ROUTE - Implementing Cisco IP Routing (5 Days)

Course Overview:
Implementing Cisco IP Routing (ROUTE) is an instructor-led training course presented by Cisco training partners to their end customers. This five-day course is designed to help students prepare for Cisco CCNP certification. The ROUTE course is a component of the CCNP curriculum.

The ROUTE course is designed to provide professionals of medium to large network sites with information on the use of advanced routing in implementing scalability for Cisco routers that are connected to LANs and WANs. The goal is to train professionals to dramatically increase the number of routers and sites using these techniques instead of redesigning the network when additional sites or wiring configurations are added. The ROUTE training reinforces the instruction by providing students with hands-on labs to ensure they thoroughly understand how to implement advanced routing within their networks.

Who will benefit from this course?
This course is intended for those engineers who are candidates for Cisco CCNP certifications as well as those who are candidates for Cisco CCIE Routing and Switching and CCIE certifications. Others who will benefit from this course are:

- Network professionals who want to correctly implement routing-based solutions given a network design using Cisco IOS services and features, where implementation of routing includes planning, configuration, and verification.
- The typical job roles for this type of network professional are network engineers; network operations center (NOC) technical support personnel, and help desk technicians.
- Any individual involved in implementation and verification of routing protocols in enterprise networks.

Prerequisites:
The knowledge and skills that a student must have before attending this course are as follows:

- Knowledge and skill level equal to Cisco CCNA certification.
- In addition to knowledge and skill level equal to Cisco CCNA certification, it is recommended that the student have practical experience in installing, operating, and maintaining Cisco routers and switches in an enterprise environment.
- Knowledge of and experience with the implementation and verification of enterprise routing and switching technologies as offered by the Interconnecting Cisco Networking Devices Part 1 (ICND1) and Interconnecting Cisco Networking Devices Part 2 (ICND2) courses or equivalent skills and knowledge.

Course Objectives:
Upon completing this course, the student will be able to meet these overall objectives:

- Plan and document the configuration and verification of routing protocols and their optimization in enterprise networks.
- Identify the technologies, components, and metrics of EIGRP used to implement and verify EIGRP routing in diverse, large-scale internetworks based on requirements.
- Identify, analyze, and match OSPF multi-area routing functions and benefits for routing efficiencies in network operations in order to implement and verify OSPF routing in a complex enterprise network
- Implement and verify a redistribution solution in a multi-protocol network that uses Cisco IOS features to control path selection and provides a loop-free topology according to a given network design and requirements
- Evaluate common network performance issues and identify the tools needed to provide Layer 3 path control that uses Cisco IOS features to control the path

- Implement and verify a Layer 3 solution using BGP to connect an enterprise network to a service provider

Course Outline:

Module 1: Planning Routing Services to Requirements
Lesson 1: Assessing Complex Enterprise Network Requirements
Lesson 2: Common Maintenance Processes and Procedures

Module 2: Implementing an EIGRP based Solution
Lesson 1: Planning Routing Implementations with EIGRP
Lesson 2: Implementing and Verifying Basic EIGRP for the Enterprise LAN Architecture
Lesson 3: Configuring and Verifying EIGRP for the Enterprise WAN Architecture
Lesson 4: Implementing and Verifying EIGRP Authentication
Lesson 5: Advanced EIGRP Features in an Enterprise Network

Module 3: Implementing a Scalable Multi-area Network OSPF Based Solution
Lesson 1: Planning Routing Implementations with OSPF as Scalable Routing Protocol
Lesson 2: How OSPF Packet Processes Work
Lesson 3: Improving Routing Performance in a Complex Enterprise Network
Lesson 4: Configuring and Verifying OSPF Routing
Lesson 5: Configuring and Verifying OSPF Route Summarization
Lesson 6: Configuring and Verifying OSPF Special Area Types
Lesson 7: Configuring and Verifying OSPF Authentication

Module 4: Implement an IPv4-based Redistribution Solution
Lesson 1: Assessing Network Routing Performance and Security Issues
Lesson 2: Operating a Network Using Multiple IP Routing Protocols
Lesson 3: Configuring and Verifying Route Redistribution

Module 5: Implementing Path Control
Lesson 1: Assessing Path Control Network Performance Issues
Lesson 2: References to additional Path Control in E-Learning

Module 6: Connection of an Enterprise Network to an ISP Network
Lesson 1: Planning the Enterprise-to-ISP Connection
Lesson 2: Considering the Advantages of Using BGP
Lesson 3: Comparing the Functions and Uses of EBGP and IBGP
Lesson 4: Configuring and Verifying Basic BGP Operations
Lesson 5: Using the BGP Attributes and Path Selection Process
Lesson 6: E-Learning Training on IPv6 and Routing for Branch Offices and Remote Workers

Lab Outline

- Lab 1-1: Assess Skills for Implementing Complex Networks
- Lab 2-1: Configure and Verify EIGRP Operations
- Lab 2-2: Configure and Verify EIGRP Circuit Emulation and Frame Relay Operations
- Lab 2-3: Configure and Verify EIGRP Authentication
- Lab 2-4: Implement and Verify EIGRP operations ***Lab modified by SLI – detailed below***
- Lab 3-1: Configure and Verify OSPF to Improve Routing Performance
- Lab 3-2: Implement and Verify OSPF Multiarea Routing
- Lab 3-3: Configure and Verify OSPF Route Summarization for Interarea and External Routes
- Lab 3-4: Configure and Verify OSPF Special Area Types
- Lab 3-5: Configure and Verify OSPF Authentication
- Lab 4-1: Configure Route Redistribution Between Multiple IP Routing Protocols
- Lab 5-1: Configure and Verify Path Control Between Multiple IP Routing Protocols
- Lab 6-1: Configure BGP Operations
- Lab 6-2: Manipulate EBGP Path Selections

Modified Existing Lab from above - Implement Advanced EIGRP Features

- New Lab - Configuring Integrated IS-IS
- New Lab - Configuring IPv6 Addresses
- New Lab - Enabling IPv6 OSPF Routing
- New Lab - Configuring IPv6 Tunnels