

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, virtual LANs (VLANs), provider bridging, VLAN translation, spanning-tree protocols, and Ethernet Operation, Administration, and Maintenance (OAM).

This course also covers Junos operating system-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 multi-chassis LAG (MC-LAG). This course uses MX Series 3D Ethernet Universal Edge Routers for the hands-on component. This course is based on the Junos OS Release 22.1R1.10.

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and in device operations.

COURSE LEVEL

Intermediate

AUDIENCE

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

PREREQUISITES

- Basic networking knowledge and an understanding of the Open Systems Interconnection (OSI) reference model and the TCP/IP protocol suite
- Attend the [Introduction to the Junos Operating System](#) course prior to attending this class

RELATED CERTIFICATION

[JNCIS-SP](#)

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 usage 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 Institute of Electrical and Electronics Engineers (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 the STP, the Rapid Spanning Tree Protocol (RSTP), the Multiple Spanning Tree Protocol (MSTP), and the VLAN Spanning Tree Protocol (VSTP).
- Configure and monitor the STP, the RSTP, the MSTP, and the 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).

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- Configure and monitor ERP.
- Describe the basic operation of LAGs and MC-LAGs.
- Configure and monitor a LAG 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

Module 1 Course Introduction

- Cover course objectives
- Review course contents
- Identify additional resources
- Discuss Juniper certifications

Module 2 Ethernet Switching and Layer 2

- Discuss the functions of an Ethernet LAN
- Explain learning and forwarding in a bridging environment
- Implement Layer 2 address learning and forwarding
- Implement Layer 2 firewall filters

Module 3 Virtual LANs and IRBs

- Implement VLAN tagging
- Automate VLAN administration through MVRP
- Configure IRBs

Lab 1: Ethernet Switching and VLANs

Module 4 Virtual Switches

- Describe the use of a routing instance
- Describe the functions of a virtual router and a virtual switch
- Configure a virtual switch
- Interconnect routing instances
- Describe the use of logical systems

Lab 2: Virtual Switches

Module 5 Provider Bridging

- Describe the different IEEE VLAN stacking models
- Describe the components of provider bridging
- Configure and monitor provider bridging

Lab 3: Provider Bridging

Module 6 Spanning-Tree Protocols

- Explain the purpose of spanning-tree protocols
- Describe the operation of STP, RSTP, MSTP and VSTP

Module 7 Configuring Spanning-Tree

- Configure and monitor STP, RSTP, MSTP, and VSTP
- Explain how BPDU, loop, and root protection works

Lab 4: MSTP

DAY 2

Module 8 Ethernet OAM

- Explain the features of Ethernet OAM
- Describe the operation of link fault management (LFM)
- Describe the operation of connectivity fault management (CFM)

Module 9 Configuring OAM

- Examine and implement LFM settings
- Examine and implement CFM settings

Lab 5: Ethernet OAM – LFM and CFM

Module 10 ERP and LAG

- Describe and configure Ethernet ring protection (ERP)
- Describe and configure a link aggregation group (LAG)

Lab 6: High Availability and Network Optimization – ERP and LAG

Module 11 High Availability and Network Optimization

- Explain MC-LAGs
- Configure and monitor an MC-LAG
- Explain the purpose of an MX virtual chassis

Lab 7: MC-LAG

Module 12 Troubleshooting and Monitoring

- Describe basic troubleshooting methods
- List common issues that disrupt networks
- Identify tools used in network troubleshooting
- Use available tools to resolve network issues

Lab 8: Troubleshooting and Monitoring

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