

Implementing Cisco MPLS

Duration: 5 Day(s)

Course Overview

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 significant 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.

The latest version of this instructor led training course contains a virtual lab model that allows each student to have their own pod and access the lab 24 hours a day, 7 days a week for 90 days from the start of the course.

Review this course online at <https://www.alta3.com/courses/MPLS>

Objectives

- Describe critical MPLS features and functionalities.
- Implement and troubleshoot MPLS and MPLS VPNs on Cisco platforms.
- Manage secure VPN operations using MPLS technologies.
- Understand and apply MPLS Traffic Engineering principles and components.

Who Should Attend

- Network Administrators
- Network Engineers
- Network Managers
- Systems Engineers
- Network Designers
- Project Managers

Prerequisites

- Cisco Certified Network Associate (CCNA) certification or equivalent level of working knowledge and experience
- Configuring Border Gateway Protocol (BGP) on Cisco routers
- Practical experience with deploying and operating networks based on Cisco network devices and Cisco IOS is strongly recommended
- The QoS course is highly recommended because QoS knowledge is assumed in several sections of the course Implementing Cisco Quality of Service

Course Outline

MPLS Features

1. Introducing Basic MPLS Concepts
2. Introducing MPLS Labels and Label Stack

3. Identifying MPLS Applications

Label Assignment and Distribution

- 4. Discovering LDP Neighbors
- 5. Introducing Typical Label Distribution in Frame-Mode MPLS
- 6. Introducing Convergence in Frame-mode MPLS

Frame-Mode MPLS Implementation on Cisco IOS Platforms

- 7. Introducing Cisco Express Forwarding (CEF) Switching
- 8. Configuring Frame-Mode MPLS on Cisco IOS Platforms
- 9. Monitoring Frame-Mode MPLS on Cisco IOS Platforms
- 10. Troubleshooting Frame-Mode MPLS on Cisco IOS Platforms

MPLS VPN Technology

- 11. Introducing Virtual Private Networks
- 12. Introducing MPLS VPN Architecture
- 13. Introducing the MPLS VPN Routing Model
- 14. Forwarding MPLS VPN Packets

MPLS VPN Implementation

- 15. Using MPLS VPN Mechanisms of Cisco IOS platforms
- 16. Configuring an MP-BGP Session Between PE Routers
- 17. Configuring VRF Tables
- 18. Configuring Small-Scale Routing Protocols Between PE and CE routers
- 19. Monitoring MPLS VPN Operations
- 20. Configuring OSPF as the Routing Protocol Between PE and CE Routers
- 21. Configuring BGP as the Routing Protocol between PE and CE Routers
- 22. Troubleshooting MPLS VPNs

Complex MPLS VPNs

- 23. Introducing Overlapping VPNs
- 24. Introducing Central Services VPNs
- 25. Introducing the Managed CE Routers Service

Internet Access and MPLS VPNs

- 26. Combining Internet Access with MPLS VPNs
- 27. Implementing Internet Access in the MPLS VPN Environment

MPLS Traffic Engineering Overview

- 28. Introducing MPLS Traffic Engineering Components
- 29. MPLS Traffic Engineering Operations
- 30. Configuring MPLS Traffic Engineering on Cisco IOS Platforms
- 31. Monitoring Basic MPLS TE on Cisco IOS Platforms

Lab Outline

- 32. Discovery 1: Verifying CEF Switching
- 33. Discovery 2: Enabling MPLS
- 34. Discovery 3: Change IP TTL Propagation
- 35. Discovery 4: Configure MP-IBGP
- 36. Discovery 5: Configure the VRF Instances
- 37. Discovery 6: Configure RIP as a PE-CE Routing Protocol
- 38. Discovery 7: Configure EIGRP as a PE-CE Routing Protocol
- 39. Discovery 8: Configure OSPF as a PE-CE Routing Protocol
- 40. Discovery 9: Configure BGP as a PE-CE Routing Protocol
- 41. Discovery 10: Configure a Central Services VPN
- 42. Discovery 11: Configure MPLS Traffic Engineering
- 43. Challenge 1: Implement the Service Provider's and Customer's IP Addressing and IGP Routing
- 44. Challenge 2: Implement the Core MPLS Environment in the Service Provider Network
- 45. Challenge 3: Implement EIGRP Based VPNs
- 46. Challenge 4: Implement OSPF Based MPLS VPNs
- 47. Challenge 5: Implement BGP Based MPLS VPNs
- 48. Challenge 6: Implement MPLS Traffic Engineering