

Implementing and Operating Cisco Enterprise Network Core Technologies (ENCOR)

Duration: 5 Days

Prerequisites:

Knowledge and skills you should have before attending this training:

- Implementation of Enterprise LAN networks
- Basic understanding of Enterprise routing and wireless connectivity
- Basic understanding of Python scripting

Course 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.

Course Objectives:

After taking this training, you should 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 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

Target Audience:

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

Course Outlines:

- 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 outlines

- 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

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