

# CCNP Routing & Switching



Cisco Certified Network Professional (CCNP) validates the ability to plan, implement, verify and troubleshoot local and wide-area enterprise networks and work collaboratively with specialists on advanced security, voice, wireless and video solutions. The CCNP certification is appropriate for those with at least some networking experience who are ready to advance their skills and work independently on complex network solutions. Those who achieve CCNP have demonstrated the skills required in enterprise roles such as network technician, support engineer, systems engineer or network engineer.

**Prerequisites:** Valid Cisco CCNA Routing and Switching certification or any Cisco CCIE certification can act as a prerequisite.

**Recommended Training:** Implementing Cisco IP Routing (ROUTE), Implementing Cisco IP Switched Networks (SWITCH), Troubleshooting and Maintaining Cisco IP Networks (TSHOOT)

**Exams :** 642-902 ROUTE, 642-813 SWITCH, 642-832 TSHOOT

## Syllabus:

### 642-902 ROUTE

#### 1.0 Implement an EIGRP Based Solution, given a Network Design and a set of Requirements

- 1.1 Determine network resources needed for implementing EIGRP in a network
- 1.2 Create an EIGRP implementation plan
- 1.3 Create an EIGRP verification plan
- 1.4 Configure EIGRP routing
- 1.5 Verify EIGRP solution was implemented properly using show and debug commands
- 1.6 Document the results of EIGRP implementation and verification

#### 2.0 Implement a Multi-Area OSPF Network, given a Network Design and a set of Requirements

- 2.1 Determine network resources needed for implementing OSPF in a network
- 2.2 Create an OSPF implementation plan
- 2.3 Create an OSPF verification plan
- 2.4 Configure OSPF routing
- 2.5 Verify OSPF solution was implemented properly using show and debug commands
- 2.6 Document the results of OSPF implementation and verification

### **3.0 Implement an eBGP Based Solution, given a Network Design and a set of Requirements**

- 3.1 Determine network resources needed for implementing eBGP in a network
- 3.2 Create an eBGP implementation plan
- 3.3 Create an eBGP verification plan
- 3.4 Configure eBGP routing
- 3.5 Verify eBGP solution was implemented properly using show and debug commands
- 3.6 Document the results of eBGP implementation and verification

### **4.0 Implement an IPv6 Based Solution, given a Network Design and a set of Requirements**

- 4.1 Determine network resources needed for implementing IPv6 in a network
- 4.2 Create an IPv6 implementation plan
- 4.3 Create an IPv6 verification plan
- 4.4 Configure IPv6 routing
- 4.5 Configure IPv6 interoperation with IPv4
- 4.6 Verify IPv6 solution was implemented properly using show and debug commands
- 4.7 Document the results of IPv6 implementation and verification

### **5.0 Implement an IPv4 or IPv6 Based Redistribution Solution, given a Network Design and a set of Requirements**

- 5.1 Create a redistribution implementation plan based upon the results from a redistribution analysis
- 5.2 Create a redistribution verification plan
- 5.3 Configure a redistribution solution
- 5.4 Verify that a redistribution was implemented
- 5.5 Document results of a redistribution implementation and verification plan
- 5.6 Identify the differences between implementing an IPv4 and IPv6 redistribution solution

### **6.0 Implement Layer 3 Path Control Solution**

- 6.1 Create a Layer 3 path control implementation plan based upon the results of the redistribution analysis
- 6.2 Create a Layer 3 path control verification plan
- 6.3 Configure Layer 3 path control
- 6.4 Verify that a Layer 3 path control was implemented
- 6.5 Document results of a Layer 3 path control implementation and verification plan

### **7.0 Implement Basic Teleworker and Branch Services**

- 7.1 Describe broadband technologies
- 7.2 Configure basic broadband connections
- 7.3 Describe basic VPN technologies
- 7.4 Configure GRE
- 7.5 Describe branch access technologies

# 642-813 SWITCH

## 1.0 Implement VLAN Based Solution, given a Network Design and a set of Requirements

- 1.1 Determine network resources needed for implementing a VLAN based solution on a network
- 1.2 Create a VLAN based implementation plan
- 1.3 Create a VLAN based verification plan
- 1.4 Configure switch-to-switch connectivity for the VLAN based solution
- 1.5 Configure loop prevention for the VLAN based solution

## 2.0 Implement a Security Extension of a Layer 2 Solution, given a Network Design and a set of Requirements

- 2.1 Determine network resources needed for implementing a security solution
- 2.2 Create a implementation plan for the security solution
- 2.3 Create a verification plan for the security solution
- 2.4 Configure port security features
- 2.5 Configure general switch security features
- 2.6 Configure private VLANs
- 2.7 Configure VACL and PACL
- 2.8 Verify the Security based solution was implemented properly using show and debug commands
- 2.9 Document results of security implementation and verification

## 3.0 Implement Switch Based Layer 3 Services, given a Network Design and a set of Requirements

- 3.1 Determine network resources needed for implementing a Switch based Layer 3 solution
- 3.2 Create an implementation plan for the Switch based Layer 3 solution
- 3.3 Create a verification plan for the Switch based Layer 3 solution
- 3.4 Configure routing interfaces
- 3.5 Configure Layer 3 Security
- 3.6 Verify the Switch based Layer 3 solution was implemented properly using show and debug commands
- 3.7 Document results of Switch based Layer 3 implementation and verification

## 4.0 Prepare infrastructure to Support Advanced Services

- 4.1 Implement a Wireless Extension of a Layer 2 solution
- 4.2 Implement a VoIP support solution
- 4.3 Implement video support solution

## **5.0 Implement High Availability, given a Network Design and a set of Requirements**

- 5.1 Determine network resources needed for implementing High Availability on a network
- 5.2 Create a High Availability implementation plan
- 5.3 Create a High Availability verification plan
- 5.4 Implement first hop redundancy protocols
- 5.5 Implement switch supervisor redundancy
- 5.6 Verify High Availability solution was implemented properly using show and debug commands
- 5.7 Document results of High Availability implementation and verification

## **642-832 TSHOOT**

### **1.0 Maintain and Monitor Network Performance**

- 1.1 Develop a plan to monitor and manage a network
- 1.2 Perform network monitoring using IOS tools
- 1.3 Perform routine IOS device maintenance
- 1.4 Isolate sub-optimal internetwork operation at the correctly defined OSI Model layer

### **2.0 Troubleshoot Multi Protocol System Networks**

- 2.1 Troubleshoot EIGRP
- 2.2 Troubleshoot OSPF
- 2.3 Troubleshoot eBGP
- 2.4 Troubleshoot routing redistribution solution
- 2.5 Troubleshoot a DHCP client and server solution
- 2.6 Troubleshoot NAT
- 2.7 Troubleshoot first hop redundancy protocols
- 2.8 Troubleshoot IPv6 routing
- 2.9 Troubleshoot IPv6 and IPv4 interoperability
- 2.10 Troubleshoot switch-to-switch connectivity for the VLAN based solution
- 2.11 Troubleshoot loop prevention for the VLAN based solution
- 2.12 Troubleshoot Access Ports for the VLAN based solution
- 2.13 Troubleshoot private VLANS
- 2.14 Troubleshoot port security
- 2.14 Troubleshoot general switch security
- 2.16 Troubleshoot VACLs and PACLs
- 2.17 Troubleshoot switch virtual interfaces (SVIs)
- 2.18 Troubleshoot switch supervisor redundancy
- 2.19 Troubleshoot switch support of advanced services (i.e., Wireless, VoIP and Video)

- 2.20 Troubleshoot a VoIP support solution
- 2.21 Troubleshoot a video support solution
- 2.22 Troubleshoot Layer 3 Security
- 2.23 Troubleshoot issues related to ACLs used to secure access to Cisco routers
- 2.24 Troubleshoot configuration issues related to accessing the AAA server for authentication purposes
- 2.25 Troubleshoot security issues related to IOS services (i.e.,finger,NTP, HTTP, FTP, RCP etc.)

