

# Advanced Junos Enterprise Routing

## COURSE OVERVIEW

This five-day 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

### AUDIENCE

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

### RECOMMENDED NEXT COURSE

*JNCIE-ENT Self-Study Bundle*

### RELATED CERTIFICATION

[JNCIP-ENT](#)

### RELEVANT JUNIPER PRODUCT

- Junos OS
- M Series
- MX Series
- SRX Series

### 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.
- 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.

## CONTACT YOUR REGIONAL EDUCATION SERVICES TEAM:

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## COURSE CONTENTS

### DAY 1

1	<b>Course Introduction</b>
2	<b>OSPF-Part 1</b> <ul style="list-style-type: none"> <li>Describe OSPFv2 operations</li> <li>Differentiate link-state advertisements</li> </ul>
3	<b>OSPF-Part 2</b> <ul style="list-style-type: none"> <li>Distinguish protocol operations</li> <li>Explain OSPF authentication</li> <li>Apply OSPFv3</li> <li>Lab: Configuring and monitoring OSPF</li> </ul> <b>Lab: Configuring and Monitoring OSPF</b>
4	<b>OSPF Areas-Part 1</b> <ul style="list-style-type: none"> <li>Identify OSPF areas</li> <li>Describe stub area operations</li> <li>Add a stub area configuration</li> </ul>
5	<b>OSPF Areas-Part 2</b> <ul style="list-style-type: none"> <li>Explain NSSA operation</li> <li>Add an NSSA configuration</li> <li>Explain route summarization</li> </ul> <b>Lab: OSPF Route Summarization</b>
6	<b>Advanced OSPF Options</b> <ul style="list-style-type: none"> <li>Explain NSSA operation</li> <li>Generate a NSSA configuration</li> <li>Explain route summarization</li> </ul>
7	<b>Advanced OSPF Case Studies</b> <ul style="list-style-type: none"> <li>Interpret external reachability case studies</li> </ul> <b>Lab: Configuring Advanced OSPF Options</b>

### DAY 2

8	<b>Troubleshooting OSPF</b> <ul style="list-style-type: none"> <li>Perform troubleshooting and verification of OSPF adjacencies</li> <li>Perform troubleshooting and verification of OSPF consistencies</li> </ul>
9	<b>Troubleshooting OSPF Routing Issues</b> <ul style="list-style-type: none"> <li>Conduct troubleshooting and verification of OSPF routing</li> </ul> <b>Lab: Troubleshooting OSPF</b>
10	<b>BGP-Part 1</b> <ul style="list-style-type: none"> <li>Explain BGP concepts</li> <li>Describe BGP configuration options</li> </ul>
11	<b>BGP-Part 2</b> <ul style="list-style-type: none"> <li>Explain BGP route options</li> <li>Describe BGP path selection</li> </ul> <b>Lab: Implementing BGP</b>
12	<b>BGP Attributes and Policy</b> <ul style="list-style-type: none"> <li>Explain BGP route processing</li> <li>Describe BGP Attributes</li> </ul>
13	<b>Common BGP Attributes</b> <ul style="list-style-type: none"> <li>Describe and configure common BGP attributes</li> </ul>
14	<b>BGP Communities</b> <ul style="list-style-type: none"> <li>Configure BGP communities</li> <li>Explain how to use regular expressions with BGP communities</li> <li>Examine a BGP community use case</li> </ul> <b>Lab: BGP Attributes</b>
15	<b>Troubleshooting BGP</b> <ul style="list-style-type: none"> <li>Examine IBGP and EBGP troubleshooting</li> </ul>
16	<b>BGP Troubleshooting Case Study</b> <ul style="list-style-type: none"> <li>Examine troubleshooting BGP neighbor issues</li> </ul> <b>Lab: Troubleshooting BGP</b>

## COURSE CONTENTS (contd.)

## DAY 3

17	<b>Enterprise Routing Policies–Part 1</b> <ul style="list-style-type: none"> <li>Review an enterprise routing policy use case</li> </ul>
18	<b>Enterprise Routing Policies–Part 2</b> <ul style="list-style-type: none"> <li>Examine enterprise external network deployment</li> </ul> <b>Lab: Implementing Enterprise Routing Policies</b>
19	<b>Troubleshooting Policies–Part 1</b> <ul style="list-style-type: none"> <li>Examine routing policy structure</li> <li>Describe regular expression matching with routing policies</li> <li>Examine routing policy troubleshooting methods</li> </ul>
20	<b>Troubleshooting Policies–Part 2</b> <ul style="list-style-type: none"> <li>Examine the routing policy troubleshooting command usage</li> <li>Review a routing policy use case</li> </ul> <b>Lab: Troubleshooting Routing Policy</b>
21	<b>Introduction to Multicast–Part 1</b> <ul style="list-style-type: none"> <li>Describe IP multicast traffic flow and multicast components</li> <li>Describe multicast addressing</li> <li>Describe the need for RPF check in multicast networks</li> <li>Describe multicast routing tables</li> </ul>
22	<b>Introduction to Multicast–Part 2</b> <ul style="list-style-type: none"> <li>Explain the role of IGMP</li> <li>Describe the different versions of IGMP</li> <li>Configure and monitor IGMP</li> </ul>

## DAY 4

23	<b>Multicast Operations–Part 1</b> <ul style="list-style-type: none"> <li>Describe PIM sparse mode operation</li> </ul> <b>Lab: Implementing PIM-SM</b>
24	<b>Multicast Operations–Part 2</b> <ul style="list-style-type: none"> <li>Configure and monitor PIM sparse mode</li> <li>Configure and monitor RP discovery mechanisms</li> </ul> <b>Lab: Implementing SSM</b>
25	<b>BGP Route Reflection</b> <ul style="list-style-type: none"> <li>Describe the operation of BGP route reflection</li> <li>Configure a route reflector</li> </ul> <b>Lab: BGP Route Reflection</b>

## DAY 4 (contd.)

26	<b>Enterprise Architectures–Part 1</b> <ul style="list-style-type: none"> <li>Describe traditional enterprise networks</li> <li>Examine new enterprise networking methods</li> </ul>
27	<b>Enterprise Architectures–Part 2</b> <ul style="list-style-type: none"> <li>Examine EVPN-VXLAN enterprise networks</li> <li>Examine new enterprise networking methods</li> </ul>
28	<b>VXLAN Overview</b> <ul style="list-style-type: none"> <li>Describe Layer 2 tunneling</li> <li>Explain VXLAN functionality</li> <li>Describe VXLAN gateways</li> </ul>

## DAY 5

29	<b>EVPN-VXLAN Architecture</b> <ul style="list-style-type: none"> <li>Describe EVPN features</li> <li>Describe EVPN operations</li> <li>Describe EVPN with VXLAN for data plane encapsulation</li> </ul>
30	<b>Configuring EVPN-VXLAN Networks–Part 1</b> <ul style="list-style-type: none"> <li>Examine a case study</li> <li>Configure an underlay network</li> <li>Configure an overlay network</li> <li>Verify an ECC network</li> </ul>
31	<b>Configuring EVPN-VXLAN Networks–Part 2</b> <ul style="list-style-type: none"> <li>Add leaf nodes to an ECC network</li> <li>Build a full fabric EVPN-VXLAN network</li> </ul> <b>Lab: Configuring an EVPN-VXLAN Network</b>
32	<b>Verifying and Troubleshooting EVPN-VXLAN Architecture–Part 1</b> <ul style="list-style-type: none"> <li>Explain EVPN route identification</li> </ul>
33	<b>Verifying and Troubleshooting EVPN-VXLAN Architecture–Part 2</b> <ul style="list-style-type: none"> <li>Explain EVPN troubleshooting commands</li> </ul>

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