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# Cisco CCNP Routing and Switching Certification


## Course outline

### Module 1. ROUTE v1.0 - Implementing Cisco IP Routing

**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 Multiarea 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

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### 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 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
- 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

## Module 2. SWITCH v1.0 - Implementing Cisco Switched Networks

### Module 1: Analyzing Campus Network Designs

- Lesson 1: Enterprise Campus Architecture
- Lesson 2: Cisco Lifecycle Services and Network Implementation

### Module 2: Implementing VLANs in Campus Networks

- Lesson 1: Applying Best Practices for VLAN Topologies
- Lesson 2: Configuring Private VLANs
- Lesson 3: Configuring Link Aggregation with EtherChannel

### Module 3: Implementing Spanning Tree

- Lesson 1: Spanning Tree Protocol Enhancements
- Lesson 2: Describing STP Stability Mechanisms

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### Module 4: Implementing Inter-VLAN Routing

- Lesson 1: Describing Routing Between VLANs
- Lesson 2: Deploying Multilayer Switching with Cisco Express Forwarding

### Module 5: Implementing a Highly Available Network

- Lesson 1: Understanding High Availability
- Lesson 2: Implementing High Availability
- Lesson 3: Implementing Network Monitoring

### Module 6: Implementing Layer 3 High Availability

- Lesson 1: Configuring Layer 3 Redundancy with HSRP
- Lesson 2: Configuring Layer 3 Redundancy with VRRP and GLBP

### Module 7: Minimizing Service Loss and Data Theft in a Campus Network

- Lesson 1: Understanding Switch Security Issues
- Lesson 2: Protecting Against VLAN Attacks
- Lesson 3: Protecting Against Spoofing Attacks
- Lesson 4: Securing Network Services

### Module 8: Accommodating Voice and Video in Campus Networks

- Lesson 1: Planning for Support of Voice in a Campus Network
- Lesson 2: Integrating and Verifying VoIP in a Campus Infrastructure
- Lesson 3: Working with Specialists to Accommodate Voice and Video on Campus Switches

### Module 9: Integrating Wireless LANs into a Campus Network

- Lesson 1: Comparing WLANs with Campus Networks
- Lesson 2: Assessing the Impact of WLANs on Campus Networks
- Lesson 3: Preparing the Campus Infrastructure for WLANs

### Lab Outline

- Lab 1-1: New Hire Test
- Lab 2-1: Design and Implement VLANs, Trunks, and EtherChannel
- Lab 2-2: Troubleshoot Common VLAN Configuration and Security Issues
- Lab 2-3: Configure Private VLANs
- Lab 3-1: Implement Multiple Spanning Tree
- Lab 3-2: Implement PVSRT+
- Lab 3-3: Troubleshoot Spanning Tree Issues
- Lab 4-1: Implement Inter-VLAN Routing
- Lab 4-2 Troubleshoot Inter-VLAN Routing
- Lab 5-1: Implement High Availability in a Network Design
- Lab 6-1: Implement and Tune HSRP
- Lab 6-2: Implement VRRP
- Lab 7-1: Secure Network Switches to Mitigate Security Attacks
- Lab 8-1: Plan Implementation and Verification of VoIP in a Campus Network
- Lab 9-1: Integrate Wireless in the Campus

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# Module 3. TSHOOT v1.0 - Troubleshooting and Maintaining Cisco IP Networks

### Module 1: Planning Maintenance for Complex Networks

- Lesson 1: Applying Maintenance Methodologies
- Lesson 2: Common Maintenance Processes and Procedures
- Lesson 3: Network Maintenance Tools, Applications, and Resources

### Module 2: Planning Troubleshooting Processes for Complex Enterprise Networks

- Lesson 1: Applying Troubleshooting Methodologies
- Lesson 2: Planning and Implementing Troubleshooting Procedures
- Lesson 3: Integrating Troubleshooting into the Network Maintenance Process

### Module 3: Maintenance and Troubleshooting Tools and Applications

- Lesson 1: Assembling a Basic Diagnostic Toolkit Using Cisco IOS Software
- Lesson 2: Using Specialized Maintenance and Troubleshooting Tools

### Module 4: Maintaining and Troubleshooting Campus Switching-Based Solutions

- Lesson 1: Troubleshooting VLANs
- Lesson 2: Troubleshooting Spanning Tree
- Lesson 3: Troubleshooting Switched Virtual Interfaces and Inter VLAN Routing
- Lesson 4: Troubleshooting FHRPs
- Lesson 5: Troubleshooting Performance Problems on Switches
- Lesson 6: References to Additional Campus Switching Technologies in E-Learning

### Module 5: Maintaining and Troubleshooting Routing-Based Solutions

- Lesson 1: Troubleshooting Network Layer Connectivity
- Lesson 2: Troubleshooting EIGRP
- Lesson 3: Troubleshooting OSPF
- Lesson 4: Troubleshooting Route Redistribution
- Lesson 5: Troubleshooting BGP
- Lesson 6: Troubleshooting Performance Problems on Routers
- Lesson 7: References to Additional Troubleshooting on NAT and DHCP in E-Learning

### Module 6: Maintaining and Troubleshooting Network Security Solutions

- Lesson 1: Troubleshooting Security Features
- Lesson 2: Security Features Review
- Lesson 3: References to Additional Security Troubleshooting in E-Learning

### Module 7: Maintaining and Troubleshooting Integrated, Complex Enterprise Networks

- Lesson 1: Troubleshooting Complex Environments

### Lab Outline

- Lab 1-1: Lab Access
- Lab 2-1: Introduction to Troubleshooting
- Lab 3-1: Maintenance and Troubleshooting Tools
- Lab 4-1: Layer 2 Connectivity and Spanning Tree

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- Lab 4-2: Layer 3 Switching and First-Hop Redundancy
- Lab 5-1: Layer 3 Connectivity and EIGRP
- Lab 5-2: OSPF and Route Redistribution
- Lab 5-3: Border Gateway Protocol
- Lab 5-4: Router Performance
- Lab 6-1: Introduction to Network Security
- Lab 6-2: Cisco IOS Security Features
- Lab 7-1: Troubleshooting Complex Environments