



**Course No:** (TWI-JUN-AJSPR)  
**Length:** 4 days

### About this Course

This two-day course is designed to provide introductory troubleshooting skills for engineers in a network operations center (NOC) environment. Key topics within this course include troubleshooting methodology, troubleshooting tools, hardware monitoring and troubleshooting, interface monitoring and troubleshooting, and troubleshooting data and control planes on devices running the Junos operating system.

This course is based on Junos OS Release 10.3R1.9.

### 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.
- 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.
- 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.

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- Configure a route reflector.
- Describe the operation of a BGP confederation.
- Configure confederations.
- Describe peering relationships in a confederation.

### Intended Audience

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

### Course Level

JTNOC is an introductory-level course.

### 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.

### Course Contents

Day1

#### Chapter 1: Course Introduction

#### Chapter 2: OSPF

- OSPFv2 Review
- Link-State Advertisements
- Protocol Operations
- OSPF Authentication
- Lab 1: Configuring and Monitoring OSPF

#### Chapter 3: OSPF Areas

- Review of OSPF Areas
- Stub Area Operation
- Stub Area Configuration
- NSSA Operation
- NSSA Configuration
- Route Summarization
- Lab 2: Configuring and Monitoring OSPF Areas and Route Summarization

#### Chapter 4: OSPF Case Studies and Solutions

- Virtual Links
- OSPF Multiarea Adjacency
- External Reachability
- Lab 3: Advanced OSPF Options and Routing Policy

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Day 2

### **Chapter 5: IS-IS**

- Overview of IS-IS
- IS-IS PDUs
- Neighbors and Adjacencies
- Configuring and Monitoring IS-IS
- Lab 4: IS-IS Configuration and Monitoring

### **Chapter 6: Advanced IS-IS Operations and Configuration Options**

- IS-IS Operations
- IS-IS Configuration Options
- IS-IS Routing Policy
- Lab 5: Advanced IS-IS Configuration Options and Routing Policy

Chapter 7: Multilevel IS-IS Networks

- Level 1 and Level 2 Operations
- Multilevel Configuration
- Lab 6: Configuring a Multilevel IS-IS Network

Day 3

### **Chapter 8: BGP**

- Review of BGP
- BGP Operations
- BGP Path Selection and Options
- Configuration Options
- Lab 7: BGP

### **Chapter 9: BGP Attributes and Policy—Part 1**

- BGP Policy
- Next Hop
- Origin and MED
- AS Path
- Lab 8: BGP Attributes: Next Hop, Origin, MED, and AS Path

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Day 4

### **Chapter 10: BGP Attributes and Policy—Part 2**

- Local Preference
- Communities
- Lab 9: BGP Attributes: Local Preference and Communities

### **Chapter 11: BGP Route Damping**

- Route Flap and Damping Overview
- Route Damping Parameters
- Configuring and Monitoring Route Damping
- Lab 10: Route Damping

### **Chapter 12: Route Reflection and Confederations**

- Route Reflection Operation
- Configuration and Routing Knowledge
- BGP Confederations
- Lab 11: Scaling BGP

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