

Juniper Junos MPLS and VPNs (JMV)

Code: ACBE-JUN-JMV

Days: 5

Course Description:

This five-day course is designed to provide students with MPLS-based virtual private network (VPN) knowledge and configuration examples. The course includes an overview of MPLS concepts such as control and forwarding plane, RSVP Traffic Engineering, LDP, Layer 3 VPNs, next-generation multicast virtual private networks (MVPNs), BGP Layer 2 VPNs, LDP Layer 2 Circuits, and virtual private LAN service (VPLS).

This course also covers JunOS operating system-specific implementations of Layer 2 control instances and active interface for VPLS. Through demonstration and hands-on labs, students will gain experience in configuring and monitoring JunOS routers running MPLS and VPN.

Course Summarize:

Day 1

Chapter 1: Course Introduction

Chapter 2: MPLS Fundamentals

- MPLS Foundation
- Terminology
- MPLS Configuration
- MPLS Packet Forwarding

Chapter 3: Label Distribution Protocols

- Label Distribution Protocols
- RSVP
- LDP

Chapter 4: Constrained Shortest Path First

- RSVP Behavior Without CSPF
- CSPF Algorithm
- CSPF Tie Breaking
- Administrative Groups

Day 2

Chapter 5: Traffic Protection and Optimization

- Default Traffic Protection Behavior
- Primary and Secondary LSPs
- Fast Reroute
- Bypass LSPs

- LSP Optimization

Chapter 6: Miscellaneous MPLS Features

- Routing Table Integration
- Forwarding Adjacencies
- Policy Control over LSP Selection
- LSP Metrics
- Automatic Bandwidth
- TTL Handling
- Explicit Null Configuration
- MPLS Pings

Chapter 7: VPN Review

- Overview of VPNs
- CPE-Based VPNs
- Provider-Provisioned

Chapter 8: Layer 3 VPNs

- Layer 3 VPN Terminology
- VPN-IPv4 Address Structure
- Operational Characteristics

Day 3

Chapter 9: Basic Layer 3VPN Configuration

- Preliminary Steps
- PE Router Configuration

Chapter 10: Troubleshooting Layer 3 VPNs

- A Layered Approach
- The routing-instance Switch
- PE-Based and CE-Based Traceroutes
- Viewing VRF Tables and PE-PE Signaling Flow
- Monitoring PE-CE Routing Protocols

Chapter 11: Layer 3 VPN Scaling and Internet Access

- Scaling Layer 3 VPNs
- Public Internet Access Options

Chapter 12: Layer 3 VPNs—Advanced Topics

- Exchanging Routes Between VRF Tables
- Hub-and-Spoke Topologies
- Layer 3 VPN CoS Options
- Layer 3 VPN and GRE Tunneling Integration
- Layer 3 VPN and IPsec Integration

Day 4

Chapter 13: Multicast VPNs

- Multicast VPN Overview
- Next-Generation MVPN Operation
- Configuration
- Monitoring

Chapter 14: BGP Layer 2 VPNs

- Overview of Layer 2 Provider-Provisioned VPNs
- BGP Layer 2 VPN Operational Model: Control Plane
- BGP Layer 2 VPN Operational Model: Data Plane
- Preliminary BGP Layer 2 VPN Configuration
- BGP Layer 2 Configuration
- Monitoring and Troubleshooting BGP Layer 2 VPNs

Chapter 15: Layer 2 VPN Scaling and CoS

- Review of VPN Scaling Mechanisms
- Layer 2 VPNs and CoS

Chapter 16: LDP Layer 2 Circuits

- LDP Layer 2 Circuit Operation
- LDP Layer 2 Circuit Configuration
- LDP Layer 2 Circuit Monitoring and Troubleshooting
- Circuit Cross-Connect

Chapter 17: Virtual Private LAN Services

- Layer 2 MPLS VPNs Versus VPLS
- BGP VPLS Control Plane
- BGP VPLS Data Plane
- Learning and Forwarding Process
- Loops

Day 5

Chapter 13: VPLS Configuration

- VPLS Configuration
- VPLS Troubleshooting

Chapter 14: Interprovider VPNs

- Hierarchical VPN Models
- Junos Support of Carrier-of-Carriers Model
- Junos Support of Carrier-of-Carrier VPN Applications