Junos IP Version 6

Revision 26A

Course overview

This two-day, intermediate-level course provides students with a comprehensive understanding of IPv6. The course begins with the fundamentals of IPv6 addressing and packet structure, then progresses through neighbor discovery, autoconfiguration, router advertisements, and key IPv6 services including path maximum transmission unit discovery (PMTUD), Virtual Router Redundancy Protocol (VRRP), and DHCPv6. The second half of the course covers IPv6 routing protocols—OSPFv3, IS-IS, and BGP—followed by IPv6 multicast and transition mechanisms including dual-stack, static tunneling, NAT64/DNS64, and Mapping of Address and Port with Translation (MAP-T). An appendix module covers advanced transitioning mechanisms for service provider environments.
Through lecture and hands-on labs, students will gain experience configuring and verifying IPv6 on Juniper Networks® routers and firewalls running Junos OS. Lab exercises reinforce each major topic, giving students direct experience with interface configuration, routing protocol deployment, multicast setup, firewall filters, and transition mechanism implementation.
This course is based on Junos OS 25.2R1.8 running on Juniper Networks® vMX Virtual Routers in a dedicated student lab environment.

Course level

Junos IP Version 6 is an intermediate-level course.

Audience

- Network engineers and architects responsible for designing, deploying, or migrating networks to IPv6.
- Service provider and enterprise engineers who need hands-on experience configuring IPv6 on Junos OS.
- Individuals seeking to understand IPv6 routing protocols, multicast, and transition mechanisms in a production context.
- Individuals preparing for Juniper Networks IPv6-related certification examinations.

Prerequisites

- General understanding of TCP/IP networking and IPv4 addressing.
- Basic knowledge of routing protocols such as OSPF and BGP.
- Familiarity with the Junos OS CLI.
- Completion of the *Introduction to the Junos Operating System* course or equivalent knowledge.
- Completion of the *Junos Intermediate Routing* course or equivalent knowledge.

Related products

Juniper Networks® MX Series Universal Routers, Juniper Networks® SRX Series Firewalls, and Junos OS

Recommended next course

Advanced Junos Service Provider Routing

Objectives

- Describe the similarities and differences between IPv4 and IPv6.
- Explain IPv6 subnets.
- Explain ICMPv6.
- Configure IPv6 router advertisements on Junos devices.
- Configure IPv6 services on Junos devices.
- Explain IPv6 routing tables.
- Describe and implement OSPFv3 networking.
- Explain and configure IPv6 networks using IS-IS.
- Describe and implement BGP peering sessions using IPv6.
- Describe and implement a multicast session using IPv6.
- Explain transition methods.
- Describe IPv6 transition mechanisms.

Course contents

Day 1

Module 01: IPv6 Fundamentals: Addressing and Packet Structure

- Describe the IPv6 structure
- Explain the different extension headers and their uses
- Identify the different IPv6 address types

Module 02: IPv6 Addressing and Interface Configuration

- Describe the IPv6 address types
- Describe how to subnet IPv6 addresses
- Configure IPv6 interfaces

Lab 01: Configuring IPv6 Interfaces

Module 03: IPv6 Neighbor Discovery and Autoconfiguration

- Explain the IPv6 neighbor discovery process
- Explain IPv6 optimization services

Module 04: Configuring Router Advertisements

- Explain router advertisements
- Configure router advertisement options and flags
- Use router advertisements to perform prefix renumbering
- Verify neighbor reachability using the IPv6 neighbor cache

Module 05: Configuring IPv6 Services

- Describe the MTU discovery process
- Describe the VRRP process
- Explain the DHCPv6 and DNS processes

Lab 02: Configuring IPv6 Services

Module 06: Protocol Independent Routing and Filters

- Explain and configure static, aggregated, and generated IPv6 routes
- Identify and explain IPv6 firewall filters

Lab 03: Configuring Protocol Independent Routing

Day 2

Module 07: OSPFv3

- Describe OSPFv3 routing
- Configure OSPFv3 networks

Lab 04: Configuring OSPFv3

Module 08: IS-IS

- Explain IS-IS using IPv6
- Configure IS-IS

Lab 05: Configuring IS-IS

Module 09: BGP

- Explain the BGP process
- Configure IPv6 BGP

Lab 06: Configuring BGP

Module 10: IPv6 Multicast

- Explain the multicast process
- Configure IPv6 multicast

Lab 07: Implementing Multicast with IPv6

Module 11: Transition Methods

- Identify the different transition methods
- Explain the concepts for using dual-stack
- Identify and explain the different methods for tunneling IPv6 traffic
- Explain the different translation methods for IPv6-only reachability

Lab 08: Configuring IPv6 Transition Mechanisms

Resources

All-Access Training Pass

On-Demand

Courses

Schedule

Learning Paths

Certification

Key contacts

Americas: networking.training.ams@hpe.com

Europe, Middle East, Africa: networking.training.emea@hpe.com

Asia Pacific & Japan: networking.training.apj@hpe.com

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