FIREFLY

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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) v1.0 course gives you the knowledge and skills needed to configure, troubleshoot, and manage enterprise wired and wireless networks. You'll 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 helps you prepare to take the 350-401 Implementing Cisco Enterprise Network Core Technologies (ENCOR) exam, which is part of four new certifications:

- CCNP Enterprise
- CCIE Enterprise Infrastructure
- CCIE Enterprise Wireless
- Cisco Certified Specialist – Enterprise Core

This course will help you:

- Configure, troubleshoot, and manage enterprise wired and wireless networks
- Implement security principles within an enterprise network
- Prepare you prepare to take the 350-401 Implementing Cisco Enterprise Network Core Technologies (ENCOR) exam

WHO SHOULD ATTEND

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

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

Implementation of redundant switched networks using Spanning Tree Protocol

Troubleshooting link aggregation using Etherchannel

Describe the features, metrics, and path selection concepts of Enhanced Interior Gateway Routing Protocol (EIGRP)

Implementation and optimization of Open Shortest Path First (OSPF)v2 and OSPFv3, including adjacencies, packet types, and areas, summarization, and route filtering for IPv4 and IPv6

Implementing External Border Gateway Protocol (EBGP) interdomain routing, path selection, and single and dual-homed networking

Implementing network redundancy using protocols including Hot Standby Routing Protocol (HSRP) and Virtual Router Redundancy Protocol (VRRP)

Implementing 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

Implementing 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

Troubleshooting 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 vManage

COURSE OUTLINE

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
24. Implementing Infrastructure Security
25. Implementing Secure Access Control
26. Understanding Enterprise Network Security Architecture
27. Exploring Automation and Assurance Using Cisco DNA Center
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 Center and vManage

DISCOVERY LABS

1: Investigate the CAM
2: Analyze Cisco Express Forwarding
3: Troubleshoot VLAN and Trunk Issues
4: Tuning Spanning Tree Protocol (STP) and Configuring 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: Implementing 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: Configuring Cisco IOS Embedded Event Manager (EEM)
23: Troubleshoot Connectivity and Analyze Traffic with Ping, Traceroute, 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: Writing and Troubleshooting 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