Implementing Cisco Enterprise Network Core Technologies (ENCOR) v1.3

Duration: 40 Hours (5 Days)

Overview

The Implementing Cisco Enterprise Network Core Technologies (ENCOR) v1.3 course is a comprehensive program designed for networking professionals seeking to deepen their understanding of core technologies in enterprise networks. This course covers a wide array of subjects, ranging from Network architecture, virtualization, Infrastructure, Network assurance, Security, and Automation.Learners will delve into Cisco's enterprise Network architecture, exploring design principles, WLAN deployments, cloud vs. on-premises Infrastructure, and QoS concepts. They will learn about Cisco's SD-WAN and SD-Access solutions, as well as differences between Hardware and software switching. Virtualization modules cover device, data path, and network virtualization technologies, equipping students with the skills to configure and verify these technologies.The course also emphasizes hands-on experience, with various labs designed to apply theoretical knowledge to real-world scenarios. Upon completion, participants will be well-prepared for the Cisco CCNP Enterprise certification and for roles that require advanced understanding of Cisco enterprise networking solutions. This training is essential for those aiming to advance in Network design, Network assurance, and network Automation, ensuring they are equipped with the latest skills required in a modern network environment.

Audience Profile

The Implementing Cisco Enterprise Network Core Technologies (ENCOR) v1.3 course prepares IT professionals for enterprise networking technologies.

- Target job roles and audience for the course include:
- Network Engineers
- Systems Engineers
- Network Support Technicians
- Network Consultants
- Network Administrators
- Network Managers
- Solutions Architects focusing on networking
- IT professionals seeking Cisco CCNP Enterprise certification
- Professionals working with Cisco networking equipment
- Network Designers
- Technical Support Personnel
- Cisco Channel Partners
- Network Analysts
- Wireless Network Engineers
- Data Center Operations Staff
- Network Security Engineers with a focus on Cisco solutions
- Infrastructure Engineers
- Network Specialists
- Employees of organizations undergoing digital transformation with Cisco technologies

Course Syllabus

How you'll benefit

- This training will help you:
- Configure, troubleshoot, and manage enterprise wired and wireless networks
- Implement security principles within an enterprise network

Who should enroll

- Mid-level network engineers
- Network administrators
- Network support technicians
- Help desk technicians
- Technology areas
- Enterprise networking
- Routing and switching
- Training overview
- 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 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 IntentBased 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

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

Lab outline

- Investigate the CAM
- Analyze Cisco Express Forwarding
- Troubleshoot VLAN and Trunk Issues
- Tuning Spanning Tree Protocol (STP) and Configuring Rapid Spanning Tree Protocol (RSTP)
- Configure Multiple Spanning Tree Protocol
- Troubleshoot EtherChannel
- Implement Multi-area OSPF
- Implement OSPF Tuning
- Apply OSPF Optimization
- Implement OSPFv3
- Configure and Verify Single-Homed EBGP
- Implementing Hot Standby Routing Protocol (HSRP)
- Configure Virtual Router Redundancy Protocol (VRRP)
- Implement NAT
- Configure and Verify Virtual Routing and Forwarding (VRF)
- Configure and Verify a Generic Routing Encapsulation (GRE) Tunnel
- Configure Static Virtual Tunnel Interface (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
- Configuring Cisco IOS Embedded Event Manager (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
- Writing and Troubleshooting Python Scripts
- Explore JavaScript Object Notation (JSON) Objects and Scripts in Python
- Use NETCONF Via SSH
- Use RESTCONF with Cisco IOS XE Software