# Cisco Networks
# Implementing Cisco MPLS (MPLS)
Course:ET922

## Course Description

This course is designed to introduce you to MPLS concepts, installation, migration, operation, inspection, and trouble-shooting. In the first two days, you'll get an overview of MPLS and MPLS operation. After that, you'll concentrate on MPLS VPN deployment.

## Who should attend?

Technical professionals responsible for designing, implementing, and/or troubleshooting MPLS networks or solutions based on MPLS technology. Individuals who are working toward their CCIP certification or Communications & Services CCIE. Students will benefit from the presentation and extensive labs of MPLS.

## Pre-requisites

- Cisco Certified Network Associate (CCNA)

## Course Objectives

- Label and Tag Distribution Protocol
- MPLS VPNs/VPN deployment models
- Multi-protocol BGP
- MPLS VPN configurations, integration, and management

## Lab Equipments

## Course Outline

1. MPLS Concepts
   - Basic MPLS Concepts
   - MPLS Labels and Label Stack
   - MPLS Applications

***Hands-On Labs***

*Configure an IP Routed Network*

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 on Cisco IOS Platforms
   - Monitoring Frame-Mode MPLS on Cisco IOS Platforms
   - Troubleshooting Frame-Mode MPLS on Cisco IOS Platforms

***Hands-On Labs***

*Enabling MPLS in the Core Environment*

4. MPLS Virtual Private Networks Technology
   - Introduction to Virtual Private Networks (VPNs)
   - VPN Categorization
   - MPLS VPN Architecture
   - MPLS VPN Routing Model
   - MPLS VPN Packet Forwarding

***Hands-On Labs***

*Initial MPLS VPN Setup*

5. MPLS VPN Implementation
   - MPLS VPN Mechanisms on Cisco IOS Platforms
   - Configuring VRF Tables
   - Configuring an MP-BGP Session Between PE Routers
   - Configuring RIP as the Routing Protocol Between PE and CE Routers
   - Configuring EIGRP as the Routing Protocol Between PE and CE Routers
   - Configuring OSPF as the Routing Protocol Between PE and CE Routers
   - Configuring BGP as the Routing Protocol Between PE and CE Routers
   - Monitoring MPLS VPN Operation
   - Troubleshooting MPLS VPN

***Hands-On Labs***

*Running EIGRP Between the PE and CE Routers*
*Running OSPF Between the PE and CE Routers*
*Running BGP Between the PE and CE Routers*

6. Complex MPLS VPNs
   - Advanced VRF Import/Export Features
   - Overlapping VPNs
   - Central Services VPNs
   - Managed CE Router Service
   - MPLS Managed Services

***Hands-On Labs***

*Configuring Overlapping VPNs*

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

***Hands-On Labs***

*Merging Service Providers*
*Enabling Common Services VPNs*
*Configuring Central Site Internet Connectivity with an MPLS VPN*

8. MPLS Traffic Engineering Overview
   - Traffic Engineering (TE) Concepts
   - Understanding MPLS TE Components
   - Configuring MPLS TE on Cisco IOS Platforms
   - Monitoring Basic MPLS TE on Cisco IOS

***Hands-On Labs***

*Implementing Basic MPLS Traffic Engineering*