Junos Layer 3 VPNs

Category: Networking & Security | **Vendor:** Juniper

Duration: 24.00 hours (3 days) **19.5 CPD Hours** **Rating:** ⭐ 4.6 (5,878 reviews)

Course Information

Delivery Format: Instructor Led - Online

Course Overview

This three-day course is designed to provide students with MPLS-based Layer 3 virtual private network (VPN) knowledge and configuration examples. The course includes an overview of MPLS Layer 3 VPN concepts, scaling Layer 3 VPNs, Internet access, Interprovider L3VPNs, and Multicast for Layer 3 VPNs. This course also covers Junos operating system-specific implementations of Layer 3 VPNs. This course is based on the Junos OS Release 15.1R2.9.

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and in device operations.

About This Course

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Who Should Attend

This course benefits individuals responsible for configuring and monitoring devices running the Junos OS.

Prerequisites & Entry Requirements

General Prerequisites:

Students should have intermediate-level networking knowledge and an understanding of OSPF, IS-IS,BGP, and Junos policy. Students should have experience configuring MPLS label-switched paths using Junos. Students should also attend the Introduction to the Junos Operating System (IJOS), Junos Intermediate Routing (JIR) and the Junos MPLS Fundamentals (JMF) courses prior to attending this class.

Learning Outcomes

Upon successful completion of this course, participants will be able to:

After successfully completing this course, you should be able to:

- Describe the value of MPLS VPNs.
- Describe the differences between provider-provisioned VPNs and customer-provisioned VPNs.
- Describe the differences between Layer 2 VPNs and Layer 3 VPNs.
- List the provider-provisioned MPLS VPN features supported by the JUNOS software.
- Describe the roles of a CE device, PE router, and P router in a BGP Layer 3 VPN.
- Describe the format of the BGP routing information, including VPN-IPv4 addresses and route distinguishers.
- Describe the propagation of VPN routing information within an AS.
- List the BGP design constraints to enable Layer 3 VPNs within a provider network.
- Explain the operation of the Layer 3 VPN data plane within a provider network.
- Create a routing instance, assign interfaces to a routing instance, create routes in a routing instance, and import/export routes from a routing instance using route distinguishers/route targets.
- Describe the purpose of BGP extended communities, configure extended BGP extended communities, and use BGP extended communities.
- List the steps necessary for proper operation of a PE-CE dynamic routing protocol.
- List the troubleshooting and monitoring techniques for routing instances.
- Explain the difference between the bgp.l3vpn table and the inet.0 table of a routing instance.
- Monitor the operation of a CE-PE dynamic routing protocol.
- Explain the operation of a PE mulit-access interface in a Layer 3 VPN and list commands to modify that behavior.
- Describe ways to support communication between sites attached to a common PE router.
- Provision and troubleshoot hub-and-spoke Layer 3 VPNs,
- Describe the flow of control traffic and data traffic in a hub-and-spoke Layer 3 VPN.
- Describe QoS mechanisms available in L3VPNs.
- Configure L3VPN over GRE tunnels.
- Describe the RFC 4364 VPN options.
- Describe the carrier-of-carriers model.
- Configure the carrier-of-carriers and “Option C” configuration.
- Describe the flow of control and data traffic in a draft-rosen multicast VPN.

- Describe the configuration steps for establishing a draft-rosen multicast VPN.
- Monitor and verify the operation of draft-rosen multicast VPNs.
- Describe the flow of control traffic and data traffic in a next-generation multicast VPN.
- Describe the configuration steps for establishing a next-generation multicast VPN.
- Describe the configuration steps for establishing a next-generation multicast VPN.
- Monitor and verify the operation of next-generation multicast VPNs.
- Describe the flow of control traffic and data traffic when using MPVNs for Internet multicast.
- Describe the configuration steps for enabling internet multicast using MVPNs.
- Monitor and verify the operation of MVPN internet multicast.

Detailed Course Outline

Day 1

Chapter 1: Course Introduction

Chapter 2: MPLS VPNs

- MPLS VPNs
- Provider-Provisioned VPNs

Chapter 3:\tLayer 3 VPNs

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

Chapter 4:\tBasic Layer 3 VPN Configuration

- Preliminary Steps

- PE Router Configuration

- Lab: Layer 3 VPN with Static and BGP Routing

Chapter 5: Layer 3 VPN Scaling and Internet Access

- Scaling Layer 3 VPNs

- Public Internet Access Options

- Lab: LDP over RSVP Tunnels and Public Internet Access

Day 2

Chapter 6:\tLayer 3 VPNs – Advanced Topics

- Exchanging Routes between Routing Instances

- Hub-and-Spoke Topologies

- Layer 3 VPN CoS Options

- Layer 3 VPN and GRE Tunneling Integration

- Layer 3 VPN and IPSec Integration

- Layer 3 VPN Egress Protection

- BGP prefix-independent convergence (PIC) edge for MPLS VPNs

- VRF Localization

- Provider Edge Link Protection

- Support for configuring more than 3 million L3VPN Labels

- Lab: GRE Tunneling

Chapter 7:\tInterprovider Backbones for Layer 3 VPNs

- Hierarchical VPN Models
- Carrier-of-Carriers Model
- Option C Configuration
- Lab: Carrier-of-Carriers Layer 3 VPNs

Chapter 8:\tTroubleshooting Layer 3 VPNs

- Working with Multiple Layers
- Troubleshooting Commands on a PE Device
- Multiaccess Interfaces in Layer 3 VPNs
- PE and CE-based Traceroutes
- Layer 3 VPN Monitoring Commands
- Lab: Troubleshooting Layer 3 VPNs

Day 3

Chapter 9:\tDraft Rosen Multicast VPNs

- Multicast Overview
- Draft Rosen MVPN Overview
- Draft Rosen MVPN Operation
- Configuration
- Monitoring

Chapter 10: Next-Generation Multicast VPNs

- Multicast VPN Overview

- Next-Generation MVPN Operation
- Configuration
- Monitoring
- Internet Multicast
- Ingress Replication
- Internet Multicast Signaling and Data Plane
- Configuring MVPN Internet Multicast
- Monitoring MVPN Internet Multicast
- Lab: MVPNs

Skills You Will Learn:

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- Configure L3VPN over GRE tunnels.
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- Describe the carrier-of-carriers model.
- Configure the carrier-of-carriers and “Option C” configuration.
- Describe the flow of control and data traffic in a draft-rosen multicast VPN.
- Describe the configuration steps for establishing a draft-rosen multicast VPN.
- Monitor and verify the operation of draft-rosen multicast VPNs.
- Describe the flow of control traffic and data traffic in a next-generation multicast VPN.
- Describe the configuration steps for establishing a next-generation multicast VPN.
- Describe the configuration steps for establishing a next-generation multicast VPN.
- Monitor and verify the operation of next-generation multicast VPNs.
- Describe the flow of control traffic and data traffic when using MPVNs for Internet multicast.
- Describe the configuration steps for enabling internet multicast using MVPNs.
- Monitor and verify the operation of MVPN internet multicast.

Frequently Asked Questions

Q: What delivery options are available for Junos Layer 3 VPNs?

We offer multiple delivery formats:

- Live Instructor-Led Classroom Online (Virtual/Live Online)
- Traditional Instructor-Led Classroom Training (ILT)
- On-site delivery at your offices anywhere in United Kingdom
- Private dedicated courses customized for your team

Q: How many CPD hours does this course provide?

The 3-day Junos Layer 3 VPNs course provides up to 19.5 CPD hours of structured learning. CPD certificates can be provided upon request.

Q: What is the duration of the Junos Layer 3 VPNs training?

The training takes place over 3 day(s), with each day lasting approximately 24.00 hours including breaks for lunch and refreshments.

Q: Do you provide corporate training for Junos Layer 3 VPNs?

Yes, we provide corporate training, dedicated training, and closed classes for Junos Layer 3 VPNs. Training can take place anywhere in United Kingdom including London, Manchester, Birmingham, Edinburgh, or live online allowing teams from across United Kingdom or internationally to attend.

Q: What related terms do people search for?

Popular related searches include: Junos Layer 3 VPNs, Service Provider Routing and Switching, JL3V

Q: Why choose Nexus Human for Junos Layer 3 VPNs?

Nexus Human is recognized as one of the leading training providers. Our trainers have won multiple awards including:

- Small Firms Best Trainer Award
- National Training Partner of the Year (Ireland) - Multiple Years
- Global Top 30 Instructor Awards (2012, 2019, 2021)
- Tech Excellence Award Nominations
- Learning Performance Institute (LPI) External Training Provider Sponsor 2024

Q: Are there any discount codes available?

Yes! Use discount code **PENPAL5** when booking your Junos Layer 3 VPNs training. Please note that only one discount code can be used per booking and cannot be combined with other special offers.

Nexus Human

Professional Training & Development

Email: info@nexushuman.com

Website: www.nexushuman.com

Phone: +353 1 889 8700 (Ireland) | +44 20 8142 8961 (UK)

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