

Course Catalog 2012-2013

CCNA



Cisco Certified Network Associate (CCNA 640 -802)

The Cisco CCNA network associate certification validates the ability to install, configure, operate, and troubleshoot medium-size routed and switched networks, including implementation and verification of connections to remote sites in a WAN. This new curriculum includes basic mitigation of security threats, introduction to wireless networking concepts and terminology, and performance-based skills. This new curriculum also includes (but is not limited to) the use of these protocols: IP, Enhanced Interior Gateway Routing Protocol (EIGRP), Serial Line Interface Protocol Frame Relay, Routing Information Protocol Version 2 (RIPv2), VLANs, Ethernet, access control lists (ACLs), IPv6 etc.

Course Objectives

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Upon completion of this course, students will be able to perform tasks related to:

- Entry Level task on Ethernet and TCP/IP networks
- IP Addressing, Sub-netting, VLSM
- Configure and troubleshoot Routing Information Protocol (RIP), Enhanced Interior Gateway Routing Protocol (EIGRP), and Open Shortest Path First (OSPF)
- Configure and troubleshoot Virtual LANs (VLANs), Spanning Tree Protocols (STP)
- Configure IP access lists, WLAN Implementation
- Configure serial interfaces using PPP and High-Level Data Link Control (HDLC)
- Configure Frame Relay, SDM etc.

Course Prerequisites

The knowledge and skills that you must have before attending this course are as follows:

- Basic computer literacy
- Windows navigation skills
- Basic Internet usage skills
- Fundamental understanding of data networking and IP addressing

Who Should Attend

This course is intended for the following audience:

- Network Administrator
- Network Engineer
- Systems Engineer
- CCNA Exam Candidates

Course Duration

60 Hours, 20 Classes, 3 Hours per class

Course Details

Lesson 01: Internetworking Basic

- What is Computer network?
- Why need networking?
- Types of Network
- Internetworking Basic
- Intranet, Internet, Extranet, VPN
- Network Architecture & Model
- Networking Topologies
- Network Devices & Components
- Server, Workstation, Host
- Number System Introduction
- Bandwidth & Speed Calculation
- Unicast, Multicast & Broadcast
- The Cisco Three-Layer Hierarchical Model

Lesson 02: OSI & TCP/IP Model

- Network Reference Model
- The OSI Reference Model
- OSI Reference Model Upper Layers
- OSI Reference Model Lower Layers
- Functions of Application Layer Protocols
- OSI Reference Model Transport Layer
- Introduction TCP and UDP Protocols
- Encapsulation & Layered Communication
- Layer1, Layer2, and Layer3 Devices
- TCP/IP and the DoD Model

Lesson 03: Ethernet Technologies

- Networking Technologies
- Overview of Ethernet Technology
- Ethernet Categories
- Ethernet Frame, CSMA/CD
- Ethernet Media Access Control (MAC)
- Data Transmission Technique
- Ethernet Standard, Media, Connector, Devices
- Ethernet Hubs and Switches
- Collision Vs Broadcast Domain
- Address Resolution Protocol (ARP)
- Reverse Address Resolution Protocol (RARP)
- MAC Address Flooding & Learning
- Power Over Ethernet (PoE)
- Media: Wireless, Fiber, Copper
- Cabling (Straight, Cross, Rollover)

Lesson 04: IPv4 Addressing & Sub-netting

- Physical and Logical Address
- IP Addressing, IP Version
- IPv4 Addressing, IPv4 Header
- IPv4 Classes, Unicast, Multicast & Broadcast
- Network ID, Host ID, Broadcast Address
- Subnet mask & Anding Operation
- Public and Private Address
- Sub-netting Basics, Class A, B, C Sub-netting
- CIDR (Classless Inter-domain Routing)
- Class-full Address Vs Classless

Lesson 05: Cabling, Networking, Testing

- Making Straight & Cross Cable
- Networking with HUB/Switch
- IP, Subnet mask, Gateway Address
- Optical MC to Ethernet MC Test
- Sharing & Security, Remote Login
- Testing Utilities Ping, Tracert, Ipconfig

Lesson 06: Sub-netting, VLSM

- Super-netting
- Variable Length Subnet Masks (VLSMs)
- Wildcard Mask Introduction
- Router Summarization
- Troubleshooting IP Addressing

Lesson 07: Router Introduction

- Function of Router
 - The Internal Components of a Cisco Router
 - The Router Boot Sequence
 - Introduction to Cisco CLI
 - Backing up and Restoring the Cisco IOS
 - Backing Up and Restoring the Configuration
 - Managing Configuration Register
 - Router Password, Password Break
 - Using Telnet
 - Using Cisco Discovery Protocols (CDP)
- Network Connectivity and Troubleshooting

Course Details

Lesson 08: IP Routing Process

- Routing Basics
- Routed Vs Routing Protocol
- Types of Routing Protocols
- Static Vs Dynamic Routing Protocols
- Link State Routing Protocols
- Distance-Vector Routing Protocols
- Classless vs Class-full Routing Protocols
- Administrative Distance (AD)
- Routing Protocols Metric
- Autonomous System Number (AS)
- Packet Tracer & GNS3 Introduction
- Verifying your Configuration

Lesson 09: Static and Default Routing

- Static Routing Introduction
- Advantage & disadvantage of Static Route
- Introduction of Hop Count, Next Hop
- Configure Static Routing
- Configure Default Routing
- Verifying your Configuration

Lesson 10: Routing Information Protocol

- RIP (Routing Information Protocol)
- RIP Version
- RIPv1, RIPv2 Configuration
- RIPv1 Limitations
- RIP Timers
- RIP Loop Avoidance Mechanism
- Verifying and Troubleshooting RIP

Lesson 11: Enhanced IGRP (EIGRP)

- Overview of IGRP, EIGRP
- EIGRP Features and Operation
- Using EIGRP to Support Large Networks
- DUAL Algorithm
- EIGRP Metric Calculation
- EIGRP Tables, Neighbor, Packet Types
- Configuring EIGRP
- Load Balancing with EIGRP
- Verifying & Troubleshooting EIGRP

Lesson 12: Open Shortest Path First

- Open Shortest Path First (OSPF) Basics
- OSPF Neighbor relationship, SPF Algorithm
- OSPF Metrics, Packet & Tables Types
- OSPF Network and Router types
- Configuring OSPF
- OSPF DR and BDR Elections
- OSPF and Loopback Interfaces
- Verifying and Troubleshooting OSPF

Lesson 13: Security (ACL)

- Introduction to Access Lists
- Types of ACL
- Standard Access Lists
- Extended Access Lists
- Named, Time Based Access Lists
- Perimeter, Firewall and Internal Routers
- Access Configuration Lab
- Monitoring Access Lists

Lesson 14: NAT and PAT

- When Do We Use NAT?
- Types of Network Address Translation
- NAT Terminology
- How NAT Works
- Configuring Static & Dynamic NAT
- Configure NAT overload (PAT)
- Testing and Troubleshooting NAT

Lesson 15: Switches and Redundancy

- Before Layer 2 Switching
- Types of Switch, Switch series
- Switching Mode, Switching Services
- Switching Loop
- Spanning Tree Protocol (STP)
- STP Types, STP Process
- Per VLAN Spanning Tree Protocol (PVST)
- Rapid Spanning Tree Protocol (RSTP)
- Configuring Catalyst Switches

Lesson 16: Virtual LANs (VLANs)

- Review Collision Vs Broadcast Domain
- Virtual LAN (VLAN) Basics
- VLAN Example, Advantage, VLAN Types
- Configure Static VLAN
- Access Link, Trunk Links
- Identifying VLANs, VLAN Tagging
- VTP Mode, Configure VTP, VTP Pruning
- VLAN Trunking Protocol (VTP)
- Routing between VLANs

Lesson 17: Wireless Technologies

- Introduction to Wireless Technology
- Collision and CSMA/CA
- WLAN Technologies & Standards
- RF Band Overview, and Comparison
- 802.11 Channel, Overlaps
- WLAN security & Authentication
- WLAN Devices & Components
- Cisco Lightweight Access Points (LWAP)
- Implementation a Wireless Internetwork

Lesson 17: IPv6

- Introduction to IPv6
- IPv6 Address, Header and Representation
- IPv6 Address Types
- IPv6 Address Allocations
- IPv6 Routing Protocols
- IPv6 transition Technique
- IPv6 Comparison with IPv4
- Configuring IPv6 on Our Internetwork

Lesson 18: Security Device Manager

- Introduction to SDM
- Necessary Router Configuration
- Introduction to SDM Users Interfaces
- Basic Router Configuration Using SDM
- Basic Router monitoring Using SDM

Lesson 19: Wide Area Networks

- Introduction to Wide Area Networks
- WAN Connection Types
- Common WAN Terms
- WAN Encapsulation Protocols
- WAN Devices, WAN Cable
- HDLC, PPP Overview & Configuration
- Frame Relay Overview
- Frame Relay Encapsulation Types
- Frame Relay PVC, SVC, DLCI, PVC, LMI
- Frame Relay Network Types
- Frame Relay Configuration

Lesson 20: Miscellaneous Services

- Virtual Private Network (VPN)
- Dynamic Host Configuration Protocol
- Domain Name System (DNS)
- Secure Shell (SSH)
- Quality of Services (QoS)
- Network Management (SNMP, MIB)
- Cisco Enterprise Network Design
- Monitoring & Troubleshooting

