequisite is CCNA. Understanding of BGP is also strongly suggested. This course is for network technicians responsible for VoIP networks.

Objectives

By the end of this course, students will be able to:

- Given a converged network, explain the need to implement Quality of Service (QoS) and explain methods for implementing and managing QoS
- Given a converged network, identify and describe different models used for ensuring QoS in a network and explain key IP QoS mechanisms used to implement the models
- Given a converged network, explain the use of MQC and AutoQoS to implement QoS on the network
- Given a converged network and a policy defining QoS requirements, successfully classify and mark network traffic to implement the policy
- Given a congested network, use Cisco QoS queuing mechanisms to manage network congestion
- Given a converged network, use Cisco QoS congestion avoidance mechanisms to reduce the effects of congestion on the network
- Given a network, use Cisco QoS traffic policing and traffic shaping mechanisms to effectively limit the rate of network traffic

Topics

- Introduction to QoS
- The Building Blocks of QoS
- Introduction to MQC and Cisco AutoQoS
- Classification and Marking
- Congestion Management
- Congestion Avoidance
- Traffic Policing and Shaping
- Link Efficiency Mechanisms
- QoS Best Practices

Audience

This course is designed for:

- Network technicians responsible for VoIP networks.
- Anyone seeking CCVP Certification.
- CCIE candidates.

Prerequisites

Prior to taking this course, knowledge of CCNA is suggested.

Duration

Five days

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Course Outline

- I. Introduction to QoS**
 - A. Understanding the Need for QoS
 - B. Understanding QoS
 - C. Implementing QoS
- II. The Building Blocks of QoS**
 - A. Identifying Models for Implementing QoS
 - B. Understanding the Integrated Services Model
 - C. Understanding the Differentiated Services Model
 - D. Identifying QoS Mechanisms
- III. Introduction to MQC and Cisco AutoQoS**
 - A. Introducing Modular QoS CLI
 - B. Introducing Cisco AutoQoS VoIP
 - C. Introducing Cisco AutoQoS for the Enterprise
- IV. Classification and Marking**
 - A. Understanding Classification and Marking
 - B. Using MQC for Classification
 - C. Using MQC for Class-Based Marking
 - D. Using NBAR for Classification
 - E. Configuring QoS Preclassify
 - F. Configuring QoS Policy Propagation via BGP
 - G. Configuring LAN Classification and Marking
 - H. Understanding QoS in the Life of a Packet
- V. Congestion Management**
 - A. Introducing Queuing
 - B. Understanding Queuing Implementations
 - C. Configuring FIFO and WFQ
 - D. Configuring CBWFQ and LLQ
 - E. Configuring LAN Congestion Management
- VI. Congestion Avoidance**
 - A. Introducing Congestion Avoidance
 - B. Introducing RED
 - C. Configuring Class-Based Weighted RED
 - D. Configuring Explicit Congestion Notification
- VII. Traffic Policing and Shaping**
 - A. Understanding Traffic Policing and Shaping
 - B. Configuring Class-Based Policing
 - C. Configuring Class-Based Shaping
 - D. Configuring Class-Based Shaping on Frame Relay Interfaces
 - E. Frame Relay Voice-Adaptive Traffic Shaping and Fragmentation
- VIII. Link Efficiency Mechanisms**
 - A. Understanding Link Efficiency Mechanisms
 - B. Configuring Class-Based Header Compression
 - C. Configuring Link Fragmentation and Interleaving
- IX. QoS Best Practices**
 - A. Understanding Traffic Classification Best Practices
 - B. Deploying End-to-End QoS
 - C. Providing QoS for Security