Cisco Certified Network Associate (200-301)

Exam Description:

- Cisco Certified Network Associate (CCNA 200-301) exam tests a candidate's knowledge and skills related to:
  (1) Network Fundamentals (2) Network Access (3) IP Connectivity
  (4) IP Services (5) Security Fundamentals (6) Automation and Programmability

- The following topics are general guidelines for the content likely to be included on the exam
- However, other related topics may also appear on any specific delivery of the exam
- To better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice

1.0 Network Fundamentals 20%

- Explain the role and function of network components
  - Routers
  - L2 and L3 Switches
  - Next-Generation Firewalls and IPS
  - Access Points
  - Controllers (Cisco DNA Center and WLC)
  - Endpoints
  - Servers
- Describe characteristics of network topology architectures
  - 2 Tier
  - 3 Tier
  - Spine-Leaf
  - WAN
  - Small Office/Home Office (SOHO)
  - On-premises and Cloud
- Compare physical interface and cabling types
  - Single-mode fiber, multimode fiber, copper
  - Connections (Ethernet shared media and point-to-point)
  - Concepts of PoE
- Identify interface and cable issues (collisions, errors, mismatch duplex, and/or speed)
- Compare TCP to UDP
- Configure and verify IPv4 addressing and subnetting
- Describe the need for private IPv4 addressing
- Configure and verify IPv6 addressing and prefix
- Compare IPv6 address types
  - Global unicast
  - Unique local
  - Link local
  - Anycast
  - Multicast
  - Modified EUI 64
- Verify IP parameters for Client OS (Windows, Mac OS, Linux)
- Describe wireless principles
  - Nonoverlapping Wi-Fi channels
  - SSID
  - RF
  - Encryption
- Explain virtualization fundamentals (virtual machines)
- Describe switching concepts
  - MAC learning and aging
  - Frame switching
  - Frame flooding
  - MAC Address Table

2.0 Network Access 20%

- Configure and verify VLANs (normal range) spanning multiple switches
  - Access ports (data and voice)
  - Default VLAN
  - Connectivity
- Configure and verify interswitch connectivity
  - Trunk ports
  - 802.1Q
  - Native VLAN
- Configure and verify Layer 2 discovery protocols (CDP and LLDP)
- Configure and verify (Layer 2/Layer 3) EtherChannel (LACP)
- Describe the need for and basic operations of Rapid PVST+ STP and identify basic operations
  - Root port, root bridge (primary/secondary), and other port names
  - Port states (forwarding/blocking)
  - PortFast benefits
- Compare Cisco Wireless Architectures and AP modes
- Describe physical infrastructure connections of WLAN components (AP, WLC, access/trunk ports, and LAG)
- Describe AP and WLC management access connections (Telnet, SSH, HTTP, HTTPS, console, and TACACS+/RADIUS)
- Configure the components of a wireless LAN access for client connectivity using GUI only such as WLAN creation, security settings, QoS profiles, and advanced WLAN settings

3.0 IP Connectivity 25%

- Interpret the components of routing table
  - Routing protocol code
  - Prefix
  - Network mask
  - Next hop
  - Administrative distance
  - Metric
  - Gateway of last resort

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- Determine how a router makes a forwarding decision by default
  - Longest match
  - Administrative distance
  - Routing protocol metric
- Configure and verify IPv4 and IPv6 static routing
  - Default route
  - Network route
  - Host route
  - Floating static
- Configure and verify single area OSPFv2
  - Neighbor adjacencies
  - Point-to-point
  - Broadcast (DR/BDR selection)
  - Router ID
- Describe the purpose of first hop redundancy protocol

4.0 IP Services 10%

- Configure and verify inside source NAT using static and pools
- Configure and verify NTP operating in a client and server mode
- Explain the role of DHCP and DNS within the network
- Explain the function of SNMP in network operations
- Describe the use of syslog features including facilities and levels
- Configure and verify DHCP client and relay
- Explain the forwarding Per-Hop Behavior (PHB) for QoS such as classification, marking, queuing, congestion, policing, shaping
- Configure network devices for remote access using SSH
- Describe the capabilities and function of TFTP/FTP in the network

5.0 Security Fundamentals 15%

- Define key security concepts (threats, vulnerabilities, exploits, and mitigation techniques)
- Describe security program elements (user awareness, training, and physical access control)
- Configure device access control using local passwords
- Describe security password policies elements, such as management, complexity, and password alternatives (multifactor authentication, certificates, and biometrics)
- Describe remote access and site-to-site VPNs
- Configure and verify Access Control Lists
- Configure Layer 2 security features (DHCP snooping, dynamic ARP inspection, and port security)
- Differentiate authentication, authorization, and accounting concepts
- Describe wireless security protocols (WPA, WPA2, and WPA3)
- Configure WLAN using WPA2 PSK using the GUI

6.0 Automation and Programmability 10%

- Explain how automation impacts network management
- Compare traditional networks with controller-based networking
- Describe controller-based and software defined architectures (overlay, underlay, and fabric)
  - Separation of control plane and data plane
  - North-bound and south-bound APIs
- Compare traditional campus device management with Cisco DNA Center enabled device management
- Describe characteristics of REST-based APIs (CRUD, HTTP verbs, and data encoding)
- Recognize the capabilities of configuration management mechanisms Puppet, Chef, and Ansible
- Interpret JSON encoded data

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