

CCNP - Routing and Switching

Course Outline

Network Principles

- Identify Cisco Express Forwarding concepts
- FIB
- Adjacency table ☒ Explain general network challenges
- Unicast
- Out-of-order packets
- Asymmetric routing ☒ Describe IP operations
- ICMP Unreachable and Redirects
- IPv4 and IPv6 fragmentation
- TTL
- Explain TCP operations
- IPv4 and IPv6 (P)MTU
- MSS
- Latency
- Windowing
- Bandwidth-delay product
- Global synchronization
- Describe UDP operations
- Starvation
- Latency
- 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
- Authentication (PAP, CHAP)



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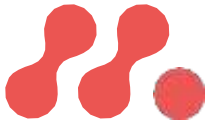
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- PPPoE (client side only) ☑ Explain Frame Relay
- Operations
- Point-to-point
- Multipoint

Layer 3 Technologies

- Identify, configure, and verify IPv4 addressing and subnetting
- Address types (Unicast, broadcast, multicast, and VLSM)
- ARP
- DHCP relay and server
- DHCP protocol operations
- Identify IPv6 addressing and subnetting
- Unicast
- EUI-64
- ND, RS/RA
- Autoconfigure (SLAAC)
- DHCP relay and server
- DHCP protocol operations
- Configure and verify static routing
- Configure and verify default routing
- Evaluate routing protocol types
- 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 auto summarization with any routing protocol



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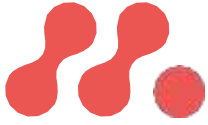
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- Configure and verify policy-based routing
- Identify suboptimal routing
- Explain ROUTE maps
- Configure and verify loop prevention mechanisms
- Route tagging and filtering
- Split-horizon
- Route poisoning
- Configure and verify RIPv2
- Describe RIPng
- Describe EIGRP packet types
- Configure and verify EIGRP neighbor relationship and authentication
- Configure and verify EIGRP stubs
- Configure and verify EIGRP load balancing
- 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
- 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
- Peer group
- Active, passive



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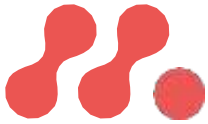
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- States and timers ☑ Configure and verify eBGP (IPv4 and IPv6 address families)
- eBGP
- 4-byte AS number
- Private AS
- Explain BGP attributes and best-path selection

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
- Lines (VTY, AUX, console)
- Management plane protection
- Password encryption
- Configure and verify router security features
- IPv4 access control lists (standard, extended, time-based)
- IPv6 traffic filter
- Unicast reverse path forwarding

Infrastructure Services

- Configure and verify device management
- Console and VTY
- Telnet, HTTP, HTTPS, SSH, SCP
- (T)FTP
- Configure and verify SNMP
- v2
- v3

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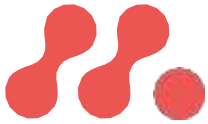
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- Configure and verify logging
- Local logging, syslog, debugs, conditional debugs
- Timestamps
- Configure and verify Network Time Protocol (NTP)
- NTP master, client, version 3, version 4
- NTP authentication
- Configure and verify IPv4 and IPv6 DHCP
- DHCP client, IOS DHCP server, DHCP relay
- DHCP options (describe)
- Configure and verify IPv4 Network Address Translation (NAT)
- Static NAT, dynamic NAT, PAT
- Describe IPv6 NAT
- NAT64
- NPTv6
- Describe SLA architecture ☑ Configure and verify IP SLA
- ICMP
- Configure and verify tracking objects
- Tracking objects
- Tracking different entities (for example, interfaces, IPSLA results) ☑
Configure and verify Cisco NetFlow
- NetFlow v5, v9
- Local retrieval
- Export (configuration only)

Cisco IP Switched Networks (SWITCH)

(Exam :300-115)

Course Outline

Layer 2 Technologies

- Configure and verify switch administration
- SDM templates
- Managing MAC address table
- Troubleshoot Err-disable recovery

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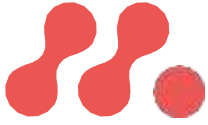
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- Configure and verify Layer 2 protocols
- CDP, LLDP
- UDLD
- Configure and verify VLANs
- Access ports
- VLAN database
- Normal, extended VLAN, voice VLAN ☑ Configure and verify trunking
- VTPv1, VTPv2, VTPv3, VTP pruning
- dot1Q
- Native VLAN
- Manual 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
- Stackwise

Infrastructure Security

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

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