Advanced Junos Service Provider Routing (AJSPR)

COURSE LEVEL
Advanced Junos Service Provider Routing (AJSPR) is an advanced-level course.

Intended Audience
This course benefits individuals responsible for implementing, monitoring, and troubleshooting Layer 3 components of a service provider’s network.

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 (UOS) and Junos Intermediate Routing (JIR) courses prior to attending this class.

COURSE OVERVIEW
This five-day 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, monitoring, and troubleshooting the Junos operating system and in monitoring device and protocol operations.

This course uses Juniper Networks vMX Series Routers for the hands-on component, but the lab environment does not preclude the course from being applicable to other Juniper hardware platforms running the Junos OS. This course is based on the Junos OS Release 19.3.

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.
- Explain OSPF link metrics.
- Describe the various OSPF authentication methods.
- Explain the key differences between OSPFv2 and OSPFv3.
- Describe OSPF area types and operations.
- Configure various OSPF area types.
- Summarize and restrict routes.
- Configure OSPF multi-area adjacencies.
- Configure OSPF virtual links.
- Explain OSPF external reachability.
- List useful commands that are used to troubleshoot and verify OSPF.
- Isolate different OSPF issues.
- 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 multilevel IS-IS.
- Describe address summarization methods used in IS-IS.
- Configure and monitor a multilevel IS-IS network.
- List useful commands to troubleshoot and verify IS-IS problems.
- Troubleshoot and isolate different IS-IS issues.
- 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.
- Explain how policies function in BGP.
- Describe BGP attributes and explain how these attributes can be used to manipulate traffic.
- Show how Regex can be used in policies to manipulate AS-path.
- Describe the BGP attributes Origin, MED and communities in detail and explain the operation of those attributes.
- Manipulate these BGP attributes using routing policy.

ASSOCIATED CERTIFICATION
JNCIP-SP

RELEVANT JUNIPER PRODUCT
- Junos OS
- M Series
- MX Series
- PTX Series
- T Series

RECOMMENDED NEXT COURSE
JNCIE-SP Bootcamp

CONTACT INFORMATION
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### COURSE CONTENT

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- Troubleshooting OSPF Adjacency Issues
- Troubleshooting LSDB Consistency Issues
- Troubleshooting OSPF Routing Issues
- Case Study – Adjacency Issues

**LAB: Troubleshooting OSPF**

### 6 IS-IS
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- IS-IS PDUs
- Neighbors and Adjacencies
- Configuring and Monitoring IS-IS

**Lab: IS-IS Configuration and Monitoring**

## Day 3

### 8 Multilevel IS-IS Networks
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- Multilevel Configuration

**LAB: Configuring a Multilevel IS-IS Network**

### 9 Troubleshooting IS-IS
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**LAB: Troubleshooting IS-IS**

### 7 Advanced IS-IS Operations
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**LAB: Advanced IS-IS Configuration Options and Routing Policy**

### 10 BGP
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- BGP Operations
- BGP Path Selection and Options
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**LAB: Configuring BGP**
Day 4

11 BGP Attributes and Policy—Part 1
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LAB: BGP Attributes – Part 1

12 BGP Attributes and Policy—Part 2
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LAB: BGP Attributes – Part 2

Day 5

14 BGP FlowSpec
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- DDoS Mitigation Techniques
- FlowSpec Overview
- Configuring and Monitoring FlowSpec

LAB: BGP FlowSpec

15 Troubleshooting BGP
- BGP Troubleshooting
- Case Study: Neighborship Issues

LAB: Troubleshooting BGP

13 Route Reflection and Confederations
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LAB: Scaling BGP

16 Troubleshooting Policy
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- Case Studies

LAB: Troubleshooting Routing Policy

Appendix A: BGP Route Damping
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- Route Damping Parameters
- Configuring and Monitoring Route Damping

LAB: BGP Route Damping