CCENT

Length: Five Days

Prerequisites: The knowledge and skills that a learner must have before attending this course are as follows:

- Basic computer literacy
- Basic Microsoft Windows navigation skills
- Basic Internet usage skills
- Basic e-mail usage skills

Course Content: CCENT focuses on providing the skills and knowledge necessary to implement and support a small switched and routed network. For the purpose of this course, a small network is defined as 1 to 20 hosts connected to a single switch, with the switch running a single VLAN (VLAN1). The switch is also connected to a router providing a routed link (Routing Information Protocol [RIP] and default) to a simulated Internet and corporate office. ICND1 works from the bottom up, providing knowledge and skills as they are needed. The course starts with an introduction to networks. It then introduces host-to-host communications using TCP / IP. Next, Layer 2 devices (switches) are introduced into the network. Next, Layer 3 devices (routers) are introduced into the network. The introduction of Layer 3 devices leads to the use of WANs and routing to connect the site to the Internet and corporate sites.

Course Objectives:
- Upon completing this course, the learner will be able to meet these overall objectives:
- Describe how networks function, identifying major components, function of network components, and the OSI reference model
- Using the host-to-host packet delivery process, describe issues related to increasing traffic on an Ethernet LAN and identify switched LAN technology solutions to Ethernet networking issues
- Describe the reasons for extending the reach of a LAN and the methods that can be used, with a focus on RF wireless access
- Describe the reasons for connecting networks with routers and how routed networks transmit data through networks using TCP / IP
- Describe the function of WANs, the major devices of WANs, and configure PPP encapsulation, static and dynamic routing, PAT, and RIP routing
- Use the command-line interface to discover neighbors on the network and manage the router start up and configuration

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Course Content

BUILDING A SIMPLE NETWORK

- Exploring the Functions of Networking
- Securing the Network
- Host-to-Host Communication Model

- TCP/IP's Internet Layer
- TCP/IP's Transport Layer
- Packet Delivery Process
- Understanding Ethernet
- Connecting to an Ethernet LAN

ETHERNET LANS

- Challenges of Shared LANs

- Solving Network Challenges with Switched LAN Technology
- Packet Delivery Process
- Operating Cisco IOS Software
- Starting the Switch
- Understanding Switch Security
- Maximizing the Benefits of Switching
- Troubleshooting Switch Issues

WIRELESS LOCAL AREA NETWORKS (WLANS)

- Exploring Wireless Networking
- Understanding WLAN Security
- Implementing a WLAN

LAN CONNECTIONS

- Functions of Routing
- Understanding Binary Basics
- Constructing a Network Addressing Scheme
- Starting a Router
- Configuring a Router
- Packet Delivery Process
- Understanding Router Security
- Using Cisco Router and Security Device Manager
- Using a Router as a DHCP Server
- Accessing Remote Devices

WIDE AREA NETWORKS (WANS)

- WAN Technologies
- Enabling the Internet Connection
- Enabling Static Routing
- Configuring Serial Encapsulation
- Enabling Routing Information Protocol (RIP)

NETWORK ENVIRONMENT MANAGEMENT

- Discovering Neighbors on the Network
- Managing Router Startup and Configuration
- Managing Cisco Devices

LABS

- Lab 1: Using Host-Based Tools
  - o Utilize Windows applications and commands to investigate the IP configuration of your PC and the local network.
- Lab 2: Observing the TCP Three-Way Handshake
  - o Use a packet sniffer software application to observe the TCP initial Three-Way Handshake.
- Lab 3: Observing Extended PC Network Information
  - o Use PC Tools, such as ping, traceroute, and ipconfig to gather network-related information.
- Lab 4: Connecting to Remote Lab Equipment
  - o Begin preparations for the subsequent labs. Test and practice the connectivity for your assigned workgroup equipment that will be used for the remaining lab practice exercises.
- Lab 5: Switch Startup and Initial Configuration
  - o Connect to your workgroup switch and complete the initial configuration.
- Lab 6: Enhancing Security of Switch Configuration
  - o Increase the security of the initial switch configuration.
- Lab 7: Operating and Configuring a Cisco IOS Device
  - o Practice and demonstrate the use of the Command Line Interface (CLI) features.
- Lab 8: Converting Decimal to Binary and Binary to Decimal
  - o Test your ability to convert numbers from binary to decimal and decimal to binary.
- Lab 9: Classifying Network Addressing
  - o Classify network addresses and convert addresses from decimal to binary format or binary to decimal format.
- Lab 10: Computing Usable Subnetworks and Hosts

- o Determine how to create subnets from a given IP address, how many hosts per subnet, and how many subnets per IP address.
- Lab 11: Calculating Subnet Masks
  - o Determine the subnet mask used based on specific criteria provided. Determine the binary and decimal format of the mask, subnet address, number of host addresses, and the Directed Broadcast address.
- Lab 12: Initial Router Startup
  - o Connect to your workgroup router and examine the startup process.
- Lab 13: Initial Router Configuration
  - o Connect to your workgroup router and complete the initial configuration.
- Lab 14: Enhancing Security of Initial Router Configuration
  - o Increase the security of the initial router configuration.
- Lab 15: Using Security Device Manager (SDM) to Configure DHCP Server Functions
  - o Use the Cisco SDM to configure DHCP server functionality on your workgroup router.
- Lab 16: Managing Remote Access Sessions
  - o Utilize Telnet and SSH to create connections to your workgroup devices.
- Lab 17: Connecting to the Internet
  - o Configure the WAN Ethernet Interface to use a DCHP-obtained address and perform Port Address Translation to the inside network.
- Lab 18: Connecting to the Main Office
  - o Configure your workgroup router to connect to another device via a serial interface using PPP and provide a static route to that device.
- Lab 19: Enable Dynamic Routing to Main Office
  - o Enable the workgroup router to use the dynamic routing protocol RIP.

- Lab 20: Using CDP
  - o Obtain information about your directly connected Cisco device using Cisco Discovery Protocol (CDP) and disable CDP from running on selected interfaces.
- Lab 21: Managing Router Startup Operations
  - o Make changes to control the router startup behavior, such as boot commands or configuration register settings.
- Lab 22: Managing Cisco Devices
  - o Understand how to use the IOS Copy and Debug commands.
- Lab 23: Confirming the Re-Configuration of the Branch Network
  - o Using all the skills that you have learned, you will assume the management of an incorrectly configured network. You will need to reconfigure or correct the network and then test the new network configuration for accuracy.