Course Outline

Junos Intermediate Routing

2 Day Course

DESCRIPTION

This two-day CLASSROOM course provides students with intermediate routing knowledge and configuration examples. The course includes an overview of protocol-independent routing features, load balancing and filter-based forwarding, OSPF, BGP, IP tunneling, and high availability (HA) features.

Through demonstrations and hands-on labs, students will gain experience in configuring and monitoring the Junos OS and monitoring device operations. This course uses Juniper Networks vSRX Series Services Gateways for the hands-on component, but the lab environment does not preclude the course from being applicable to other Juniper hardware platforms running the Junos OS.

This course is based on Junos OS Release 15.1X49-D70.3.

Junos Intermediate Routing (JIR) is an intermediate-level course.

PARTICIPANTS

This course benefits individuals responsible for configuring and monitoring devices running the Junos OS.

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) and Junos Routing Essentials (JRE) courses prior to attending this class.

OBJECTIVES

After successfully completing this course, you should be able to:

- Describe typical uses of static, aggregate, and generated routes.
- Configure and monitor static, aggregate, and generated routes.
- Explain the purpose of Martian routes and add new entries to the default list.
- Describe typical uses of routing instances.
- Configure and share routes between routing instances.
- Describe load-balancing concepts and operations.
- Implement and monitor Layer 3 load balancing.
- Illustrate benefits of filter-based forwarding.
- Configure and monitor filter-based forwarding.
- Explain the operations of OSPF.
- Describe the role of the designated router.
- List and describe OSPF area types.
- Configure, monitor, and troubleshoot OSPF.
- Describe BGP and its basic operations.
- Name and describe common BGP attributes.

- List the steps in the BGP route selection algorithm.
- Describe BGP peering options and the default route advertisement rules.
- Configure and monitor BGP.
- Describe IP tunneling concepts and applications.
- Explain the basic operations of generic routing encapsulation (GRE) and IP over IP (IP-IP) tunnels.
- Configure and monitor GRE and IP-IP tunnels.
- Describe various high availability features supported by the Junos OS.
- Configure and monitor some of the highlighted high availability features.

PROGRAMME

Day 1

Chapter 1: Course Introduction
Chapter 2: Protocol-Independent Routing
- Static Routes
- Aggregated Routes
- Generated Routes
- Martian Addresses
- Routing Instances
- Lab 1: Protocol-Independent Routing

Chapter 3: Load Balancing and Filter-Based Forwarding
- Overview of Load Balancing
- Configuring and Monitoring Load Balancing
- Overview of Filter-Based Forwarding
- Configuring and Monitoring Filter-Based Forwarding
- Lab 2: Load Balancing and Filter-Based Forwarding

Chapter 4: Open Shortest Path First
- Overview of OSPF
- Adjacency Formation and the Designated Router Election
- OSPF Scalability
- Configuring and Monitoring OSPF
- Basic OSPF Troubleshooting
- Lab 3: Open Shortest Path First

Day 2

Chapter 5: Border Gateway Protocol
- Overview of BGP
- BGP Attributes
- IBGP Versus EBGP
- Configuring and Monitoring BGP
- Lab 4: Border Gateway Protocol

Chapter 6: IP Tunneling
- Overview of IP Tunneling
- GRE and IP-IP Tunnels
- Implementing GRE and IP-IP Tunnels
- Lab 5: IP Tunneling

Chapter 7: High Availability
- Overview of High Availability Networks
- Graceful Restart
- Graceful RE Switchover

- Nonstop Active Routing
- BFD
- VRRP
- Lab 6: High Availability

Appendix A: IPv6
- Introduction to IPv6
- Routing Protocol Configuration Examples
- Tunneling IPv6 over IPv4
- Lab 7 (Optional): IPv6

Appendix B: IS-IS
- Overview of IS-IS
- Overview of IS-IS PDUs
- Adjacency Formation and DIS Election
- Configuring and Monitoring IS-IS
- Basic IS-IS Troubleshooting
- Lab 8 (Optional): IS-IS

Appendix C: Routing Information Protocol
- Introduction to RIP
- RIP Configuration Examples
- Monitoring and Troubleshooting RIP