**Document Generated: 11/03/2026**

**Learning Style: Virtual Classroom**

**Technology: Cisco**

**Difficulty: Intermediate**

**Course Duration: 5 Days**

# IPv6 Fundamentals, Design, and Deployment v4.1 (IP6FD)



## About this course:

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.

## Course Objective:

Upon completing this course, the learner will be able to meet these overall 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

## Audience:

The primary audience for this course is as follows:

- Network Engineers

## Prerequisite:

The knowledge and skills that a learner should have before attending this course are as follows:

- Cisco CCNA® certification, including either the Interconnecting Cisco Network Devices 1 (ICND1) certification or the Interconnecting Cisco Network Devices 2 (ICND2) certification
- 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
- IPv6 Mobility
- Describing DNS in an IPv6 Environment
- Understanding DHCPv6 Operations
- Understanding QoS Support in an IPv6 Environment
- Using Cisco IOS Software Features
- Routing with RIPng
- Examining OSPFv3
- Examining Integrated IS-IS
- Examining EIGRP for IPv6
- Understanding MP-BGP
- Configuring IPv6 Policy-Based Routing
- Configuring FHRP for IPv6
- Configuring Route Redistribution
- Implementing Multicast in an IPv6 Network
- Using IPv6 MLD
- Implementing Dual-Stack
- Describing IPv6 Tunneling Mechanisms
- Configuring IPv6 ACLs
- Using IPsec, IKE, and VPNs
- Discussing Security Issues in an IPv6 Transition Environment
- Understanding IPv6 Security Practices
- Configuring Cisco IOS Firewall for IPv6
- Examining IPv6 Address Allocation
- Understanding the IPv6 Multihoming Issue
- Identifying IPv6 Enterprise Deployment Strategies
- Identifying IPv6 Service Provider Deployment
- Understanding Support for IPv6 in MPLS
- Understanding 6VPE
- Understanding IPv6 Broadband Access Services
- Planning and Implementing IPv6 in Enterprise Networks
- Planning and Implementing IPv6 in Service Provider Networks
- Planning and Implementing IPv6 in Branch Networks

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Lab Outline:

Labs are designed to assure learners a whole practical experience, through the following practical activities:

- 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
- Configuring Advanced ACLs
- Implementing IPsec and IKE
- Configuring Cisco IOS Firewall
- Configuring 6PE and 6VPE

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