

CCNA Routing and Switching

Interconnecting Cisco Networking Devices, Part 1 (ICND1) v3.0

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
- Expand small to medium-sized networks
- Describe IPv6 basics

Prerequisites

We recommend but do not require that you have the following knowledge and skills before taking this course:

- Basic computer literacy
- Basic PC operating system navigation skills
- Basic Internet usage skills
- Basic knowledge of IP addressing

Outline

- 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
- 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
- Enabling Static Routing
- Learning the Basics of ACL
- Enabling Internet Connectivity
- Summary Challenge 1
 - Establish Internet Connectivity
 - Troubleshoot Internet Connectivity
- Medium-Sized Network
 - Implementing VLANs and Trunk
 - Routing Between VLANs
 - Using a Cisco IOS Network Device as a DHCP Server
 - Implementing RIPv2
- Network Device Management and Security
 - Securing Administrative Access
 - Implementing Device Hardening
 - Configuring System Message Logging
 - Managing Cisco Devices
 - Licensing
- Summary Challenge 2
 - Implement a Medium-Sized Network
 - Troubleshoot a Medium-Sized Network
- IPv6 Overview
 - Introducing Basic IPv6
 - Understanding IPv6 Operation
 - Configuring IPv6 Static Routes

Lab outline

- Get Started with Cisco 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 NAT
- Configure Dynamic NAT and PAT
- Troubleshoot NAT
- Configure VLAN and Trunk
- Configure a Router on a Stick
- Configure a Cisco Router as a DHCP Server
- Troubleshoot DHCP Issues
- Configure and Verify RIPv2
- Troubleshoot RIPv2
- Enhance Security of Initial Configuration
- Limit Remote Access Connectivity
- Configure and Verify Port Security
- Configure and Verify NTP
- Configure Syslog
- Configure Basic IPv6 Connectivity
- Configure IPv6 Static Routes
- Implement IPv6 Static Routing

Interconnecting Cisco Networking Devices, Part 2 (ICND2) v3.0

Objectives

After taking this course, you should be able to:

- 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 the characteristics, functions, and components of a WAN
- Describe how device management can be implemented

Prerequisites

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

- Understanding of network fundamentals
- Ability to implement LANs
- Proficiency implementing Internet connectivity
- Basic network management skills
- Basic network security skills
- Ability to implement basic IPv6 connectivity

Outline

- Implementation of Scalable Medium-Sized Networks
 - Troubleshooting VLAN Connectivity
 - Building Redundant Switched Topologies
 - Improving Redundant Switched Topologies with EtherChannel
 - Understanding Layer 3 Redundancy
- Troubleshoot Basic Connectivity
 - Troubleshooting IPv4 Network Connectivity
 - Troubleshooting IPv6 Network Connectivity
- Implementation of an EIGRP-Based Solution
 - Implementing EIGRP
 - Implementing EIGRP for IPv6

- Troubleshooting EIGRP
- Summary Challenge 1
 - Implementing and Troubleshooting Scalable Medium-Sized Networks, Part 1
 - Implementing and Troubleshooting Scalable Medium-Sized Networks, Part 2
- Implementation of a Scalable OSPF-Based Solution
 - Understanding OSPF
 - Implementing Multiarea OSPF IPv4
 - Implementing OSPFv3 for IPv6
 - Troubleshooting Multiarea OSPF
- Wide-Area Networks
 - Understanding WAN Technologies
 - Understanding Point-to-Point Protocols
 - Configuring GRE Tunnels
 - Configuring Single-Homed EBGP
- Network Device Management
 - Implementing Basic Network Device Management and Security
 - Learning About the Evolution of Intelligent Networks
 - Introducing QoS
- Summary Challenge 2
 - Implementing and Troubleshooting a Scalable Multiarea Network, Part 1
 - Implementing and Troubleshooting a Scalable Multiarea Network, Part 2

Lab outline

- Troubleshoot VLAN and Trunk Issues
- Configure Root Bridge and Analyze STP Topology
- Configure and Verify EtherChannel
- Configure and Verify HSRP
- Troubleshoot HSRP
- Use Troubleshooting Tools
- Configure SPAN
- Configure and Verify IPv4 Extended Access Lists
- Troubleshoot IPv4 Network Connectivity

- Configure and Verify IPv6 Extended Access Lists
- Troubleshoot IPv6 Network Connectivity
- Configure and Verify EIGRP
- Configure and Verify EIGRP for IPv6
- Troubleshoot EIGRP Issues
- Configure and Verify Single-Area OSPF
- Configure and Verify Multiarea OSPF
- Configure and Verify OSPFv3
- Troubleshoot Multiarea OSPF
- Configure Serial Interface and PPP
- Configure and Verify MLP
- Configure and Verify a PPPoE Client
- Configure and Verify a GRE Tunnel
- Configure and Verify Single-Homed EBGP
- Configure External Authentication Using RADIUS and TACACS+
- Configure SNMP

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

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
 - 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
 - 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