Training overview

Implementing and Operating Cisco Enterprise Network Core Technologies (ENCOR)

Description

The **Implementing and Operating Cisco Enterprise Network Core Technologies (ENCOR)** training gives you the knowledge and skills needed to configure, troubleshoot, and manage enterprise wired networks. You'll learn how to implement recommended security principles, automation, and programmability within an enterprise network, as well as learn overlay network design using Cisco SD-Access and SD-WAN solutions.

This training prepares you for the 350-401 ENCOR v1.2 exam. If passed, you earn the Cisco Certified Specialist – Enterprise Core certification and satisfy the core exam requirements for the Cisco Certified Network Professional (CCNP) and Cisco Certified Internetwork Expert (CCIE) Enterprise Infrastructure certifications. This training also earns you 64 Continuing Education (CE) credits toward recertification.

Note: This training contains Wireless content from the v1.1 exam. You may skip these sections, as this content has been moved to dedicated Wireless certifications and is not covered in the ENCOR v1.2 exam.

How you'll benefit

This training will help you:

- Configure, troubleshoot, and manage enterprise wired networks
- Implement security principles, automation, and programmability within an enterprise network
- Understand overlay network design by using Cisco SD-Access and Cisco Catalyst SD-WAN solutions
- Prepare for the 350-401 ENCOR v1.2 exam
- Earn 64 CE credits toward recertification

Who should enroll

- Entry to Mid-levelNetwork Engineers
- Network Administrators

- Network Support Technicians
- Help Desk Technicians

Technology areas

- Enterprise Networking
- Routing and Switching

Objectives

- Illustrate the hierarchical network design model and architecture using the access, distribution, and core layers
- Compare and contrast the various hardware and software switching mechanisms and operation, while defining the ternary content addressable memory (TCAM) and content addressable memory (CAM), along with process switching, fast switching, and Cisco Express Forwarding concepts
- Troubleshoot Layer 2 connectivity using virtual local area networks (VLANs) and trunking
- Implement redundant switched networks using Spanning Tree Protocol (STP)
- Troubleshoot link aggregation using EtherChannel
- Describe the features, metrics, and path selection concepts of Enhanced Interior Gateway Routing Protocol (EIGRP)
- Implement and optimize Open Shortest Path First (OSPF)v2 and OSPFv3, including adjacencies, packet types, areas, summarization, and route filtering for internet protocol (IP)v4 and IPv6
- Implement External Border Gateway Protocol (EBGP) interdomain routing, path selection, and single and dual-homed networking
- Implement network redundancy using protocols including Hot Standby Routing Protocol (HSRP) and Virtual Router Redundancy Protocol (VRRP)
- Implement internet connectivity within enterprise using static and dynamic Network Address Translation (NAT)
- Describe the virtualization technology of servers, switches, and the various network devices and components
- Implement overlay technologies, such as Virtual Routing and Forwarding (VRF), Generic Routing Encapsulation (GRE), virtual private network (VPN), and Location Identifier Separation Protocol (LISP)
- Describe the components and concepts of wireless networking including radio frequency (RF) and antenna characteristics, and define the specific wireless standards
- Describe the various wireless deployment models available, include autonomous access point (AP) deployments and cloud-based designs within the centralized Cisco Wireless LAN Controller (WLC) architecture
- Describe wireless roaming and location services
- Describe how APs communicate with WLCs to obtain software, configurations, and centralized management
- Configure and verify Extensible Authentication Protocol (EAP), WebAuth, and pre-shared key (PSK) wireless client authentication on a WLC
- Troubleshoot wireless client connectivity issues using various available tools
- Troubleshoot enterprise networks using services such as Network Time Protocol (NTP), Simple Network Management Protocol (SNMP), Cisco Internetwork Operating System (Cisco IOS®) IP Service Level Agreements (SLAs), NetFlow, and Cisco IOS Embedded Event Manager
- Explain the use of available network analysis and troubleshooting tools, which include show and debug commands, as well as best practices in troubleshooting
- Configure secure administrative access for Cisco IOS devices using the command-line interface (CLI) access, Role-Based Access Control (RBAC), access control list (ACL), and Secure Shell (SSH), and explore device hardening concepts to secure devices from less secure applications, such as Telnet and HTTP

- Implement scalable administration using authentication, authorization, and accounting (AAA) and the local database, while exploring the features and benefits
- Describe the enterprise network security architecture, including the purpose and function of VPNs, content security, logging, endpoint security, personal firewalls, and other security features
- Explain the purpose, function, features, and workflow of Cisco Catalyst Center™ Assurance for intent-based networking (IBN), network visibility, proactive monitoring, and application experience
- Describe the components and features of the Cisco SD-Access solution, including the nodes, fabric control plane, and data plane, while illustrating the purpose and function of the virtual extensible LAN (VXLAN) gateways
- Define the components and features of Cisco SD-WAN solutions, including the orchestration plane, management plane, control plane, and data plane
- Describe the concepts, purpose, and features of multicast protocols, including Internet Group Management Protocol (IGMP) v2/v3, Protocol-Independent Multicast (PIM) dense mode/sparse mode, rendezvous points, PIM SSM, Bidirectional PIM, and MSDP
- Describe the concepts and features of Quality of Service (QoS), and describe the need within the enterprise network
- Explain basic Python components and conditionals with script writing and analysis
- Describe network programmability protocols such as Network Configuration Protocol (NETCONF) and Representational State Transfer Configuration Protocol (RESTCONF)
- Describe application programming interfaces (APIs) in Cisco Catalyst Center and vManage

Prerequisites

There are no prerequisites for this training. However, the knowledge and skills you are recommended to have before attending this training are:

- Understanding of how to implement enterprise LAN networks
- Basic understanding of enterprise routing and switching
- Basic understanding of Python scripting

These skills can be found in the following Cisco Learning Offerings:

- Implementing and Administering Cisco Solutions (CCNA)
- Programming for Network Engineers (PRNE)

Outline

- Examining Cisco Enterprise Network Architecture
- Exploring Cisco Switching Paths
- Implementing Campus LAN Connectivity
- Building Redundant Switched Topology
- Implementing Layer 2 Port Aggregation
- Implementing OSPF
- Optimizing OSPF
- Explaining EIGRP
- Exploring EBGP
- Implementing Network Redundancy
- Implementing NAT

- Introducing Virtualization Protocols and Techniques
- Exploring Virtual Private Networks and Interfaces
- Examining Wireless Deployment Options
- Examining Wireless AP Operation
- Implementing Wireless Client Authentication
- Troubleshooting Wireless Client Connectivity
- Implementing Network Services
- Introducing Multicast Protocols
- Introducing QoS
- Using Network Analysis Tools
- Implementing Infrastructure Security
- Implementing Secure Access Control
- Discovering the Basics of Python Programming
- Introducing Network Programmability Protocols
- Explaining Wireless Principles
- Exploring Wireless Roaming and Location Services
- Exploring Enterprise Network Security Architecture
- Exploring Cisco Catalyst Center—Network Automation and Management
- Examining the Cisco SD-Access Solution
- Exploring the Working Principles of the Cisco Catalyst SD-WAN Solution
- Introducing APIs in Cisco Catalyst Center and Cisco Catalyst SD-WAN Manager

Lab Outline

- Investigate the CAM
- Analyze Cisco Express Forwarding
- Troubleshoot VLAN and Trunk Issues
- Tune STP and Configure RSTP
- Configure Multiple STP
- Troubleshoot EtherChannel
- Implement Multiarea OSPF
- Implement OSPF Tuning
- Apply OSPF Optimization
- Implement OSPFv3
- Configure and Verify Single-Homed EBGP
- Implement HSRP
- Configure VRRP
- Implement NAT
- Configure and Verify VRF
- Configure and Verify a GRE Tunnel
- Configure Static VTI Point-to-Point Tunnels
- Configure Wireless Client Authentication in a Centralized Deployment
- Troubleshoot Wireless Client Connectivity Issues
- Configure Syslog
- Configure and Verify Flexible NetFlow

- Configure Cisco IOS EEM
- Troubleshoot Connectivity and Analyze Traffic with Ping, Traceroute, and Debug
- Configure and Verify Cisco IP SLAs
- Configure Standard and Extended ACLs
- Configure Control Plane Policing
- Implement Local and Server-Based AAA
- Write and Troubleshoot Python Scripts
- Explore JSON Objects and Scripts in Python
- Use NETCONF Via SSH
- Use RESTCONF with Cisco IOS XE Software

What to expect on the exam

Implementing and Operating Cisco Enterprise Network Core Technologies (350-401 ENCOR) v1.2 is a 120-minute exam associated with the Cisco Certified Specialist – Enterprise Core certification and satisfies the core exam requirements for the CCNP and CCIE Enterprise Infrastructure certifications.

This exam tests your knowledge of implementing core enterprise network technologies, including:

- Dual stack (IPv4 and IPv6) architecture
- Virtualization
- Infrastructure
- Network assurance
- Security
- Automation