

IPv6 Fundamentals, Design, and Deployment

Course Description

The **IPv6 Fundamentals, Design, and Deployment (IP6FD)** is a five-day training that provides individuals with the knowledge and skills needed to implement and configure the IP version 6 (IPv6) features of Cisco IOS Software. The training also provides an overview of IPv6 technologies; covers IPv6 design and implementation; describes IPv6 operations, addressing, routing, services, and transition; and describes deployment of IPv6 in enterprise networks as well as in service provider networks. The training also includes case studies that are useful for deployment scenarios and remote labs.

This training also earns you 40 Continuing Education (CE) credits toward recertification.

How You'll Benefit

This training will help you:

- Learn how to successfully configure the IP version 6 features of Cisco IOS Software
- Gain leading-edge skills for high-demand responsibilities in the enterprise sector
- Earn 40 CE credits toward recertification

Who Should Enroll

Network Engineers

Course Objectives

- Describe the factors that led to the development of IPv6, and the possible uses of this new IP structure
- Describe the structure of the IPv6 address format, how IPv6 interacts with data link layer technologies, and how IPv6 is supported in Cisco IOS Software
- Describe the nature of changes to Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) to support IPv6, and how networks can be renumbered using both services
- Understand the updates to IPv4 routing protocols needed to support IPv6 topologies
- Understand multicast concepts and IPv6 multicast specifics
- Describe IPv6 transition mechanisms and which methods will be most effective in your network
- Describe security issues, how security for IPv6 is different than for IPv4, and emerging practices for IPv6-enabled networks
- Describe the standards bodies that define IPv6 address allocation, as well as one of the leading IPv6 deployment issues, multihoming

- Describe the deployment strategies that service providers are facing when deploying IPv6

Course Prerequisites

The knowledge and skills you are expected to have before attending this course are:

- Understanding of networking and routing (on Cisco CCNP® level, but no formal certification is required)
- Working knowledge of the Microsoft Windows operating system

Course Outline

1. Explaining the Rationale for IPv6
2. Evaluating IPv6 Features and Benefits
3. Understanding Market Drivers
4. Understanding the IPv6 Addressing Architecture
5. Describing the IPv6 Header Format
6. Enabling IPv6 on Hosts
7. Enabling IPv6 on Cisco Routers
8. Using ICMPv6 and Neighbor Discovery
9. Troubleshooting IPv6
10. IPv6 Mobility
11. Describing DNS in an IPv6 Environment
12. Understanding DHCPv6 Operations
13. Understanding QoS Support in an IPv6 Environment
14. Using Cisco IOS Software Features
15. Routing with RIPng
16. Examining OSPFv3
17. Examining Integrated IS-IS
18. Examining EIGRP for IPv6
19. Understanding MP-BGP
20. Configuring IPv6 Policy-Based Routing
21. Configuring FHRP for IPv6
22. Configuring Route Redistribution
23. Implementing Multicast in an IPv6 Network
24. Using IPv6 MLD
25. Implementing Dual-Stack
26. Describing IPv6 Tunneling Mechanisms
27. Configuring IPv6 ACLs
28. Using IPsec, IKE, and VPNs
29. Discussing Security Issues in an IPv6 Transition Environment
30. Understanding IPv6 Security Practices
31. Configuring Cisco IOS Firewall for IPv6

32. Examining IPv6 Address Allocation
33. Understanding the IPv6 Multihoming Issue
34. Identifying IPv6 Enterprise Deployment Strategies
35. Identifying IPv6 Service Provider Deployment
36. Understanding Support for IPv6 in MPLS
37. Understanding 6VPE
38. Understanding IPv6 Broadband Access Services
39. Planning and Implementing IPv6 in Enterprise Networks
40. Planning and Implementing IPv6 in Service Provider Networks
41. Planning and Implementing IPv6 in Branch Networks

Lab Outline

1. Enabling IPv6 on Hosts
2. Using Neighbor Discovery
3. Using Prefix Delegation
4. Routing with OSPFv3
5. Routing with IS-IS
6. Routing with EIGRP
7. Routing with BGP and MP-BGP
8. Multicasting
9. Implementing Tunnels for IPv6
10. Configuring Advanced ACLs
11. Implementing IPsec and IKE
12. Configuring Cisco IOS Firewall
13. Configuring 6PE and 6VPE