Implementing Cisco IP Routing (300-101)

Implementing Cisco IP Routing (ROUTE 300-101) is a 120-minute qualifying exam with 50–60 questions for the Cisco CCNP and CCDP certifications. The ROUTE 300-101 exam certifies the routing knowledge and skills of successful candidates. They are certified in using advanced IP addressing and routing in implementing scalable and highly secure Cisco routers that are connected to LANs, WANs, and IPv6.
The exam also covers the configuration of highly secure routing solutions to support branch offices and mobile workers.

Topics
Network Principals • **Identify Cisco Express Forwarding concepts** • **Out-of-order packets** • **Asymmetric routing** • **Describe IP operations** • **ICMP Unreachable and Redirects** • **IPv4 and IPv6 fragmentation** • **TTL** • **Explain TCP operations** • **Describe UDP operations** • **Recognize proposed changes to the network** • **Changes to routing protocol parameters** • **Migrate parts of the network to IPv6** • **Routing protocol migration**
Layer 2 Technologies • **Configure and verify PPP** • **Explain Frame Relay**
Layer 3 Technologies • **Identify, configure, and verify IPv4 addressing and subnetting** • **Identify IPv6 addressing and subnetting** • **Configure and verify static routing** • **Configure and verify default routing** • **Evaluate routing protocol types** • **Describe administrative distance** • **Troubleshoot passive interfaces** • **Configure and verify VRF lite** • **Configure and verify filtering with any protocol** • **Configure and verify redistribution between any routing protocols or routing sources** • **Configure and verify manual and autosummarization with any routing protocol** • **Configure and verify policy-based routing** • **Identify suboptimal routing** • **Explain ROUTE maps** • **Configure and verify loop prevention mechanisms** • **Configure and verify RIPv2** • **Describe RIPng** • **Describe EIGRP packet types** • **Configure and verify EIGRP neighbor relationship and authentication** • **Configure and verify EIGRP stubs** • **Configure and verify EIGRP load balancing** • **Describe and optimize EIGRP metrics**

- **Configure and verify EIGRP for IPv6**
- **Describe OSPF packet types**
- **Configure and verify OSPF neighbor relationship and authentication**
- **Configure and verify network types, area types, and router types**
- **Point-to-point, multipoint, broadcast, nonbroadcast**
- **LSA types, area type: backbone, normal, transit, stub, NSSA, totally stub**
- **Internal router, backbone router, ABR, ASBR**
- **Virtual link**
- **Configure and verify OSPF path preference**
- **Configure and verify OSPF operations**
- **Configure and verify OSPF for IPv6**
- **Describe, configure, and verify BGP peer relationships and authentication**
- **Configure and verify eBGP (IPv4 and IPv6 address families)**
- **eBGP**
- **4-byte AS number**
- **Private AS**
- **Explain BGP attributes and best-path selection**

VPN Technologies

- **Configure and verify GRE**
- **Describe DMVPN (single hub)**
- **Describe Easy Virtual Networking (EVN)**

Infrastructure Security

- **Describe IOS AAA using local database**
- **Describe device security using IOS AAA with TACACS+ and RADIUS**
- **AAA with TACACS+ and RADIUS**
- **Local privilege authorization fallback**
- **Configure and verify device access control**
- **Configure and verify router security features**

Infrastructure Services

- **Configure and verify device management**
- **Configure and verify SNMP**
- **Configure and verify logging**

Implementing Cisco IP Switched Networks (300-115)

Implementing Cisco IP Switched Networks (SWITCH 300-115) is a 120-minute qualifying exam with 45–55 questions for the Cisco CCNP and CCDP certifications. The SWITCH 300-115 exam certifies the switching knowledge and skills of successful candidates. They are certified in planning, configuring, and verifying the implementation of complex enterprise switching solutions that use the Cisco Enterprise Campus Architecture. The SWITCH exam also covers highly secure integration of VLANs and WLANs.

CCNP Syllabus

Layer 2 Technologies

- **Configure and verify switch administration**
- **SDM templates**
- **Managing MAC address table**
- **Troubleshoot Err-disable recovery**
- **Configure and verify Layer 2 protocols**
- **CDP, LLDP**
- **UDLD**
- **Configure and verify VLANs, Access ports, VLAN database**
- **Normal, extended VLAN, voice VLAN**
- **Configure and verify trunking**
- **VTPv1, VTPv2, VTPv3, VTP pruning, dot1Q, Native VLAN, Manual pruning**
- **Configure and verify EtherChannels LACP, PAgP, manual**
- **Layer 2, Layer 3 Load balancing ,EtherChannel misconfiguration guard**
- **Configure and verify spanning tree**
- **PVST+, RPVST+, MST**
- **Switch priority, port priority, path cost, STP timers**
- **PortFast, BPDUguard, BPDUfilter**
- **Loopguard and Rootguard**
- **Configure and verify other LAN switching technologies SPAN, RSPAN**
- **Describe chassis virtualization and aggregation technologies**

Infrastructure Security

- **Configure and verify switch security features**
- **DHCP snooping, IP Source Guard, Dynamic ARP inspection, Port security, Private VLAN, Storm control**
- **Describe device security using Cisco IOS AAA with TACACS+ and RADIUS**

Infrastructure Services

- **Configure and verify first-hop redundancy protocols**
- **HSRP, VRRP GLBP**

Troubleshooting and Maintaining Cisco IP Networks v2 (300-135)

Troubleshooting and Maintaining Cisco IP Networks v2 (TSHOOT 300-135) is a 120-minute qualifying exam with 15–25 questions for the Cisco CCNP certification. The TSHOOT 300-135 exam certifies that the successful candidate has the knowledge and skills necessary to:
Plan and perform regular maintenance on complex enterprise routed and switched networks
Use technology-based practices and a systematic ITIL-compliant approach to perform network troubleshooting.

Topics

CCNP Syllabus

Network Principles

- Use Cisco IOS troubleshooting tools
- Apply troubleshooting methodologies

Layer 2 Technologies

- Troubleshoot switch administration
- Troubleshoot Layer 2 protocols
- Troubleshoot VLANs
- Troubleshoot trunking
- Troubleshoot EtherChannels
- Troubleshoot spanning tree
- Troubleshoot other LAN switching technologies
- Troubleshoot chassis virtualization and aggregation technologies

Layer 3 Technologies

- Troubleshoot IPv4 addressing and subnetting
- Troubleshoot IPv6 addressing and subnetting
- Troubleshoot static routing
- Troubleshoot default routing
- Troubleshoot administrative distance
- Troubleshoot passive interfaces
- Troubleshoot VRF lite
- Troubleshoot filtering with any protocol
- Troubleshoot between any routing protocols or routing sources
- Troubleshoot manual and autosummarization with any routing protocol
- Troubleshoot policy-based routing
- Troubleshoot suboptimal routing
- Troubleshoot loop prevention mechanisms
- Troubleshoot RIPv2
- Troubleshoot EIGRP neighbor relationship and authentication
- Troubleshoot loop free path selection
- Troubleshoot EIGPR operations
- Troubleshoot EIGRP stubs
- Troubleshoot EIGRP load balancing
- Troubleshoot EIGRP metrics
- Troubleshoot EIGRP for IPv6
- Troubleshoot OSPF neighbor relationship and authentication
- Troubleshoot network types, area types, and router types
- Troubleshoot OSPF path preference
- Troubleshoot OSPF operations
- Troubleshoot OSPF for IPv6
- Troubleshoot BGP peer relationships and authentication
- Troubleshoot eBGP

VPN Technologies

- Troubleshoot GRE

Infrastructure Security

- Troubleshoot IOS AAA using local database
- Troubleshoot device access control
- Troubleshoot router security features

CCNP Syllabus

Infrastructure Services

- **Troubleshoot device management**
- **Troubleshoot SNMP**
- **Troubleshoot logging**
- **Troubleshoot Network Time Protocol(NTP)**
- **Troubleshoot IPv4 and IPv6 DHCP**
- **Troubleshoot IPv4 Network Address Translation (NAT)**
- **Troubleshoot SLA architecture**
- **Troubleshoot tracking objects**