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MPLS - IMPLEMENTING CISCO MPLS V3.1

Course Code: 3097

Learn to deploy MPLS and MPLS VPN infrastructures.

This course is designed to introduce you to MPLS concepts, installation, migration, operation, inspection, and troubleshooting. You'll start with an overview of MPLS and its operation, after which you'll concentrate on MPLS Virtual Private Network (VPN) deployment. The MPLS fundamentals covered in this class will provide the theory and hands-on knowledge to implement, integrate, and deploy an MPLS infrastructure. The MPLS VPN lecture and labs will cover the models, diversity, implementation, troubleshooting, and flexibility of MPLS VPNs.

This course is eligible for 40 Continuing Education Credits (ILT & ELT Modality).

What You'll Learn

- Label and tag distribution protocol
- MPLS VPNs/VPN deployment models
- Multiprotocol BGP
- MPLS VPN configurations, integration, and management

Who Needs to Attend

- Anyone responsible for designing, implementing, or troubleshooting MPLS networks or solutions based on MPLS technology

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CLASSROOM LIVE	$3,695 USD	5 Day

Classroom Live Outline

1. MPLS Concepts
   - MPLS Labels and Label Stack
   - MPLS Applications
2. MPLS Label Assignment and Distribution
   - Discovering LDP Neighbors
   - Label Distribution in Frame-Mode MPLS
   - Convergence in Frame-Mode MPLS
   - MPLS Label Allocation, Distribution, and Retention Modes
3. Frame-Mode MPLS Implementation on Cisco IOS Platforms
   - CEF Switching
   - Configuring Frame-Mode MPLS
   - Monitoring Frame-Mode MPLS
   - Troubleshooting Frame-Mode MPLS
4. MPLS Virtual Private Network (VPN) Technology
   - VPN Categorization
   - MPLS VPN Architecture
   - MPLS VPN Routing Model
   - MPLS VPN Packet Forwarding
5. MPLS VPN Implementation
   - MPLS VPN Mechanisms
   - Configuring VRF Tables
   - Configuring an MP-BGP Session Between PE Routers
   - Configuring Routing Protocols Between PE and CE Routers
     - RIP
     - EIGRP
     - OSPF
     - BGP
   - Monitoring MPLS VPN Operation
   - Troubleshooting MPLS VPN

6. Complex MPLS VPNs
    - Central Services VPNs
    - Managed CE Router Service
    - MPLS Managed Services
7. Integrated Internet Access with MPLS VPNs
    - VPN Internet Access Topologies
    - VPN Internet Access Implementation Methods
    - Separating Internet Access from VPN Services
    - Internet Access Backbone as a Separate VPN

8. MPLS Traffic Engineering

- Traffic Engineering (TE) Concepts
- MPLS TE Components
- MPLS TE Operations
- Configuring MPLS TE on Cisco IOS Platforms
- Monitoring Basic MPLS TE on Cisco IOS

Classroom Live Labs

Lab 1: Configure an IP Routed Network
- Establish the Service Provider IGP Routing Environment.

Lab 2: Enabling MPLS in the Core Environment
- Perform initial configuration of MPLS on routers.

Lab 3: Initial MPLS VPN Setup
- Configure and verify MP-BGP and VRFs tables.

Lab 4: Running EIGRP Between the PE and CE Routers
- Turn on an EIGRP VPN.

Lab 5: Running OSPF Between the PE and CE Routers
- Turn on an OSPF VPN.

Lab 6: Running BGP Between the PE and CE Routers
- Turn on a BGP VPN. Configure the primary and backup BGP links.

Lab 7: Configuring Overlapping VPNs
- Enable overlapping VPNs between multiple VPN clients.

Lab 8: Merging Service Providers
- Enable MPLS with a central core device and migrate the MPLS core to IS-IS. Enable route reflectors in the core.

Lab 9: Enabling Common Services VPNs
- Configure a Network Management VPN and establish connectivity between the NMS VRF and other VRFs.

Lab 10: Configuring Central Site Internet Connectivity with an MPLS VPN

- Establish routing connectivity between the customer and Internet routers.

Lab 11: Implementing Basic MPLS Traffic Engineering

- Establish basic MPLS TE in an MPLS VPN network environment.

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VIRTUAL CLASSROOM LIVE	$3,695 USD	5 Day

Virtual Classroom Live Outline

1. MPLS Concepts
   - MPLS Labels and Label Stack
   - MPLS Applications
2. MPLS Label Assignment and Distribution
   - Discovering LDP Neighbors
   - Label Distribution in Frame-Mode MPLS
   - Convergence in Frame-Mode MPLS
   - MPLS Label Allocation, Distribution, and Retention Modes
3. Frame-Mode MPLS Implementation on Cisco IOS Platforms
   - CEF Switching
   - Configuring Frame-Mode MPLS
   - Monitoring Frame-Mode MPLS
   - Troubleshooting Frame-Mode MPLS
4. MPLS Virtual Private Network (VPN) Technology
   - VPN Categorization
   - MPLS VPN Architecture
   - MPLS VPN Routing Model
   - MPLS VPN Packet Forwarding
5. MPLS VPN Implementation
   - MPLS VPN Mechanisms
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   - Configuring Routing Protocols Between PE and CE Routers
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     - EIGRP
     - OSPF
     - BGP
   - Monitoring MPLS VPN Operation
   - Troubleshooting MPLS VPN

6. Complex MPLS VPNs
    - Central Services VPNs
    - Managed CE Router Service
    - MPLS Managed Services
7. Integrated Internet Access with MPLS VPNs
    - VPN Internet Access Topologies
    - VPN Internet Access Implementation Methods
    - Separating Internet Access from VPN Services
    - Internet Access Backbone as a Separate VPN

8. MPLS Traffic Engineering

- Traffic Engineering (TE) Concepts
- MPLS TE Components
- MPLS TE Operations
- Configuring MPLS TE on Cisco IOS Platforms
- Monitoring Basic MPLS TE on Cisco IOS

Virtual Classroom Live Labs

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Oct 26 - 30, 2026 | 8:30 AM - 4:30 PM EDT

Mar 1 - 5, 2027 | 8:30 AM - 4:30 PM EST

Jun 7 - 11, 2027 | 8:30 AM - 4:30 PM EDT

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ON-DEMAND	$750 USD

On-Demand Outline

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PRIVATE GROUP TRAINING	5 Day

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