

# Junos Troubleshooting in the NOC (JTNOOC)

Engineering Simplicity

## COURSE LEVEL

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

## 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.

## 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.

## ASSOCIATED CERTIFICATION

N/A

## RELEVANT JUNIPER PRODUCT

- Software
- Junos OS
- Support
- Routing
- Switching
- EX Series
- SRX Series
- M Series
- MX Series
- PTX Series
- T Series
- Service Provider Routing and Switching Track
- Enterprise Routing and Switching Track

## RECOMMENDED NEXT COURSE

N/A

## CONTACT INFORMATION

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## COURSE 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, working with JTAC, and using Automated Support and Prevention (ASAP). This course uses virtual MX devices in the lab and is based on Junos OS Release 17.3R1.10.

## OBJECTIVES

- Reduce the time it takes to identify and isolate the root cause of an issue impacting your network.
- Gain familiarity with Junos products as they pertain to troubleshooting.
- Become familiar with online resources valuable to Junos troubleshooting.
- Gain familiarity with Junos tools 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.
- Become familiar with JTAC procedures.
- Become familiar with Automated Support and Prevention tools in Junos Space.

## COURSE CONTENT

### Day 1

1	<p><b>Course Introduction</b></p>
2	<p><b>Troubleshooting as a Process</b></p> <ul style="list-style-type: none"> <li>• Before You Begin</li> <li>• The Troubleshooting Process</li> <li>• Challenging Network Issues</li> </ul>
3	<p><b>Junos Product Families</b></p> <ul style="list-style-type: none"> <li>• The Junos OS</li> <li>• Control Plane and Data Plane</li> <li>• Field-Replaceable Units</li> <li>• Junos Product Families</li> </ul> <p><b>Lab 1: Identifying Hardware Components</b></p>

4	<p><b>Troubleshooting Toolkit</b></p> <ul style="list-style-type: none"> <li>• Troubleshooting Tools</li> <li>• Best Practices</li> </ul> <p><b>Lab 2: Monitoring Tools and Establishing a Baseline</b></p>
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### Day 2

5	<p><b>Hardware and Environmental Conditions</b></p> <ul style="list-style-type: none"> <li>• Hardware Troubleshooting Overview</li> <li>• Memory and Storage</li> <li>• Boot Monitoring</li> <li>• Hardware-Related System Logs</li> <li>• Chassis and Environmental Monitoring</li> </ul> <p><b>Lab 3: Monitoring Hardware and Environmental Conditions</b></p>
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7	<p><b>Control Plane Protection</b></p> <ul style="list-style-type: none"> <li>• Protection Overview</li> <li>• DDOS Protection</li> <li>• Loopback Filter</li> </ul> <p><b>Lab 5: Monitoring and Verifying DDOS Protection</b></p>
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6	<p><b>Control Plane</b></p> <ul style="list-style-type: none"> <li>• Control Plane Review</li> <li>• System and User Processes</li> <li>• Monitoring Routing Tables and Protocols</li> <li>• Monitoring Bridging</li> <li>• Monitoring the Address Resolution Protocol</li> </ul> <p><b>Lab 4: Control Plane Monitoring and Troubleshooting</b></p>
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8	<p><b>Data Plane – Interfaces</b></p> <ul style="list-style-type: none"> <li>• Interface Properties</li> <li>• General Interface Troubleshooting</li> <li>• Ethernet Interface Troubleshooting</li> </ul> <p><b>Lab 6: Monitoring and Troubleshooting Ethernet Interfaces</b></p>
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## Day 3

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### 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

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### Staging and Acceptance Testing

- Physical Inspection and Power-on
- General System Checks
- Interface Testing

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### Troubleshooting Routing Protocols

- Troubleshooting OSPF
- Troubleshooting BGP
- Troubleshooting Routing Loops and Remote Oscillation

#### Lab 8: Troubleshooting Routing Protocols

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### High Availability

- High Availability Overview
- Graceful routing Engine Switchover
- Graceful Restart
- Nonstop Active Routing and Bridging
- Unified In-Service Software Upgrade

## Day 4

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### Network Monitoring

- SNMP
- RMON
- Telemetry
- Flow Monitoring

#### Lab 9: Monitoring the Network

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### Automated Support and Prevention

- Overview
- Service Now
- Service Insight

#### Lab 11: Automated Support and Prevention

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### vMX Troubleshooting

- vMX Overview
- Troubleshooting

#### Lab 10: Monitoring vMX

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### Interface Troubleshooting

- Interface Troubleshooting Chart
- Troubleshooting Various Interface Types

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### JTAC Procedures

- Opening a Support Case
- Customer Support Tools
- The Content of a PR
- Transferring Files to JTAC