

# Junos Intermediate Routing, Revision 26A

## COURSE OVERVIEW

This three-day, intermediate-level 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, Virtual Router Redundancy Protocol (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 25.2R1.

## COURSE LEVEL

[Junos Intermediate Routing](#) is an intermediate-level course.

## AUDIENCE

This course benefits individuals responsible for configuring and monitoring devices running the Junos operating system (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

SRX Series Firewalls

## RELATED CERTIFICATION

[Enterprise Routing and Switching, Specialist \(JNCIS-ENT\)](#)  
[Service Provider Routing and Switching, Specialist \(JNCIS-SP\)](#)

## RECOMMENDED NEXT COURSE

[Junos Service Provider Switching](#)  
[Junos Enterprise Switching](#)  
[Junos MPLS Fundamentals](#)

## 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.



## COURSE CONTENTS

### DAY 1

#### Module 01: 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

#### Module 02: Protocol Independent Routing

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

#### Lab 01: Protocol Independent Routing

#### Module 03: Fundamentals of OSPF

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

#### Module 04: 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

#### Module 05: Deploying OSPF

- Configure and monitor OSPF
- Troubleshoot OSPF

#### Lab 02: OSPF

### DAY 2

#### Module 06: IS-IS

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

#### Lab 03: IS-IS

#### Module 07: Fundamentals of BGP

- Explain BGP
- Describe BGP attributes

#### Module 08: Deploying BGP

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

#### Lab 04: Border Gateway Protocol

#### Module 09: Advanced Routing Policy Features

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

**Module 10: Routing Instances**

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

**Lab 05: Routing Instances****Module 11: Load Balancing**

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

**Lab 06: Load Balancing****DAY 3****Module 12: VRRP**

- Describe, configure, and monitor VRRP

**Module 13: Graceful Restart and Bidirectional Forwarding Detection**

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

**Lab 07: High Availability****Module 14: GRES, NSR, and Unified ISSU**

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

**Module 15: IP Tunneling**

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

**Lab 08: IP Tunneling****Module 16: IPv6**

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

**Lab 09: IPv6****SELF-STUDY MODULES****Module 17: Filter-Based Forwarding**

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

**Lab 10: Filter-Based Forwarding****Module 18: Class of Service**

- Describe the purpose and benefits of CoS
- Implement traffic classification within Junos
- Describe traffic queuing within Junos
- Configure traffic scheduling within Junos
- Implement CoS for a given use case

**Lab 11: Class of Service**

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