Juniper Networks Certified Professional Service Provider Routing and Switching Bootcamp 1, AJSPR, JCOS, and JMR (JNCIP-SP BC1)

Course Summary

Description

This course combines Advanced Junos Service Provider Routing (AJSPR), Junos Class of Service (JCOS) and Junos Multicast Routing (JMR) into five consecutive days of training. Students can choose to attend the individual classes (AJSPR, JCOS, or JMR) or attend the five-day course.

ADVANCED JUNOS SERVICE PROVIDER ROUTING (AJSPR) COURSE OVERVIEW
This course is designed to provide students with detailed coverage of OSPF, IS-IS, BGP, and routing policy. Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos operating system and in monitoring device and protocol operations.

JUNOS CLASS OF SERVICE (JCOS) COURSE OVERVIEW
This two-day course provides students with advanced class-of-service (CoS) knowledge and configuration examples. The course begins with an overview of CoS before going into classification, policing, scheduling, and rewriting. The course then covers class-based forwarding and finishes with a case study.

Through demonstrations and hands-on labs, students will gain experience in configuring and verifying Junos CoS features.

JUNOS MULTICAST ROUTING (JMR) COURSE OVERVIEW
This two-day course is designed to provide students with detailed coverage of multicast protocols including Internet Group Management Protocol (IGMP), Protocol Independent Multicast-Dense Mode (PIM-DM), Protocol Independent Multicast-Sparse Mode (PIM-SM), Bidirectional PIM, and Multicast Source Discovery Protocol (MSDP).

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

Objectives
At the end of this course, students will be able to:

ADVANCED JUNOS SERVICE PROVIDER ROUTING (AJSPR) OBJECTIVES
- Describe the various OSPF link-state advertisement (LSA) types.
- Explain the flooding of LSAs in an OSPF network.
- Describe the shortest-path-first (SPF) algorithm.
- List key differences between OSPFv2 and OSPFv3.
- Describe OSPF area types and operations.
- Configure various OSPF area types.
- Summarize and restrict routes.
- Identify some scenarios in a service provider network that can be solved using routing policy or specific configuration options.
- Use routing policy and specific configuration options to implement solutions for various scenarios.
- Explain the concepts and operation of IS-IS.
- Describe various IS-IS link-state protocol data unit (LSP) types.
- List IS-IS adjacency rules and troubleshoot common adjacency issues.
- Configure and monitor IS-IS.
- Display and interpret the link-state database (LSDB).
- Perform advanced IS-IS configuration options.
- Implement IS-IS routing policy.
- Explain the default operation in multiarea IS-IS.

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Course Summary (cont'd)

- Describe IS-IS address summarization methods.
- Configure and monitor a multiarea IS-IS network.
- Describe basic BGP operation.
- List common BGP attributes.
- Explain the route selection process for BGP.
- Describe how to alter the route selection process.
- Configure some advanced options for BGP peers.
- Describe various BGP attributes in detail and explain the operation of those attributes.
- Manipulate BGP attributes using routing policy.
- Explain the causes for route instability.
- Describe the effect of damping on BGP routing.
- Explain the default behavior of damping on links.
- Control damping using routing policy.
- View damped routes using command-line interface (CLI) commands.
- Describe the operation of BGP route reflection.
- Configure a route reflector.
- Describe the operation of a BGP confederation.
- Configure confederations.
- Describe peering relationships in a confederation.

JUNOS CLASS OF SERVICE (JCOS) OBJECTIVES

- Understand the history and evolution of CoS.
- Identify the CoS fields in various packet headers.
- List the CoS processing stages on devices running the Junos OS.
- Identify the default CoS settings on devices running the Junos OS.
- Configure and verify behavior aggregate (BA) and multifield (MF) classification.
- Configure and verify two-color and tricolor marking policers.
- Configure and verify schedulers and their components.
- Configure and verify the multiple levels of hierarchical schedulers.
- Configure and verify packet header rewriting.
- Configure and verify class-based forwarding.
- Create a CoS configuration based on a set of design requirements.

JUNOS MULTICAST ROUTING (JMR) OBJECTIVES

- Describe IP multicast traffic flow
- Identify the components of IP multicast.
- Explain how IP multicast addressing works.
- Describe the need for reverse path forwarding (RPF) in multicast.
- Explain the role of IGMP and describe the available IGMP versions.
- Configure and monitor IGMP.
- Identify common multicast routing protocols.
- Explain the differences between dense-mode and sparse-mode protocols.
- Describe rendezvous point (RP) discovery options.
- Describe bidirectional PIM.
- Configure and monitor rendezvous point discovery mechanisms.
- Configure bidirectional PIM sparse mode.

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Course Summary (cont'd)

- Explain the purpose and operation of MSDP.
- Describe the usage of MSDP within a single PIM domain with anycast-RP.
- Describe the usage of MSDP across multiple PIM domains.
- Configure and monitor MSDP.
- Compare the any-source multicast (ASM) and source-specific multicast (SSM) service models.
- Describe the basic requirements, benefits, and caveats of SSM.
- List the address ranges used for SSM.
- Illustrate the role of IGMPv3 and PIM-SM in an SSM implementation.
- Configure and monitor SSM.
- Describe the default PIM sparse mode information distribution.
- Explain how routing policies control IGMP joins.
- Explain how routing policies alter PIM protocol message flow.
- Identify the role of a policy in controlling MSDP message advertisement.
- Explain how you can use a policy to scope multicast groups.
- Configure and monitor PIM dense mode and PIM sparse mode.
- Describe IPv6 multicast addresses.
- Describe IPv6 multicast scoping.
- Compare IPv6 Multicast Listener Discovery (MLD) versions with IPv4's IGMP protocol versions.
- Describe IPv6 SSM.

Topics

- Course Introduction
- OSPF
- OSPF Area
- OSPF Case Studies and Solutions
- IS-IS
- Advanced IS-IS Operations and Configuration Options
- Multilevel IS-IS Networks
- BGP
- BGP Attributes and Policy Part 1
- BGP Attributes and Policy Part 2
- Route Reflection and Confederations
- BGP Route Damping
- CoS Overview
- Packet Classification
- Policing
- Scheduling
- Hierarchical Scheduling
- Rewrite Rules
- CoS-Based Forwarding
- Case Study
- Appendix A: CoS Processing on M Series, T Series, and MX Series Devices
- Introduction to Multicast
- Multicast Routing Protocols
- MSDP
- Source-Specific Multicast
- Multicast and Policy
- Appendix A: IPv6 Multicast

Audience

ADVANCED JUNOS SERVICE PROVIDER ROUTING (AJSPR) TARGET AUDIENCE
This course benefits individuals responsible for implementing, monitoring, and troubleshooting Layer 3 components of a service provider's network.

Course Level: AJSPR is an advanced-level course.

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Course Summary (cont'd)

JUNOS CLASS OF SERVICE (JCOS) TARGET AUDIENCE
This course benefits individuals responsible for configuring and monitoring devices running the Junos OS, especially those in a service provider environment. It also benefits individuals responsible for designing networks containing devices running the Junos OS.

Course Level: Junos Class of Service is an advanced level course.

JUNOS MULTICAST ROUTING (JMR) TARGET AUDIENCE
This course benefits individuals responsible for implementing, monitoring, and troubleshooting multicast components in a service provider's network.

Course Level: JMR is an advanced-level course.

Prerequisites

ADVANCED JUNOS SERVICE PROVIDER ROUTING (AJSPR) PREREQUISITES
Students should have intermediate-level networking knowledge and an understanding of the Open Systems Interconnection (OSI) model and the TCP/IP protocol suite. Students should also attend the Introduction to the Junos Operating System (IJOS), Junos Routing Essentials (JRE), and Junos Intermediate Routing (JIR) courses prior to attending this class.

JUNOS CLASS OF SERVICE (JCOS) PREREQUISITES
Students should attend the Introduction to the Junos Operating System (IJOS) course, the Junos Routing Essentials (JRE) course, and the Junos Intermediate Routing (JIR) course, or have equivalent experience prior to attending this class. General knowledge of CoS concepts is also helpful.

JUNOS MULTICAST ROUTING (JMR) PREREQUISITES
Students should have basic networking knowledge and an understanding of the Open Systems Interconnection (OSI) model and the TCP/IP protocol suite. Students should also have working knowledge of security policies.

Students should also attend the Introduction to the Junos Operating System (IJOS), Junos Routing Essentials (JRE), and Junos Intermediate Routing (JIR) courses prior to attending this class.

Duration

Five days