Interconnecting Cisco Networking Devices: Accelerated (CCNAX) v3.0

What you’ll learn in this course

The Interconnecting Cisco Networking Devices: Accelerated (CCNAX) v3.0 course teaches you how to install, operate, configure, and verify a basic Internet Protocol version 4 (IPv4) and Internet Protocol version 6 (IPv6) network, including configuring a LAN switch, configuring an IP router, connecting to a WAN, and identifying basic security threats. You will also learn how to perform basic troubleshooting steps in enterprise branch office networks, as well as prepare for Cisco® Cisco Certified Network Associate (CCNA) certification.

The course covers the elements of Quality of Service (QoS) and their applicability, explores how virtualized and cloud services interact and impact enterprise networks, and provides an overview of network programmability with the related controller types and tools that are available to support Software-Defined Networking (SDN) architectures. You’ll also gain an understanding of the interactions and network functions of firewalls, wireless controllers, and access points, along with additional focus on IPv6 and basic network security.

This course consists of two courses merged into a single course: Interconnecting Cisco Networking Devices, Part 1 (ICND1) and Interconnecting Cisco Networking Devices, Part 2 (ICND2).

Course duration

- Instructor-led training: 5 days with hands-on lab practice
- Virtual instructor-led training: 5 days of web-based classes with hands-on lab practice

How you’ll benefit

This course will help you:

- Install, operate, configure, and verify a basic IPv4 and IPv6 network
- Perform basic troubleshooting steps in enterprise branch office
- Prepare for the CCNA certifications exams

Who should enroll

- Network administrators
- Network support engineers
- Network engineer associates
- Network specialists
- Network analysts

How to enroll

- For instructor-led training, visit the [Cisco Learning Locator](http://ciscolearninglocator.com).
- For private group training, visit [Cisco Private Group Training](http://ciscoprivatetraining.com).

Technology areas

- Routing and switching
Course details

Objectives

After taking this course, you should be able to:

- Describe network fundamentals and build simple LANs
- Establish Internet connectivity
- Manage and secure network devices
- Operate a medium-sized LAN with multiple switches, supporting VLANs, trunking, and spanning tree
- Troubleshoot IP connectivity
- Describe how to configure and troubleshoot Enhanced Interior Gateway Routing Protocol (EIGRP) in an IPv4 environment, and configure EIGRP for IPv6
- Configure and troubleshoot Open Shortest Path First (OSPF) in an IPv4 environment and configure OSPF for IPv6
- Define characteristics, functions, and components of a WAN
- Describe how device management can be implemented
- Understand QoS, virtualization and cloud services, and network programmability related to WAN, access, and core segments.

Prerequisites

We recommend that you have the following knowledge and skills before taking this course:

- Basic computer literacy
- Basic PC operating system navigation
- Basic Internet usage
- Basic IP addressing
- Good understanding of network fundamentals

Outline

- Building a Simple Network
  - Exploring the Functions of Networking
  - Understanding the Host-to-Host Communications Model
  - Introducing LANs
  - Operating Cisco IOS® Software
  - Starting a Switch
  - Understanding Ethernet and Switch Operation
  - Troubleshooting Common Switch Media Issues
- Establishing Internet Connectivity
  - Understanding the TCP/IP Internet Layer
  - Understanding IP Addressing and Subnets
  - Understanding the TCP/IP Transport Layer
  - Exploring the Functions of Routing
  - Configuring a Cisco Router
  - Exploring the Packet Delivery Process
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Course overview

- Enabling Static Routing
  - Learning Basics of Access Control Lists (ACLs)
  - Enabling Internet Connectivity

- Summary Challenge
  - Establish Internet Connectivity
  - Troubleshoot Internet Connectivity

- Implementing Scalable Medium-Sized Networks
  - Implementing and Troubleshooting VLANs and Trunks
  - Building Redundant Switched Topologies
  - Improving Redundant Switched Topologies with EtherChannel
  - Routing Between VLANs
  - Using a Cisco IOS Network Device as a Dynamic Host Configuration Protocol (DHCP) Server
  - Understanding Layer 3 Redundancy
  - Implementing Routing Information Protocol (RIP) v2

- Introducing IPv6
  - Introducing Basic IPv6
  - Understanding IPv6 Operation
  - Configuring IPv6 Static Routes

- Troubleshooting Basic Connectivity
  - Troubleshooting IPv4 Network Connectivity
  - Troubleshooting IPv6 Network Connectivity

- Implementing Network Device Security
  - Securing Administrative Access
  - Implementing Device Hardening
  - Implementing Advanced Security

- Implementing an EIGRP-Based Solution
  - Implementing EIGRP
  - Implementing EIGRP for IPv6
  - Troubleshooting EIGRP

- Summary Challenge
  - Troubleshooting a Medium-Sized Network
  - Troubleshooting a Scalable Medium-Sized Network

- Implement a Scalable OSPF-Based Solution
  - Understanding OSPF
  - Implementing Multiarea OSPF IPv4
  - Implementing OSPFv3 for IPv6
  - Troubleshooting Multiarea OSPF

- Implementing Wide Area Networks
  - Understanding WAN Technologies
  - Understanding Point-to-Point Protocols
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Course overview

- Configuring Generic Routing Encapsulation (GRE) Tunnels
- Configuring Single-Homed External Border Gateway Protocol (EBGP)

- Network Device Management
  - Implementing Basic Network Device Management
  - Learning About the Evolution of Intelligent Networks
  - Introducing QoS
  - Managing Cisco Devices
  - Licensing

- Summary Challenge
  - Troubleshooting Scalable Multiarea Network
  - Implementing and Troubleshooting Scalable Multiarea Network

Lab outline

- Get Started with Cisco Command-Line Interface (CLI)
- Perform Basic Switch Configuration
- Observe How a Switch Operates
- Troubleshoot Switch Media and Port Issues
- Inspect TCP/IP Applications
- Start with Cisco Router Configuration
- Configure Cisco Discovery Protocol
- Configure Default Gateway
- Explore Packet Forwarding
- Configure and Verify Static Routes
- Configure and Verify ACLs
- Configure a Provider-Assigned IP Address
- Configure Static Network Address Translation (NAT)
- Configure Dynamic NAT and Port Address Translation (PAT)
- Troubleshoot NAT
  - Summary Challenge Lab 1
  - Summary Challenge Lab 2
- Configure VLAN and Trunk
- Troubleshoot VLAN and Trunk Issues
- Configure Root Bridge and Analyze Spanning Tree Protocol (STP) Topology
- Troubleshoot STP Issues
- Configure and Verify EtherChannel
- Configure a Router on a Stick
- Configure a Cisco Router as a DHCP Server
- Troubleshoot DHCP Issues
- Configure and Verify Hot Standby Router Protocol (HSRP)
- Troubleshoot HSRP
- Configure and Verify RIPv2
- Troubleshoot RIPv2
  - Implementing RIPv2
- Configure Basic IPv6 Connectivity
- Configure IPv6 Static Routes
  - Implement IPv6 Static Routing
- Use Troubleshooting Tools
- Configure SPAN
- Configure and Verify IPv4 Extended Access Lists
- Troubleshoot IPv4 Network Connectivity
  - Challenge 5: Troubleshoot IPv4 Connectivity
- Configure and Verify IPv6 Extended Access Lists
- Troubleshoot IPv6 Network Connectivity
  - Troubleshoot IPv6 Connectivity
- Enhance Security of Initial Configuration
- Limit Remote Access Connectivity
  - Securing Device Administrative Access
- Configure and Verify Port Security
- Configure and Verify Network Time Protocol (NTP)
  - Implementing Device Hardening
- Configure External Authentication Using Remote Access Dial-In User Service (RADIUS) and Terminal Access Controller Access Control Service Plus (TACACS+)
- Configure and Verify EIGRP
- Configure and Verify EIGRP for IPv6
- Troubleshoot EIGRP Issues
  - Troubleshoot EIGRP
  - Summary Challenge Lab 3
  - Summary Challenge Lab 4
- Configure and Verify Single-Area OSPF
- Configure and Verify Multiarea OSPF
- Configure and Verify OSPFv3
- Troubleshoot Multiarea OSPF
  - Troubleshoot OSPF
- Configure Serial Interface and Point-to-Point Protocol (PPP)
- Configure and Verify MLP
- Configure and Verify a Point-to-Point Protocol over Ethernet (PPPoE) Client
- Configure and Verify a GRE Tunnel
- Configure and Verify Single-Homed EBGP
  - Implement Single-Homed EBGP
- Configure Syslog