

## Course Number: 640-801 Cisco Certified Network Associate

### Interconnecting Cisco Networking Devices Part 1 (ICND1)

#### Prerequisites

None

#### Course Content

The Cisco Certified Network Associate (CCNA) Exam requires the understanding of important networking fundamentals using the Open Systems Interconnect (OSI) seven layer model concepts; terminology and technologies are to be mastered. Both routing and switching concepts under both Layer 2 and Layer 3 are an integral part of the exam objectives. The examinee should be versant in using Cisco Catalyst switches and Cisco routers connected in local-area networks (LANs) and wide-area networks (WANs) typically found at small to medium network sites. As a CCNA you are expected be able to select, connect, configure, and troubleshoot the various Cisco networking devices.

#### Who is CCNA intended for?

CCNA was designed for Network Technicians new to Cisco products and Network Administrators responsible for implementing and managing small and medium size networks. Also targeted are Network Support staff who will perform a help desk role in a medium or enterprise sized company that has an internal network support escalation staff as well as staff who will act as network device installers and first line support in a small business environment.

#### Detailed Objectives

##### I) Bridging/Switching, Definition of Objectives:

- Name and describe two switching methods.
- Distinguish between cut-through and store-and-forward LAN switching.
- Understand the operation of the Spanning Tree Protocol and its benefits.
- Explain the benefits of FILE LANs.

##### II) OSI Reference Model & Layered Communications, Definition of Objectives:

- Understand data link and network addresses and identify key differences between them.
- Define and describe the function of the MAC address.
- List the key internetworking functions for the OSI Network layer.
- Identify at least three reasons why the industry uses a layered model.
- Master the two parts of network addressing.
- Define and explain the five conversion steps of data encapsulation.
- Describe connection-oriented network service and connectionless network service, and identify their key differences.
- Identify the parts in specific protocol address examples. Describe the advantages of LAN segmentation and of LAN and Network segmentation using bridges, routers and switches.

##### III) Network Protocols, Definition of Objectives:

- Describe the different classes of IP addresses (and subnetting).
- Identify the functions of the TCP/IP network-layer protocol.
- Identify the functions performed by ICMP. Configure and verify IP addresses.
- List the required IPX address and encapsulation type.

##### IV) Routing, Definition of Objectives:

- Define flow control and describe the three basic methods used in networking.
- Separately add the RIP and IGRP routing protocols to your configuration.

**V) WAN Protocols, Definition of Objectives:**

- Recognize key Frame Relay terms and features.
- List commands to configure Frame Relay LMIs, maps, and subinterfaces.
- List commands to monitor Frame Relay operation in the router.
- State a relevant use and context for ISDN networking. Identify ISDN protocols, function groups, reference points, and channels.
- Identify PPP operations to encapsulate WAN data on Cisco routers.

**VI) Network Management, Definition of Objectives:**

- Configure standard access lists to filter IP traffic and configure extended access lists to filter IP traffic.
- Monitor and verify selected access list operations on the router.

**VII) LAN Design, Definition of Objectives:**

- Describe full- and half-duplex Ethernet operation.
- Describe network congestion problem in Ethernet networks.
- Describe the features and benefits of Fast Ethernet as well as the guidelines and distance limitations of Fast Ethernet.

**VIII) Cisco Basics, IOS & Network Basics, Definition of Objectives:**

- Examine router elements and manage configuration files from the privilege EXEC mode.
- Control router passwords, identification, and banner.
- Identify the main Cisco IOS software commands for router startup.
- Log in to a router in both user and privilege modes.
- Check an initial configuration using the setup command.
- Use the context-sensitive help facility and the command history and editing features.
- List the commands to load Cisco IOS software.
- Prepare to backup, upgrade, and load a backup Cisco IOS software image.
- Master the initial configuration of your router and enable IP.
- Understand the problems that each routing type encounters when dealing with topology changes, and describe techniques to reduce the number of these problems.

## **Course Number: 640-802**

### **Interconnecting Cisco Networking Devices Part 2 (ICND2)**

#### **Prerequisites**

Course 640-801

#### **Course Content**

This course develops a candidate's knowledge and skills required to install, operate, and troubleshoot a small to medium size enterprise branch network. The topics include connecting to a WAN; implementing network security; network types; network media; routing and switching fundamentals; the TCP/IP and OSI models; IP addressing; WAN technologies; operating and configuring IOS devices; extending switched networks with VLANs; determining IP routes; managing IP traffic with access lists; establishing point-to-point connections; and establishing Frame Relay connections.

#### **CourseTopics**

- **Describe how a network works**
  - Configure, verify and troubleshoot a switch with VLANs and interswitch communications
  - Implement an IP addressing scheme and IP Services to meet network requirements in a medium-size Enterprise branch office network.
  - Configure, verify, and troubleshoot basic router operation and routing on Cisco devices
  - Explain and select the appropriate administrative tasks required for a WLAN
  - Identify security threats to a network and describe general methods to mitigate those threats
  - Implement, verify, and troubleshoot NAT and ACLs in a medium-size Enterprise branch office network.
  - Implement and verify WAN links
  - Describe the purpose and functions of various network devices
  - Select the components required to meet a network specification
  - Use the OSI and TCP/IP models and their associated protocols to explain how data flows in a network
  - Describe common networked applications including web applications
  - Describe the purpose and basic operation of the protocols in the OSI and TCP models
  - Describe the impact of applications (Voice Over IP and Video Over IP) on a network
  - Interpret network diagrams

- o Determine the path between two hosts across a network
  - o Describe the components required for network and Internet communications
  - o Identify and correct common network problems at layers 1, 2, 3 and 7 using a layered model approach
  - o Differentiate between LAN/WAN operation and features
- **Configure, verify and troubleshoot a switch with VLANs and interswitch communications**
    - o Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts
    - o Explain the technology and media access control method for Ethernet networks
    - o Explain network segmentation and basic traffic management concepts
    - o Explain basic switching concepts and the operation of Cisco switches
    - o Perform and verify initial switch configuration tasks including remote access management
    - o Verify network status and switch operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), SHOW & DEBUG commands
    - o Identify, prescribe, and resolve common switched network media issues, configuration issues, auto negotiation, and switch hardware failures
    - o Describe enhanced switching technologies (including: VTP, RSTP, VLAN, PVSTP, 802.1q)
    - o Describe how VLANs create logically separate networks and the need for routing between them
    - o Configure, verify, and troubleshoot VLANs
    - o Configure, verify, and troubleshoot trunking on Cisco switches
    - o Configure, verify, and troubleshoot interVLAN routing
    - o Configure, verify, and troubleshoot VTP
    - o Configure, verify, and troubleshoot RSTP operation
    - o Interpret the output of various show and debug commands to verify the operational status of a Cisco switched network.
    - o Implement basic switch security (including: port security, trunk access, management vlan)