

Advanced Junos Enterprise Routing

COURSE OVERVIEW

This five-day, advanced-level course is designed to provide students with the tools and methods required for implementing, monitoring, and troubleshooting Layer 3 components in an enterprise network. This course covers OSPF, BGP, multicast, enterprise architecture, and Ethernet VPN-Virtual Extensible LAN (EVPN-VXLAN) is covered in depth. The course also exposes students to common troubleshooting commands and tools used to diagnose various intermediate to advanced issues.

Through demonstrations and hands-on labs, students will gain experience with features of each of these devices, vSRX virtual firewalls and vQFX virtual switches. This course is based on Junos OS Release 22.1R1.10.

COURSE LEVEL

[Advanced Junos Enterprise Routing](#) is an advanced-level course.

AUDIENCE

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

PREREQUISITES

- Familiarity with the Junos Operating System (OS)
- Basic understanding of the Open Systems Interconnection model
- Knowledge of basic routing and switching principles
- Experience configuring and monitoring the TCP/IP protocol suite
- Basic understanding of firewall filters.

OBJECTIVES

- Describe OSPFv2 concepts.
- Describe OSPF operations.
- Describe and configure OSPF area types and operations.
- Configure OSPF areas through summarization and restrictions.
- Utilize commands to troubleshoot and verify OSPF operations.
- Analyze different OSPF issues.
- Describe BGP operations.
- Describe and configure the BGP route selection process.
- Explain the use of routing policies in BGP.
- Describe BGP attributes and their usages.
- Describe and configure BGP communities.
- Describe BGP troubleshooting.
- Explain how routing policies are used in an enterprise network.
- Reduce problems related to routing policy structure and configuration.
- Identify commands for troubleshooting routing policy.
- Explain the fundamentals of multicast routing.
- Describe and configure Internet Group Management Protocol (IGMP).
- Describe Protocol Independent Multicast (PIM).
- Configure PIM.
- Describe and configure route reflection.
- Explain enterprise networking.
- Describe the key concepts of Evolved core and Layer 3 based campus designs.
- Explain the benefits of VXLAN.
- Explain why you would use EVPN-VXLAN in a campus network.

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- Describe and configure an Evolved Campus Core (ECC) network.
- Describe and configure a distribution and access network.
- Describe Ethernet Virtual Private Network (EVPN) route types.
- Describe EVPN troubleshooting.

Course Contents

Day 1

Module 1: Introduction

Module 2: OSPF—Part 1

- Describe OSPFv2 operations
- Differentiate link-state advertisements

Module 3: OSPF—Part 2

- Distinguish protocol operations
- Explain OSPF authentication
- Apply OSPFv3

Lab 1: Configuring and Monitoring OSPF

Module 4: OSPF Areas—Part 1

- Identify OSPF areas
- Describe stub area operations
- Add a stub area configuration

Module 5: OSPF Areas—Part 2

- Explain NSSA operation
- Add an NSSA configuration
- Explain route summarization

Lab 2: OSPF Route Summarization

Module 6: Advanced OSPF Options

- Explain NSSA operation
- Generate a NSSA configuration
- Explain route summarization

Module 7: Advanced OSPF Case Studies

- Interpret external reachability case studies

Lab 3: Configuring Advanced OSPF Options

Day 2

Module 8: Troubleshooting OSPF

- Perform troubleshooting and verification of OSPF adjacencies
- Perform troubleshooting and verification of OSPF consistencies

Module 9: Troubleshooting OSPF Routing Issues

- Conduct troubleshooting and verification of OSPF routing

Lab 4: Troubleshooting OSPF

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Module 10: BGP–Part 1

- Explain BGP concepts
- Describe BGP configuration options

Module 11: BGP–Part 2

- Explain BGP route options
- Describe BGP path selection

Lab 5: Implementing BGP

Module 12: BGP Attributes and Policy

- Explain BGP route processing
- Describe BGP attributes

Module 13: Common BGP Attributes

- Describe and configure common BGP attributes

Module 14: BGP Communities

- Configure BGP communities
- Explain how to use regular expressions with BGP communities
- Examine a BGP community use case

Lab 6: BGP Attributes

Module 15: Troubleshooting BGP

- Examine IBGP and EBGP troubleshooting

Module 16: BGP Troubleshooting Case Study

- Examine troubleshooting BGP neighbor issues

Lab 7: Troubleshooting BGP

Day 3

Module 17: Enterprise Routing Policies–Part 1

- Review an enterprise routing policy use case

Module 18: Enterprise Routing Policies–Part 2

- Examine enterprise external network deployment

Lab 8: Implementing Enterprise Routing Policies

Module 19: Troubleshooting Policies–Part 1

- Examine routing policy structure
- Describe regular expression matching with routing policies
- Examine routing policy troubleshooting methods

Module 20: Troubleshooting Policies–Part 2

- Examine the routing policy troubleshooting command usage
- Review a routing policy use case

Lab 9: Troubleshooting Routing Policy

Module 21: Introduction to Multicast—Part 1

- Describe IP multicast traffic flow and multicast components
- Describe multicast addressing
- Describe the need for RPF check in multicast networks
- Describe multicast routing tables

Module 22: Introduction to Multicast—Part 2

- Explain the role of IGMP
- Describe the different versions of IGMP
- Configure and monitor IGMP

Day 4

Module 23: Multicast Operations—Part 1

- Describe PIM sparse mode operation

Lab 10: Implementing PIM-SM

Module 24: Multicast Operations—Part 2

- Configure and monitor PIM sparse mode
- Configure and monitor RP discovery mechanisms

Lab 11: Implementing SSM

Module 25: BGP Route Reflection

- Describe the operation of BGP route reflection
- Configure a route reflector

Lab 12: BGP Route Reflection

Module 26: Enterprise Architectures—Part 1

- Describe traditional enterprise networks
- Examine new enterprise networking methods

Module 27: Enterprise Architectures—Part 2

- Examine EVPN-VXLAN enterprise networks
- Examine new enterprise networking methods

Module 28: VXLAN Overview

- Describe Layer 2 tunneling
- Explain VXLAN functionality
- Describe VXLAN gateways

Day 5

Module 29: EVPN-VXLAN Architecture

- Describe EVPN features
- Describe EVPN operations
- Describe EVPN with VXLAN for data plane encapsulation

Module 30: Configuring EVPN-VXLAN Networks—Part 1

- Examine a case study
- Configure an underlay network
- Configure an overlay network
- Verify an ECC network

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Module 31: Configuring EVPN-VXLAN Networks–Part 2

- Add leaf nodes to an ECC network
- Build a full fabric EVPN-VXLAN network

Lab 13: Configuring an EVPN-VXLAN Network

Module 32: Verifying and Troubleshooting EVPN-VXLAN Architecture–Part 1

- Explain EVPN route identification

Module 33: Verifying and Troubleshooting EVPN-VXLAN Architecture–Part 2

- Explain EVPN troubleshooting commands

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