

CCNP: ENARSI - Implementing Cisco Enterprise Advanced Routing and Services (Exam 300-410)

Course Overview

This course teaches students about implementing and troubleshooting advanced routing technologies and services. Topics covered include EIGRP, Path Control, DHCP, router security, and more.

<u>Course Introduction</u>	2m
Course Introduction	
<u>Chapter 1 - EIGRP</u>	23m
EIGRP Features	
EIGRP Reliable Transport Protocol	
EIGRP Operations	
EIGRP Tables	
EIGRP Classic vs Named Mode	
EIGRP Classic vs Named Mode Configs	
Demo - EIGRP Configuration	
EIGRP Metric	
EIGRP Metric	
EIGRP Metric	
EIGRP Metric	
EIGRP Metric	
EIGRP Metric	
EIGRP Wide Metric	
Demo - Topology Tables	
EIGRP Queries	
EIGRP Stub Routers	
EIGRP SIA	
EIGRP Summary Routes	
Demo - Routing	
EIGRP Load Balancing	
EIGRP Load Balancing	
EIGRP Authentication	
Demo - Authentication	
EIGRP Troubleshooting	
EIGRP Neighbor Troubleshooting	
EIGRP Neighbor Troubleshooting	
EIGRP Neighbor Troubleshooting	
EIGRP Neighbor Troubleshooting	
EIGRP Neighbor Troubleshooting	
EIGRP Routing Table Troubleshooting	
EIGRP Routing Table Troubleshooting	
EIGRP Routing Table Troubleshooting	

EIGRP Stub Troubleshooting
EIGRP Summarization Troubleshooting
EIGRP IPv6 Troubleshooting
EIGRP Authentication Troubleshooting
Demo - EIGRP Troubleshooting

Chapter 2 - OSPF

1h 1m

OSPF Features
OSPF Operation
Hierarchical Structure of OSPF
Area Requirements of OSPF
OSPF Message Types
Compare OSPFv2 and OSPFv3
OSPFv2 and OSPFv3 LSA Types
Periodic OSPF Database Changes
Exchange and Synchronize LSDBs
OSPF LSDB on Multiaccess Networks
Trigger the SPF Algorithm
Demo - OSPF Implementation
OSPF Route Summarization
OSPF Route Summarization
Default Routing in OSPF
OSPF Special Areas
OSPF Special Areas
OSPF Special Areas
OSPF Special Areas
Default Route Cost in OSPF Special Areas
OSPF Authentication
OSPF Authentication
OSPF Authentication
OSPF Virtual Link
Demo - OSPF Optimization
Components of Troubleshooting OSPF
Troubleshoot OSPF Adjacency
Troubleshoot OSPF Adjacency
Troubleshoot OSPF Adjacency
Troubleshoot OSPF Adjacency
Troubleshoot OSPF Adjacency
Troubleshoot Routing Issues
Troubleshoot Routing Issues
Troubleshoot OSPF Special Areas
Troubleshoot OSPF Special Areas
Troubleshoot OSPF Special Areas
Troubleshoot OSPF Special Areas
Troubleshoot OSPF Special Areas
Troubleshoot OSPF Special Areas
Troubleshoot OSPF Summarization
Demo - OSPF Troubleshooting

Chapter 3 - Redistribution

43m

Route Redistribution
Route Redistribution
Redistribution of Route Information
Default Metrics for Redistributed Routes
Calculation of Costs for OSPF E1 and E2 Routes
Calculation of Costs for OSPF E1 and E2 Routes
Types of Redistribution
Types of Redistribution
Types of Redistribution
Mutual Redistribution
Redistribution Manipulation
Distribute Lists
Distribute Lists
Distribute Lists
Prefix Lists
Route Maps
Route Maps
Route Maps
Route Maps
Route Maps
Route Maps
Route Maps
Demo - Redistribution Configuration
Troubleshooting Redistribution
Troubleshooting Redistribution
Troubleshooting Redistribution
Troubleshooting Redistribution
Troubleshooting Redistribution
Troubleshooting Redistribution
Troubleshooting Route Feedback
Troubleshooting Route Feedback
Troubleshooting Route Feedback
Demo - Redistribution Troubleshooting

Chapter 4 - Path Control

17m

Need for Path Control
PBR Features
PBR Benefits
Configure PBR
PBR Default Keywords
PBR for IPv6
Bidirectional Forwarding Detection
Bidirectional Forwarding Detection
BFD Operational Modes
BFD Operational Modes
Demo - Path Control

Chapter 5 - BGP

2h 14m

BGP Fundamentals
BGP Fundamentals
BGP Neighbor Relationships
BGP Neighbor Relationships
BGP Neighbor Relationships
BGP Path Attributes
BGP Path Attributes
Mandatory Well-known BGP Attributes
Discretionary Well-Known BGP Attributes
Optional BGP Attributes
Optional BGP Attributes
BGP Path Selection
BGP Path Selection
BGP Transit AS Functionality
BGP Transit AS Functionality
BGP Transit AS Functionality
BGP Transit AS Functionality
BGP Transit AS Functionality
IBGP Path Processing
IBGP Path Processing
IBGP Path Processing
IBGP Split Horizon
IBGP Full Mesh
IBGP Full Mesh Example
IBGP Full Mesh Example
IBGP Full Mesh Example
Demo - IBGP Implementation
Configure the Weight Attribute
Configure the Weight Attribute
Configure the Weight Attribute
Configure the MED Attribute
Configure the MED Attribute
Configure BGP Route Filtering
Configure BGP Route Filtering
Implementing AS Path Access Lists
Implementing AS Path Access Lists
Using Route Maps to Manipulate BGP Updates
Configure BGP Route Filtering (Cont.)
Configure BGP Route Filtering (Cont.)
Filtering Order
Implement BGP Peer Groups
Implement BGP Peer Groups
Implement BGP Peer Groups
IBGP Scalability Issues in a Transit AS
Route Reflector Split-Horizon Rules
Route Reflector Split-Horizon Rules
Route Reflector Split-Horizon Rules
Route Reflector Split-Horizon Rules
Redundant Route Reflectors

Chapter 6 - MPLS

1h 3m

Traditional IP Routing
Traditional IP Routing Example
MPLS Features and Benefits
MPLS Features and Benefits
Explain MPLS Terminology
Explain MPLS Terminology
Explain MPLS Terminology
MPLS Architecture Components
MPLS Architecture: Control Plane
MPLS Architecture: Data Plane
Ingress Edge LSR Architecture
Ingress Edge LSR Architecture Example
Intermediate LSR Architecture
Intermediate LSR Architecture Example
Egress Edge LSR Architecture
Egress Edge LSR Architecture Example
MPLS Labels
FEC and MPLS Forwarding
MPLS Label Format
Label Distributing Protocols
Label Distributing Protocols
Using LDP to Forward Packets
IGP and LDP Propagation
IGP and LDP Propagation
MPLS L3 VPN Architecture
MPLS L3 VPN Architecture
PE Router Architecture
VRF
Propagating Routing Information Across the P-Network
Propagating Routing Information Across the P-Network
Propagating Routing Information Across the P-Network
Propagating Routing Information Across the P-Network
Propagating Routing Information Across the P-Network
Route Distinguishers
Route Distinguishers
RD Operation in MPLS VPN
RD Operation in MPLS VPN
RD Operation in MPLS VPN
Route Targets
Route Targets
RT and RD Process Flow
RT and RD Process Flow
MPLS L3 VPN Routing Requirements
CE Router MPLS L3 VPN Routing Model
P Router MPLS L3 VPN Routing Model
PE Router MPLS L3 VPN Routing Model
MPLS Support for Internet Routing
Routing Tables on PE Routers
End-to-End Flow of Routing Updates

End-to-End Flow of Routing Updates
End-to-End Flow of Routing Updates
End-to-End Flow of Routing Updates
End-to-End Flow of Routing Updates
End-to-End VPN Packet Forwarding Mechanisms
End-to-End VPN Packet Forwarding Mechanisms
End-to-End VPN Packet Forwarding Mechanisms
End-to-End VPN Packet Forwarding Mechanisms
End-to-End VPN Packet Forwarding Mechanisms
End-to-End VPN Packet Forwarding Mechanisms
End-to-End VPN Packet Forwarding Mechanisms
VPN Penultimate Hop Popping
Propagation of VPN Labels Between PE Routers

Chapter 7 - VRF-Lite

21m

PE Router Routing Contexts
VPN-Aware Routing Protocols
VRF Table
VRF Table
VRF-Lite Functionality
Implement VRF-Lite
Migration from Old to New Style VRF CLI
Routing with VRF-Lite: OSPF
Routing with VRF-Lite: EIGRP
Routing with VRF-Lite: Static Routing
Routing with VRF-Lite: BGP
Demo - VRF Lite

Chapter 8 - DMVPN

46m

DMVPN Overview
DMVPN Components
DMVPN Components
GRE
GRE
GRE
GRE
GRE
NHRP
NHRP
DMVPN Operations
DMVPN Operations
DMVPN Operations
DMVPN Operations
DMVPN Operations
DMVPN Operations
DMVPN Operations
DMVPN Operations
DMVPN Operations
DMVPN Authentication
DMVPN Hub Configuration
DMVPN Hub Configuration

DMVPN Spoke Configuration
DMVPN Spoke Configuration
DMVPN Routing Configuration
DMVPN Routing Configuration
DMVPN Routing Configuration
Verifying DMVPN
Verifying DMVPN
Verifying DMVPN
Verifying DMVPN
Verifying DMVPN
Verifying DMVPN
Verifying DMVPN
Verifying DMVPN
Verifying DMVPN
Demo – DMVPN

Chapter 9 - DHCP

44m

DHCP Overview
Configuring a DHCP Server
Configuring a DHCP Server
DHCP Relay
DHCP Relay
DHCP Manual Address Binding
DHCP Manual Address Binding
DHCP Options
Cisco Plug-n-Play and DHCP
IPv6 Stateless Address Autoconfiguration Overview
IPv6 Stateless Address Autoconfiguration Overview
DHCPv6 Overview
DHCPv6 Operation
Stateless DHCPv6 Overview
DHCPv6 Relay Agent
Troubleshoot DHCP
Troubleshoot DHCP
Troubleshoot DHCP
Troubleshoot IPv6 Address Assignment on Clients
Troubleshoot IPv6 Address Assignment on Clients
Troubleshoot IPv6 Address Assignment on Clients
Demo - DHCP
Demo - Troubleshooting

Chapter 10 - Router Security

38m

IPv4 ACL
Standard IPv4 ACL
Extended IPv4 ACL
IPv4 ACL for Filtering
IPv4 ACL for Filtering
Time-Based IPv4 ACL
Time-Based IPv4 ACL
Time-Based IPv4 ACL
IPv6 ACL

IPv6 ACL
IPv6 ACL for Filtering
IPv6 ACL for Filtering
Troubleshooting Access Lists
Demo - ACL Troubleshooting
Control Plane Security
Control Plane Security
Control Plane Policing
CoPP Implementation Steps
CoPP Configuration Sample: ACLs
CoPP Configuration Sample: Class Maps
CoPP Configuration Sample: Policy Map and Service Policy
CoPP Verification
uRPF
uRPF
uRPF Configuration Example
uRPF Configuration Example
Verifying uRPF Configuration
Demo - uRPF Securing Cisco Routers

Chapter 11 - First Hop Security

11m

IPv6 Snooping
IPv6 ND Inspection
IPv6 RA Guard
DHCPv6 Guard
IPv6 Source Guard
IPv6 Source Guard
IPv6 Destination Guard
IPv6 Destination Guard

Chapter 12 - Troubleshooting

1h 21m

AAA Overview
AAA Overview
AAA Configuration Using Local Database
AAA Configuration Using TACACS+ Server
AAA Configuration Using TACACS+ Server
Troubleshoot AAA
Troubleshoot AAA
SNMP
SNMPv2c Configuration
SNMPv3
SNMPv3 Configuration
Troubleshoot SNMP
Troubleshoot SNMP
Troubleshoot SNMP
Syslog
Syslog Messages
Syslog Configuration
Network Management Protocols
Network Management Protocols

Network Management Protocols
Network Management Protocols
Network Management Protocols
Network Management Protocols
Network Management Protocols
NetFlow
NetFlow
NetFlow Configuration
NetFlow Verification
NetFlow Verification
NetFlow Verification
NetFlow Verification
Cisco Flexible NetFlow
Cisco Flexible NetFlow Configuration
Cisco Flexible NetFlow Configuration
Cisco Flexible NetFlow Configuration
Cisco Flexible NetFlow Configuration
Cisco Flexible NetFlow Configuration
Cisco Flexible NetFlow Configuration
Validate Cisco Flexible NetFlow
Demo - Troubleshooting AAA, SCP, and IP SLA
Need for DNA Assurance
Need for DNA Assurance
Assurance
Cisco DNA Center Assurance
Cisco DNA Center Assurance
DNA Assurance Architecture
Cisco AI Network Analytics
Cisco AI Network Analytics
Cisco AI Network Analytics
Cisco AI Network Analytics
Cisco AI Network Analytics
DNA Assurance Health Scores
DNA Assurance Health Scores
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Network Health
DNA Assurance Health Scores: Client Health
Using Path Trace for Troubleshooting
Using Path Trace for Troubleshooting
Using Path Trace for Troubleshooting
Using Path Trace for Troubleshooting
Case Study 1: NTP
Case Study 1: NTP
Case Study 2: DHCP Issue for a Wired Client
Case Study 2: DHCP Issue for a Wired Client
Case Study 2: DHCP Issue for a Wired Client
Case Study 2: DHCP Issue for a Wired Client
Case Study 3: DNA Assurance Time Travel Feature

Case Study 3: DNA Assurance Time Travel Feature
Case Study 3: DNA Assurance Time Travel Feature
Demo - DNA Center Assurance

Total Duration: 10h 47m