IP6FD - IPv6 Fundamentals, Design, and Deployment v4.0

Duration: 40 Hours (5 Days)

Overview

The IP6FD - IPv6 Fundamentals, Design, and Deployment v4.0 course is a comprehensive IPv6 training program that equips learners with the knowledge and skills needed to design and deploy Internet Protocol version 6 (IPv6). The course covers a wide range of topics, including IPv6 operations, addressing architecture, header formats, and the use of ICMPv6 for neighbor discovery. It also delves into IPv6 certification-related areas such as IPv6-enabled routing protocols, multicast services, transition mechanisms, security, and deployment strategies. Through case studies and practical lessons, participants will learn to evaluate the features and benefits of IPv6, understand market drivers, and effectively implement IPv6 in various network environments. This course is essential for IT professionals looking to stay ahead in the networking field by mastering IPv6's intricacies and ensuring a smooth transition from IPv4.

Audience Profile

The IP6FD course offers in-depth IPv6 training, ideal for IT professionals involved in network design, deployment, and maintenance.

- Target Audience for the IP6FD - IPv6 Fundamentals, Design, and Deployment v4.0:
- Network Engineers and Architects
- Systems Engineers
- Network Analysts
- IT Project Managers
- Network Administrators
- Technical Operation Staff
- Security Engineers and Administrators
- IT Professionals looking to upgrade their skills to IPv6
- Service Provider Technical Staff
- Data Center Managers and Staff
- Enterprise Infrastructure Staff
- IT Decision Makers planning IPv6 integration
- Technical Sales and Pre-sales Consultants
- Technical Support Personnel for IPv6 Networks

Course Syllabus

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

- Explaining the Rationale for IPv6
- Evaluating IPv6 Features and Benefits
- Understanding Market Drivers
- Understanding the IPv6 Addressing Architecture
- Describing the IPv6 Header Format
- Enabling IPv6 on Hosts
- Enabling IPv6 on Cisco Routers
- Using ICMPv6 and Neighbor Discovery
- Troubleshooting IPv6
- 10.IPv6 Mobility
- 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

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