



CCNA Boot Camp CCNAX v2.0

Interconnecting Cisco Networking Devices Accelerated

Course Length: 5 days, 60 Hours

Course Delivery: Traditional Classroom • Online Live

Course Overview

Interconnecting Cisco Networking Devices: Accelerated (CCNAX) v2.0 is a 60-hour instructor-led course that provides students with the knowledge and skills necessary to install, operate, and troubleshoot a small to medium-sized network, including connecting to a WAN and implementing network security.

This course is the equivalent of Interconnecting Cisco Network Devices Part 1 v2.0 and Interconnecting Cisco Network Devices Part 2 v2.0 together.

The ideal candidate would be someone who has worked in a data network environment (PC support/helpdesk or network operations/monitoring), and has had hands-on experience, though no formal training, with Cisco IOS devices. This boot camp will serve to review and expand on what the candidate already knows and add to it, the detailed configuration and implementation of Cisco IOS devices.

Audience

Individuals seeking the Cisco CCNA® Routing and Switching certification. The course is also appropriate for pre-sales and post-sales network engineers involved in the installation and support of enterprise branch office networks.

Prerequisites

Computer literacy
IP Addressing Knowledge, Including Subnetting
CompTIA Network + of equivalent knowledge
Experience with Cisco IOS Devices

Those new to Cisco IOS should consider taking the ICND1 and ICND2 classes instead of CCNAX v2.0



At the end of this CCNA training course, you'll be able to:

- Describe network fundamentals and build simple LANs
- Establish Internet connectivity
- Manage network device security
- Describe IPv6 basics
- Troubleshoot VLAN issues, explain how STP works, configure EtherChannel, and understand the idea behind Layer 3 redundancy
- Troubleshoot IP connectivity
- Define the characteristics, functions, and components of a WAN
- Configure and troubleshoot EIGRP in an IPv4 environment, and configure EIGRP for IPv6
- Configure, verify, and troubleshoot multi-area OSPF
- Describe SNMP, syslog and NetFlow, and manage Cisco device configurations, IOS images, and licenses

Outline

Module 1: Building a Simple Network

Lesson 1: Exploring the Functions of Networking

- What Is a Network?
- Physical Components of a Network
- Interpreting a Network Diagram
- Impact of User Applications on the Network
- Characteristics of a Network
- Physical vs. Logical Topologies

Lesson 2: Understanding the Host-to-Host Communications Model

- Introducing Host-to-Host Communications
- OSI Reference Model
- TCP/IP Protocol Suite
- Encapsulation and De-Encapsulation
- Peer-to-Peer Communications

Lesson 3: Introducing LANs

- Local Area Networks
- LAN Components
- Need for Switches
- Switches



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Lesson 4: Operating Cisco IOS Software

- Cisco IOS Software Features and Functions
- Cisco IOS CLI Functions
- User EXEC Mode
- Privileged EXEC Mode
- Help Functions in the CLI
- CLI Error Messages
- Managing Cisco IOS Configurations
- Improving the User Experience in the CLI

Lesson 5: Starting a Switch

- Switch Installation
- Switch LED Indicators
- Connecting to a Console Port
- Basic Switch Configuration
- Verifying the Switch Initial Startup Status

Lesson 6: Understanding Ethernet and Switch Operation

- Ethernet LAN Connection Media
- Ethernet Frame Structure
- MAC Addresses
- Switching Operation
- Duplex Communication
- Configuring Duplex and Speed Options

Lesson 7: Troubleshooting Common Switch Media Issues

- Common Troubleshooting Tools
- Media Issues
- Troubleshooting Switch Media Issues
- Port Issues
- Troubleshooting Port Issues

Lesson 8: Module Summary

- References

Lesson 9: Module Self-Check

Module 2: Establishing Internet Connectivity



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Lesson 1: Understanding the TCP/IP Internet Layer

- Internet Protocol
- IPv4 Address Representation
- IPv4 Header Address Fields
- Decimal and Binary Systems
- Decimal-to-Binary Conversion
- IP Address Classes
- Reserved IPv4 Addresses
- Domain Name System
- Verifying the IPv4 Address of a Host
- Summary

Lesson 2: Understanding IP Addressing and Subnets

- Subnets
- Subnet Masks
- Octet Values of a Subnet Mask
- Default Gateways
- Computing Usable Subnetworks and Hosts
- Applying Subnet Masks
- Determining the Network Addressing Scheme
- Example: Addressing Scheme
- Variable-Length Subnet Mask
- VLSM Example
- Summary

Lesson 3: Understanding the TCP/IP Transport Layer

- TCP/IP Transport Layer Functions
- Reliable vs. Best-Effort Transport
- TCP vs. UDP Analogy
- UDP Characteristics
- TCP Characteristics
- TCP/IP Applications
- Summary

Lesson 4: Exploring the Functions of Routing

- Role of a Router
- Router Characteristics
- Router Functions
- Path Determination
- Routing Table
- Types of Routes
- Dynamic Routing Protocols



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- Summary

Lesson 5: Configuring a Cisco Router

- Initial Router Startup
- Initial Router Setup
- Configuring Router Interfaces
- Configuring the Cisco Router IP Address
- Verifying Interface Configuration and Status
- Exploring Connected Devices
- Cisco Discovery Protocol
- Discovering Neighbors Using Cisco Discovery Protocol
- Summary

Lesson 6: Exploring the Packet Delivery Process

- Layer 2 Addressing
- Layer 3 Addressing
- Address Resolution Protocol
- Host-to-Host Packet Delivery
- Role of a Switch in Packet Delivery
- Summary

Lesson 7: Enabling Static Routing

- Routing Operations
- Static and Dynamic Routing Comparison
- When to Use Static Routing
- Static Route Configuration
- Default Routes
- Static Route Configuration Verification
- Summary

Lesson 8: Managing Traffic Using ACLs

- Using ACLs
- ACL Operation
- ACL Wildcard Masking
- Wildcard Bit Mask Abbreviations
- Types of ACLs
- Testing an IP Packet Against a Numbered Standard Access List
- Basic Configuration of Numbered Standard IPv4 ACLs
- Summary



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Lesson 9: Enabling Internet Connectivity

- The Demarcation Point
- Dynamic Host Configuration Protocol
- Options for Configuring a Provider-Assigned IP Address
- Configuring a Static Provider-Assigned IP Address
- Configuring a DHCP Client
- Public vs. Private IPv4 Addresses
- Introducing NAT
- Types of Addresses in NAT
- Types of NAT
- Understanding Static NAT
- Configuring Static NAT
- Verifying Static NAT Configuration
- Understanding Dynamic NAT
- Configuring Dynamic NAT
- Verifying Dynamic NAT Configuration
- Understanding PAT
- Configuring PAT
- Verifying PAT Configuration
- Troubleshooting NAT
- Troubleshooting NAT Case Study
- Summary

Lesson 10: Module Summary

- References

Lesson 11: Module Self-Check

Module 3: Managing Network Device Security

Lesson 1: Securing Administrative Access

- Network Device Security Overview
- Securing Access to Privileged EXEC Mode
- Securing Console Access
- Securing Remote Access
- Enabling Remote Access Connectivity
- Limiting Remote Access with ACLs
- External Authentication Options
- Configuring the Login Banner
- Summary



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Lesson 2: Implementing Device Hardening

- Securing Unused Ports
- Port Security
- Port Security Configuration
- Port Security Verification
- Disabling Unused Services
- Network Time Protocol
- Configuring NTP
- Verifying NTP
- Summary

Lesson 3: Implementing Traffic Filtering with ACLs

- Using ACLs to Filter Network Traffic
- ACL Operation
- Applying ACLs to Interfaces
- The Need for Extended ACLs
- Configuring Numbered, Extended IPv4 ACLs
- Configuring Named ACLs
- ACL Configuration Guidelines
- Monitoring ACLs
- Troubleshooting Common ACL Errors
- Summary

Lesson 4: Module Summary

- References

Lesson 5: Module Self-Check

Module 4: Introducing IPv6

Lesson 1: Introducing Basic IPv6

- IPv4 Addressing Exhaustion Workarounds
- IPv6 Features
- IPv6 Addresses
- IPv6 Unicast Addresses
- IPv6 Addresses Allocation
- Basic IPv6 Connectivity
- Summary



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Lesson 2: Understanding IPv6

- IPv6 Header Changes and Benefits
- ICMPv6
- Neighbor Discovery
- Stateless Autoconfiguration
- Summary

Lesson 3: Configuring IPv6 Routing

- Overview
- Routing for IPv6
- Static Routing
- Summary

Lesson 4: Module Summary

- References

Lesson 5: Module Self-Check

Module 5: Building a Medium-Sized Network

Lesson 1: Implementing VLANs and Trunks

- Overview
- Issues in a Poorly Designed Network
- VLAN Introduction
- Trunking with 802.1Q
- Creating a VLAN
- Assigning a Port to a VLAN
- Configuring an 802.1Q Trunk
- VLAN Design Considerations
- Summary

Lesson 2: Routing Between VLANs

- Purpose of Inter-VLAN Routing
- Options for Inter-VLAN Routing
- Configuring a Router with a Trunk Link
- Summary



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Lesson 3: Using a Cisco Network Device as a DHCP Server

- Need for a DHCP Server
- Understanding DHCP
- Configuring a DHCP Server
- Monitoring DHCP Server Functions
- DHCP Relay Agent
- Summary

Lesson 4: Troubleshooting VLAN Connectivity

- Overview
- Dynamic Trunking Protocol
- VLAN Troubleshooting
- Trunk Troubleshooting
- Summary

Lesson 5: Building Redundant Switched Topologies

- Issues in Redundant Topologies
- Spanning-Tree Operation
- Types of Spanning-Tree Protocols
- Per VLAN Spanning Tree Plus
- Modifying the Bridge ID
- Analyzing the STP Topology
- Spanning-Tree Failure Consequences
- PortFast and BPDU Guard
- Summary

Lesson 6: Improving Redundant Switched Topologies with EtherChannel

- The Need for EtherChannel
- Advantages of EtherChannel
- EtherChannel Protocols
- Configuring EtherChannel
- Verifying EtherChannel
- Summary

Lesson 7: Understanding Layer 3 Redundancy

- The Need for Default Gateway Redundancy
- Default Gateway Redundancy
- HSRP
- HSRP Interface Tracking



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- HSRP Load Balancing
- Gateway Load Balancing Protocol
- Summary

Lesson 8: Module Summary

- References

Lesson 9: Module Self-Check

Module 6: Troubleshooting Basic Connectivity

Lesson 1: Troubleshooting IPv4 Network Connectivity

- Components of Troubleshooting End-to-End Connectivity
- Verification of End-to-End Connectivity
- Verification of Physical Connectivity Issue
- Identification of Current and Desired Path
- Default Gateway Issues
- Name Resolution Issues
- ACL Issues
- Summary

Lesson 2: Troubleshooting IPv6 Network Connectivity

- Troubleshooting End-to-End IPv6 Connectivity
- Verification of End-to-End IPv6 Connectivity
- Identification of Current and Desired IPv6 Path
- Default Gateway Issues in IPv6
- Name Resolution Issues in IPv6
- ACL Issues in IPv6
- Summary

Lesson 3: Module Summary

- References

Lesson 4: Module Self-Check

Module 7: Wide Area Networks

Lesson 1: Understanding WAN Technologies

- Introducing WANs
- WANs vs. LANs
- WAN Devices
- Role of Routers in WANs
- Serial WAN Cabling



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- WAN Layer 2 Protocols
- WAN Link Options
- Summary

Lesson 2: Configuring Serial Encapsulation

- Point-to-Point Connectivity
- Configuring a Point-to-Point Link
- Serial Communication Links
- Configuration of a Serial Interface
- HDLC Protocol
- Point-to-Point Protocol
- PPP Configuration
- PPP Authentication: PAP
- PPP Authentication: CHAP
- Configuring CHAP for PPP Authentication
- Verifying CHAP Configuration
- Troubleshooting Serial Connections
- Summary

Lesson 3: Establishing a WAN Connection Using Frame Relay

- Understanding Frame Relay
- Frame Relay Topologies
- Frame Relay Reachability Issues
- Frame Relay Signaling
- Frame Relay Address Mappings
- Configuring Frame Relay
- Point-to-Point vs. Multipoint
- Configuring Point-to-Point Frame Relay
- Configuring Multipoint Frame Relay
- Verifying Frame Relay Configuration
- Summary

Lesson 4: Introducing VPN Solutions

- VPNs and Their Benefits
- Cisco SSL VPN Solutions
- Introducing IPsec
- Summary

Lesson 5: Configuring GRE Tunnels

- GRE Tunnel Overview
- GRE Tunnel Configuration



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- GRE Tunnel Verification
- Summary

Lesson 6: Module Summary

- References

Lesson 7: Module Self-Check

Module 8: Implementing an EIGRP-Based Solution

Lesson 1: Implementing EIGRP

- Purpose of Dynamic Routing Protocols
- Interior and Exterior Routing Protocols
- Distance Vector and Link-State Routing Protocols
- Administrative Distance
- EIGRP Features
- EIGRP Path Selection
- EIGRP Metric
- EIGRP Configuration
- Verification of EIGRP Configuration
- Load Balancing with EIGRP
- Summary

Lesson 2: Troubleshooting EIGRP

- Components of Troubleshooting EIGRP
- Troubleshooting EIGRP Neighbor Issues
- Troubleshooting EIGRP Routing Table Issues
- Summary

Lesson 3: Implementing EIGRP for IPv6

- EIGRP for IPv6
- EIGRP for IPv6 Commands
- EIGRP for IPv6 Configuration Example
- Summary

Lesson 4: Module Summary

- References

Lesson 5: Module Self-Check



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Module 9: Implementing a Scalable OSPF-Based Solution

Lesson 1: Implementing OSPF

- Link-State Routing Protocol Overview
- Link-State Routing Protocol Data Structures
- Introducing OSPF
- Establishing OSPF Neighbor Adjacencies
- SPF Algorithm
- Building a Link-State Database
- OSPF Area Structure
- Router ID
- Configuring Single-Area OSPF
- Verifying OSPF Configuration
- Summary

Lesson 2: Multiarea OSPF IPv4 Implementation

- Single-Area vs. Multiarea OSPF
- Planning for the Implementation of OSPF
- Multiarea OSPF Configuration
- Multiarea OSPF Verification
- Summary

Lesson 3: Troubleshooting Multiarea OSPF

- OSPF Neighbor States
- Components of Troubleshooting OSPF
- Troubleshooting OSPF Neighbor Issues
- Troubleshooting OSPF Routing Table Issues
- Troubleshooting OSPF Path Selection
- Summary

Lesson 4: Examining OSPFv3

- OSPFv3 Key Characteristics
- OSPFv3 Configuration
- OSPFv3 Configuration Verification
- Summary

Lesson 5: Module Summary

- References

Lesson 6: Module Self-Check



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Module 10: Network Device Management

Lesson 1: Configuring Network Devices to Support Network Management Protocols

- SNMP Overview
- SNMP Versions
- Obtaining Data from an SNMP Agent
- SNMP Configuration
- Syslog Overview
- Syslog Message Format
- Syslog Configuration
- NetFlow Overview
- NetFlow Architecture
- Netflow Configuration
- Summary

Lesson 2: Managing Cisco Devices

- Router Internal Components Overview
- ROM Functions
- Stages of the Router Power-On Boot Sequence
- Configuration Register
- Changing the Configuration Register
- Locating Cisco IOS Image Files
- Loading Cisco IOS Image Files
- Loading Cisco IOS Configuration Files
- Cisco IOS Integrated File System and Devices
- Managing Cisco IOS Images
- Deciphering Cisco IOS Image Filenames
- Creating the Cisco IOS Image Backup
- Upgrading Cisco IOS Images
- Managing Device Configuration Files
- Password Recovery
- Summary

Lesson 3: Licensing

- Licensing Overview
- Licensing Verification
- Permanent License Installation
- Evaluation License Installation
- Backing up the License
- Uninstalling the License
- Summary



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Lesson 4: Module Summary

- References

Lesson 5: Module Self-Check

Lab Outline

- Lab 1-1: Performing Switch Startup and Initial Configuration
- Lab 1-2: Troubleshooting Switch Media Issues
- Lab 2-1: Performing Initial Router Setup and Configuration
- Lab 2-2: Connecting to the Internet
- Lab 3-1: Enhancing the Security of the Initial Configuration
- Lab 3-2: Device Hardening
- Lab 3-3: Filtering Traffic with ACLs
- Lab 4-1: Configure and Verify Basic IPv6
- Lab 4-2: Configure and Verify Stateless Autoconfiguration
- Lab 4-3: Configure and Verify IPv6 Routing
- Lab 5-1: Configuring Expanded Switched Networks
- Lab 5-2: Configuring DHCP Server
- Lab 5-3: Troubleshooting VLANs and Trunks
- Lab 5-4: Optimizing STP
- Lab 5-5: Configuring EtherChannel
- Lab 6-1: Troubleshooting IP Connectivity
- Lab 7-1: Configuring and Troubleshooting a Serial Connection
- Lab 7-2: Establishing a Frame Relay WAN
- Lab 7-3: Establishing a GRE Tunnel
- Lab 8-1: Implementing EIGRP
- Lab 8-2: Troubleshooting EIGRP
- Lab 8-3: Implementing EIGRP for IPv6
- Lab 9-1: Implementing OSPF
- Lab 9-2: Configuring Multiarea OSPF
- Lab 9-3: Troubleshooting Multiarea OSPF
- Lab 9-4: Configuring OSPF for IPv6
- Lab 10-1: SNMP and Syslog Basic Configuration
- Lab 10-2: Analyzing NetFlow Data
- Lab 10-3: Managing Cisco Devices and Licensing



To register or for more information call our office **(208) 898-9036** or email register@leapfoxlearning.com



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