



# 200-301 CCNA Exam Topics

## Customize Your Study Plan

To earn your CCNA certification, you must pass the **200-301 CCNA** exam. This 120-minute exam tests your knowledge of network fundamentals, network access, IP connectivity, IP services, security fundamentals, and automation and programmability.

The following topics are likely to be included on the **200-301 CCNA** exam. The topics are subject to change at any time to reflect the latest technologies aligned to Cisco's products.



**Cisco Cert Prep Tip:** Print out this document and use it as you assess your strengths and challenges in preparing your study plan.

### Exam Topics:

#### Section: 1.0 Network Fundamentals

| 1.1 Explain the role and function of network components | Need to Study? | Complete by: | Resource: | Completed                |
|---|----------------|--------------|-----------|--------------------------|
| 1.1.a Routers   | Y / N          |              |           | <input type="checkbox"/> |
| 1.1.b L2 and L3 switches                                | Y / N          |              |           | <input type="checkbox"/> |
| 1.1.c Next-generation firewalls and IPS                 | Y / N          |              |           | <input type="checkbox"/> |
| 1.1.d Access points                                     | Y / N          |              |           | <input type="checkbox"/> |
| 1.1.e Controllers (Cisco DNA Center and WLC)            | Y / N          |              |           | <input type="checkbox"/> |
| 1.1.f Endpoints   | Y / N          |              |           | <input type="checkbox"/> |
| 1.1.g Servers   | Y / N          |              |           | <input type="checkbox"/> |
| 1.1.h PoE   | Y / N          |              |           | <input type="checkbox"/> |

|  |                       |                     |                  |                          |
|--|-----------------------|---------------------|------------------|--------------------------|
| <b>1.2 Describe characteristics of network topology architectures</b>                              | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 1.2.a Two-tier   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.2.b Three-tier   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.2.c Spine-leaf   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.2.d WAN  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.2.e Small office/home office (SOHO)  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.2.f On-premise and cloud   | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.3 Compare physical interface and cabling types</b>  | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 1.3.a Single-mode fiber, multimode fiber, copper   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.3.b Connections (Ethernet shared media and point-to-point)                                       | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.4 Identify interface and cable issues (collisions, errors, mismatch duplex, and/or speed)</b> | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.5 Compare TCP to UDP</b>  | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.6 Configure and verify IPv4 addressing and subnetting</b>                                     | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.7 Describe the need for private IPv4 addressing</b>   | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.8 Configure and verify IPv6 addressing and prefix</b>   | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.9 Describe IPv6 address types</b>   | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 1.9.a Unicast (global, unique local, and link local)   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.9.b Anycast  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.9.c Multicast  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 1.9.d Modified EUI 64  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>1.10 Verify IP parameters for Client OS (Windows, Mac OS, Linux)</b>                            | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |

|  |                |              |           |                          |
|--|----------------|--------------|-----------|--------------------------|
| 1.11 Describe wireless principles  | Need to Study? | Complete by: | Resource: | Completed                |
| 1.11.a Nonoverlapping Wi-Fi channels   | Y / N          |              |           | <input type="checkbox"/> |
| 1.11.b SSID  | Y / N          |              |           | <input type="checkbox"/> |
| 1.11.c RF  | Y / N          |              |           | <input type="checkbox"/> |
| 1.11.d Encryption  | Y / N          |              |           | <input type="checkbox"/> |
| 1.12 Explain virtualization fundamentals (server virtualization, containers, and VRFs) | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 1.13 Describe switching concepts   | Need to Study? | Complete by: | Resource: | Completed                |
| 1.13.a MAC learning and aging  | Y / N          |              |           | <input type="checkbox"/> |
| 1.13.b Frame switching   | Y / N          |              |           | <input type="checkbox"/> |
| 1.13.c Frame flooding  | Y / N          |              |           | <input type="checkbox"/> |
| 1.13.d MAC address table   | Y / N          |              |           | <input type="checkbox"/> |

## Section: 2.0 Network Access

|  |                |              |           |                          |
|--|----------------|--------------|-----------|--------------------------|
| 2.1 Configure and verify VLANs (normal range) spanning multiple switches                 | Need to Study? | Complete by: | Resource: | Completed                |
| 2.1.a Access ports (data and voice)  | Y / N          |              |           | <input type="checkbox"/> |
| 2.1.b Default VLAN   | Y / N          |              |           | <input type="checkbox"/> |
| 2.1.c Connectivity   | Y / N          |              |           | <input type="checkbox"/> |
| 2.2 Configure and verify interswitch connectivity  | Need to Study? | Complete by: | Resource: | Completed                |
| 2.2.a Trunk ports  | Y / N          |              |           | <input type="checkbox"/> |
| 2.2.b 802.1Q   | Y / N          |              |           | <input type="checkbox"/> |
| 2.2.c Native VLAN  | Y / N          |              |           | <input type="checkbox"/> |
| 2.3 Configure and verify Layer 2 discovery protocols (Cisco Discovery Protocol and LLDP) | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 2.4 Configure and verify (Layer 2/Layer 3) EtherChannel (LACP)                           | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |

|  |                       |                     |                  |                          |
|--|-----------------------|---------------------|------------------|--------------------------|
| <b>2.5 Interpret basic operations of Rapid PVST+ Spanning Tree Protocol</b>  | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 2.5.a Root port, root bridge (primary/secondary), and other port names   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 2.5.b Port states (forwarding/blocking)  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 2.5.c PortFast   | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>2.6 Describe Cisco Wireless Architectures and AP modes</b>  | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>2.7 Describe physical infrastructure connections of WLAN components (AP, WLC, access/trunk ports, and LAG)</b>  | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>2.8 Describe AP and WLC management access connections (Telnet, SSH, HTTP, HTTPS, console, and TACACS+/RADIUS)</b>   | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>2.9 Interpret the wireless LAN GUI configuration for client connectivity, such as WLAN creation, security settings, QoS profiles, and advanced settings</b> | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |

## Section: 3.0 IP Connectivity

|  |                       |                     |                  |                          |
|--|-----------------------|---------------------|------------------|--------------------------|
| <b>3.1 Interpret the components of routing table</b>                     | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 3.1.a Routing protocol code  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.1.b Prefix   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.1.c Network mask   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.1.d Next hop   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.1.e Administrative distance  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.1.f Metric   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.1.g Gateway of last resort   | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>3.2 Determine how a router makes a forwarding decision by default</b> | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 3.2.a Longest prefix match   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.2.b Administrative distance  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.2.c Routing protocol metric  | Y / N                 |                     |                  | <input type="checkbox"/> |

|  |                       |                     |                  |                          |
|--|-----------------------|---------------------|------------------|--------------------------|
| <b>3.3 Configure and verify IPv4 and IPv6 static routing</b>                               | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 3.3.a Default route  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.3.b Network route  | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.3.c Host route   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.3.d Floating static  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>3.4 Configure and verify single area OSPFv2</b>   | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
| 3.4.a Neighbor adjacencies   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.4.b Point-to-point   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.4.c Broadcast (DR/BDR selection)   | Y / N                 |                     |                  | <input type="checkbox"/> |
| 3.4.d Router ID  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>3.5 Describe the purpose, functions, and concepts of first hop redundancy protocols</b> | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |

## Section: 4.0 IP Services

|  |                       |                     |                  |                          |
|--|-----------------------|---------------------|------------------|--------------------------|
| <b>4.1 Configure and verify inside source NAT using static and pools</b>       | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>4.2 Configure and verify NTP operating in a client and server mode</b>      | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>4.3 Explain the role of DHCP and DNS within the network</b>                 | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>4.4 Explain the function of SNMP in network operations</b>                  | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>4.5 Describe the use of syslog features including facilities and levels</b> | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |
| <b>4.6 Configure and verify DHCP client and relay</b>                          | <b>Need to Study?</b> | <b>Complete by:</b> | <b>Resource:</b> | <b>Completed</b>         |
|  | Y / N                 |                     |                  | <input type="checkbox"/> |

|  |                |              |           |                          |
|--|----------------|--------------|-----------|--------------------------|
| 4.7 Explain the forwarding per-hop behavior (PHB) for QoS, such as classification, marking, queuing, congestion, policing, and shaping | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 4.8 Configure network devices for remote access using SSH  | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 4.9 Describe the capabilities and function of TFTP/FTP in the network  | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |

## Section: 5.0 Security Fundamentals

|  |                |              |           |                          |
|--|----------------|--------------|-----------|--------------------------|
| 5.1 Define key security concepts (threats, vulnerabilities, exploits, and mitigation techniques)   | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.2 Describe security program elements (user awareness, training, and physical access control)   | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.3 Configure and verify device access control using local passwords   | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.4 Describe security password policies elements, such as management, complexity, and password alternatives (multifactor authentication, certificates, and biometrics) | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.5 Describe IPsec remote access and site-to-site VPNs   | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.6 Configure and verify access control lists  | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.7 Configure and verify Layer 2 security features (DHCP snooping, dynamic ARP inspection, and port security)  | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |

|  |                |              |           |                          |
|--|----------------|--------------|-----------|--------------------------|
| 5.8 Compare authentication, authorization, and accounting concepts | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.9 Describe wireless security protocols (WPA, WPA2, and WPA3)     | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 5.10 Configure and verify WLAN within the GUI using WPA2 PSK       | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |

## Section: 6.0 Automation and Programmability

|  |                |              |           |                          |
|--|----------------|--------------|-----------|--------------------------|
| 6.1 Explain how automation impacts network management  | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 6.2 Compare traditional networks with controller-based networking                                | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 6.3 Describe controller-based, software defined architecture (overlay, underlay, and fabric)     | Need to Study? | Complete by: | Resource: | Completed                |
| 6.3.a Separation of control plane and data plane   | Y / N          |              |           | <input type="checkbox"/> |
| 6.3.b Northbound and Southbound APIs   | Y / N          |              |           | <input type="checkbox"/> |
| 6.4 Compare traditional campus device management with Cisco DNA Center enabled device management | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 6.5 Describe characteristics of REST-based APIs (CRUD, HTTP verbs, and data encoding)            | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 6.6 Recognize the capabilities of configuration management mechanisms Puppet, Chef, and Ansible  | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |
| 6.7 Recognize components of JSON-encoded data  | Need to Study? | Complete by: | Resource: | Completed                |
|  | Y / N          |              |           | <input type="checkbox"/> |

## CCNA Study Resources

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