

Cisco Certified Network Associate (200-301 CCNA)

Course Overview

This course will prepare students to take the CCNA 200-301 exam. Topics covered include networking fundamentals, basic ethernet LAN implementation, designing ethernet LANs, understanding IPv4, implementing IPv4, IPv4 design and troubleshooting, IPv4 services, configuring IPv4 routing protocols, implementing IPv6, and wireless LANs.

<u>Course Introduction</u>	6m
Course Introduction	
<u>Chapter 01 - Networking Fundamentals</u>	1h 39m
Networking Fundamentals	
Topic A: Introduction to TCP/IP Networking	
Computer Networking	
Networking Models	
History of Networking	
Networking Standards	
TCP/IP Protocol	
Layered Approach	
TCP/IP Layers	
Application Layer	
Client Request and Response	
Transport Layer	
Acknowledgements	
Layer Interaction	
Network Layer	
IP Addressing	
Addressing Basics	
Routing	
Link Layer	
Encapsulation	
De-encapsulation	
Link Layer Process	
Updated TCP/IP Model	
Sending Data via TCP/IP	
Comparing Network Models	
OSI/RM Layers	
Topic B: Ethernet LAN	
Ethernet LAN Fundamentals	
Network Types	
Small Office / Home Office Network	
Small Office / Home Office Network	
Enterprise Networks	
Wiring Standards	

Wiring Standards
Wiring Standards
UTP
Ports and Connectors
How it Works
Straight Through Cables
Straight Through Cables
Crossover Cables
Comparing Cable Types
Comparing Cable Types
Data Link Standards
Frame Components
Physical Addresses
MAC Address Types
Frame Check Sequence
Hubs vs. Switches
Access Methods
Topic C: Wide Area Networks
Wide Area Networks
WAN Components
Leased Line
Leased Line Terms
Customer Premises Equipment
Customer Premises Equipment
Additional Terms
Data Link Basics
Data Link Protocols
HDLC
WAN Packet Forwarding
Point of Presence
MPLS
Other WAN Access Methods
DSL
Cable
Topic D: IPv4 Addressing and Routing Fundamentals
Addressing and Routing
Internet Protocol
Routing Process
ARP
IPv4 Addressing
Routing Requirements
IPv4 Address Rules
Demo - Binary to Decimal Conversion
Rules for Grouping Addresses
Address Space
Classful Addressing
Subnetting
Subnetting a Network
Router Logic
Routing Goals

Routing Tables
DNS
PING
Topic E: TCP/IP Transport and Applications
Understanding the Difference
TCP vs. UDP
Transport Layer Services
Layer 4 PDUs
Multiplexing
Port Numbers
Common Port Numbers
Connection Establishment
Connection Termination
Understanding Connections
TCP Acknowledgements
Flow Control
Web Examples
Web Components
Chapter 1 Review

Chapter 2 - Basic Ethernet LAN Implementation

1h 25m

Basic Ethernet LAN Implementation
Topic A: Command Line Essentials
Command Line Essentials
Switch Types
Naming Conventions
IOS
Connecting to the CLI
Console Ports
Serial Ports
Switch Modes
Console Passwords
Configuring Passwords
Getting Help
Getting Help
Demo - Getting Help
Command History
Showing Configurations
Configuration Mode
Configuration Mode
Demo - Using Context Setting Commands
Switch Memory
Memory Types
Configuration Files
Demo - Examining Configuration Files
Topic B: Ethernet LAN Switching
Switching Logic
Switch Functions
Frame Categories
Switch Learning

Flooding
STP
Catalyst Switches
MAC Address Tables
Dynamic MAC Addresses
Demo - MAC Address Tables
Switch Layouts
Understanding Planes
Topic C: Managing Ethernet Switches
Managing Ethernet Switches
Using Passwords
Securing Privileged Mode
Demo - Configuring Login Security on the Switch
Configuring Usernames and Passwords
Configuration Checklist
External Authentication
Using SSH
Using SSH
Additional Security Considerations
Configuring IP Addresses
VLAN Interfaces
Configuring IPv4
Demo - Configuring IP Settings on the Switch
Verifying Switch Status
Topic D: Configuring Switch Interfaces
Configuring Switch Interfaces
Basic Interface Settings
Demo - Configuring Basic Interface Settings
Interface Status
Port Security
Security Options
Enabling Port Security
Demo - Configuring Port Security
Chapter 2 Review

Chapter 3 - Designing Ethernet LANs

1h 13m

Designing Ethernet LANs
Topic A: Understanding LAN Design Options
Understanding LAN Design Options
Design Factors
Collision Domains
Ethernet with Hubs
Using Bridges
Using Layer 2 Switches
Additional Considerations
Broadcast Domains
Broadcast Domains
Router and Switch Placement
Campus LANs
Two Tier Campus Design

- Topologies
- Connecting Multiple Buildings
- Three Tier Topology
- Physical Standards
- Ethernet Standard Evolution
- Physical Standard Factors
- Wireless Standards
- Wireless Access Points
- Wireless Controllers
- Wireless Controllers
- Topic B: Implementing and Configuring Ethernet VLANs
- Implementing and Configuring Ethernet VLANs
- VLAN Advantages
- VLAN Features
- Multiple VLANs
- VLAN Trunking
- Trunk Ports
- Trunking Protocols
- Native VLANs
- VLAN Communications
- Forwarding Options
- VLAN Configuration
- VLAN Configuration
- Demo - Configuring VLAN Interfaces
- Trunking Configuration
- Configuring Trunking Ports
- Topic C: Understanding Spanning Tree Protocol (STP)
- Introduction to Spanning Tree Protocol
- STP Functions
- Broadcast Storms
- Looping Frames
- Multiple Frame Transmission
- Port States
- STP Algorithm
- STP Bridge ID
- Understanding Spanning Tree Protocol
- STP Elections
- STP Elections (Cont.)
- Root Ports
- Designated Ports
- Handling Changes
- Modifying STP Port Costs
- Reacting to Changes
- STP States and Roles
- Rapid STP
- RSTP vs. STP
- RSTP vs. STP
- Alternate Ports
- Port State Comparison
- RSTP Messages

Backup Ports
Port Types Comparison
Optional Features
EtherChannel
PortFast
BPDU Guard
Topic D: Implementing STP
Design Considerations
Design Models
Initial Configuration
Spanning Tree Implementation
Default Configuration
Bridge ID
Configuring Costs
Spanning Tree Implementation
Additional Features
EtherChannel Configuration
Manual Configuration
Dynamic Configuration
Protocol Options
Migrating to RSTP
Verifying Configuration
Chapter 3 Review

Chapter 4 - Understanding IPv4

2h 3m

Understanding IPv4
Topic A: IPv4 Subnetting
IPv4 Implementation
Subnetworks
Required Subnets
The Subnetting Process
Discovery
Planning
Subnetting Rules
Determining the Number of Subnets
Number of Hosts
Determining Subnet Mask Length
One Size Fits All
Demo - Subnetting 101
Designing Subnets
Classful Networks
IPv4 Limitations
Private Addresses
Classful vs. Classless
Classful Subnetting
Understanding Classes
Subnetwork ID
Checking Requirements
Test Case
Demo - Go Over the Mathematics of the Test Case

Building Subnets
Demo - Finish the Test Scenario on Paper
Finalizing the Design
Topic B: Analyzing Classful IPv4 Networks
Analyzing Classful IPv4 Networks
Understanding Classes
Class Network Details
The Keys to Classful IP
Demo - Determining Network IDs
Identifying other Characteristics
Determining Addresses
Demo - Determining Key Facts About Classful IP Addresses
Keys to Remember
Subnet Masks
Subnet Masks
Dotted Decimal Notation
CIDR or Prefix Masks
Converting between Subnet Mask Forms
Demo - Practice Converting Between Formats
IP Address Division
Topic C: Analyzing Subnet Masks
Analyzing Subnet Masks
Analyzing Subnet Masks
Let's Do the Math
Determining Hosts and Subnets
Demo - Determining Hosts and Subnets
Topic D: Analyzing Existing Subnets
Definition of a Subnet
Analyzing Existing Subnets
Subnet ID Facts
Determining Ranges of Addresses
Demo - Determining Subnet IDs
Chapter 4 Review

Chapter 5 - Implementing IPv4

49m

Implementing IPv4
Topic A: Working with Cisco Routers
Working with Cisco Routers
Physical Installation
Connecting Routers
Integrated Services Routers
Physical Installation
Installing SOHO Internet Access Routers
Configuring Routers
Router/Switch Similarities
Router/Switch Differences
Router Interfaces
Displaying Interfaces
Interface Addresses
Demo - Configuring IP Addresses for Interfaces

Topic B: Configuring IPv4 Addresses and Static Routes

Configuring IPv4 Addresses and Static Routes

Routing Process

Routing Process

Methods for Adding IPv4 Routes

Viewing Routing Tables

Adding Static Routes

Demo - Working with Static Routes

Default Route

Troubleshooting Routing

VLAN Routing

VLAN Routing

Configuring 802.1Q Trunking

Using a Layer 3 Switch

Layer 3 Switch Configuration

Topic C: Using Dynamic Routing Protocols

Using Dynamic Routing Protocols

Types of Protocols

Types of Protocols

Older Protocols

Dynamic Routing Considerations

Distance Vector

Distance Vector Features

RIPv2 vs. RIPv1

RIPv2 Configuration

Displaying Configuration

Additional Configuration Options

Maximum Paths

Topic D: Configuring IPv4 Hosts

DCHP

Lease Generation

Lease Renewal

Configuration Options

Scope Options

Allocation Modes

Configuring DHCP on a Cisco Router

Verifying Configuration

Chapter 5 Review

Chapter 6 - IPv4 Design and Troubleshooting

36m

IPV4 Design and Troubleshooting

Topic A: Designing IP Subnets

Design Considerations

Subnetting Process Review

Demo - Practicing Subnet Examples

Topic B: Using VLSM

Using VLSM

Classless Routers

Demo - Finding Overlaps using VLSM

Creating Variable Length Subnets

Demo - Developing a VLSM Strategy
Topic C: Troubleshooting IPv4
Basic Troubleshooting
Additional Options
Demo - Using PING
Traceroute
Chapter 6 Review

Chapter 7 - IPv4 Services

35m

IPv4 Services
Topic A: Access Control Lists
Access Control Lists
ACL Features
ACL Actions
ACL Types
First Match Logic
Creating ACLs
Creating ACLs
Demo - Create a Standard ACL
Examining Existing ACLs
Extended ACLs
Extended ACLs
Matching Port Numbers
ACL Considerations
Demo - Creating Extended ACLs
Additional Options
Named ACLs
Editing ACLs
Editing ACLs
Implementing ACLs
Topic B: Network Address Translation
Network Address Translation
NAT Functions
NAT Types
Terminology
Dynamic NAT
How Dynamic NAT Works
Network Address Translation Overload
Configuring PAT
NAT Troubleshooting
Common Issues
ACLs vs. NAT
Chapter 7 Review

Chapter 8 - Configuring IPv4 Routing Protocols

48m

Configuring IPv4 Routing Protocols
Topic A: Understanding OSPF
Routing Protocols
Types of Protocols
Autonomous Systems

Routing within Autonomous Systems
Route Redistribution
Administrative Distance
Introduction to OSPF
Link-state Database
LSAs and LSDB
OSPF Fundamentals
Neighbor Establishment
Neighbor Relationships
Hello Process
Hello Process
Two-way State Requirements
Exchange Process
Additional Communication
Designated Routers
Additional Ethernet Terms
Route Determination
Network Size
Understanding Areas
Understanding Areas
Area Terminology
Topic B: Implementing OSPF
Implementing OSPF
Configuration Process
OSPF Configuration Key Points
Single Area Configuration
Matching Logic
Demo - Single Area Configuration in OSPF and Verification
Router ID Configuration
Choosing the RID
Enabling OSPF
Multiarea Configuration
Verifying the Configuration
Displaying Configuration
Determining Designated Routers
Verifying Routing Table Entries
Additional Configuration
Default Routes
Default Routes
Defining Metrics
Defining Metrics
Key Points for Metrics
Load Balancing
OSPFv2
Chapter 8 Review

Chapter 9 - Implementing IPv6

Implementing IPv6
Topic A: IPv6 Fundamentals
Introducing IPv6

1h 11m

- IPv6 Improvements
- Protocol Goals
- Other Updated Protocols
- IPv6 Packet
- IPv6 Routing
- Need to Know
- Address Space
- Hexadecimal Numbering
- Abbreviation of IPv6 Addresses
- Demo - Abbreviation
- Understanding Masks
- IPv6 Prefix
- Demo - Finding Prefixes
- Topic B: IPv6 Addressing and Subnetting
- Types of Addresses
- IPv6 Addressing and Subnetting
- Global Unicast Addresses
- Global Unicast Addresses
- Subnetting
- Number of Subnets
- Address Rules
- Subnetting Process
- Demo - Listing Out Subnets Based on a Global Unicast Address
- Assigning Subnet IDs
- Local Unicast Addresses
- Local Unicast Address Rules
- Topic C: Implementing IPv6
- Implementing IPv6
- Configuring Routers
- IPv6 Commands
- Configuring Interface IDs
- Static vs. Dynamic
- Additional Functions
- Link Local Routing
- Multicast Addresses
- Link Local Multicast
- Common Addresses
- Solicited-Node Multicast
- Solicited-Node Concepts
- Solicited-Node Concepts
- Anycast Addresses
- Miscellaneous Addresses
- Host Configuration
- Neighbor Discovery Protocol
- Router Discovery
- Neighbor Discovery
- Duplicate Address Detection
- Automatic Host Configuration
- DHCPv6
- Stateful DHCP

Stateless Configuration
SLAAC Process
Host Configuration and Troubleshooting
Chapter 9 Review

Chapter 10 - Wireless LANs

1h 14m

Wireless LANs
Topic A: Wireless Network Fundamentals
Wired vs. Wireless
Wireless LAN Topologies
Basic Service Set
Distribution System
Extended Service Set
Other Topologies
Wireless Bands and Channels
Wireless Standards
Topic B: Cisco Wireless Architectures
Autonomous AP Architecture
Cloud-Based AP Architecture
Split-MAC Architectures
WLC Functions
WLC Deployments
Comparing Deployment Models
Cisco AP Modes
Topic C: Securing Wireless Networks
The Need for Security
Authentication
Message Privacy
Message Integrity
Authentication Methods
Authentication Methods
Privacy and Integrity Methods
Wi-Fi Protected Access (WPA)
Topic D: Building a Wireless LAN
Connecting a Cisco AP
Accessing a Cisco WLC
Connecting a Cisco WLC
Using WLC Interfaces
Configuring a WLAN
Configuring a WLAN
Configuring WLAN Security
Configuring WLAN QoS
Demo - Examining a Wireless Configuration
Chapter 10 Review
Course Closure

Total Duration: 11h 39m