



# CISCO CERTIFIED NETWORK PROFESSIONAL( Version-2)

## CCNP Paper 1 SWITCHING 300-115

### **Layer 2 Technologies**

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

### **2.0 Infrastructure Security**

- 2.1 Configure and verify switch security features
  - DHCP snooping
  - IP Source Guard
  - Port security
  - Private VLAN
  - Storm control
- 2.2 Describe device security using Cisco IOS AAA with TACACS+ and RADIUS
  - AAA with TACACS+ and RADIUS
  - Local privilege authorization fallback

### **3.0 Infrastructure Services**

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

## **1.0 Network Principles**

- 1.1 Identify Cisco Express Forwarding concepts
  - 1.1.a FIB
  - 1.1.b Adjacency table
- 1.2 Explain general network challenges
  - 1.2.a Unicast
  - 1.2.b Out-of-order packets
  - 1.2.c Asymmetric routing
- 1.3 Describe IP operations
  - 1.3.a ICMP Unreachable and Redirects
  - 1.3.b IPv4 and IPv6 fragmentation
  - 1.3.c TTL
- 1.4 Explain TCP operations
  - 1.4.a IPv4 and IPv6 (P)MTU
  - 1.4.b MSS
  - 1.4.c Latency
  - 1.4.d Windowing
  - 1.4.e Bandwidth-delay product
  - 1.4.f Global synchronization
- 1.5 Describe UDP operations
  - 1.5.a Starvation
  - 1.5.b Latency
- 1.6 Recognize proposed changes to the network
  - 1.6.a Changes to routing protocol parameters
  - 1.6.b Migrate parts of the network to IPv6
  - 1.6.c Routing protocol migration

## **2.0 Layer 2 Technologies**

- 2.1 Configure and verify PPP
  - 2.1.a Authentication (PAP, CHAP)
  - 2.1.b PPPoE (client side only)
- 2.2 Explain Frame Relay
  - 2.2.a Point-to-point
  - 2.2.c Multipoint

## **3.0 Layer 3 Technologies**

- 3.1 Identify, configure, and verify IPv4 addressing and subnetting
  - 3.1.a Address types (Unicast, broadcast, multicast, and VLSM)
  - 3.1.b ARP
  - 3.1.c DHCP relay and server

- 3.1.d DHCP protocol operations
- 3.2 Identify IPv6 addressing and subnetting
  - 3.2.a Unicast
  - 3.2.b EUI-64
  - 3.2.c ND, RS/RA
  - 3.2.d Autoconfig (SLAAC)
  - 3.2.e DHCP relay and server
  - 3.2.f DHCP protocol operations
- 3.3 Evaluate routing protocol types
  - 3.3.a Distance vector
  - 3.3.b Link state
  - 3.3.c Path vector
- 3.4 Configure and verify VRF lite
- 3.5 Configure and verify redistribution between any routing protocols or routing sources
- 3.6 Configure and verify policy-based routing
- 3.7 Identify suboptimal routing
- 3.8 Explain ROUTE maps
- 3.9 Configure and verify loop prevention mechanisms
  - 3.9.a Route tagging and filtering
  - 3.9.b Split-horizon
  - 3.9.c Route poisoning
- 3.10 Describe RIPng
- 3.11 Describe EIGRP packet types
- 3.12 Configure and verify EIGRP neighbor relationship and authentication
- 3.13 Configure and verify EIGRP for IPv6
- 3.14 Describe OSPF packet types
- 3.15 Configure and verify OSPF neighbor relationship and authentication
- 3.16 Configure and verify network types, area types, and router types
- 3.17 Configure and verify OSPF for IPv6
- 3.18 Describe, configure, and verify BGP peer relationships and authentication
- 3.19 Configure and verify eBGP (IPv4 and IPv6 address families)
- 3.20 Explain BGP attributes and best-path selection

## **4.0 VPN Technologies**

- 4.1 Configure and verify GRE
- 4.2 Describe DMVPN (single hub)
- 4.3 Describe Easy Virtual Networking (EVN)

## **5.0 Infrastructure Security**

- 5.1 Describe IOS AAA using local database
- 5.2 Describe device security using IOS AAA with TACACS+ and RADIUS
- 5.3 Configure and verify device access control
- 5.4 Configure and verify router security features

## **6.0 Infrastructure Services**

- 6.1 Configure and verify device management
  - 6.1.a Console and VTY
  - 6.1.b Telnet, HTTP, HTTPS, SSH, SCP
  - 6.1.c (T)FTP
- 6.2 Configure and verify SNMP
  - 6.2.a v2
  - 6.2.b v3
- 6.3 Configure and verify logging
  - 6.3.a Local logging, syslog, debugs, conditional debugs
- 6.4 Configure and verify Network Time Protocol (NTP)
  - 6.4.a NTP master, client, version 3, version 4
  - 6.4.b NTP authentication
- 6.5 Configure and verify IPv4 and IPv6 DHCP
  - 6.5.a DHCP client, IOS DHCP server, DHCP relay
  - 6.5.b DHCP options (describe)
- 6.6 Describe IPv6 NAT
- 6.7 Describe SLA architecture
- 6.8 Configure and verify IP SLA
  - 6.8.a ICMP
- 6.9 Configure and verify tracking objects
  - 6.9.a Tracking objects
  - 6.9.b Tracking different entities (for example, interfaces, IPSLA results)
- 6.10 Configure and verify Cisco NetFlow
  - 6.10.a NetFlow v5, v9
  - 6.10.b Local retrieval
  - 6.10.c Export (configuration only)

### **CCNP Paper 3 TROUBLESHOOT 300-135**

- 1 Troubleshoot Layer 2 protocols
- 2 Troubleshoot VLANs
- 3 Troubleshoot trunking
- 4 Troubleshoot EtherChannels
- 5 Troubleshoot spanning tree
- 6 Troubleshoot chassis virtualization and aggregation technologies
- 7 Troubleshoot IPv4 addressing and subnetting
- 8 Troubleshoot IPv6 addressing and subnetting
- 9 Troubleshoot filtering with any protocol
- 10 Troubleshoot between any routing protocols or routing sources

- 11 Troubleshoot manual and autosummarization with any routing protocol
- 12 Troubleshoot policy-based routing
- 13 Troubleshoot suboptimal routing
- 14 Troubleshoot loop prevention mechanisms
- 15 Troubleshoot RIPv2
- 16 Troubleshoot EIGRP neighbor relationship and authentication
- 17 Troubleshoot loop free path selection
- 18 Troubleshoot EIGRP stubs
- 19 Troubleshoot EIGRP load balancing
- 20 Troubleshoot EIGRP metrics
- 21 Troubleshoot EIGRP for IPv6
- 22 Troubleshoot OSPF neighbor relationship and authentication
- 23 Troubleshoot network types, area types, and router types
- 24 Troubleshoot OSPF path preference
- 25 Troubleshoot OSPF operations
- 26 Troubleshoot OSPF for IPv6
- 27 Troubleshoot BGP peer relationships and authentication
- 28 Troubleshoot eBGP
- 30 VPN Technologies
- 31 Troubleshoot GRE
- 32 Troubleshoot IOS AAA using local database
- 33 Troubleshoot device access control
- 34 Troubleshoot router security features
- 35 Troubleshoot device management
- 36 Troubleshoot SNMP
- 37 Troubleshoot logging
- 38 Local logging, syslog, debugs, conditional debugs
- 39 Troubleshoot Network Time Protocol(NTP)
- 40 NTP master, client, version 3, version 4
- 41 Troubleshoot SLA architecture
- 42 Troubleshoot tracking objects
- 43 Tracking objects
- 44 Tracking different entities (for example, interfaces, IPSLA results)

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