



31 Days Before Your CCNA Exam (200-301)

**A Day-By-Day Review Guide for the
CCNA 200-301 Certification Exam**

CCNA Countdown Calendar

The lines after the countdown number allow you to add the actual calendar days for reference.

31

Networking
Models, Devices,
and Components

30

Ethernet
Switching

29

Switch
Configuration
Basics

28

IPv4
Addressing

24

EtherChannel
and HSRP

23

DHCP and
DNS

22

Wireless
Concepts

21

WLAN
Configuration

17

The Routing
Table

16

Inter-VLAN
Routing

15

Static and
Default Route
Configuration

14

OSPF
Operation

10

ACL Concepts

9

ACL
Implementation

8

NAT

7

WAN, VPN, and
IPsec

3

Cloud,
Virtualization,
and SDN

2

SDA and Cisco
DNA Center

1

Network
Automation

EXAM

Time

Location

31 Days Before your CCNA Exam: A Day-By-Day Review Guide for the CCNA 200-301 Certification Exam

Table of Contents

Cover

Title Page

Copyright Page

About the Author

Dedications

Contents

31 Days Before Your CCNA Exam Introduction

Day 31: Networking Models, Devices, and
Components

CCNA 200-301 Exam Topics

Key Points

The OSI and TCP/IP Models

OSI Layers

TCP/IP Layers and Protocols

Protocol Data Units and Encapsulation

The TCP/IP Application Layer

The TCP/IP Transport Layer

TCP Header

Port Numbers

Error Recovery

Table of Contents

Flow Control

Connection Establishment and Termination

UDP

The TCP/IP Internet Layer

The TCP/IP Network Access Layer

Data Encapsulation Summary

Networking Icons

Devices

Switches

Access Layer Switches

Distribution Layer Switches

Core Layer Switches

Routers

Specialty Devices

Firewalls

IDS and IPS

Next-Generation Firewalls

Access Points and Wireless LAN Controllers

Physical Layer

Network Media Forms and Standards

LAN Device Connection Guidelines

LANs and WANs

Small Office/Home Office (SOHO)

SOHO Routers

Physical and Logical Topologies

Hierarchical Campus Designs

Study Resources

Day 30: Ethernet Switching

Table of Contents

CCNA 200-301 Exam Topics

Key Topics

Evolution to Switching

Switching Logic

Collision and Broadcast Domains

Frame Forwarding

- Switch Forwarding Methods

- Symmetric and Asymmetric Switching

- Memory Buffering

- Layer 2 and Layer 3 Switching

Ethernet Overview

Legacy Ethernet Technologies

- CSMA/CD

- Legacy Ethernet Summary

Current Ethernet Technologies

UTP Cabling

Benefits of Using Switches

Ethernet Addressing

Ethernet Framing

The Role of the Physical Layer

Study Resources

Day 29: Switch Configuration Basics

CCNA 200-301 Exam Topics

Key Topics

Accessing and Navigating the Cisco IOS

- Connecting to Cisco Devices

- CLI EXEC Sessions

Table of Contents

Using the Help Facility

CLI Navigation and Editing Shortcuts

Command History

IOS Examination Commands

Subconfiguration Modes

Basic Switch Configuration Commands

Half Duplex, Full Duplex, and Port Speed

Automatic Medium-Dependent Interface Crossover (auto-MDIX)

Verifying Network Connectivity

Troubleshoot Interface and Cable Issues

Media Issues

Interface Status and Switch Configuration

Interface Status Codes

Duplex and Speed Mismatches

Common Layer 1 Problems On Up Interfaces

Study Resources

Day 28: IPv4 Addressing

CCNA 200-301 Exam Topics

Key Topics

IPv4 Addressing

Header Format

Classes of Addresses

Purpose of the Subnet Mask

Private and Public IP Addressing

Subnetting in Four Steps

Determine How Many Bits to Borrow

Determine the New Subnet Mask

Determine the Subnet Multiplier

Table of Contents

List the Subnets, Host Ranges, and Broadcast Addresses

Subnetting Example 1

Subnetting Example 2

Subnetting Example 3

VLSM

Study Resources

Day 27: IPv6 Addressing

CCNA 200-301 Exam Topics

Key Topics

Overview and Benefits of IPv6

The IPv6 Protocol

IPv6 Address Types

Unicast

Global Unicast Address

Link-Local Address

Loopback Address

Unspecified Address

Unique Local Address

IPv4 Embedded Address

Multicast

Assigned Multicast

Solicited-Node Multicast

Anycast

Representing the IPv6 Address

Conventions for Writing IPv6 Addresses

Conventions for Writing IPv6 Prefixes

IPv6 Subnetting

Subnetting the Subnet ID

Subnetting into the Interface ID

Table of Contents

EUI-64 Concept

Stateless Address Autoconfiguration

Migration to IPv6

Study Resources

Day 26: VLAN and Trunking Concepts and Configurations

CCNA 200-301 Exam Topics

Key Points

VLAN Concepts

- Traffic Types

- Types of VLANs

- Voice VLAN Example

Trunking VLANs

- Dynamic Trunking Protocol

VLAN Configuration and Verification

Trunking Configuration and Verification

VLAN Troubleshooting

- Disabled VLANs

Trunking Troubleshooting

- Check Both Ends of a Trunk

- Check Trunking Operational States

Study Resources

Day 25: STP

CCNA 200-125 Exam Topics

Key Topics

STP Concepts and Operation

STP Algorithm

Table of Contents

STP Convergence

STP Varieties

PVST Operation

Port States

Extended System ID

Rapid PVST+ Operation

RSTP Interface Behavior

RSTP Port Roles

Edge Ports

Configuring and Verifying Varieties of STP

STP Configuration Overview

Configuring and Verifying the BID

Configuring PortFast and BPDU Guard

Configuring Rapid PVST+

Verifying STP

Study Resources

Day 24: EtherChannel and HSRP

CCNA 200-301 Exam Topics

Key Topics

EtherChannel Operation

Benefits of EtherChannel

Implementation Restrictions

EtherChannel Protocols

Port Aggregation Protocol

Link Aggregation Control Protocol

Configuring EtherChannel

Verifying EtherChannel

Table of Contents

Troubleshooting EtherChannel

First-Hop Redundancy Concepts

FHRPs

HSRP Operation

- HSRP Versions

- HSRP Priority and Preemption

HSRP Configuration and Verification

HSRP Load Balancing

Troubleshooting HSRP

Study Resources

Day 23: DHCP and DNS

CCNA 200-301 Exam Topics

Key Topics

DHCPv4

DHCPv4 Configuration Options

- Configuring a Router as a DHCPv4 Server

- Configuring a Router to Relay DHCPv4 Requests

- Configuring a Router as a DHCPv4 Client

DHCPv6

- SLAAC

- Stateless DHCPv6

- Stateful DHCPv6

- Stateless and Stateful DHCPv6 Operation

DHCPv6 Configuration Options

- Configuring a Router as a Stateless DHCPv6 Server

- Configuring a Router as a Stateful DHCPv6 Server

DHCP Troubleshooting

Table of Contents

Resolving IPv4 Address Conflicts

Testing Connectivity Using a Static IP Address

Verifying Switch Port Configuration

Testing DHCPv4 Operation on the Same Subnet or VLAN

DNS Operation

Troubleshooting DNS

Verifying Host IP Configuration

IP Settings

Host IP Settings on Windows

Host IP Settings on macOS

Host IP Settings on Linux

Study Resources

Day 22: Wireless Concepts

CCNA 200-301 Exam Topics

Key Topics

Wireless Standards

RF Spectrum

Channels

802.11 Standards

Wireless Topologies

Infrastructure Mode

IBSS, or Ad Hoc Mode

Mesh

AP Architectures

Autonomous AP Architecture

Cloud-Based AP Architecture

Lightweight AP Architectures

CAPWAP Operation

Table of Contents

Wireless Security Protocols

- Wireless Authentication Methods

- WPA and WPA2

- 802.1X/EAP

- WPA3

- Wireless Encryption Methods

Study Resources

Day 21: WLAN Configuration

- CCNA 200-301 Exam Topics

- Key Topics

- Logging Into a Cisco WLC

- Configuring a WLC with a WLAN

- Configuring a RADIUS Server

- Configuring a New Interface

- Configuring a WPA2 Enterprise WLAN

Study Resources

Day 20: LAN Security and Device Hardening

- CCNA 200-301 Exam Topics

- Key Topics

- Endpoint Security

- Cisco ESA

- Cisco WSA

- Access Control

- Local Authentication

- SSH Configuration

- Switch Port Hardening

- AAA

Table of Contents

802.1X

Port Security

Port Security Configuration

Port Security Aging

Port Restoration After a Violation

LAN Threat Mitigation

Native and Management VLAN Modification

VLAN Attacks

VLAN Attack Mitigation

DHCP Attacks

DHCP Starvation Attacks

DHCP Spoofing Attacks

DHCP Snooping

ARP Attacks

Dynamic ARP Inspection

Study Resources

Day 19: Basic Routing Concepts

CCNA 200-301 Exam Topics

Key Topics

Packet Forwarding

Path Determination and Switching Function Example

Routing Methods

Classifying Dynamic Routing Protocols

IGP and EGP

Distance Vector Routing Protocols

Link-State Routing Protocols

Classful Routing Protocols

Classless Routing Protocols

Table of Contents

Dynamic Routing Metrics

Administrative Distance

IGP Comparison Summary

Routing Loop Prevention

Link-State Routing Protocol Features

Building the LSDB

Calculating the Dijkstra Algorithm

Convergence with Link-State Protocols

Study Resources

Day 18: Basic Router Configuration

CCNA 200-301 Exam Topics

Key Topics

Basic Router Configuration with IPv4

Command Syntax

Configuration Example

Verification Example

Basic Router Configuration with IPv6

Command Syntax

Configuration Example

Verifying IPv4 and IPv6 Network Connectivity

Small Office or Home Office Routers

Basic IP Addressing Troubleshooting

Default Gateway

Duplicate IP Addresses

Study Resources

Day 17: The Routing Table

CCNA 200-301 Exam Topics

Table of Contents

Key Topics

Two Router Functions

- Longest Match Determines Best Path

- Three Packet Forwarding Decisions

Components of the Routing Table

- Routing Table Principles

- Route Entry Structure

Study Resources

Day 16: Inter-VLAN Routing

CCNA 200-301 Exam Topics

Key Points

Inter-VLAN Routing Concepts

- Legacy Inter-VLAN Routing

- Router on a Stick

- Multilayer Switching

Router on a Stick Configuration and Verification

Multilayer Switching Inter-VLAN Routing Configuration and Verification

- Creating Additional SVIs

- Configuring a Layer 3 Routed Port

Study Resources

Day 15: Static and Default Route Configuration

CCNA 200-301 Exam Topics

Key Topics

Static and Default Routing Overview

IPv4 Static Route Configuration

- IPv4 Static Routes Using the Next-Hop Parameter

Table of Contents

IPv4 Static Routes Using the Exit Interface Parameter

IPv4 Default Route Configuration

IPv4 Summary Static Route Configuration

IPv6 Static Routing

IPv6 Static Route Configuration

IPv6 Default Route Configuration

IPv6 Summary Static Route Configuration

Study Resources

Day 14: OSPF Operation

CCNA 200-301 Exam Topics

Key Topics

Single-Area OSPF Operation

OSPF Message Format

OSPF Packet Types

Neighbor Establishment

Link-State Advertisements

OSPF DR and BDR

OSPF Algorithm

Link-State Routing Process

OSPFv2 Versus OSPFv3

Similarities Between OSPFv2 and OSPFv3

Differences Between OSPFv2 and OSPFv3

Multiarea OSPF Operation

Multiarea OSPF Design

Multiarea OSPF Improves Performance

Study Resources

Day 13: Single-Area OSPF Implementation

CCNA 200-301 Exam Topics

Table of Contents

Key Topics

Single-Area OSPFv2 Configuration

- The router ospf Command

- Router ID

- The network Command

- Passive Interfaces

- Modifying the OSPF Metric

Verifying OSPFv2

Study Resources

Day 12: Fine-Tuning and Troubleshooting OSPF

CCNA 200-125 Exam Topics

Key Topics

OSPFv2 Configuration Example

Modifying OSPFv2

- Redistributing a Default Route

- Modifying Hello and Dead Intervals

- OSPF Network Types

- DR/BDR Election

- Controlling the DR/BDR Election

Troubleshooting OSPF

- OSPF States

- OSPF Adjacency

- OSPF Troubleshooting Commands

Study Resources

Day 11: Network Security Concepts

CCNA 200-301 Exam Topics

Key Topics

Table of Contents

Security Fundamentals

- Security Terms
- Attack Vectors and Data Exfiltration
- Penetration Testing Tools
- Attack Types
- Types of Malware

Network Attacks

- Reconnaissance Attacks
- Access Attacks
- Social Engineering Attacks
- DoS and DDoS Attacks
- IP Attacks
- Transport Layer Attacks

Security Program

Study Resources

Day 10: ACL Concepts

CCNA 200-301 Exam Topics

Key Topics

ACL Operation

- Defining an ACL
- Processing Interface ACLs
- List Logic with IP ACLs

Planning to Use ACLs

- Types of ACLs
- ACL Identification
- ACL Design Guidelines

Study Resources

Day 9: ACL Implementation

Table of Contents

CCNA 200-301 Exam Topics

Key Topics

Configuring Standard Numbered IPv4 ACLs

- Standard Numbered IPv4 ACL: Permit Specific Network

- Standard Numbered IPv4 ACL: Deny a Specific Host

- Standard Numbered IPv4 ACL: Deny a Specific Subnet

- Standard Numbered IPv4 ACL: Deny Telnet or SSH Access to the Router

Configuring Extended Numbered IPv4 ACLs

- Extended Numbered IPv4 ACL: Deny FTP from Subnets

- Extended Numbered IPv4 ACL: Deny Only Telnet from Subnet

Configuring Named IPv4 ACLs

- Standard Named IPv4 ACL Steps and Syntax

- Standard Named IPv4 ACL: Deny a Single Host from a Given Subnet

- Extended Named IPv4 ACL Steps and Syntax

- Adding Comments to Named or Numbered IPv4 ACLs

Verifying IPv4 ACLs

Comparing IPv4 and IPv6 ACLs

Configuring IPv6 ACLs

- Step 1: Name the IPv6 ACL

- Step 2: Create the IPv6 ACL

- Step 3: Apply the IPv6 ACL

- Standard IPv6 ACL: Allow SSH Remote Access

- Extended IPv6 ACL: Allow Only Web Traffic

Verifying IPv6 ACLs

Troubleshooting ACLs

Study Resources

Table of Contents

Day 8: NAT

CCNA 200-301 Exam Topics

Key Topics

NAT Concepts

A NAT Example

Dynamic and Static NAT

NAT Overload

NAT Benefits

NAT Limitations

Configuring Static NAT

Configuring Dynamic NAT

Configuring NAT Overload

Verifying NAT

Troubleshooting NAT

Study Resources

Day 7: WAN, VPN, and IPsec

CCNA 200-301 Exam Topics

Key Topics

WAN Topologies

WAN Connection Options

Dedicated Connection Options

Circuit-Switched Connection Options

Packet-Switched Connection Options

Metro Ethernet

MPLS

Internet Connection Options

DSL

Cable Modem

Table of Contents

Wireless

Choosing a WAN Link Option

VPN Technology

VPN Benefits

Types of VPN Access

VPN Components

Establishing Secure VPN Connections

VPN Tunneling

VPN Encryption Algorithms

Hashes

VPN Authentication

IPsec Security Protocols

Study Resources

Day 6: QoS

CCNA 200-301 Exam Topics

Key Topics

QoS

Classification and Marking

DSCP and IPP

EF and AF

Congestion Management

Policing, Shaping, and TCP Discards

QoS and TCP

Study Resources

Day 5: CDP and LLDP

CCNA 200-301 Exam Topics

Key Topics

CDP Overview

Table of Contents

CDP Configuration

CDP Verification

LLDP Overview

LLDP Configuration

LLDP Verification

Study Resources

Day 4: Device Monitoring, Management, and Maintenance

CCNA 200-301 Exam Topics

Key Topics

SNMP Operation

SNMP Components

SNMP Messages

SNMP Versions

The Management Information Base

Configuring SNMP

Verifying SNMP

Syslog

Syslog Operation

Configuring and Verifying Syslog

Network Time Protocol

Cisco IOS File System and Devices

IFS Commands

URL Prefixes for Specifying File Locations

Commands for Managing Configuration Files

Managing Cisco IOS Images

Backing Up a Cisco IOS Image

Restoring a Cisco IOS Image

Table of Contents

Password Recovery

Study Resources

Day 3: Cloud, Virtualization, and SDN

CCNA 200-301 Exam Topics

Key Topics

Cloud Computing

Server Virtualization

Cloud Computing Services

Virtual Network Infrastructure

Software-Defined Networking

Data, Control, and Management Planes

Controllers

SDN Examples: Open SDN and OpenFlow

SDN Examples: The Cisco Application Centric Infrastructure

SDN Examples: Spine and Leaf

SDN Examples: The Cisco APIC Enterprise Module (APIC-EM)

Study Resources

Day 2: SDA and Cisco DNA Center

CCNA 200-301 Exam Topics

Key Topics

SDA Architecture

Fabric

Underlay

Overlay

Cisco DNA Center

Cisco DNA Center and SDA

Cisco DNA Center Network Management Platform

Table of Contents

Study Resources

Day 1: Network Automation

CCNA 200-301 Exam Topics

Key Topics

Data Formats

JSON Data Format

JSON Syntax Rules

RESTful APIs

RESTful Implementation

RESTful API Requests

Configuration Management Tools

Ansible

Puppet

Chef

Study Resources

Exam Day

What You Need for the Exam

What You Should Receive After Completion

Summary

Post-Exam Information

Receiving Your Certificate

Determining Career Options

Examining Certification Options

If You Did Not Pass the Exam

Summary

Index

Table of Contents

Blank Page