Cisco | Networking Academy
Mind Wide Open™

# Scope and Sequence: CCNA Exploration

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## Target Audience

The Cisco® CCNA® Exploration curriculum is designed for Cisco Networking Academy® students who are seeking entry-level information and communication technology (ICT) skills. CCNA Exploration provides an integrated and comprehensive coverage of networking topics, from fundamentals to advanced applications and services, while providing opportunities for hands-on practical experience and soft-skills development.

While primarily designed for postsecondary institutions, the curriculum is appropriate for students at many education levels if they have the required skills, and if the instructional approach complements their learning style and educational goals.

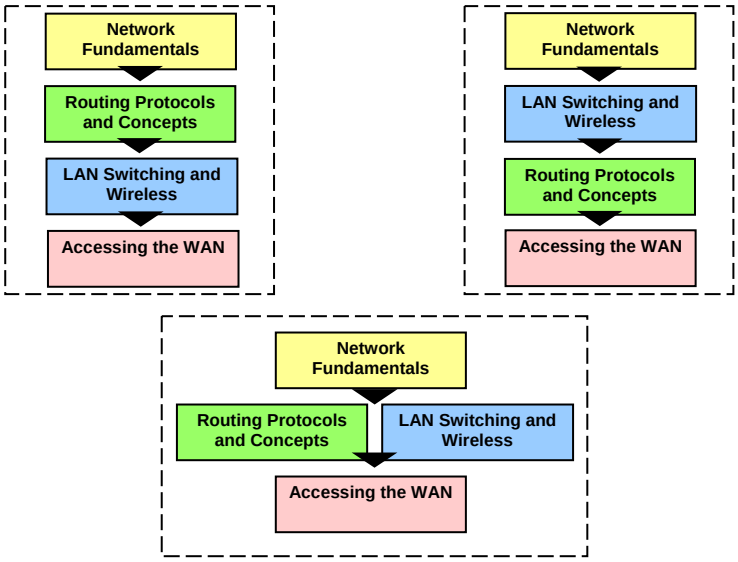
## Prerequisites

CCNA Exploration is designed for students with advanced problem solving and analytical skills, such as students pursuing degrees in engineering, information technology, math, or science. Students are expected to know binary math and understand the concept of algorithms.

CCNA Exploration is composed of four courses: Network Fundamentals, Routing Protocols and Concepts, LAN Switching and Wireless, and Accessing the WAN. Network Fundamentals is the first course and it has no prerequisites. It is a prerequisite for the other three courses.

Routing Protocols and Concepts is the preferred second course in the sequence, but variations are possible as shown in Figure 1. LAN Switching and Wireless can be taught before Routing Protocols and Concepts, or concurrently. Network Fundamentals, Routing Protocols and Concepts, and LAN Switching and Wireless are all prerequisites for Accessing the WAN.

**Figure 1.** CCNA Exploration Course Delivery Options

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## Target Certifications

After completing all four courses of CCNA Exploration, students will be prepared to take the Cisco CCNA certification exam.

## Curriculum Description

CCNA Exploration teaches networking based on technology, covering networking concepts using a top-down, theoretical, and integrated approach – from network applications to the network protocols and services provided to those applications by the lower layers of the network. CCNA Exploration includes the following features:

- Students learn the basics of routing, switching, and advanced technologies to prepare for Cisco CCNA certification and entry-level networking careers
- The curriculum discusses networking concepts in depth and uses language that allows for integration with engineering concepts, providing a deep, theoretical understanding of networking concepts for experienced learners with advanced problem-solving and analytical skills.
- Courses emphasize critical thinking, problem solving, collaboration, and the practical application of skills
- Rich multimedia content, including Flash-based interactive activities, videos, games, and quizzes, addresses a variety of learning styles and help stimulate learning and increase knowledge retention
- Hands-on labs and Packet Tracer simulation-based learning activities help students develop critical thinking and complex problem solving skills
- Innovative assessments provide immediate feedback to support the evaluation of knowledge and acquired skills
- Provides students with the skills needed to succeed in networking-related degree programs

## Curriculum Goals and Objectives

This curriculum provides students with the skills needed to succeed in networking-related degree programs and helps them prepare for CCNA certification. It also helps students develop the skills necessary to fulfill the job responsibilities of network technicians, network administrators, and network engineers. It provides a theoretically-rich, hands-on introduction to networking and the Internet.

Students who complete Network Fundamentals will be able to perform the following tasks:

- Explain the importance of data networks and the Internet in supporting business communications and everyday activities
- Explain how communication works in data networks and the Internet
- Recognize the devices and services that are used to support communications across an Internetwork
- Use network protocol models to explain the layers of communications in data networks
- Explain the role of protocols in data networks
- Describe the importance of addressing and naming schemes at various layers of data networks
- Describe the protocols and services provided by the application layer in the OSI and TCP/IP models and describe how this layer operates in various networks
- Analyze the operations and features of transport layer protocols and services
- Analyze the operations and feature of network layer protocols and services and explain the fundamental concepts of routing
- Design, calculate, and apply subnet masks and addresses to fulfill given requirements

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- Describe the operation of protocols at the OSI data link layer and explain how they support communications
- Explain the role of physical layer protocols and services in supporting communications across data networks
- Explain fundamental Ethernet concepts such as media, services, and operation
- Employ basic cabling and network designs to connect devices in accordance with stated objectives
- Build a simple Ethernet network using routers and switches
- Use Cisco command-line interface (CLI) commands to perform basic router and switch configuration and verification
- Analyze the operations and features of common application layer protocols such as HTTP, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), Simple Mail Transfer Protocol (SMTP), Telnet, and FTP
- Utilize common network utilities to verify small network operations and analyze data traffic

Students who complete Routing Protocols and Concepts will be able to perform the following functions:

- Describe the purpose, nature, and operations of a router
- Explain the critical role routers play in enabling communications across multiple networks
- Describe the purpose and nature of routing tables
- Describe how a router determines a path and switches packets
- Explain the route lookup process and determine the path packets will take in a network
- Configure and verify basic operations for a newly-installed router
- Describe the purpose of static routes and the procedure for configuring them
- Configure and verify static and default routing
- Describe the role of dynamic routing protocols and place these protocols in the context of modern network design
- Describe how metrics are used by routing protocols and identify the metric types used by dynamic routing protocols
- Identify the characteristics of distance vector routing protocols
- Describe the network discovery process of distance vector routing protocols using Routing Information Protocol (RIP)
- Describe the functions, characteristics, and operations of the RIPv1 protocol
- Compare and contrast classful and classless IP addressing
- Describe classful and classless routing behaviors in routed networks
- Design and implement a classless IP addressing scheme for a given network
- Describe the main features and operations of the Enhanced Interior Gateway Routing Protocol (EIGRP)
- Use advanced configuration commands with routers implementing EIGRP and OSPF
- Describe the basic features and concepts of link-state routing protocols
- Describe the purpose, nature, and operations of the Open Shortest Path First (OSPF) Protocol
- Configure and verify basic RIPv1, RIPv2, single area OSPF, and EIGRP operations in a small routed network
- Use router **show** and **debug** commands to troubleshoot common errors that occur in small routed networks

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Students who complete LAN Switching and Wireless will be able to perform the following functions:

- Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach
- Interpret network diagrams
- Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts
- Explain the technology and media access control method for Ethernet networks
- Explain basic switching concepts and the operation of Cisco switches
- Perform and verify initial switch configuration tasks including remote access management
- Describe enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and 802.1q
- Describe how VLANs create logically separate networks and how routing occurs between them
- Configure, verify, and troubleshoot VLANs, trunking on Cisco switches, interVLAN routing, VTP, and RSTP
- Interpret the output of various **show** and **debug** commands to verify the operational status of a Cisco switched network
- Verify network status and switch operation using basic utilities such as ping, traceroute, Telnet, Secure Shell (SSH), Address Resolution Protocol (ARP), and ipconfig, as well as the **show** and **debug** commands.
- Identify, prescribe, and resolve common switched network media issues, configuration issues, autonegotiation, and switch hardware failures
- Manage Cisco IOS® Software
- Manage Cisco IOS configuration files (save, edit, upgrade, and restore)
- Describe standards associated with wireless media, such as IEEE  WI-FI Alliance and ITU/FCC
- Identify and describe the purpose of the components in a small wireless network, such as Service Set Identification (SSID), Basic Service Set (BSS), and Extended Service Set (ESS)
- Identify basic configuration parameters on a wireless network to ensure that devices connect to the correct access points
- Compare and contrast Wi-Fi Protected Access (WPA) security features and capabilities of open, Wired Equivalent Privacy (WEP), and WPA-1/2 networks
- Describe common wireless-network implementation issues such as interference and  misconfiguration

Students who complete Accessing the WAN will be able to perform the following functions:

- Describe the impact of Voice Over IP and Video Over IP applications on a network
- Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach
- Interpret network diagrams
- Describe the components required for network and Internet communications
- Implement basic switch security measures such as port security, trunk access, and management VLANs
- Explain the operation and benefits of DHCP and DNS
- Configure, verify, and troubleshoot DHCP and DNS operations on a router
- Describe current network security threats and explain how to implement a comprehensive security policy to mitigate common threats to network devices, hosts, and applications
- Describe the functions of common security appliances and applications

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- Describe recommended security practices to secure network devices
- Describe the purpose and types of access control lists (ACLs)
- Configure and apply ACLs based on network filtering requirements
- Configure and apply an ACLs to limit Telnet and SSH access to the router using the Security Device Manager command-line interface (SDM/CLI)
- Verify, monitor, and troubleshoot ACLs in a network environment
- Explain the basic operation of Network Address Translation (NAT)
- Configure NAT for given network requirements using SDM/CLI
- Troubleshoot NAT issues
- Describe different methods for connecting to a WAN
- Configure and verify a basic WAN serial connection
- Configure and verify a Point-to-Point Protocol (PPP) connection between Cisco routers
- Configure and verify Frame Relay on Cisco routers
- Troubleshoot WAN implementation issues
- Describe the importance, benefits, role, impact, and components of VPN technology

### Minimum System Requirements

Curriculum requirements:

- 1 Student PC per student; 1 local curriculum server

Lab bundle requirements:

- 3 Cisco 1841 routers with Base IP IOS, 128 MB DRAM, 32 MB Flash
- 3 2960 switches,
- 2 Linksys wireless (Linksys WRT150N is preferred, but other acceptable models include WRT54G, WRT300N, and WRT350N) or SOHO equivalent
- 1 Lab PC with Microsoft Windows 2000 Server
- 3 Lab PCs or laptops (Microsoft Windows 2000 or Windows XP)
- Assorted Ethernet and Serial cables and hubs

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## Curriculum Outline

**Table 1.** CCNA Exploration Curriculum Outline

| Chapter | Network Fundamentals | Routing Protocols and Concepts | LAN Switching and Wireless | Accessing the WAN |
|---|---|---|---|---|
| 1 | Living in a Network-Centric World | Introduction to Routing and Packet Forwarding | LAN Design | Introduction to WANs |
| 2 | Communicating Over the Network | Static Routing | Basic Switch Concepts and Configuration | PPP |
| 3 | Application Layer Functionality and Protocols | Introduction to Dynamic Routing Protocols | VLANs | Frame Relay |
| 4 | OSI Transport Layer | Distance Vector Routing Protocols | VTP | Network Security |
| 5 | OSI Network Layer | RIP Version 1 | STP | ACLs |
| 6 | Addressing the Network - IPv4 | VLSM and CIDR | Inter-VLAN Routing | Teleworker Services |
| 7 | Data Link Layer | RIPv2 | Basic Wireless Concepts and Configuration | IP Addressing Services |
| 8 | OSI Physical Layer | The Routing Table: A Closer Look | | Network Troubleshooting |
| 9 | Ethernet | EIGRP | | |
| 10 | Planning and Cabling Networks | Link-State Routing Protocols | | |
| 11 | Configuring and Testing Your Network | OSPF | | |

## Network Fundamentals

This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. It uses the OSI and TCP layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. Labs use a “model Internet” to allow students to analyze real data without affecting production networks. Packet Tracer (PT) activities help students analyze protocol and network operation and build small networks in a simulated environment. At the end of the course, students build simple LAN topologies by applying basic principles of cabling, performing basic configurations of network devices such as routers and switches, and implementing IP addressing schemes.

**Prerequisites:** None

**Chapter 1. Living in a Network-Centric World**

1.0 Chapter Introduction
1.1 Communicating in a Network-Centric World
1.2 Communication – An Essential Part of Our Lives
1.3 The Network as a Platform
1.4 The Architecture of the Internet
1.5 Trends in Networking
1.6 Chapter Labs
1.7 Chapter Summary
1.8 Chapter Quiz

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**Chapter 2. Communicating Over the Network**

- 2.0 Chapter Introduction
- 2.1 The Platform for Communications
- 2.2 LANs, WANs, and Internetworks
- 2.3 Protocols
- 2.4 Using Layered Models
- 2.5 Network Addressing
- 2.6 Chapter Labs
- 2.7 Chapter Summary
- 2.8 Chapter Quiz

**Chapter 3. Application Layer Functionality and Protocols**

- 3.0 Chapter Introduction
- 3.1 Applications – The Interface Between the Networks
- 3.2 Making Provisions for Applications and Services
- 3.3 Application Layer Protocols and Services Examples
- 3.4 Chapter Labs
- 3.5 Chapter Summary
- 3.6 Chapter Quiz

**Chapter 4. OSI Transport Layer**

- 4.0 Chapter Introduction
- 4.1 Roles of the Transport Layer
- 4.2 The TCP Protocol – Communicating with Reliability
- 4.3 Managing TCP Sessions
- 4.4 The UDP Protocol – Communicating with Low Overhead
- 4.5 Chapter Labs
- 4.6 Chapter Summary
- 4.7 Chapter Quiz

**Chapter 5. OSI Network Layer**

- 5.0 Chapter Introduction
- 5.1 IPv4
- 5.2 Networks – Dividing Devices into Groups
- 5.3 Routing – How Our Data Packets are Handled
- 5.4 Routing Processes: How Routes are Learned
- 5.5 Chapter Labs
- 5.6 Chapter Summary
- 5.7 Chapter Quiz

**Chapter 6. Addressing the Network – IPv4**

- 6.0 Chapter Introduction
- 6.1 IPv4 Addresses
- 6.2 Addresses for Different Purposes
- 6.3 Assigning Addresses
- 6.4 Is It On My Network?
- 6.5 Calculating Addresses
- 6.6 Testing the Network Layer
- 6.7 Chapter Labs

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6.8 Chapter Summaries
6.9 Chapter Quiz

**Chapter 7. Data Link Layer**

7.0 Chapter Introduction
7.1 Data Link Layer – Accessing the Media
7.2 Media Access Control Techniques
7.3 Media Access Control Addressing and Framing Data
7.4 Putting It All Together
7.5 Chapter Labs
7.6 Chapter Summary
7.7 Chapter Quiz

**Chapter 8. OSI Physical Layer**

8.0 Chapter Introduction
8.1 The Physical Layer – Communication Signals
8.2 Physical Signaling and Encoding: Representing
8.3 Physical Media – Connecting Communication
8.4 Chapter Labs
8.5 Chapter Summary
8.6 Chapter Quiz

**Chapter 9. Ethernet**

9.0 Chapter Introduction
9.1 Overview of Ethernet
9.2 Ethernet – Communication through the LAN
9.3 The Ethernet Frame
9.4 Ethernet Media Access Control
9.5 Ethernet Physical Layer
9.6 Hubs and Switches
9.7 Address Resolution Protocol (ARP)
9.8 Chapter Labs
9.9 Chapter Summary
9.10 Chapter Quiz

**Chapter 10. Planning and Cabling Networks**

10.0 Chapter Introduction
10.1 LANs – Making the Physical Connection
10.2 Device Interconnections
10.3 Developing an Addressing Scheme
10.4 Calculating the Subnets
10.5 Device Interconnections
10.6 Chapter Labs
10.7 Chapter Summary
10.8 Chapter Quiz

**Chapter 11. Configuring and Testing Your Network**

11.0 Chapter Introduction
11.1 Configuring Cisco Devices – IOS Basics
11.2 Applying a Basic Configuration Using Cisco IOS

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11.3 Verifying Connectivity
11.4 Monitoring and Documenting Networks
11.5 Chapter Labs
11.6 Chapter Summary
11.7 Chapter Quiz

## Routing Protocols and Concepts

This course describes the architecture, components, and operation of routers, and explains the principles of routing and routing protocols. Students analyze, configure, verify, and troubleshoot the primary routing protocols RIPv1, RIPv2, EIGRP, and OSPF. By the end of this course, students will be able to recognize and correct common routing issues and problems. Students complete a basic procedural lab, followed by basic configuration, implementation, and troubleshooting labs in each chapter. Packet Tracer activities reinforce new concepts, and allow students to model and analyze routing processes that may be difficult to visualize or understand.

**Prerequisites:** Network Fundamentals

**Chapter 1. Introduction to Routing and Packet Forwarding**

1.0 Chapter Introduction
1.1 Inside the Router
1.2 CLI Configuration and Addressing
1.3 Building the Routing Table
1.4 Path Determination and Switching Functions
1.5 Router Configuration Labs
1.6 Chapter Labs
1.7 Chapter Summary
1.8 Chapter Quiz

**Chapter 2. Static Routing**

2.0 Chapter Introduction
2.1 Routers in Networks
2.2 Router Configuration Review
2.3 Exploring Directly-Connected Networks
2.4 Static Routes with “Next Hop” Addresses
2.5 Static Routes with Exit Interfaces
2.6 Summary and Default Static Routes
2.7 Managing and Troubleshooting Static Routes
2.8 Static Route Configuration Labs
2.9 Chapter Labs
2.10 Chapter Summary
2.11 Chapter Quiz

**Chapter 3. Introduction to Dynamic Routing Protocols**

3.0 Chapter Introduction
3.1 Introduction and Advantages
3.2 Classifying Dynamic Routing Protocols
3.3 Metrics
3.4 Administrative Distances
3.5 Routing Protocol and Subnetting Activities

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3.6 Chapter Labs
3.7 Chapter Summary
3.8 Chapter Quiz

**Chapter 4. Distance Vector Routing Protocols**

4.0 Chapter Introduction
4.1 Introduction to Distance Vector Routing Protocols
4.2 Network Discovery
4.3 Routing Table Maintenance
4.4 Routing Loops
4.5 Distance Vector Routing Protocols Today
4.6 Chapter Labs
4.7 Chapter Summary
4.8 Chapter Quiz

**Chapter 5. RIP Version 1**

5.0 Chapter Introduction
5.1 RIPv1: Distance Vector, Classful Routing Protocol
5.2 Basic RIPv1 Configuration
5.3 Verification and Troubleshooting
5.4 Automatic Summarization
5.5 Default Route and RIPv1
5.6 Chapter Labs
5.7 Chapter Summary
5.8 Chapter Quiz

**Chapter 6. VLSM and CIDR**

6.0 Chapter Introduction
6.1 Classful and Classless Addressing
6.2 VLSM
6.3 CIDR
6.4 VLSM and Route Summarization Activity
6.5 Chapter Labs
6.6 Chapter Summary
6.7 Chapter Quiz

**Chapter 7. RIPv2**

7.0 Chapter Introduction
7.1 RIPv1 Limitations
7.2 Configuring RIPv2
7.3 VLSM and CIDR
7.4 Verifying and Troubleshooting RIPv2
7.5 RIPv2 Configuration Labs
7.6 Chapter Labs
7.7 Chapter Summary
7.8 Chapter Quiz

**Chapter 8. The Routing Table: A Closer Look**

8.0 Chapter Introduction
8.1 The Routing Table Structure

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8.2 Routing Table Lookup Process
8.3 Routing Behavior
8.4 Routing Table Labs
8.5 Chapter Labs
8.6 Chapter Summary
8.7 Chapter Quiz

**Chapter 9. EIGRP**

9.0 Chapter Introduction
9.1 Introduction to EIGRP
9.2 Basic EIGRP Configuration
9.3 EIGRP Metric Calculation
9.4 DUAL
9.5 More EIGRP Configuration
9.6 EIGRP Configuration Labs
9.7 Chapter Labs
9.8 Chapter Summary
9.9 Chapter Quiz

**Chapter 10. Link-State Routing Protocols**

10.0 Chapter Introduction
10.1 Link-State Routing Protocols
10.2 Implementing Link-State Routing Protocols
10.3 Chapter Labs
10.4 Chapter Summary
10.5 Chapter Quiz

**Chapter 11. OSPF**

11.0 Chapter Introduction
11.1 Introduction to OSPF
11.2 Basic OSPF Configuration
11.3 The OSPF Metric
11.4 OSPF and Multi-Access Networks
11.5 More OSPF Configuration
11.6 OSPF Configuration Labs
11.7 Chapter Labs
11.8 Chapter Summary
11.9 Chapter Quiz

### LAN Switching and Wireless

This course provides a comprehensive, theoretical, and practical approach to learning the technologies and protocols needed to design and implement a converged switched network. Students learn about the hierarchical network design model and how to select devices for each layer. The course explains how to configure a switch for basic functionality and how to implement Virtual LANs, VTP, and Inter-VLAN routing in a converged network. The different implementations of Spanning Tree Protocol in a converged network are presented, and students develop the knowledge and skills necessary to implement a WLAN in a small-to-medium network.

**Prerequisites:** Network Fundamentals

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**Chapter 1. LAN Design**

1.0 Chapter Introduction
1.1 Switched LAN Architecture
1.2 Matching Switches to Specific LAN Functions
1.3 Chapter Labs
1.4 Chapter Summary
1.5 Chapter Quiz

**Chapter 2. Basic Switch Concepts and Configuration**

2.0 Chapter Introduction
2.1 Introduction to Ethernet/802.3 LANs
2.2 Forwarding Frames Using a Switch
2.3 Switch Management Configuration
2.4 Configuring Switch Security
2.5 Chapter Labs
2.6 Chapter Summary
2.7 Chapter Quiz

**Chapter 3. VLANs**

3.0 Chapter Introduction
3.1 Introducing VLAN
3.2 VLAN Trunking
3.3 Configure VLANs and Trunks
3.4 Troubleshooting VLANs and Trunks
3.5 Chapter Labs
3.6 Chapter Summary
3.7 Chapter Quiz

**Chapter 4. VTP**

4.0 Chapter Introduction
4.1 VTP Concepts
4.2 VTP Operation
4.3 Configure VTP
4.4 Chapter Labs
4.5 Chapter Summary
4.6 Chapter Quiz

**Chapter 5. STP**

5.0 Chapter Introduction
5.1 Redundant Layer 2 Topologies
5.2 Introduction to STP
5.3 STP Convergence
5.4 PVST+, RSTP, and Rapid PVST+
5.5 Chapter Labs
5.6 Chapter Summary
5.7 Chapter Quiz

**Chapter 6. Inter-VLAN Routing**

6.0 Chapter Introduction
6.1 Inter-VLAN Routing

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6.2 Configuring Inter-VLAN Routing
6.3 Troubleshooting Inter-VLAN Routing
6.4 Chapter Labs
6.5 Chapter Summary
6.6 Chapter Quiz

**Chapter 7. Basic Wireless Concepts and Configuration**

7.0 Chapter Introduction
7.1 The Wireless LAN
7.2 Wireless LAN Security
7.3 Configure Wireless LAN Access
7.4 Troubleshooting Simple WLAN Problems
7.5 Chapter Labs
7.6 Chapter Summary
7.7 Chapter Quiz

## Accessing the WAN

This course discusses the WAN technologies and network services required by converged applications in enterprise networks. The course uses the Cisco Network Architecture to introduce integrated network services and explains how to select the appropriate devices and technologies to meet network requirements. Students learn how to implement and configure common data link protocols and how to apply WAN security concepts, principles of traffic, access control, and addressing services. Finally, students learn how to detect, troubleshoot, and correct common enterprise network implementation issues.

**Prerequisites:** Network Fundamentals, Routing Protocols and Concepts, and LAN Switching and Wireless

**Chapter 1. Introduction to WANs**

1.0 Chapter Introduction
1.1 Providing Integrated Services to the Enterprise
1.2 WAN Technology Concepts
1.3 WAN Connection Options
1.4 Chapter Labs
1.5 Chapter Summary
1.6 Chapter Quiz

**Chapter 2. PPP**

2.0 Chapter Introduction
2.1 Serial Point-to-Point Links
2.2 PPP Concepts
2.3 Configuring PPP
2.4 Configuring PPP with Authentication
2.5 Chapter Labs
2.6 Chapter Summary
2.7 Chapter Quiz

**Chapter 3. Frame Relay**

3.0 Chapter Introduction
3.1 Basic Frame Relay Concepts
3.2 Configuring Frame Relay

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3.3 Advanced Frame Relay Concepts
3.4 Configuring Advanced Frame Relay
3.5 Chapter Labs
3.6 Chapter Summary
3.7 Chapter Quiz

**Chapter 4. Network Security**

4.0 Chapter Introduction
4.1 Introduction to Network Security
4.2 Securing Cisco Routers
4.3 Secure Router Network Services
4.4 Using Cisco SDM
4.5 Secure Router Management
4.6 Chapter Labs
4.7 Chapter Summary
4.8 Chapter Quiz

**Chapter 5. ACLs**

5.0 Chapter Introduction
5.1 Using ACLs to Secure Networks
5.2 Configuring Standard ACLs
5.3 Configuring Extended ACLs
5.4 Configuring Complex ACLs
5.5 Chapter Labs
5.6 Chapter Summary
5.7 Chapter Quiz

**Chapter 6. Teleworker Services**

6.0 Chapter Introduction
6.1 Business Requirements for Teleworker Services
6.2 Broadband Services
6.3 VPN Technology
6.4 Chapter Summary
6.5 Chapter Quiz

**Chapter 7. IP Addressing Services**

7.0 Chapter Introduction
7.1 DHCP
7.2 Scaling Networks with NAT
7.3 IPv6
7.4 Chapter Labs
7.5 Chapter Summary
7.6 Chapter Quiz

**Chapter 8. Network Troubleshooting**

8.0 Chapter Introduction
8.1 Establishing the Network Performance Baseline
8.2 Troubleshooting Methodologies and Tools
8.3 Common WAN Implementation Issues
8.4 Network Troubleshooting

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8.5 Chapter Labs
8.6 Chapter Summary
8.7 Chapter Quiz

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