Junos Intermediate Routing

Education Services

COURSE OVERVIEW

This three-day course provides students with intermediate routing knowledge and configuration examples. The course includes an overview of protocol-independent routing features, OSPF, IS-IS, BGP, routing policy, IP tunneling, load balancing, high availability (HA) features, VRRP, and IPv6.

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring Junos OS and monitoring device operations. This course uses Juniper Networks vSRX Series Services Gateways for the hands-on component, but the lab environment does not preclude the course from being applicable to other Juniper hardware platforms running Junos OS. This course is based on Junos OS Release 23.4R1.

COURSE LEVEL

Intermediate

AUDIENCE

Individuals responsible for configuring and monitoring devices running Junos OS

PREREQUISITES

- Basic networking knowledge and an understanding of the OSI model and the TCP/IP protocol suite
- Completion of the *Introduction to the Junos Operating System* course prior to attending this class

RELATED JUNIPER PRODUCTS

- Junos OS
- SRX Series

RELATED CERTIFICATION

JNCIS-SP, JNCIS-ENT, JNCIS-DC

RECOMMENDED NEXT COURSE

Junos Service Provider Switching

Junos Enterprise Switching

CONTACT YOUR REGIONAL EDUCATION SERVICES TEAM:

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OBJECTIVES

- Describe how routes enter a routing table, and how routers choose the best routes for forwarding traffic.
- Implement static routing within Junos OS.
- Describe OSPF within Junos OS.
- Describe how routing policies control what prefixes can enter the routing table and what prefixes can be advertised by protocols.
- Deploy OSPF within Junos OS.
- Implement IS-IS within Junos OS.
- Implement BGP within Junos OS.
- Deploy BGP within Junos OS.
- Describe some important advanced routing policy features and behaviors.
- Implement routing instances within Junos OS.
- Implement load balancing within Junos OS.
- Implement VRRP within Junos OS.
- Implement graceful routing and Bidirectional Forwarding Detection (BFD) within Junos OS.
- Implement high availability features—GRES, NSR, and unified ISSU—within Junos OS.
- Implement IP tunneling within Junos OS.
- Describe IPv6 within Junos OS.
- Implement filter-based forwarding (FBF) within Junos OS.

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COURSE CONTENTS

DAY 1

1 Routing Fundamentals

- Explain the role of a router in a network
- Define the difference between directly connected, static, and dynamic routes
- Explain how route preference selects the best route to a destination
- Explain the process of longest prefix match lookups
- Demonstrate how to view and verify the inet.0 and inet6.0 routing tables

2 Protocol Independent Routing

- Configure static routes
- Configure aggregate routes
- Configure generated routes
- Manage martian routes

Lab 1: Protocol Independent Routing

3 Fundamentals of OSPF

- Describe OSPF
- Explain adjacency formation and the designated router election
- Explain OSPF scalability

4 Routing Policy

- Explain how import and export policies can re-advertise prefixes between protocols
- Describe the CLI syntax of a routing policy
- Demonstrate how a routing policy can export static routes into OSPF

5 Deploying OSPF

- Configure and monitor OSPF
- Troubleshoot OSPF

Lab 2: OSPF

DAY 2

6 IS-IS

- Explain IS-IS
- Describe IS-IS PDUs
- Define adjacency formation and DIS election
- Configure and monitor IS-IS
- Troubleshoot IS-IS

Lab 3: IS-IS

7 Fundamentals of BGP

- Explain BGP
- Describe BGP attributes

8 Deploying BGP

- Explain IBGP and EBGP
- Configure and monitor BGP
- Describe the BGP route reflection operation
- Examine the route reflection configuration

Lab 4: BGP

9 Advanced Routing Policy Features

- Describe advanced route-filter options
- Describe how to refer to a prefix list in a routing policy
- Explain route filters with mixed prefix lengths

10 Routing Instances

- Describe routing instances
- Configure and share routes between routing instances

Lab 5: Routing Instances

11 Load Balancing

- Describe the load-balancing concepts and operations
- Implement and monitor Layer 3 load balancing

Lab 6: Load Balancing

Continued on the next page.

COURSE CONTENTS (continued)

DAY 3

12 VRRP

- Describe, configure, and monitor VRRP

13 Graceful Restart and Bidirectional Forwarding Detection

- Describe high availability
- Explain graceful restart
- Explain Bidirectional Forwarding Detection

Lab 7: High Availability

14 GRES, NSR, and Unified ISSU

- Explain graceful Routing Engine switchover
- Explain nonstop active routing
- Explain unified ISSU

15 IP Tunneling

- Describe IP tunneling
- Describe GRE and IP-IP tunnels
- Deploy GRE and IP-IP tunnels

Lab 8: IP Tunneling

16 IPv6

- Explain IPv6 addressing
- Explain routing protocol configuration examples
- Describe tunneling IPv6 over IPv4

Lab 9: IPv6

SELF-STUDY MODULE

17 Filter-Based Forwarding

- Illustrate benefits of filter-based forwarding
- Configure and monitor filter-based forwarding

Lab 10: Filter-Based Forwarding

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