Advanced Junos Service Provider Routing

Duration: 5 Days Course Code: AJSPR Version: 17.A

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 17.1.

Target Audience:

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

Objectives:

- **After successfully completing this course, you should be able to:**
- 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.
- Describe how to troubleshoot OSPF.
- 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.
- Describe how to troubleshoot IS-IS.
- 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.
- Describe how to troubleshoot BGP.

- Explain the default operation in multiarea IS-IS.
- Describe IS-IS address summarization methods.
- Configure and monitor a multiarea IS-IS network.
- Describe how to troubleshoot routing policy.

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

- IJOS - Introduction to the Junos Operating System
- JIR - Junos Intermediate Routing
- JRE - Junos Routing Essentials

Follow-on-Courses:

- JCOS - Junos Class of Service
- JMR - Junos Multicast Routing

Content:

Chapter 1: Course Introduction

Chapter 2: OSPF

- OSPFv2 Review
- Link-State Advertisements
- Protocol Operations
- OSPF Authentication
- Lab: OSPF Multi-Area Networks

Chapter 3: OSPF Areas

- Review of OSPF Areas
- Stub Area Operation
- Stub Area Configuration
- NSSA Operation
- NSSA Configuration
- Route Summarization
- Lab: OSPF Route Summarization

Chapter 4: OSPF Case Studies and Solutions

- Virtual Links
- OSPF Multiarea Adjacencies
- External Reachability
- Lab: Advanced OSPF Options and Routing Policy

Chapter 5: Troubleshooting OSPF

- Troubleshooting OSPF
- Lab: OSPF Troubleshooting

Chapter 6: IS-IS

- Overview of IS-IS
- IS-IS PDUs
- Neighbors and Adjacencies
- Configuring and Monitoring IS-IS
- Lab: IS-IS Configuration and Monitoring

Chapter 7: Advanced IS-IS Operations and Configuration Options

- IS-IS Operations
- IS-IS Configuration Options
- IS-IS Routing Policy
- Lab: Advanced IS-IS Configuration Options and Routing Policy

Chapter 8: Multilevel IS-IS Networks

- Level 1 and Level 2 Operations
- Multilevel Configuration
- Lab: Configuring a Multilevel IS-IS Network

Chapter 9: Troubleshooting IS-IS

- Troubleshooting IS-IS
- Lab: IS-IS Troubleshooting

Chapter 10: BGP

- Review of BGP
- BGP Operations
- BGP Path Selection Options
- Configuration Options
- Lab: BGP and BGP Attributes

Chapter 11: BGP Attributes and Policy — Part1

- BGP Policy
- Next Hop
- Origin and MED
- AS Path
- Lab: BGP Attributes – Next Hop, Origin, MED, and AS Path

Chapter 12: BGP Attributes and Policy — Part2

- Local Preference
- Communities
- Lab: BGP Attributes – Local Preference and Communities

Chapter 13: Route Reflection and Confederations

- Route Reflection Operation
- Configuration and Routing Knowledge
- BGP Confederations
- Lab: Scaling BGP

Chapter 14: BGP Route Damping

- Route Flap and Damping Overview
- Route Damping Parameters
- Configuring and Monitoring Route Damping
- Lab: BGP Route Damping

Chapter 15: Troubleshooting BGP

- Troubleshooting BGP
- Lab: BGP Troubleshooting

Chapter 16: Troubleshooting Policy

- Troubleshooting Policy
- Lab: Policy Troubleshooting

Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

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