
Implementing and Operating Cisco Enterprise Network Core Technologies

DURATION: 5 DAYS

COURSE CODE: ENCOR

FORMAT: LECTURE/LAB

COURSE DESCRIPTION

The Implementing and Operating Cisco Enterprise Network Core Technologies (ENCOR) v1.3 course gives you the knowledge and skills needed to install, configure, operate, and troubleshoot, an enterprise network and introduces you to overlay network design by using SD-Access and SD-WAN solutions. You'll also learn to understand and implement security principles and automation and programmability within an enterprise network.

This course helps you prepare to take the 350-401 Implementing Cisco Enterprise Network Core Technologies (ENCOR) exam, which is part of four new certifications:

WHO SHOULD ATTEND

- Entry- to mid-level network engineers
- Network administrators
- Network support technicians
- Help desk technicians

PREREQUISITES

- Implementation of Enterprise LAN networks
 - Basic understanding of Enterprise routing and wireless connectivity
 - Basic understanding of Python scripting
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HOW YOU'LL BENEFIT

This training will help you:

- Configure and implement identified solutions by applying planned implementation processes using Cisco IOS Software commands and applications.
- Verify appropriate show and debug commands and applications to ensure correct solution implementation and performance.
- Troubleshoot appropriate show and debug commands and applications to identify the cause of basic-level network issues and correctly implement a solution that ensures that the network is performing as desired.

LEARNING 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 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 such as 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, including 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

LEARNING OBJECTIVES (continued)

- 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 DNA Center™ 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 script writing and analysis
- Describe network programmability protocols such as Network Configuration Protocol (NETCONF) and RESTCONF
- Describe APIs in Cisco DNA Center and Manage

COURSE OUTLINE

- Examining Cisco Enterprise Network Architecture
- Exploring Cisco Switching Paths
- Implementing Campus LAN Connectivity
- Building Redundant Switched Topology
- Implementing Layer 2 Port Aggregation
- Understanding E1 - RP
- Implementing OSPF
- Optimizing OSPF
- Exploring E1 - P
- Implementing Network Redundancy
- Implementing NAT
- Introducing Virtualization Protocols and Techniques
- Understanding Virtual Private Networks and Interfaces
- Understanding Wireless Principles
- Examining Wireless Deployment Options
- Understanding Wireless Roaming and Location Services
- Examining Wireless AP Operation
- Implementing Wireless Client Authentication
- Troubleshooting Wireless Client Connectivity
- Implementing Network Services
- Using Network Analysis Tools
- Implementing Infrastructure Security
- Implementing Secure Access Control
- Discovering the Basics of Python Programming
- Discovering Network Programmability Protocols
- Implementing Layer 2 Port Aggregation
- Discovering Multicast Protocols
- Understanding QoS
- Exploring Enterprise Network Security Architecture
- Exploring Automation and Assurance Using Cisco DNA Center
- Examining the Cisco SD-Access Solution
- Understanding the Working Principles of the Cisco SD-WAN Solution

DISCOVERY LABS

1. Investigate the CAM
2. Analyze Cisco Express Forwarding
3. Troubleshoot VLAN and Trunk Issues
4. Tune Spanning Tree Protocol (STP) and Configure Rapid Spanning Tree Protocol (RSTP)
5. Configure Multiple Spanning Tree Protocol
6. Troubleshoot EtherChannel
7. Implement Multi-area OSPF
8. Implement OSPF Tuning
9. Apply OSPF Optimization
10. Implement OSPFv3
11. Configure and Verify Single-Homed EBGp
12. Implement Hot Standby Routing Protocol (HSRP)
13. Configure Virtual Router Redundancy Protocol (VRRP)
14. Implement NAT
15. Configure and Verify Virtual Routing and Forwarding (VRF)
16. Configure and Verify a Generic Routing Encapsulation (GRE) Tunnel
17. Configure Static Virtual Tunnel Interface (VTI) Point-to-Point Tunnels
18. Configure Wireless Client Authentication in a Centralized Deployment
19. Troubleshoot Wireless Client Connectivity Issues
20. Configure Syslog
21. Configure and Verify Flexible NetFlow
22. Configure Cisco IOS Embedded Event Manager (EEM)
23. Troubleshoot Connectivity and Analyze Traffic with Ping, Trace route, and Debug
24. Configure and Verify Cisco IP SLAs
25. Configure Standard and Extended ACLs
26. Configure Control Plane Policing
27. Implement Local and Server-Based AAA
28. Write and Troubleshoot Python Scripts
29. Explore JavaScript Object Notation (JSON) Objects and Scripts in Python
30. Use NETCONF Via SSH
31. Use RESTCONF with Cisco IOS XE Software