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## Cisco® Implementing Cisco® Service Provider VPN Services 1.0 (SPVI)

### Overview

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In this course, you will learn how to manage end-customer Virtual Private Network (VPN) environments built over a common service provider Multiprotocol Label Switching (MPLS) backbone. You will complete hands-on labs to reinforce MPLS VPN fundamental concepts, benefits, and classification, MPLS components, MPLS control plane and data plane operations, MPLS VPN routing using Virtual Routing and Forwarding (VRF), Layer 2 and Layer 3 MPLS VPNs, IPv6 MPLS VPN implementations, IP Multicast VPNs, and shared services VPNs. The course also covers solutions for deploying MPLS VPN crossing multiple Service Provider domains that improve the use of network bandwidth. This course prepares you for the CCNP Service Provider concentration exam 300-515.

### Target Audience

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This course is for network professionals who need to learn the techniques to implement, configure, monitor, and support Service Provider VPN solutions based on MPLS backbones.

Network administrators  
Network engineers  
Network supervisors  
Network managers  
Network Operations Center (NOC) personnel  
Network designers  
Network architects  
Channel partners

### Course Objectives

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Upon completion of this course, you should be able to:

- How networks function, identifying major components, and function of network components.
- Understand issues related to increasing traffic on an Ethernet LAN and identify switched LAN technology solutions to Ethernet networking issues
- Extending the reach of a LAN and the methods that can be used with a focus on RF wireless access
- Functions of Wide Area Networks (WANs), the major devices of WANs, and configure PPP encapsulation, static and dynamic routing, PAT and RIP routing.
- Use of the command-line interface to discover neighbors on the network and managing the router's startup and configuration.

Technical Features of this course include the following:

- The Open System Interconnection (OSI) reference model.
- Ethernet and TCP/IP
- IOS Software
- Wireless LANs
- LAN and WAN Technologies

Associated Certification: CCENT

### Course Outline

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## 1 - Introducing VPN Services

VPN Fundamentals  
MPLS VPN Control Plane Operation

## 2 - Troubleshooting MPLS VPN Underlay

Troubleshoot Core Interior Gateway Protocol (IGP)  
Troubleshoot Border Gateway Protocol (BGP)

## 3 - Implementing Layer 3 MPLS VPNs

Multiprotocol BGP (MP-BGP) Routing Requirements in MPLS VPNs  
Provider Edge to Customer Edge (PE-to-CE) Routing Requirements in Layer 3 MPLS VPNs

## 4 - Implementing Layer 3 Interdomain MPLS VPNs

Inter-Autonomous System (AS) for Layer 3 MPLS VPNs  
Content Security and Control (CSC) for Layer 3 MPLS VPNs

## 5 - Implementing Layer 3 Multicast MPLS VPNs

Multicast VPN (MVPN) Fundamentals  
Implement Intranet MVPN

## 6 - Troubleshooting Intra-AS Layer 3 VPNs

Troubleshoot PE-CE Connectivity  
Troubleshoot PE-to-Route Reflector

## 7 - Implementing Layer 2 VPNs

Layer 2 Service Architecture and Carrier Ethernet Services  
Refresh on Traditional Ethernet LAN (E-LAN), E-Line, and E-Tree Solutions

## 8 - Troubleshooting Layer 2 VPNs

Troubleshoot Common Issues for Traditional E-Line, E-LAN, and E-Tree Ethernet Solutions  
Troubleshoot Common Issues for Ethernet VPN (EVPN) Native, EVPN Virtual Private Wire Service (VPWS), and EVPN Integrated Routing and Bridging (IRB) Solutions

## 9 - Implementing Layer 3 IPv6 MPLS VPNs

Classical Solutions for Deploying IPv6 over IPv4 Environments  
Using 6VPE to Deploy IPv6 Connectivity over MPLS Environment

## 10 - Troubleshooting Layer 3 IPv6 MPLS VPNs

Troubleshooting PE-to-PE Connectivity

## 11 - Lab Outline

Verify the Service Provider Backbone Operation for MPLS VPN

Work with VRF Instances

Troubleshoot the MPLS VPN Backbone

Configure MP-BGP as the PE-CE Routing Protocol

Configure and Verify PE-to-CE Routing Requirements

Enable Shared Services VPN

Deploy Internet Access as a VPN Service

Troubleshoot Layer 3 MPLS VPN End-Customer Connectivity

Implement Different EVPN Solutions

Troubleshoot EVPN VPWS

Implement IPv6 VPN Provider Edge Router (6VPE)

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