Implementation Cisco Enterprise Advanced Routing and Services Training

Course Duration: 40 Hours **Course code: ENARSI**

1. Course Overview

This course focuses on advanced routing technologies and services used in enterprise networks. It provides in-depth knowledge of Layer 3 infrastructure, advanced routing protocols, VPN services, infrastructure security, and network services. Learners will gain hands-on experience in implementing, troubleshooting, and optimizing complex enterprise routing solutions using Cisco technologies.

2. What you'll learn?

By the end of the course, you will be able to:

- Implement advanced routing protocols such as OSPF, EIGRP, and BGP
- Configure route redistribution between different routing domains
- Implement VPN technologies including DMVPN and IPsec
- Configure infrastructure security features
- Implement advanced IP services for enterprise networks
- Troubleshoot complex routing and network issues
- Optimize network performance using advanced techniques
- Apply best practices for scalable enterprise network design

3. Target Audience

This course is ideal for:

- Network Engineers
- Network Administrators
- System Engineers
- Network Security Engineers

- IT Professionals preparing for CCNP Enterprise

4. Pre-Requisites

Before taking this course, you should have:

- Knowledge equivalent to CCNA or ENCOR level
- Understanding of IP routing and switching fundamentals
- Basic experience with Cisco CLI
- Familiarity with network troubleshooting concepts

5. Course content

Module 1: Course Introduction

- Course objectives and structure
- Lab environment overview
- Certification pathway (CCNP Enterprise)

Module 2: Advanced Layer 3 Technologies

- Review of routing fundamentals
- Advanced routing concepts
- CEF (Cisco Express Forwarding)
- Route lookup process

Module 3: Advanced OSPF Implementation

- OSPF multi-area design
- OSPF LSA types and operations
- Route summarization and filtering
- OSPF path selection and optimization
- OSPF troubleshooting

Module 4: Advanced EIGRP Implementation

- EIGRP named mode configuration
- EIGRP metric calculation
- Route summarization and filtering
- EIGRP stub routing
- EIGRP troubleshooting

Module 5: BGP Fundamentals and Implementation

- BGP concepts and attributes
- iBGP vs eBGP
- Path selection process
- BGP peering and configuration
- BGP route filtering and policy control

Module 6: Route Redistribution

- Redistribution concepts and challenges
- Redistribution between OSPF, EIGRP, and BGP
- Route tagging and loop prevention
- Policy control in redistribution

Module 7: VPN Technologies

- VPN fundamentals
- GRE tunneling
- IPsec VPN configuration
- DMVPN (Dynamic Multipoint VPN)
- Site-to-site VPN deployment

Module 8: Infrastructure Security

- Control Plane Security (CoPP)
- Management plane protection

- Device hardening
- Secure routing protocols
- ACL-based security

Module 9: Infrastructure Services

- DHCP advanced features
- NAT advanced configurations
- NTP and SNMP enhancements
- IP SLA configuration and monitoring

Module 10: Network Services Optimization

- QoS advanced concepts
- Traffic shaping and policing
- Congestion management
- High availability techniques

Module 11: Network Troubleshooting

- Structured troubleshooting methodology
- Troubleshooting routing protocols
- Debugging tools and commands
- Packet analysis techniques

Module 12: Network Automation and Programmability

- Automation in enterprise networks
- REST APIs and model-driven programmability
- Python for network automation
- Cisco platforms for automation

Module 13: WAN Technologies

- WAN architecture overview

- MPLS basics
- SD-WAN concepts
- Hybrid WAN design

Module 14: High Availability and Redundancy

- First Hop Redundancy Protocols (HSRP, VRRP, GLBP)
- Redundant WAN design
- Fast convergence techniques
- Resilient network design

Module 15: Hands-on Labs and Real-World Scenarios

- Advanced routing labs
- VPN configuration labs
- Troubleshooting real enterprise scenarios
- Performance optimization use cases