CCNA 2.0 Bootcamp (CCNA)

Course Overview:

This **five-day course** covers the essential topics of ICND 1 and ICND 2 in an intensive Bootcamp format. It teaches students the skills needed to install, operate, and troubleshoot a small-to-medium sized branch office Enterprise network, including configuring several switches and routers, connecting to a WAN, and implementing network security. This course helps students prepare for ICND1 Exam #640-822 and ICND2 Exam #640-816, or the CCNA Composite Exam # 640-802.

Who will benefit from this course?

This course is intended for students who have general knowledge about local and wide area networking and the underlying protocols such as TCP/IP, who are prepared to learn at a fast pace. The goal is to gain the skills needed to configure, operate, and support small-to-medium sized Cisco networks and is for students working towards CCENT through CCNA certification. Students with no prior knowledge of networking are encouraged to take the ICND 1 and ICND 2 classes individually to learn the CCNA foundational topics at a slower pace.

Prerequisites:

To fully benefit from this course, students should have the following prerequisite skills and knowledge:

- Take online qualifying quiz
- Basic computer literacy
- Basic Internet usage skills
- Basic e-mail usage skills
- Basic understanding of network architecture and protocols
- Basic Windows navigation skills

Sunset Learning Differentiators:

- **World Class Instruction Team**
  - All instructors hold Certified Cisco Systems Instructor (CCSI) certification.
  - All instructors have a four-year technical degree or equivalent work experience.
  - All instructors have a minimum of either four years teaching technical networking classes or five years consulting experience.
- **Enhanced Learning Experience**
  - The goal of our instructors during class is ensure students understand the material, guide them through our up to date labs and encourage questions and interactive discussions. Enjoyment of the learning process is a primary objective for Sunset Learning instructors.
- **High Quality "Real World" Lab Environments**
  - Course offerings include real-time access to labs with the latest Cisco equipment
  - Result is real world experiences to help students prepare for actual networking environments.
  - Hands on experience aids in Cisco exam preparation.
- **Outstanding Customer Service**
  - Dedicated program manager
  - Quality instruction team
  - Creativity in creating curriculum to meet your specific needs
  - Delivery at your location or ours

Applicable Products:

- This class provides hands on labs for the Cisco 2800 series Routers and Cisco 2900 series switches.

Related Courses:

- ICND 1
- ICND 2

Program Contents:

- ICND 1 and ICND 2 essential topics
- CCNA Test Voucher

Course Objectives:

After completing this course, students will be able to:

- Describe how networks function, identifying major components, function of network components, and the Open System Interconnection (OSI) reference model.
- Using the host-to-host packet delivery process, describe issues related to increasing traffic to an Ethernet LAN and identify switched LAN technology solutions to Ethernet networking issues.
- Expand the switched network from a small LAN to a medium-sized LAN with multiple switches, supporting VLANs, trunking, and spanning tree.
- Use the command-line interface to discover neighbors on the network and manage the router's startup and configuration.
- Describe the reasons for connecting networks with routers and how routed networks transmit data through networks using TCP/IP.
- Describing routing concepts as they apply to a medium-sized network and discuss considerations when implementing routing on the network.
- Configure, verify, and troubleshoot RIP, OSPF and EIGRP
- Determine how to apply ACLS based on network requirements, and to configure, verify, and troubleshoot ACLs on a medium-sized network.
- Describe when to use NAT and PAT on a medium-sized network, and configure NAT or PAT on routers
- Identify and implement the appropriate WAN technology based on network requirements.
- Describe the function of Wide Area Networks (WANs), the major devices of WANs, and configure PPP encapsulation.
- Describe the operation and basic configuration of IPv6.
- Describe the reasons for extending the reach of a LAN and the methods that can be used with a focus on RF wireless access.

Course Outline:

Module 1: The OSI Model and Networking Basics

Lesson 1: Network Basics

- What is a Network?
- Network Basic Components
- Network Topology Types (Bus, Star, Ring)
- Network Characteristics (Bandwidth, Topology, Availability, etc.) Physical vs. Logical Topologies
- The Importance of Network Diagrams and Documentation

Lesson 2: The OSI Model

- The need for a Layered Model
- Describing the 7 OSI Layers
- Packet Encapsulation Process
- The TCP/IP Layered Model

Lesson 3: The Physical Layer

- NIC and Router Interfaces
- Media Requirements
- Types of Cables (Straight Through, Cross Over, and Rollover)

Lesson 4: The Data Link Layer

- What is a LAN?
- Media Requirements
- L2 Protocols
- What is Ethernet?
- CSMA/CD
- Components and Functions of a LAN
- Ethernet Framing
- MAC or Physical Address

Lesson 5: The Network Layer

- The Internet Protocol (IP)
- IP Addresses Format
- Private vs. Public Addresses
- IP Address Classes
- Assigning IP Addresses (Manual vs. Dynamic using DHCP)
- Domain Name System (DNS)

Lesson 6: Binary Basics

- Decimal vs. Binary
- Decimal to Binary Conversion
- Binary to Decimal Conversion

Lesson 7: IP Addressing and Subnetting

- What is Subnetting?
- What is a Subnet Mast?
- How to calculate Subnets

Lesson 8: The Transport Layer. TCP

- The Transport Control Protocol
- The User Datagram Protocol (UDP)
- Reliable vs. Unreliable Services
- Mapping Applications (Port Numbers)
- Establishing a TCP Session
- Windowing, Sequence numbers and Acknowledgement in TCP

Lesson 9: The Packet Delivery Process

- Layer Interaction
- The Address Resolution Protocol (ARP)
- PING
- Trace route

Module 2: Ethernet LANs and Switching

Lesson 1: Challenges of Shared LANs

- What is a Switch?
- Advantages of Switches
- Problems with Shared Networks (Congestion, Collisions, and Broadcast)
- The Switching Process
- Solving Shared LANs issues with Bridges and Switches
- LAN network Design using Switches (the Hierarchical Model, Interconnection Speeds)

Lesson 2: Cisco IOS Basics

- What is IOS?
- Device Startup Process
- Cisco Devices Configuration Methods
- The Command Line Interface (CLI)
- User vs. Privileged Mode
- CLI Help Facilities (Context Sensitive help and Command History)

Lesson 3: Basic Cisco Switch Configuration

- Starting a Cisco Switch
- Basic Switch Configuration
- The MAC Address Table
- Duplex vs. Half Duplex Port Operation

Lesson 4: VLANs and Trunking

- The Need for VLANs
- What is a VLAN?
- VLANs and IP Addressing
- Network Traffic Types and VLANS
- Voice VLANs
- VLAN Operation
- VLAN Membership modes (Static vs. Dynamic Using VMPS)
- IEEE 802.1q Trunking
- Cisco VLAN Trunking Protocol (VTP)
- Configuring VLANs, Trunking, and VTP

Lesson 5: VLAN Routing

- VLAN-to-VLAN Routing Overview
- Router in a Stick Configuration

Lesson 6: Spanning Tree Protocol

- Introducing Spanning Tree Protocol
- STP Port Status
- STP Portfast
- STP Portcost
- Per-VLAN STP (PVST)
- Problems with Redundant LANs (Broadcast Storms, Instabilities, and Duplicate Packets)
- Spanning Tree Operation (STP Decision Process)
- Rapid STP (RSTP)
- Selecting the Root Bridge

Lesson 7: Switch Troubleshooting

- The Layered Approach
- Troubleshooting Steps
- VTP Problems
- STP Problems
- Physical Layer Problems (Collisions, Duplex, and Speed Mismatch, etc.)
- Configuration Issues

Module 3: Cisco Router Basics

Lesson 1: Starting a Cisco Router

- The Boot Up Process
- Setup Mode
- Cisco AutoSecure
- User vs. Privileged Mode
- Show Version Command

Lesson 2: Managing Cisco Router Configuration Files and IOS Images

- Power On Self Test (POST)
- Memory Types
- Finding and Loading the IOS Image and Configuration File
- Configuration Register

Lesson 3: Cisco Router File System

Lesson 4: Basic Cisco Routing Configuration

- Router Configuration Modes
- Basic Interface Configuration

Lesson 5: Cisco Router and Security Device Manager (SDM)

- What is SDM?
- SDM Support
- SDM Menus and Wizards

Lesson 6: Configuring DHCP through SDM

- Understanding DHCP
- DHCP Configuration Steps

Lesson 7: Router Remote Access

- Telnet and SSH Details

Lesson 8: Cisco Discovery Protocol (CDP)

Module 4: Basic Network Security

Lesson 1: The Need for Network Security

- Understanding and Configuring Static and Default Routes
- Understanding and Configuring Static and Default Routes

Lesson 2: Configuring Passwords, Hostnames, and Banners for Routers and Switches

- Configuring Passwords, Hostname, and Banners

Lesson 3: Securing Remote Access

- Telnet and SSH

Lesson 4: Switch Security Practices and Features

- Recommended Switch Security Practices
- Configuring Switch Passwords and Banners
- Port Security
- IEEE 802.1x

Module 5: Routing

Lesson 1: Routing Basics

- What is a Router?
- Path Determination
- Router Operation
- The Routing Table
- Static vs. Dynamic Routing Table Entries
- Administrative Distance
- Metrics
- Types of Routing Protocols
- Distance Vector Routing Protocols Concepts
- Link State Routing Protocols Concepts

Lesson 2: VLSM and Routing Summarization

Lesson 3: Static Routing

- Understanding and Configuring Static and Default Routes

Lesson 4: Routing Information Protocol (RIP)

- RIP Overview
- RIPv1 and RIPv2
- Configuring and Verifying RIP

Lesson 5: Open Shortest Path First (OSPF)

- OSPF Overview
- OSPF Areas
- OSPF Adjacencies
- The SPF Process
- Configuring and Verifying OSPF
- OSPF Load Balancing
- OSPF Authentication

Lesson 6: Troubleshooting OSPF

Lesson 7: Cisco Enhanced Exterior Gateway Routing Protocol (EIGRP)

- EIGRP Overview
- Configuring and Verifying EIGRP
- EIGRP Metrics and Load Balancing
- EIGRP Authentication

Lesson 8: Troubleshooting EIGRP

Module 6: ACLs

Lesson 1: Understanding ACL Operations

- ACL Uses
- ACL Types
- ACL Operations
- Dynamic ACLs
- Reflexive ACLs

Lesson 2: Configuring and Verifying ACLs

Module 7: WANs

Lesson 1: WAN Concepts

- What is WAN?
- WANs vs. LANs
- WANs and the OSI Model
- WAN Physical Layer

Lesson 2: Serial Encapsulation

- HDLC
- PPP
- Serial Interface Configuration and Verification

Lesson 3: Frame Relay

- Frame Relay Overview
- NBMA Issues
- Frame Relay Signaling
- Frame Relay Inverse ARP
- Configuring and Verifying Frame Relay
- Troubleshooting Frame Relay

Lesson 4: Network Address Translation

- NAT Operations
- Port Address Translation
- Configuring and Verifying NAT/PAT
- Troubleshooting NAT/PAT

Lesson 5: Connecting to the Internet

- Connecting to the internet
- DSL
- Cable
- Configuring DHCP and SDM
- Configuring NAT/PAT Using SDM

Lesson 6: VPNs

- What is a VPN?
- Benefits of VPNs
- Site-to-Site and Remote-Access VPNs
- Cisco Easy VPN
- IPSEC (Confidentiality, Encryption, Data Integrity, Authentication)
- VPN Cisco Devices

Module 8: IPv6

Lesson 1: IPv6 Basics

- The Need of IPv6
- IPv6 Features
- IPv6 Address Representation
- EUI-64 Interface ID
- Stateless Auto configuration
- IPv6 Address Types (Unicast, Multicast, and Anycast)
- Unicast Addresses (Global, Link-Local, Unique-Local)
- Stateful Auto configuration (DHCPv6)
- IPv6 Routing Protocols (RIPng)
- Transition Mechanisms (Dual Stack, Manual Tunnels)

Lesson 2: Cisco IPv6 Configuration

Module 9: Wireless LANs

Lesson 1: Wireless LAN Concepts

- Difference Between Wired and Wireless LANs
- Radio Frequencies for Wireless LANs
- WiFi Certification
- IEEE 802.11 Standards

Lesson 2: Wireless Security

- Wireless LANs Threats
- Mitigating The Threats
- IEEE 802.1x
- Wireless LAN Security Evolution (WEP, EAP, WPA, WPA2)
- Wireless Client Associations. SSID
- WPA vs. WPA2

Lesson 3: Wireless LAN Implementation

- Ad Hoc vs. Infrastructure Mode
- Coverage and Transmission Speeds
- Access Point Configuration
- Implementation Steps
- Wireless Client Types
- Common Wireless Issues
- Wireless LAN Troubleshooting