

Junos Layer 2 VPNS

COURSE OVERVIEW

This two-day course is designed to provide students with MPLS-based Layer 2 virtual private network (VPN) knowledge and configuration examples. The course includes an overview of MPLS Layer 2 VPN concepts, such as BGP Layer 2 VPNs, LDP Layer 2 circuits, FEC 129 BGP autodiscovery, virtual private LAN service (VPLS), Ethernet VPN (EVPN), and Inter-AS Layer 2 VPNs. This course also covers Junos operating system-specific implementations of Layer 2 VPN instances, VPLS, and EVPNs. This course is based on the Junos OS Release 18.2R1.9. Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring Junos OS operations.

COURSE LEVEL

Advanced

AUDIENCE

Individuals responsible for configuring and monitoring devices running Junos OS

PREREQUISITES

- An intermediate-level networking knowledge and an understanding of OSPF, IS-IS, BGP, and Junos policy
- Experience configuring MPLS label-switched paths using Junos
- *Introduction to the Junos Operating System (IJS)* course or equivalent
- *Junos Service Provider Switching (JSPX)* course or equivalent
- *Junos Intermediate Routing (JIR)* course or equivalent
- *Junos MPLS Fundamentals (JMF)* course or equivalent

OBJECTIVES

- Define the term virtual private network.
- Describe the business drivers for MPLS VPNs.
- Describe the differences between Layer 2 VPNs and Layer 3 VPNs.
- List advantages for the use of MPLS Layer 3 VPNs and Layer 2 VPNs.
- Describe the roles of a CE device, PE router, and P router in a BGP Layer 2 VPN.
- Explain the flow of control traffic and data traffic for a BGP Layer 2 VPN.
- Configure a BGP Layer 2 VPN and describe the benefits and requirements of over-provisioning.
- Monitor and troubleshoot a BGP Layer 2 VPN.
- Explain the BGP Layer 2 VPN scaling mechanisms and route reflection.
- Describe the Junos OS BGP Layer 2 VPN CoS support.
- Describe the flow of control and data traffic for an LDP Layer 2 circuit.
- Configure an LDP Layer 2 circuit.
- Monitor and troubleshoot an LDP Layer 2 circuit.
- Describe the operation of FEC 129 BGP autodiscovery for Layer 2 VPNs.
- Configure a FEC 129 BGP autodiscovery Layer 2 VPN.
- Monitor and troubleshoot a FEC 129 BGP autodiscovery for Layer 2 VPNs.
- Describe the difference between Layer 2 MPLS VPNs and VPLS.
- Explain the purpose of the PE device, the CE device, and the P device.
- Explain the provisioning of CE and PE routers.
- Describe the signaling process of VPLS.
- Describe the learning and forwarding process of VPLS.
- Describe the potential loops in a VPLS environment.
- Configure BGP, LDP, and FEC 129 BGP autodiscovery VPLS.
- Troubleshoot VPLS.
- Describe the purpose and features of Ethernet VPN.
- Configure Ethernet VPN.
- Monitor and troubleshoot Ethernet VPN.
- Describe the Junos OS support for hierarchical VPN models.

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COURSE CONTENTS

DAY 1

1	Course Introduction
2	MPLS VPNs <ul style="list-style-type: none"> MPLS VPNs Provider-Provisioned VPNs
3	BGP Layer 2 VPNs <ul style="list-style-type: none"> 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 <p>Lab 1: BGP Layer 2 VPNs</p>
4	Layer 2 VPN Scaling and CoS <ul style="list-style-type: none"> Review of VPN Scaling Mechanisms Layer 2 VPNs and CoS <p>Lab 2: Layer 2 VPN Scaling</p>
5	LDP Layer 2 Circuits <ul style="list-style-type: none"> LDP Layer 2 Circuit Operation LDP Layer 2 Circuit Configuration LDP Layer 2 Circuit Monitoring and Troubleshooting FEC 129 BGP Autodiscovery Layer 2 Circuit Operation FEC 129 BGP Autodiscovery Layer 2 Circuit Configuration FEC 129 BGP Autodiscovery Monitoring and Troubleshooting <p>Lab 3: LDP Layer 2 Circuit and FEC 129 BGP Autodiscovery L2VPNs</p>

DAY 2

6	Virtual Private LAN Service <ul style="list-style-type: none"> Layer 2 MPLS VPNs Versus VPLS BGP VPLS Control Plane LDP VPLS Control Plane FEC 129 BGP Autodiscovery Control Plane Learning and Forwarding Process Loops
7	VPLS Configuration <ul style="list-style-type: none"> VPLS Configuration VPLS Troubleshooting <p>Lab 4: VPLS</p>
8	Ethernet VPN <ul style="list-style-type: none"> EVPN Overview EVPN Operation EVPN Configuration EVPN Troubleshooting <p>Lab 5: EVPN</p>
A	Interprovider Backbones for Layer 2 VPNs <ul style="list-style-type: none"> Hierarchical VPN Models Carrier-of-Carriers VPN Option C Interprovider VPN Option C Multisegment Pseudowires <p>Lab 6: Interprovider L2VPNs</p>
B	Circuit Cross-Connect <ul style="list-style-type: none"> Circuit Cross-Connect