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| COURSE LEVEL | COURSE OVERVIEW |
| *Junos Intermediate Routing* (JIR) is an intermediate-level course. | This two-day 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 18.2R1.9. |
| AUDIENCE |
| 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 course prior to attending this class | OBJECTIVES |
| * 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 |
| ASSOCIATED CERTIFICATION |
| [JNCIS-ENT](https://www.juniper.net/us/en/training/certification/resources/jncis-enterprise/) [JNCIS-SP](https://www.juniper.net/us/en/training/certification/resources/jncis-sp/) |
| RELEVANT JUNIPER PRODUCT |
| * Automation * Junos OS * M Series * MX Series * PTX Series * QFX Series * SRX Series * T Series * Service Provider Routing and Switching Track * Enterprise Routing and Switching Track * Instructor-Led training |
| RECOMMENDED NEXT COURSE |  |
| * *Advanced Junos Enterprise Switching*   (AJEX)   * *Advanced Junos Enterprise Routing* (AJER) * *Junos Multicast Routing* (JMR) * *Junos Class of Service* (JCOS) * *Advanced Junos Service Provider Routing*   (AJSPR)   * *Junos Layer 3 VPNs* (JL3V) * *Junos Layer 2 VPNs* (JL2V) |  |

# COURSE CONTENT

**Day 1**

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| **1** | **COURSE INTRODUCTION** |
| **2** | **Protocol-Independent Routing**   * Static Routes * Aggregated Routes * Generated Routes * Martian Addresses * Routing Instances   **LAB 1: Protocol-Independent Routing** |
| **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** |

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| **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**

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| **5** | **Border Gateway Protocol**   * Overview of BGP * BGP Attributes * IBGP Versus EBGP * Configuring and Monitoring BGP   **LAB 4: Border Gateway Protocol** |

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| **7** | **High Availability**   * Overview of High Availability Networks * Graceful Restart * Graceful RE Switchover * Nonstop Active Routing * BFD * VRRP   **LAB 6: High Availability** |

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| **6** | **IP Tunneling**   * Overview of IP Tunneling * GRE and IP-IP Tunnels * Implementing GRE and IP-IP Tunnels   **LAB 5: IP Tunneling** |

**Appendix C: Routing Information Protocol**

* **Introduction to RIP**
* **RIP Configuration Examples**
* **Monitoring and Troubleshooting RIP**

**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**

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