

Days: 5

Description: Trust the best-selling Official Cert Guide series from Cisco Press to help you learn, prepare, and practice for exam success. It is built with the objective of providing assessment, review, and practice to help ensure you are fully prepared for your certification exam. This book, combined with the CCNA 200-301 Official Cert Guide Volume 1, cover all of exam topics on the CCNA 200-301 exam.

CCNA 200-301 Official Cert Guide, Volume 2 presents you with an organized test-preparation routine using proven series elements and techniques. “Do I Know This Already?” quizzes open each chapter and enable you to decide how much time you need to spend on each section. Exam topic lists make referencing easy. Chapter-ending Exam Preparation Tasks help you drill on key concepts you must know thoroughly.

- Master Cisco CCNA 200-301 exam topics
- Assess your knowledge with chapter-opening quizzes
- Review key concepts with exam preparation tasks
- Practice with realistic exam questions in the practice test software

CCNA 200-301 Official Cert Guide, Volume 2 from Cisco Press enables you to succeed on the exam the first time and is the only self-study resource approved by Cisco. Best-selling author Wendell Odom shares preparation hints and test-taking tips, helping you identify areas of weakness and improve both your conceptual knowledge and hands-on skills.

OUTLINE:

INTRODUCTION

PART I IP ACCESS CONTROL LISTS

CHAPTER 1 INTRODUCTION TO TCP/IP

TRANSPORT AND APPLICATIONS

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

TCP/IP LAYER 4 PROTOCOLS: TCP AND UDP

- Transmission Control Protocol
 - Multiplexing Using TCP Port Numbers
 - Popular TCP/IP Applications
 - Connection Establishment and Termination
 - Error Recovery and Reliability
 - Flow Control Using Windowing
- User Datagram Protocol

TCP/IP APPLICATIONS

- Uniform Resource Identifiers
- Finding the Web Server Using DNS
- Transferring Files with HTTP
- How the Receiving Host Identifies the Correct Receiving Application

CHAPTER REVIEW

CHAPTER 2 BASIC IPV4 ACCESS CONTROL LISTS

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

IPV4 ACCESS CONTROL LIST BASICS

- ACL Location and Direction
- Matching Packets
- Taking Action When a Match Occurs
- Types of IP ACLs

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STANDARD NUMBERED IPV4 ACLS

- List Logic with IP ACLs
- Matching Logic and Command Syntax
 - Matching the Exact IP Address
 - Matching a Subset of the Address with Wildcards
 - Binary Wildcard Masks
 - Finding the Right Wildcard Mask to Match a Subnet
 - Matching Any/All Addresses
- Implementing Standard IP ACLs
 - Standard Numbered ACL Example 1
 - Standard Numbered ACL Example 2
- Troubleshooting and Verification Tips

PRACTICE APPLYING STANDARD IP ACLS

- Practice Building access-list Commands
- Reverse Engineering from ACL to Address Range

CHAPTER REVIEW

CHAPTER 3 ADVANCED IPV4 ACCESS

CONTROL LISTS

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

EXTENDED NUMBERED IP ACCESS CONTROL

LISTS

- Matching the Protocol, Source IP, and Destination IP
- Matching TCP and UDP Port Numbers
- Extended IP ACL Configuration
 - Extended IP Access Lists: Example 1
 - Extended IP Access Lists: Example 2
- Practice Building access-list Commands

NAMED ACLS AND ACL EDITING

- Named IP Access Lists
- Editing ACLs Using Sequence Numbers
- Numbered ACL Configuration Versus Named ACL Configuration
- ACL Implementation Considerations
- Additional Reading on ACLs

CHAPTER REVIEW

PART I REVIEW

PART II SECURITY SERVICES

CHAPTER 4 SECURITY ARCHITECTURES

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

SECURITY TERMINOLOGY

COMMON SECURITY THREATS

- Attacks That Spoof Addresses
 - Denial-of-Service Attacks
 - Reflection and Amplification Attacks
 - Man-in-the-Middle Attacks
 - Address Spoofing Attack Summary

RECONNAISSANCE ATTACKS

BUFFER OVERFLOW ATTACKS

MALWARE

HUMAN VULNERABILITIES

PASSWORD VULNERABILITIES

- Password Alternatives

CONTROLLING AND MONITORING USER

ACCESS

DEVELOPING A SECURITY PROGRAM TO

EDUCATE USERS

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CHAPTER 5 SECURING NETWORK DEVICES

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

SECURING IOS PASSWORDS

- Encrypting Older IOS Passwords with service password-encryption
- Encoding the Enable Passwords with Hashes
 - Interactions Between Enable Password and Enable Secret
 - Making the Enable Secret Truly Secret with a Hash
 - Improved Hashes for Cisco’s Enable Secret
- Encoding the Passwords for Local Usernames
- Controlling Password Attacks with ACLs

FIREWALLS AND INTRUSION PREVENTION

SYSTEMS

- Traditional Firewalls
 - Security Zones
- Intrusion Prevention Systems (IPS)
- Cisco Next-Generation Firewalls
- Cisco Next-Generation IPS

CHAPTER REVIEW

CHAPTER 6 IMPLEMENTING SWITCH PORT SECURITY

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

PORT SECURITY CONCEPTS AND

CONFIGURATION

- Configuring Port Security
- Verifying Port Security
- Port Security MAC Addresses

PORT SECURITY VIOLATION MODES

- Port Security Shutdown Model
- Port Security Protect and Restrict Modes

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CHAPTER 7 IMPLEMENTING DHCP

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

DYNAMIC HOST CONFIGURATION

PROTOCOL

- DHCP Concepts
 - Supporting DHCP for Remote Subnets with DHCP Relay
 - Information Stored at the DHCP Server
- Configuring DHCP Features on Routers and Switches
 - Configuring DHCP Relay
 - Configuring a Switch as DHCP Client
 - Configuring a Router as DHCP Client

IDENTIFYING HOST IPV4 SETTINGS

- Host Settings for IPv4
- Host IP Settings on Windows
- Host IP Settings on macOS
- Host IP Settings on Linux

CHAPTER REVIEW

CHAPTER 8 DHCP SNOOPING AND ARP INSPECTION

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

DHCP SNOOPING

- DHCP Snooping Concepts
 - A Sample Attack: A Spurious DHCP Server
 - DHCP Snooping Logic
 - Filtering DISCOVER Messages Based on MAC Address
 - Filtering Messages that Release IP Addresses
- DHCP Snooping Configuration
 - Configuring DHCP Snooping on a Layer 2 Switch
 - Limiting DHCP Message Rates
 - DHCP Snooping Configuration Summary

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DYNAMIC ARP INSPECTION

- DAI Concepts
 - Review of Normal IP ARP
 - Gratuitous ARP as an Attack Vector
 - Dynamic ARP Inspection Logic
- Dynamic ARP Inspection Configuration
 - Configuring ARP Inspection on a Layer 2 Switch
 - Limiting DAI Message Rates
 - Configuring Optional DAI Message Checks
 - IP ARP Inspection Configuration Summary

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PART III IP SERVICES

CHAPTER 9 DEVICE MANAGEMENT

PROTOCOLS

“DO I KNOW THIS ALREADY?” QUIZ

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SYSTEM MESSAGE LOGGING (SYSLOG)

- Sending Messages in Real Time to Current Users
- Storing Log Messages for Later Review
- Log Message Format
- Log Message Severity Levels
- Configuring and Verifying System Logging
- The debug Command and Log Messages

NETWORK TIME PROTOCOL (NTP)

- Setting the Time and Timezone
- Basic NTP Configuration
- NTP Reference Clock and Stratum
- Redundant NTP Configuration
- NTP Using a Loopback Interface for Better Availability

ANALYZING TOPOLOGY USING CDP AND LLDP

- Examining Information Learned by CDP
- Configuring and Verifying CDP
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- Configuring and Verifying LLDP

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CHAPTER 10 NETWORK ADDRESS

TRANSLATION

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

PERSPECTIVES ON IPV4 ADDRESS

SCALABILITY

- CIDR
- Private Addressing

NETWORK ADDRESS TRANSLATION

CONCEPTS

- Static NAT
- Dynamic NAT
- Overloading NAT with Port Address Translation

NAT CONFIGURATION AND

TROUBLESHOOTING

- Static NAT Configuration
- Dynamic NAT Configuration
- Dynamic NAT Verification
- NAT Overload (PAT) Configuration
- NAT Troubleshooting

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CHAPTER 11 QUALITY OF SERVICE (QoS)

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

INTRODUCTION TO QoS

- QoS: Managing Bandwidth, Delay, Jitter, and Loss
- Types of Traffic
 - Data Applications
- Voice and Video Applications
- QoS as Mentioned in This Book
- QoS on Switches and Routers

CLASSIFICATION AND MARKING

- Classification Basics
- Matching (Classification) Basics
- Classification on Routers with ACLs and NBAR
- Marking IP DSCP and Ethernet CoS
 - Marking the IP Header
 - Marking the Ethernet 802.1Q Header
 - Other Marking Fields
- Defining Trust Boundaries
- DiffServ Suggested Marking Values
 - Expedited Forwarding (EF)
 - Assured Forwarding (AF)
 - Class Selector (CS)
 - Guidelines for DSCP Marking Values

QUEUING

- Round-Robin Scheduling (Prioritization)
- Low Latency Queuing
- A Prioritization Strategy for Data, Voice, and Video

SHAPING AND POLICING

- Policing
 - Where to Use Policing
- Shaping
 - Setting a Good Shaping Time Interval for Voice and Video

CONGESTION AVOIDANCE

- TCP Windowing Basics
- Congestion Avoidance Tools

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CHAPTER 12 MISCELLANEOUS IP SERVICES

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

FIRST HOP REDUNDANCY PROTOCOL

- The Need for Redundancy in Networks
- The Need for a First Hop Redundancy Protocol
- The Three Solutions for First-Hop Redundancy
- HSRP Concepts
 - HSRP Failover
 - HSRP Load Balancing

SIMPLE NETWORK MANAGEMENT PROTOCOL

- SNMP Variable Reading and Writing: SNMP Get and Set
- SNMP Notifications: Traps and Informs
- The Management Information Base
- Securing SNMP

FTP AND TFTP

- Managing Cisco IOS Images with FTP/TFTP
 - The IOS File System
 - Upgrading IOS Images
 - Copying a New IOS Image to a Local IOS File System Using TFTP
 - Verifying IOS Code Integrity with MD5
 - Copying Images with FTP
- The FTP and TFTP Protocols
 - FTP Protocol Basics
 - FTP Active and Passive Modes
 - FTP over TLS (FTP Secure)
- TFTP Protocol Basics

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PART IV NETWORK ARCHITECTURE

CHAPTER 13 LAN ARCHITECTURE

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

ANALYZING CAMPUS LAN TOPOLOGIES

- Two-Tier Campus Design (Collapsed Core)
 - The Two-Tier Campus Design
 - Topology Terminology Seen Within a Two-Tier Design
- Three-Tier Campus Design (Core)
- Topology Design Terminology

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POWER OVER ETHERNET (POE)

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- PoE Operation
- PoE and LAN Design

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CHAPTER 14 WAN ARCHITECTURE

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

METRO ETHERNET

- Metro Ethernet Physical Design and Topology
- Ethernet WAN Services and Topologies
 - Ethernet Line Service (Point-to-Point)
 - Ethernet LAN Service (Full Mesh)
 - Ethernet Tree Service (Hub and Spoke)
- Layer 3 Design Using Metro Ethernet
 - Layer 3 Design with E-Line Service
 - Layer 3 Design with E-LAN Service

MULTIPROTOCOL LABEL SWITCHING (MPLS)

- MPLS VPN Physical Design and Topology
- MPLS and Quality of Service
- Layer 3 with MPLS VPN

INTERNET VPNS

- Internet Access
 - Digital Subscriber Line
 - Cable Internet
 - Wireless WAN (3G, 4G, LTE, 5G)
 - Fiber (Ethernet) Internet Access
- Internet VPN Fundamentals
 - Site-to-Site VPNs with IPsec
 - Remote Access VPNs with TLS
- VPN Comparisons

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CHAPTER 15 CLOUD ARCHITECTURE

“DO I KNOW THIS ALREADY?” QUIZ

FOUNDATION TOPICS

SERVER VIRTUALIZATION

- Cisco Server Hardware
- Server Virtualization Basics
- Networking with Virtual Switches on a Virtualized Host
- The Physical Data Center Network
- Workflow with a Virtualized Data Center

CLOUD COMPUTING SERVICES

- Private Cloud (On-Premise)
- Public Cloud
- Cloud and the “As a Service” Model
 - Infrastructure as a Service
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WAN TRAFFIC PATHS TO REACH CLOUD

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 - Accessing Public Cloud Services Using the Internet
 - Pros and Cons with Connecting to Public Cloud with Internet
 - Private WAN and Internet VPN Access to Public Cloud
 - Pros and Cons of Connecting to Cloud with Private WANs
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 - Summarizing the Pros and Cons of Public Cloud WAN Options
- A Scenario: Branch Offices and the Public Cloud
 - Migrating Traffic Flows When Migrating to Email SaaS
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“DO I KNOW THIS ALREADY?” QUIZ

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SDN AND CONTROLLER-BASED NETWORKS

- The Data, Control, and Management Planes
 - The Data Plane
 - The Control Plane
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 - Cisco Switch Data Plane Internals
- Controllers and Software-Defined Architecture
 - Controllers and Centralized Control
 - The Southbound Interface
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- Software Defined Architecture Summary

EXAMPLES OF NETWORK PROGRAMMABILITY AND SDN

- OpenDaylight and OpenFlow
 - The OpenDaylight Controller
 - The Cisco Open SDN Controller (OSC)
- Cisco Application Centric Infrastructure (ACI)
 - ACI Physical Design: Spine and Leaf
 - ACI Operating Model with Intent-Based Networking
- Cisco APIC Enterprise Module
 - APIC-EM Basics
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COMPARING TRADITIONAL VERSUS

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- How Automation Impacts Network Management
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CHAPTER 17 CISCO SOFTWARE-DEFINED ACCESS (SDA)

“DO I KNOW THIS ALREADY?” QUIZ

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SDA FABRIC, UNDERLAY, AND OVERLAY

- The SDA Underlay
 - Using Existing Gear for the SDA Underlay
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- The SDA Overlay
 - VXLAN Tunnels in the Overlay (Data Plane)
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DNA CENTER AND SDA OPERATION

- Cisco DNA Center
- Cisco DNA Center and Scalable Groups
 - Issues with Traditional IP-Based Security
 - SDA Security Based on User Groups

DNA CENTER AS A NETWORK MANAGEMENT PLATFORM

- DNA Center Similarities to Traditional Management
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CHAPTER 18 UNDERSTANDING REST AND JSON

“DO I KNOW THIS ALREADY?” QUIZ

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REST-BASED APIS

- REST-Based (RESTful) APIs
 - Client/Server Architecture
 - Stateless Operation
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- Background: Data and Variables
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- REST APIs and HTTP
 - Software CRUD Actions and HTTP Verbs
 - Using URIs with HTTP to Specify the Resource
- Example of REST API Call to DNA Center

DATA SERIALIZATION AND JSON

- The Need for a Data Model with APIs
- Data Serialization Languages
 - JSON
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 - Summary of Data Serialization
- Interpreting JSON
 - Interpreting JSON Key:Value Pairs
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CHAPTER 19 UNDERSTANDING ANSIBLE, PUPPET, AND CHEF

“DO I KNOW THIS ALREADY?” QUIZ

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DEVICE CONFIGURATION CHALLENGES AND SOLUTIONS

- Configuration Drift
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- Configuration Monitoring and Enforcement
- Configuration Provisioning
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- Ansible
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CHAPTER 20 FINAL REVIEW

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- Exam Event: Think About Your Time Budget
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 - Using the Practice CCNA Exams
 - Exam Review: Advice on How to Answer Exam Questions
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