

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

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
- 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
- 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
- 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
- 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**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
- 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
- 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
- 8.5 Chapter Labs
- 8.6 Chapter Summary
- 8.7 Chapter Quiz



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