

CCNP Bootcamp (ENCOR, ENARSI)

Course Summary

Description

ENCOR and ENARSI classes are covered in this 10-day course designed to help you achieve CCNP Enterprise certification. 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. The ENARSI - Implementing Cisco Enterprise Advanced Routing and Services v1.0 course gives you the knowledge you need to install, configure, operate, and troubleshoot an enterprise network. This course covers advanced routing and infrastructure technologies, expanding on the topics covered in the ENCOR - Implementing and Operating Cisco Enterprise Network Core Technologies v1.0 course.

Objectives

After taking this course, students 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 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
- 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

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Course Summary (cont'd)

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- 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 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
- Configure classic Enhanced Interior Gateway Routing Protocol (EIGRP) and named EIGRP for IPv4 and IPv6
- Optimize classic EIGRP and named EIGRP for IPv4 and IPv6
- Troubleshoot classic EIGRP and named EIGRP for IPv4 and IPv6
- Configure Open Shortest Path First (OSPF)v2 and OSPFv3 in IPv4 and IPv6 environments
- Optimize OSPFv2 and OSPFv3 behavior
- Troubleshoot OSPFv2 for IPv4 and OSPFv3 for IPv4 and IPv6
- Implement route redistribution using filtering mechanisms
- Troubleshoot redistribution
- Implement path control using Policy-Based Routing (PBR) and IP service level agreement (SLA)
- Configure Multiprotocol-Border Gateway Protocol (MP-BGP) in IPv4 and IPv6 environments
- Optimize MP-BGP in IPv4 and IPv6 environments
- Troubleshoot MP-BGP for IPv4 and IPv6

Describe the features of Multiprotocol Label Switching (MPLS)

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Course Summary (cont'd)

- Describe the major architectural components of an MPLS VPN
- Identify the routing and packet forwarding functionalities for MPLS VPNs
- Explain how packets are forwarded in an MPLS VPN environment
- Implement Cisco Internetwork Operating System (IOS®) Dynamic Multipoint VPNs (DMVPNs)
- Implement Dynamic Host Configuration Protocol (DHCP)
- Describe the tools available to secure the IPv6 first hop
- Troubleshoot Cisco router security features
- Troubleshoot infrastructure security and services

Topics

- ENCOR
 - Examining Cisco Enterprise Network Architecture
 - Understanding Cisco Switching Paths
 - Implementing Campus LAN Connectivity
 - Building Redundant Switched Topology
 - Implementing Layer 2 Port Aggregation
 - Understanding EIGRP
 - Implementing OSPF
 - Optimizing OSPF
 - Exploring EBGp
 - 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
 - Understanding Wireless Client Authentication
 - Troubleshooting Wireless Client Connectivity
 - Introducing Multicast Protocols
 - Introducing QoS
 - Implementing Network Services
 - Using Network Analysis Tools
 - Implementing Infrastructure Security
 - Implementing Secure Access Control
 - Understanding 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
 - Understanding the Basics of Python Programming
 - Introducing Network Programmability Protocols
 - Introducing APIs in Cisco DNA Center and vManage
 - ENARSI
 - Implementing EIGRP
 - Optimizing EIGRP
 - Troubleshooting EIGRP
 - Implementing OSPF
 - Optimizing OSPF
 - Troubleshooting OSPF
 - Implementing Internal Border Gateway Protocol (IBGP)
 - Optimizing BGP
 - Implementing MP-BGP
 - Troubleshooting BGP
 - Configuring Redistribution
 - Troubleshooting Redistribution
 - Implementing Path Control
- Exploring MPLS

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Course Summary (cont'd)

- Introducing MPLS L3 VPN Architecture
- Introducing MPLS L3 VPN Routing
- Configuring Virtual Routing and Forwarding (VRF)-Lite
- Implementing DMVPN
- Implementing DHCP
- Troubleshooting DHCP
- Introducing IPv6 First Hop Security
- Securing Cisco Routers
- Troubleshooting Infrastructure Security and Services

Audience

This course is designed for Cisco network engineers with a CCNA background who wish to achieve CCNP certification in an accelerated time frame.

Prerequisites

There are no formal prerequisites for CCNP Enterprise. Candidates typically have three to five years of experience implementing enterprise networking solutions and should have the following knowledge and skills prior to attending class: General understanding of network fundamentals, basic knowledge of how to implement LANs, general understanding of how to manage network devices, general understanding of how to secure network devices, and basic knowledge of network automation.

Duration

Ten days

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Course Outline

I. ENCOR

- A. Examining Cisco Enterprise Network Architecture
- B. Understanding Cisco Switching Paths
- C. Implementing Campus LAN Connectivity
- D. Building Redundant Switched Topology
- E. Implementing Layer 2 Port Aggregation
- F. Understanding EIGRP
- G. Implementing OSPF
- H. Optimizing OSPF
- I. Exploring EBGp
- J. Implementing Network Redundancy
- K. Implementing NAT
- L. Introducing Virtualization Protocols and Techniques
- M. Understanding Virtual Private Networks and Interfaces
- N. Understanding Wireless Principles
- O. Examining Wireless Deployment Options
- P. Understanding Wireless Roaming and Location Services
- Q. Examining Wireless AP Operation
- R. Understanding Wireless Client Authentication
- S. Troubleshooting Wireless Client Connectivity
- T. Introducing Multicast Protocols
- U. Introducing QoS
- V. Implementing Network Services
- W. Using Network Analysis Tools
- X. Implementing Infrastructure Security
- Y. Implementing Secure Access Control
- Z. Understanding Enterprise Network Security Architecture
- AA. Exploring Automation and Assurance Using Cisco DNA Center
- BB. Examining the Cisco SD-Access Solution
- CC. Understanding the Working Principles of the Cisco SD-WAN Solution
- DD. Understanding the Basics of Python Programming
- EE. Introducing Network Programmability Protocols
- FF. Introducing APIs in Cisco DNA Center and vManage

II. ENARSI

- A. Implementing EIGRP
- B. Optimizing EIGRP
- C. Troubleshooting EIGRP
- D. Implementing OSPF
- E. Optimizing OSPF
- F. Troubleshooting OSPF
- G. Implementing Internal Border Gateway Protocol (IBGP)
- H. Optimizing BGP
- I. Implementing MP-BGP
- J. Troubleshooting BGP
- K. Configuring Redistribution
- L. Troubleshooting Redistribution
- M. Implementing Path Control
- N. Exploring MPLS
- O. Introducing MPLS L3 VPN Architecture
- P. Introducing MPLS L3 VPN Routing
- Q. Configuring Virtual Routing and Forwarding (VRF)-Lite
- R. Implementing DMVPN
- S. Implementing DHCP
- T. Troubleshooting DHCP
- U. Introducing IPv6 First Hop Security
- V. Securing Cisco Routers
- W. Troubleshooting Infrastructure Security and Services

Labs

ENCOR

- 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)

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Course Outline (cont'd)

- 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
- Implement Routing Protocol Redistribution
- Manipulate Redistribution
- Manipulate Redistribution Using Route Maps
- Troubleshoot Redistribution Issues
- Implement PBR
- Configure IBGP and External Border Gateway Protocol (EBGP)
- Implement BGP Path Selection
- Configure BGP Advanced Features
- Configure BGP Route Reflectors
- Configure MP-BGP for IPv4 and IPv6
- Troubleshoot BGP Issues
- Implement PBR
- Configure Routing with VRF-Lite
- Implement Cisco IOS DMVPN
- Obtain IPv6 Addresses Dynamically
- Troubleshoot DHCPv4 and DHCPv6 Issues
- Troubleshoot IPv4 and IPv6 Access Control List (ACL) Issues
- Configure and Verify Control Plane Policing
- Configure and Verify Unicast Reverse Path Forwarding (uRPF)
- Troubleshoot Network Management Protocol Issues: Lab 1
- Troubleshoot Network Management Protocol Issues: Lab 2

ENARSI

- Configure EIGRP Using Classic Mode and Named Mode for IPv4 and IPv6
- Verify the EIGRP Topology Table
- Configure EIGRP Stub Routing, Summarization, and Default Routing
- Configure EIGRP Load Balancing and Authentication
- LAB: Troubleshoot EIGRP Issues
- Configure OSPFv3 for IPv4 and IPv6
- Verify the Link-State Database
- Configure OSPF Stub Areas and Summarization
- Configure OSPF Authentication
- Troubleshoot OSPF