REAL WORLD
TECHNOLOGY TRAINING & SOLUTIONS
"Training You Can Really Use"

Implementing and Operating Cisco® Enterprise Network Core Technologies (ENCOR)

Duration: 5 Days

Method: Instructor-Led Training (ILT) | Live Online Training

Certification: *Cisco Certified Specialist – Enterprise Core —*
Exam: *350-401 ENCOR*

Course Description

The course teaches participants the knowledge and skills needed to configure, troubleshoot, and manage enterprise wired and wireless networks. They will also learn to implement security principles within an enterprise network and how to overlay network design by using solutions such as SD-Access and SD-WAN. This course also helps prepare participants for the certification exam. This exam is one of two required exams for the following four certifications:

- *CCNP® Enterprise*
- *CCIE® Enterprise Infrastructure*
- *CCIE Enterprise Wireless*

NOTE: *This course also earns you 64 Continuing Education (CE) credits towards recertification.*

Target Audience

This course is intended for:

- Mid-Level Network Engineers
- Network Administrators
- Network Support Technicians
- Help Desk Technicians

Prerequisites

To attend this course, candidates must have:

- Completed the following courses:
  - *Implementing and Administering Cisco Solutions*
  - *Introduction to Cisco Programmability*
- **OR** have the following knowledge and skills:
  - Knowledge of enterprise LAN networks implementation
  - Basic understanding of enterprise routing and wireless connectivity
  - Basic understanding of Python scripting

Course Objectives

Upon successful completion of this course, attendees will be able to:

- 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 operations.
- Define 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 VLANs and trunking.
- Implement redundant switched networks using Spanning Tree Protocol.
- 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, and areas, summarization, and route filtering for IPv4 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), 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.

Course Objectives *Continued*

- 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 DNA Centre™ Assurance for Intent-Based Networking, for 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, and rendezvous points.
- 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 scriptwriting and analysis
- Describe network programmability protocols such as Network Configuration Protocol (NETCONF) and RESTCONF.
- Describe APIs in Cisco DNA Centre and vManage.

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Course Topics

1. Examining Cisco Enterprise Network Architecture
2. Understanding Cisco Switching Paths
3. Implementing Campus LAN Connectivity
4. Building Redundant Switched Topology
5. Implementing Layer 2 Port Aggregation
6. Understanding EIGRP
7. Implementing OSPF
8. Optimizing OSPF
9. Exploring EBGP
10. Implementing Network Redundancy
11. Implementing NAT
12. Introducing Virtualization Protocols and Techniques
13. Understanding Virtual Private Networks and Interfaces
14. Understanding Wireless Principles
15. Examining Wireless Deployment Options
16. Understanding Wireless Roaming and Location Services
17. Examining Wireless AP Operation
18. Understanding Wireless Client Authentication
19. Troubleshooting Wireless Client Connectivity
20. Introducing Multicast Protocols
21. Introducing QoS
22. Implementing Network Services
23. Using Network Analysis Tools

Course Topics *Continued*

24. Implementing Infrastructure Security
25. Implementing Secure Access Control
26. Understanding Enterprise Network Security Architecture
27. Exploring Automation and Assurance Using Cisco DNA Centre
28. Examining the Cisco SD-Access Solution
29. Understanding the Working Principles of the Cisco SD-WAN Solution
30. Understanding the Basics of Python Programming
31. Introducing Network Programmability Protocols
32. Introducing APIs in Cisco DNA Centre and vManage

LABS INCLUDED