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CCNP

Course Guide

Cisco Certified Network Professional (CCNP) Routing and Switching certification 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.

Cisco is globally accepted exam
The Cisco exams are trusted and accepted by leading employers, educational institutions and governments worldwide.

For a details of this market-leading exams, go to
http://www.cisco.com/web/learning/certifications/professional/ccnp/index.html

CCNP Course Objectives

The CCNP routing and switching protocol knowledge from this certification will provide a lasting foundation as these skills are equally relevant in the physical networks of today and the virtualized network functions of tomorrow.

CCNP Route 300-101

Network Principles

- Identify Cisco Express Forwarding concepts
- Explain general network challenges i.e. Unicast,
- Out-of-order packets, Asymmetric routing
- Describe IP operations i.e. ICMP Unreachable and Redirects, IPv4 and IPv6 fragmentation, TTL
- Explain TCP operations i.e. IPv4 and IPv6 (P)MTU, MSS, Latency, Windowing, Bandwidth-delay product, Global synchronization
- Describe UDP operations i.e. Starvation, Latency
- Recognize proposed changes to the network i.e. Changes to routing protocol parameters, Migrate parts of the network to IPv6, Routing protocol migration

Layer 2 Technologies

- Configure and verify PPP i.e. Authentication (PAP, CHAP), PPPoE (client side only)
- Explain Frame Relay i.e. Operations, Point-to-point, Multipoint

Layer 3 Technologies

- Identify, configure, and verify IPv4 addressing and subnetting i.e. Address types (Unicast, broadcast, multicast, and VLSM), ARP, DHCP relay and server, DHCP protocol operations
- Identify IPv6 addressing and subnetting i.e. Unicast,EUI-64, ND, RS/RA, Autoconfig (SLAAC), DHCP relay and server
- DHCP protocol operations
- Configure and verify static routing,
- Configure and verify default routing
- Evaluate routing protocol types i.e. Distance vector, Link state, Path vector
- 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 i.e. Route tagging and filtering, Split-horizon, Route poisoning
- 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 i.e. Equal cost, Unequal cost
- 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 i.e. 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 i.e. Peer group, Active, passive, States and timers
- Configure and verify eBGP (IPv4 and IPv6 address families) i.e. eBGP, 4-byte AS number, Private AS
- Explain BGP attributes and best-path selection

VPN Tecnologies

- 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 i.e. AAA with TACACS+ and RADIUS, Local privilege authorization fallback
- Configure and verify device access control i.e. Lines (VTY, AUX, console), Management plane protection, Password encryption

- Configure and verify router security features i.e. IPv4 access control lists (standard, extended, time-based), IPv6 traffic filter, Unicast reverse path forwarding

Infrastructure Services

- Configure and verify device management i.e. Console and VTY, Telnet, HTTP, HTTPS, SSH, SCP, (T)FTP
- Configure and verify SNMP i.e. v2, v3
- Configure and verify logging i.e. Local logging, syslog, debugs, conditional debugs, Timestamps
- Configure and verify Network Time Protocol (NTP) i.e. NTP master, client, version 3, version 4, NTP authentication
- Configure and verify IPv4 and IPv6 DHCP i.e. DHCP client, IOS DHCP server, DHCP relay, DHCP options (describe)
- Configure and verify IPv4 Network Address Translation (NAT) i.e. Static NAT, dynamic NAT, PAT
- Describe IPv6 NAT i.e. NAT64 NPTv6
- Describe SLA architecture
- Configure and verify IP SLA i.e. ICMP
- Configure and verify tracking objects i.e. Tracking objects, Tracking different entities (for example, interfaces, IPSLA results)
- Configure and verify Cisco NetFlow i.e. NetFlow v5, v9, Local retrieval, Export (configuration only)

CCNP Switch 300-115

Layer 2 Technologies

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

Infrastructure Security

- Configure and verify switch security features i.e. 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 i.e. AAA with TACACS+ and RADIUS, Local privilege authorization fallback

Infrastructure Services

- Configure and verify first-hop redundancy protocols i.e. HSRP, VRRP, GLBP

CCNP TShoot 300-135

Network Principles

- Use Cisco IOS troubleshooting tools i.e. Debug, conditional debug, Ping and trace route with extended options
- Apply troubleshooting methodologies i.e. Diagnose the root cause of networking issues (analyze symptoms, identify and describe root cause), Design and implement valid solutions, Verify and monitor resolution

Layer 2 Technologies

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

Layer 3 Technologies

- Troubleshoot IPv4 addressing and subnetting i.e. Address types (Unicast, broadcast, multicast, and VLSM), ARP, DHCP relay and server, DHCP protocol operations
- Troubleshoot IPv6 addressing and subnetting i.e. Unicast, EUI-64, ND, RS/RA, Autoconfig (SLAAC), DHCP relay and server, DHCP protocol operations
- 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 i.e. Route tagging, filtering, Split-horizon, Route poisoning
- Troubleshoot RIPv2
- Troubleshoot EIGRP neighbor relationship and authentication
- Troubleshoot loop free path selection i.e. RD, FD, FC, successor, feasible successor, Troubleshoot EIGPR operations, Stuck in active
- Troubleshoot EIGRP stubs
- Troubleshoot EIGRP load balancing i.e. Equal cost, Unequal cost
- Troubleshoot EIGRP metrics
- Troubleshoot EIGRP for IPv6
- Troubleshoot OSPF neighbor relationship and authentication
- Troubleshoot network types, area types, and router types i.e. 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
- Troubleshoot OSPF path preference
- Troubleshoot OSPF operations
- Troubleshoot OSPF for IPv6
- Troubleshoot BGP peer relationships and authentication i.e. Peer group, Active, passive, States and timers
- Troubleshoot eBGP i.e. eBGP, 4-byte AS number, Private AS

VPN Technologies

- Troubleshoot GRE

Infrastructure Security

- Troubleshoot IOS AAA using local database i.e. Troubleshoot device access control, Lines (VTY, AUX, console), Management plane protection, Password encryption
- Troubleshoot router security features i.e. IPv4 access control lists (standard, extended, time-based), IPv6 traffic filter, Unicast reverse path forwarding

Infrastructure Services

- Troubleshoot device management i.e. Console and VTY, Telnet, HTTP, HTTPS, SSH, SCP, (T) FTP
- Troubleshoot SNMP i.e. v2, v3
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- Troubleshoot IPv4 and IPv6 DHCP i.e. DHCP client, IOS DHCP server, DHCP relay, DHCP options (describe)
- Troubleshoot IPv4 Network Address Translation (NAT) i.e. Static NAT, Dynamic NAT, PAT, Troubleshoot SLA architecture
- Troubleshoot tracking objects i.e. Tracking objects, Tracking different entities (for example, interfaces, IPSLA results)

Practical Approach

A real-time examples, will be given throughout the lectures, starting from design, analysis, implementation and maintenance of network.

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