# CCNA Exam v1.0 (200-301)

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## Study Materials

- Udemy CCNA
- NetworkLessons
- Drive for Books

## Exam Topics

## I) 20% Network Fundamentals

1. [·] 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
2. [·] Describe characteristics of network topology architectures
    - 2 tier
    - 3 tier
    - Spine-leaf

- WAN
- Small office/home office (SOHO)
- On-premises and cloud

3. [·] Compare physical interface and cabling types
    - Single-mode fiber, multimode fiber, copper
    - Connections (Ethernet shared media and point-to-point)
    - Concepts of PoE
4. [·] Identify interface and cable issues (collisions, errors, mismatch duplex, and/or speed)
5. [·] Compare TCP to UDP
6. [·] Configure and verify IPv4 addressing and subnetting
7. [·] Describe the need for private IPv4 addressing
8. [·] Configure and verify IPv6 addressing and prefix
9. [·] Compare IPv6 address types
    - Global unicast
    - Unique local
    - Link local
    - Anycast
    - Multicast
    - Modified EUI 64
10. [·] Verify IP parameters for Client OS (Windows, Mac OS, Linux)
11. [·] Describe wireless principles
    - Nonoverlapping Wi-Fi channels
    - SSID
    - RF
    - Encryption
12. [·] Explain virtualization fundamentals (virtual machines)
13. [·] Describe switching concepts
    - MAC learning and aging
    - Frame switching
    - Frame flooding
    - MAC address table

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## II) 20% Network Access

1. [·] Configure and verify VLANs (normal range) spanning multiple switches

   - Access ports (data and voice)
   - Default VLAN
   - Connectivity

2. [·] Configure and verify interswitch connectivity

   - Trunk ports
   - 802.1Q
   - Native VLAN

3. [·] Configure and verify Layer 2 discovery protocols (Cisco Discovery Protocol and LLDP)

4. [·] Configure and verify (Layer 2/Layer 3) EtherChannel (LACP)

5. [·] Describe the need for and basic operations of Rapid PVST+ Spanning Tree Protocol and identify basic operations

   - Root port, root bridge (primary/secondary), and other port names
   - Port states (forwarding/blocking)
   - PortFast benefits

6. [·] Compare Cisco Wireless Architectures and AP modes

7. [·] Describe physical infrastructure connections of WLAN components (AP, WLC, access/trunk ports, and LAG)

8. [·] Describe AP and WLC management access connections (Telnet, SSH, HTTP, HTTPS, console, and TACACS+/RADIUS)

9. [·] 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

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## III) 25% IP Connectivity

1. [·] Interpret the components of routing table
   - Routing protocol code
   - Prefix
   - Network mask
   - Next hop
   - Administrative distance
   - Metric
   - Gateway of last resort
2. [·] Determine how a router makes a forwarding decision by default
   - Longest match
   - Administrative distance
   - Routing protocol metric
3. [·] Configure and verify IPv4 and IPv6 static routing

    - Default route
    - Network route
    - Host route
    - Floating static
4. [·] Configure and verify single area OSPFv2
    - Neighbor adjacencies
    - Point-to-point
    - Broadcast (DR/BDR selection)
    - Router ID
5. [·] Describe the purpose of first hop redundancy protocol

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## IV) 10% IP Services

1. [·] Configure and verify NTP operating in a client and server mode
2. [·] Explain the role of DHCP and DNS within the network
3. [·] Explain the function of SNMP in network operations
4. [·] Describe the use of syslog features including facilities and levels
5. [·] Configure and verify DHCP client and relay
6. [·] Explain the forwarding per-hop behavior (PHB) for QoS such as classification, marking,
7. [·] queuing, congestion, policing, shaping
8. [·] Configure network devices for remote access using SSH
9. [·] Describe the capabilities and function of TFTP/FTP in the network

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## V) 15% Security Fundamentals

1. [·] Define key security concepts (threats, vulnerabilities, exploits, and mitigation techniques)
2. [·] Describe security program elements (user awareness, training, and physical access control)
3. [·] Configure device access control using local passwords
4. [·] Describe security password policies elements, such as management, complexity, and password alternatives (multifactor authentication, certificates, and biometrics)
5. [·] Describe remote access and site-to-site VPNs
6. [·] Configure and verify access control lists
7. [·] Configure Layer 2 security features (DHCP snooping, dynamic ARP inspection, and port security)
8. [·] Differentiate authentication, authorization, and accounting concepts
9. [·] Describe wireless security protocols (WPA, WPA2, and WPA3)
10. [·] Configure WLAN using WPA2 PSK using the GUI

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## VI) 10% Automation and Programmability

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

## Notes

la capa OSI, capa TCP/IP protocolos de switching las VLANs, el Spanning-Tree Protocol, el VLAN Trunking Protocol y protocolos importantes de capa 2,

temario de routing: protocolos de enrutamiento estático, protocolos de enrutamiento dinámico: OSPF, RIP, EIGRP protocolos de redundancia de routers a nivel L3: HSRP, VRRP, GLBP

Soy un waffle. Y yo un Ruffle.