Junos Service Provider Switching

COURSE OVERVIEW

This two-day course is designed to provide students with intermediate switching knowledge and configuration examples. The course includes an overview of switching concepts such as LANs, Layer 2 address learning, bridging, VLANs, provider bridging, VLAN translation, spanning-tree protocols, and Ethernet Operation, Administration, and Maintenance (OAM).

This course also covers Junos operating system (OS) specific implementations of integrated routing and bridging (IRB) interfaces, routing instances, virtual switches, load balancing, and port mirroring. Furthermore, this course covers the basics of Multiple VLAN Registration Protocol (MVRP), link aggregation groups (LAGs), and multichassis LAG (MC-LAG). This course is based on Junos OS Release 22.1R1.10.

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring Junos OS operations. This course uses MX Series 3D Ethernet Universal Edge Routers for the hands-on component.

COURSE LEVEL

Intermediate

AUDIENCE

Individuals responsible for configuring, managing, and monitoring devices running Junos OS

PREREQUISITES

- Basic networking knowledge and an understanding of the OSI model and the TCP/IP protocol suite
- Completion of the *Introduction to the Junos Operating System* course prior to attending this class

RELATED CERTIFICATION

JNCIS-SP

RELEVANT JUNIPER PRODUCT

- MX Series 3D router

CONTACT YOUR REGIONAL EDUCATION SERVICES TEAM:

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OBJECTIVES

- Describe the different Ethernet standards organizations.
- Describe the Layer 2 services that are available on the MX Series 3D Ethernet Universal Edge Routers.
- Describe the function of an Ethernet LAN.
- Describe learning and forwarding in a bridging environment.
- Describe Ethernet frame filtering.
- Implement VLAN tagging.
- Describe and implement MVRP.
- Implement IRB.
- Implement a Layer 2 firewall filter.
- Describe the use of a routing instance.
- Describe the function of a virtual router.
- Describe the function of a virtual switch.
- Describe the usage of logical systems.
- Implement a virtual switch.
- Describe interconnecting routing instances.
- Describe the different IEEE VLAN stacking models.
- Describe the components of provider bridging.
- Configure and monitor provider bridging.
- Explain the purpose of the Spanning Tree Protocol (STP).
- Describe the basic operation of STP, Rapid Spanning Tree Protocol (RSTP), Multiple Spanning Tree Protocol (MSTP), and VLAN Spanning Tree Protocol (VSTP).
- Configure and monitor STP, RSTP, MSTP, and VSTP.
- Explain the purpose of bridge protocol data unit (BPDU), loop, and root protection.
- Explain typical OAM features.
- Describe the basic operation of link fault management (LFM).
- Describe the basic operation of connectivity fault management (CFM).
- Configure and monitor Ethernet OAM.
- Describe the basic operation of Ethernet ring protection (ERP).
- Configure and monitor ERP.
- Describe the basic operation of LAGs and MC-LAGs.
- Configure and monitor LAGs and MC-LAGs.
- Describe the basic functionality of MX Series Virtual Chassis.
- Describe a basic troubleshooting method.
- List common issues that disrupt network operations.
- Identify tools used in network troubleshooting.
- Use available tools to resolve network issues.

COURSE CONTENTS

DAY 1

1 **Course Introduction**

2 **Ethernet Switching and Layer 2**
- Learn the Junos OS nomenclature
- Learn the functions of an Ethernet LAN
- Describe learning and forwarding in a bridging environment
- Implement Layer 2 address learning and forwarding
- Implement Layer 2 firewall filters

3 **VLANs and IRBs**
- Configure and monitor VLANs
- Automate VLAN administration
- Configure and monitor IRBs

Lab: Ethernet Switching and VLANs

4 **Virtual Switches**
- Describe the use of a routing instance
- Configure and monitor virtual switches
- Interconnect different routing instances
- Explain the purpose of logical systems

Lab: Virtual Switches

5 **Provider Bridging**
- Expanding the Bridged Network
- Explaining How Provider Bridging Works
- Configuring and Monitoring Provider Bridging

Lab: Provider Bridging

6 **Spanning-Tree Protocols**
- Summarize Spanning-Tree Protocols
- Explain How Rapid STP Works
- Review the Functions of Multiple STP
- Identify VLAN STP Improvements

7 **Configuring Spanning-Tree**
- Configuring and Monitoring Spanning-Tree Protocols
- Understanding BPDU, Loop, and Root Protection

Lab: MSTP

DAY 2

8 **Ethernet OAM**
- Summarize Ethernet Operation, Administration, and Maintenance
- Identify Capabilities in Link Fault Management
- Review the Features of Connectivity Fault Management

9 **Configuring OAM**
- Configuring and Monitoring Ethernet OAM

Lab: Ethernet OAM – LFM and CFM

10 **ERP and LAG**
- Summarize What ERP Does
- Explain How to Configure and Monitor ERP
- Provide an Overview of LAG
- Explain How to Configure and Monitor a LAG

Lab: High Availability and Network Optimization – ERP and LAG

11 **MC-LAG and Virtual Chassis**
- Provide a Brief Overview of MC-LAG
- Explain How to Configure and Monitor an MC-LAG
- Give a Brief Synopsis of the MX Virtual Chassis

Lab: MC-LAG

12 **Troubleshooting and Monitoring**
- Identify Basic Approaches to Troubleshooting and Monitoring
- Introduce Troubleshooting and Monitoring Tools
- Review Troubleshooting Case Study: Network Congestion

Lab: Troubleshooting and Monitoring

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