IP6FD (CISCO IPV6 FUNDAMENTALS, DESIGN & DEPLOYMENT)

Objetivo

Upon completing this course, you will be able to: Describe the factors that led to the development of IPv6 and 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 Implement IPv6 services and applications Understand the updates to IPv4 routing protocols needed to support IPv6 topologies Understand multicast concepts and IPv6 multicast specifics Evaluate the scenario and desired outcome and identify the best transition mechanism for the situation 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, in addition to one of the leading IPv6 deployment issuesâ□□multihoming Describe the deployment strategies that service providers might consider when deploying IPv6 Describe case studies for enterprise, service provider, and branch networks

PÃºblico Alvo

This course is primarily intended for Network Engineers and Technicians, Network Operations Center (NOC) Support Personnel and Help Desk Technicians, Any individual involved in implementation and verification of routing protocols in the enterprise networks.

PrÃ©-Requisitos

The knowledge and skills that a learner must have before attending this course are as follows: Cisco Certified Network Associate (CCNA) certification. Understanding of networking and routing (on CCNP level, but no certification required). Working knowledge of the Microsoft Windows operating system.

Carga HorÃ¡ria

40 horas (5 dias).

ConteÃºdo ProgramÃ¡tico

Module 1: Introduction to IPv6
Lesson 1: Explaining the Rationale for IPv6
IP Address Allocation
History of IPv4
Next Generation of IP
IPv4 Workarounds
Lesson 2: Evaluating IPv6 Features and Benefits
Features and Benefits of IPv6

IPv6 Addresses
IPv6 Autoconfiguration and Aggregation
Advanced IPv6 Features
Transition Strategies to IPv6
Lesson 3: Understanding Market Drivers
Market Growth for IPv6
Native IPv6 Content
Drivers for Adoption

Module 2: IPv6 Operations
Lesson 1: Understanding the IPv6 Addressing Architecture
IPv6 Addressing Architecture
IPv6 Address Formats and Types
IPv6 Address Uses
Required IPv6 Addresses
Lesson 2: Describing the IPv6 Header Format
IPv6 Header Changes and Benefits
IPv6 Header Fields
IPv6 Extension Headers
Lesson 3: Enabling IPv6 on Hosts
Enabling IPv6 on Hosts
Enabling IPv6 on Windows
Enabling IPv6 on Mac OS X
Enabling IPv6 on Linux
Lesson 4: Enabling IPv6 on Cisco Routers
Enabling IPv6 on Cisco Routers
IPv6 Address Configuration
Autoconfiguration
Lesson 5: Using ICMPv6 and Neighbor Discovery
ICMPv6
ICMP Errors
Echo
IPv6 over Data Link Layers
Neighbor Discovery
Stateless Autoconfiguration
Value of Autoconfiguration
Renumbering
Cisco IOS Neighbor Discovery Command Syntax
Cisco IOS Network Prefix Renumbering Scenario
ICMP MLD
IPv6 Mobility
Lesson 6: Troubleshooting IPv6
Cisco IOS IPv6 Configuration Example
Cisco IOS show Commands
Cisco IOS debug Commands
Cisco IOS debug Command Example

Module 3: IPv6 Services

Lesson 1: IPv6 Mobility
Introduction to IP Mobility
Mobile IPv6
Network Mobility Examples
Lesson 2: Describing DNS in an IPv6 Environment
DNS Objects and Records
DNS Tree Structure
Dynamic DNS
Lesson 3: Understanding DHCPv6 Operations
DHCPv6
DHCPv6 Operation
DHCPv6 Multicast Addresses
DHCPv6 Prefix Delegation Process
DHCPv6 Troubleshooting
Lesson 4: Understanding QoS Support in an IPv6 Environment
IPv6 Header Fields Used for QoS
IPv6 and the Flow Label Field
IPv6 QoS Configuration
Lesson 5: Using Cisco IOS Software Features
Cisco IOS Software Features
Cisco IOS IPv6 Tools
IPv6 Support for Cisco Discovery Protocol
Cisco Express Forwarding IPv6
IP Service Level Agreements

Module 4: IPv6-Enabled Routing Protocols
Lesson 1: Routing with RIPng
Introducing RIPng for IPv6
Examining RIPng Enhancements
Configuring RIPng
Lesson 2: Examining OSPFv3
OSPFv3 Key Characteristics
OSPFv3 Enhancements
OSPFv3 Configuration
OSPFv3 IPsec ESP Authentication and Encryption
OSPFv3 Advanced Functionalities
Lesson 3: Examining Integrated IS-IS
Integrated IS-IS Characteristics
Changes Made to IS-IS to Support IPv6
Single SPF Architecture
Multitopology IS-IS for IPv6
IS-IS IPv6 Configuration on Cisco Routers
Lesson 4: Examining EIGRP for IPv6
EIGRP for IPv6
Cisco IOS EIGRP for IPv6 Commands
Lesson 5: Understanding MP-BGP
MP-BGP Support for IPv6
IPv6 as Payload and Transport Mechanism in MP-BGP

BGP Peering Over Link-Local Addresses
BGP Prefix Filtering
MP-BGP Configuration and Troubleshooting
Lesson 6: Configuring IPv6 Policy-Based Routing
Policy-Based Routing
Configure PBR
Lesson 7: Configuring FHRP for IPv6
First-Hop Redundancy Protocols and Concepts
HSRP for IPv6
GLBP for IPv6
Lesson 8: Configuring Route Redistribution
Route Redistribution
PE-CE Redistribution for Service Providers

Module 5: IPv6 Multicast Services
Lesson 1: Implementing Multicast in an IPv6 Network
IPv6 Multicast Addressing
PIM for IPv6
Rendezvous Points
MP-BGP for the IPv6 Multicast Address Family
How to Implement Multicasting in an IPv6 Network
IPv6 Multicast Application Example
The lesson includes these activities:
Lesson 2: Using IPv6 MLD
Multicast Listener Discovery
MLD Snooping and MLD Group Limits
Multicast User Authentication and Group Range Support

Module 6: IPv6 Transition Mechanisms
Lesson 1: Implementing Dual-Stack
Dual-Stack Applications
Dual-Stack Node
The Dual-Stack Approach
Lesson 2: Describing IPv6 Tunneling Mechanisms
Overlay Tunnels
Manually Configured Tunnels
Automatic Tunnels
The lesson includes these activities:

Module 7: IPv6 Security
Lesson 1: Configuring IPv6 ACLs
IPv6 ACLs
IPv6 ACL Configuration
Reflexive and Time-Based ACLs
Cisco IOS IPv6 Header Filtering
Cisco IOS New ICMPv6 Types
Editing of ACLs
How to Configure ACLs in an IPv6 Environment

The lesson includes these activities:
Lesson 2: Using IPsec, IKE, and VPNs
IPsec, IKE, and VPNs Basics
IPsec and IKE
VPN Connections Using IPv6
The lesson includes these activities:
Lesson 3: Discussing Security Issues in an IPv6 Transition Environment
Dual-Stack Issues
Tunnel Security Issues
NAT-PT Security Issues
ICMP Traffic Requirements
Lesson 4: Understanding IPv6 Security Practices
Threats in IPv6 Networks
Build Distributed Security Capability
Hide Topology when Possible
Secure the Local Link
ICMPv6 at Edge—Manage ICMPv6 Traffic
Develop Mobility Support Plan
Use Transition Mechanisms as Transport
Secure the Routing Plane
Deploy an Early-Warning System
Lesson 5: Configuring Cisco IOS Firewall for IPv6
Cisco IOS Firewall for IPv6
IPv6 Inspection on ISRs
Implement IPv6 Inspection on ISRs
Zone-Based Policy Firewall for IPv6 on ISRs
Configuring Zones and Zone Pairs
Configuring a Basic OSI Layer 3 to 4 Interzone Access Policy
Troubleshooting the Zone-Based Policy Firewall

Module 8: Deploying IPv6
Lesson 1: Examining IPv6 Address Allocation
IPv6 Internet
IPv6 Address Allocation
Connecting to the IPv6 Internet
Lesson 2: Understanding the IPv6 Multihoming Issue
IPv6 Multihoming Aspects and Issues
IPv6 Multihoming Status
Lesson 3: Identifying IPv6 Enterprise Deployment Strategies
Enterprise Networks
Impacts of Network Services
WAN Networks
Dual Stack: Advantages and Disadvantages
Tunneling: Advantages and Disadvantages
Translation: Advantages and Disadvantages

Module 9: IPv6 and Service Providers
Lesson 1: Identifying IPv6 Service Provider Deployment

IPv6 Service Provider Deployment
Dual-Stack Deployment
IPv6-Only Deployment
Encapsulation
IPv6 Services
Key Service Provider Strategies
Service Layer Address Allocation
Encapsulation Support

Lesson 2: Understanding Support for IPv6 in MPLS

MPLS Operations
IPv6 over MPLS Deployment Scenarios
IPv6 Tunnels Configured on CE Routers
IPv6 over Layer 2 MPLS VPN
Cisco 6PE
How to Deploy Cisco 6PE on MPLS Networks

Lesson 3: Understanding 6VPE

Cisco 6VPE
Configuring 6VPE
The lesson includes these activities:

Lesson 4: Understanding IPv6 Broadband Access Services

IPv6 Rapid Deployment
Customer Link Encapsulations
FTTH Access Architecture
Cable Access Architecture
Wireless Access Architecture
DSL Access Architecture

Module 10: IPv6 Case Studies

Lesson 1: Planning and Implementing IPv6 in Enterprise Networks

Enterprise Network Definition
Implementing IPv6 in an Enterprise Campus Network
IPv6 in an Enterprise WAN Network

Lesson 2: Planning and Implementing IPv6 in Service Provider Networks

Service Provider Network Design
Native IPv6 Deployment in Service Provider Access Networks
Native IPv6 Deployment in the Service Provider Core Network
6PE Deployment in the Service Provider Core Network

Lesson 3: Planning and Implementing IPv6 in Branch Networks

Branch Deployment Overview
Branch Deployment Profiles: Single-Tier Profile Implementation
Branch Deployment Profiles: Dual-Tier and Multitier Profile Implementations

Labs

Lab 1: Enabling IPv6 on Hosts
Lab 2: Using Neighbor Discovery
Lab 3: Using Prefix Delegation
Lab 4: Routing with OSPFv3
Lab 5: Routing with IS-IS

Lab 6: Routing with EIGRP
Lab 7: Routing with BGP and MP-BGP
Lab 8: Multicasting
Lab 9: Implementing Tunnels for IPv6
Lab 10: Configuring Advanced ACLs
Lab 11: Implementing IPsec and IKE
Lab 12: Configuring Cisco IOS Firewall
Lab 13: Configuring 6PE and 6VPE