Implementing Cisco MultiProtocol Label Switching (MPLS)

Description

Multiprotocol Label Switching (MPLS) is a high-performance method for forwarding packets through a network enabling routers at the edge of a network to apply simple labels to packets. This practice allows the edge devices to switch packets according to labels, with minimal lookup overhead. MPLS integrates the performance and traffic-management capabilities of data link Layer 2 with the scalability and flexibility of network Layer 3 routing.This course covers both introductory and advanced MPLS and MPLS VPNs concepts. Configuration, implementation and troubleshooting skills are all included with a significnat focus on the use of labs to consolidate the learners knowledge. At the end of this course you should be able to design, implement and maintain core IP routing network infrastructures.

Course Content
Module 1: MPLS Concepts

- Lesson 1: MPLS Labels and Label Stack
- Lesson 2: MPLS Applications

Module 2: MPLS Label Assignment and Distribution

- Lesson 1: Discovering LDP Neighbors
- Lesson 2: Label Distribution in Frame-Mode MPLS
- Lesson 3: Convergence in Frame-Mode MPLS
- Lesson 4: MPLS Label Allocation, Distribution, and Retention Modes

Module 3: Frame-Mode MPLS Implementation on Cisco IOS Platforms

- Lesson 1: CEF Switching
- Lesson 2: Configuring Frame-Mode MPLS
- Lesson 3: Monitoring Frame-Mode MPLS
- Lesson 4: Troubleshooting Frame-Mode MPLS

Module 4: MPLS Virtual Private Network (VPN) Technology

- Lesson 1: VPN Categorization
- Lesson 2: MPLS VPN Architecture
- Lesson 3: MPLS VPN Routing Model
- Lesson 4: MPLS VPN Packet Forwarding

Module 5: MPLS VPN Implementation

- Lesson 1: MPLS VPN Mechanisms
- Lesson 2: Configuring VRF Tables
- Lesson 3: Configuring an MP-BGP Session Between PE Routers
- Lesson 4: Configuring Routing Protocols Between PE and CE Routers
    - RIP
    - EIGRP
    - OSPF

- ○ BGP
- ○ Monitoring MPLS VPN Operation
- ○ Troubleshooting MPLS VPN

Module 5: Complex MPLS VPNs

- Lesson 1: Central Services VPNs
- Lesson 2: Managed CE Router Service
- Lesson 3: MPLS Managed Services

Module 6: Integrated Internet Access with MPLS VPNs

- Lesson 1: VPN Internet Access Topologies
- Lesson 2: VPN Internet Access Implementation Methods
- Lesson 3: Separating Internet Access from VPN Services
- Lesson 4: Internet Access Backbone as a Separate VPN

Module 7: MPLS Traffic Engineering

- Lesson 1: Traffic Engineering (TE) Concepts
- Lesson 2: MPLS TE Components
- Lesson 3: MPLS TE Operations
- Lesson 4: Configuring MPLS TE on Cisco IOS Platforms
- Lesson 5: Monitoring Basic MPLS TE on Cisco IOS

Lab / Exercises
Lab 1: Configure an IP Routed Network Lab 2: Enabling MPLS in the Core Environment Lab 3: Initial MPLS VPN Setup Lab 4: Running EIGRP Between the PE and CE Routers Lab 5: Running OSPF Between the PE and CE Routers Lab 6: Running BGP Between the PE and CE Routers Lab 7: Configuring Overlapping VPNs Lab 8: Merging Service Providers Lab 9: Enabling Common Services VPNs Lab 10: Configuring Central Site Internet Connectivity with an MPLS VPN Lab 11: Implementing Basic MPLS Traffic Engineering
Documentation

- Digital courseware included

Participant profiles

- Service Provider and Enterprise network engineers that design, deploy and maintain core IP routing network infrastructures

Prerequisites

- Participants should have a valid CCNA or equivalent knowledge

Objectives

- Describe the features of MPLS
- Describe how MPLS labels are assigned and distributed
- Configure and troubleshoot frame-mode MPLS on Cisco IOS platforms
- Describe the MPLS peer-to-peer architecture and explain the routing and packet-forwarding model in this architecture
- Configure, monitor, and troubleshoot VPN operations
- Describe how the MPLS VPN model can be used to implement managed services and Internet access
- Describe the various Internet access implementations that are available and the benefits and drawbacks

of each mode
- Describe the tasks and commands that are necessary to implement MPLS TE

Niveau
Intermédiaire
Virtual Classroom Registration Price (CHF)
4350
Duration (in Days)
5
Reference
CIS-MPLS