

## JTNOC

### Junos Troubleshooting in the NOC

#### Overview

This four-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, troubleshooting the data plane and control plane on devices running the Junos operating system, securing the control plane, staging and acceptance methodology, troubleshooting routing protocols, monitoring the network, troubleshooting vMX devices, and working with JTAC. This course uses virtual MX devices in the lab and is based on Junos OS Release 19.3R2.

#### Intended Audience

The course content is aimed at operators of devices running the Junos OS in a NOC environment. These operators include network engineers, administrators, support personnel, and reseller support personnel.

#### Course Level

Junos Troubleshooting in the NOC (JTNOC) is an introductory-level course.

#### Prerequisites

Students should have basic networking knowledge and an understanding of the Open Systems Interconnection (OSI) reference model and the TCP/IP protocol suite. Students should also attend the Introduction to the Junos Operating System (IJOS) course, or have equivalent experience prior to attending this class.

#### Objectives

- Reduce the time it takes to identify and isolate the root cause of an issue impacting your network.
- Describe Junos products and related information and recovery options.
- List various tools that can be used to troubleshoot Junos devices.
- Explain Junos CLI commands used in troubleshooting.
- Identify and isolate hardware issues.

- Troubleshoot problems with the control plane.
- Describe control plane protection features.
- Troubleshoot problems with interfaces and other data plane components.
- Describe the staging and acceptance methodology.
- Troubleshoot routing protocols.
- Describe how to monitor your network with SNMP, RMON, Junos Telemetry Interface, Junos Traffic Vision (formerly known as JFlow), and port mirroring.
- Monitor and troubleshoot vMX routers.
- Describe JTAC procedures and how to navigate the customer support site

## Course Length

4 Days

## Course Contents

### Day 1

- Course Introduction
- Troubleshooting as a Process
  - Before You Begin
  - The Troubleshooting Process
  - Challenging Network Issues
- Junos Product Families
  - The Junos OS
  - Control Plane and Data Plane
  - Field-Replaceable Units
  - Junos Product Families
  - **Lab 1: Identifying Hardware Components**
- Troubleshooting Toolkit
  - Troubleshooting Tools
  - Best Practices
  - **Lab 2: Monitoring Tools and Establishing a Baseline**

### Day 2

- Hardware and Environmental Conditions

- Hardware Troubleshooting Overview
- Memory and Storage
- Boot Monitoring
- Hardware-Related System Logs
- Chassis and Environmental Monitoring
- **Lab 3: Monitoring Hardware and Environmental Conditions**
- Control Plane
  - Control Plane Review
  - System and User Processes
  - Monitoring Routing Tables and Protocols
  - Monitoring Bridging
  - Monitoring the Address Resolution Protocol
  - **Lab 4: Control Plane Monitoring and Troubleshooting**
- Control Plane Protection
  - Protection Overview
  - DDOS Protection
  - Loopback Filter
  - **Lab 5: Monitoring and Verifying DDOS Protection**
- Data Plane – Interfaces
  - Interface Properties
  - General Interface Troubleshooting
  - Ethernet Interface Troubleshooting
  - **Lab 6: Monitoring and Troubleshooting Ethernet Interfaces**

### Day 3

- Data Plane – Other Components
  - Definition of a Data Plane Problem
  - Data Plane Components
  - Data Plane Forwarding
  - Load-Balancing Behavior
  - Firewall Filters and Policers
  - Data Plane Troubleshooting Case Study
  - **Lab 7: Isolate and Troubleshoot PFE Issues**
- Staging and Acceptance Testing

- Physical Inspection and Power-on
- General System Checks
- Interface Testing
- Troubleshooting Routing Protocols
  - Troubleshooting OSPF
  - Troubleshooting BGP
  - Troubleshooting Routing Loops and Remote Oscillation
  - **Lab 8: Troubleshooting Routing Protocols**
- High Availability
  - High Availability Overview
  - Graceful routing Engine Switchover
  - Graceful Restart
  - Nonstop Active Routing and Bridging
  - Unified In-Service Software Upgrade

#### Day 4

- Network Monitoring
  - SNMP
  - RMON
  - Telemetry
  - Flow Monitoring
  - **Lab 9: Monitoring the Network**
- vMX Troubleshooting
  - vMX Overview
  - Troubleshooting
  - **Lab 10: Monitoring vMX**
- JTAC Procedures
  - Opening a Support Case
  - Customer Support Tools
  - The Content of a PR
  - Transferring Files to JTAC
- Interface Troubleshooting
  - Interface Troubleshooting Chart
  - Troubleshooting Various Interface Types

- Junos RPM
  - RPM Overview
  - RPM Components
  - RPM Configuration
  - RPM Monitoring