

Course:

CCNA Bootcamp (Intensive CCNA)

Duration: 5 Days

Description

Introduction to Networking course will prepare you for the basic knowledge and in-depth technology of networking design and implementation. This course will help you gain experience of networking area by both learning theory and practicing with software simulator.

To maximize your classroom experience and ensure that you get comprehensive coverage of the course materials, our three-step, blended learning approach to the class consists of:

1. Pre-Class Activity and Discussion
2. Classroom Instruction
3. Post-Class Lab Practice

The Pre-Class Activity and Discussion provides you with review materials and exercises, including a pre-test assessment, and a readiness test, all designed to give you a firm foundation and get you focused and prepared to get the most out of Classroom Instruction.

Classroom Instruction includes intensive instructor-led training and hands-on labs where you'll learn to install, configure, operate, and troubleshoot small to medium-sized routed and switched networks. You'll also learn the basics of wireless networking as well as mitigating security threats.

Following Classroom Instruction, Post-Class Lab Practice allows you to gain your skills using the hands-on lab equipment you used in the classroom.

Objectives

Students will learn:

- How networks function, network components and their functions, and the Open Systems Interconnection (OSI) reference model
- Binary, decimal, and hexadecimal numbering
- Switching operations and theory
- Host-to-Host packet delivery process
- TCP/IP network addressing and routing
- IP V4 vs IP V6 Framework
- IP sub netting
- Local Area (LAN), Wide Area (WAN), and remote access services
- Advanced network theory, including Virtual Private Networks (VPN), Firewall, Intranets and extranets, and wireless networking
- Cisco IOS operation, initial configuration using Telnet, HTTP
- Network discovery and management using Cisco Discovery Protocol (CDP)
- Multi Switch environment, Spanning Tree Protocol
- Concepts of VLANs and turning
- Routing Protocol : distance vector, link state, EIGRP, OSPF
- How to configure and troubleshoot a switch and router in a small to medium size network environment
- Implementing VLSM
- Access Control List (ACL) : Configuration, implementation, Verification, Troubleshooting
- Network Address Translation (NAT) vs. Port Address Translation (PAT)
- Authentication Protocol using Radius, PPP, CHAP, PAP
- Frame Relay operation
- VPN solutions
- Wireless Technology: Technology, Security Involved, Implementation for LAN, WAN and MAN

Outline of this course

CHAPTER 1: Standard Internetworking Models

- Introduction
- What is network and Internetwork?
- Types of Internetworks : LAN, WAN, MAN, SAN, PAN
- Open Systems Interconnection (OSI) Model
- How OSI Layer Communication take place?
- TCP/IP Model
- Best Practice Layer Hierarchical Model

CHAPTER 2: Physical Layer Networking Concepts

- Introduction to physical layer networking
- Network Topologies : Bus, Star, Ring, Mesh
- Media in Physical Layer Cable, Fiber-Optic, Wireless, Infrared
- Devices in Physical Layer
- Network Interfaces

CHAPTER 3: Data Link Networking Concepts

- Introduction
- Data Link Protocols : Token Ring, FDDI, Ethernet
- Ethernet at the Data Link Layer
- Physical Ethernet Standards : Ethernet, Fast Ethernet, Gigabit Ethernet, 10-Gigabit Ethernet (10GbE), Long Reach Ethernet
- Data Link Layer Devices Bridges, Switches
- Duplex

CHAPTER 4: General Network Security

- Introduction
- Classes of Attack
- Access Attacks
- Reconnaissance Attacks
- Denial of Service (DoS) Attacks
- Mitigating Network Threats
- AAA
- Cisco ACLs
- Cisco IOS Secure Management Features
- Encryption Protocols
- Security Appliances and Applications

CHAPTER 5: IP at the Network Layer

- Introduction
- Network Layer Functions
- IP Addressing and Formats
- Basic of number in Binary, Hexadecimal
- IP Address Classes
- Subnet Masks
- Private Addressing (RFC 1918)
- Calculating Hosts and Networks in a Subnet
- Determining the Range of Valid IPs
- IPv6 Communications, Address Format, Type of Address, Auto configuration, Integration with IPv4
- Network Layer Devices : Routers, Layer 3 Switches

CHAPTER 6 : Introduction to Cisco Routers and Switches

- Introduction
- Interfaces and Modules
- LAN / WAN Interfaces
- Cisco Memory Components : ROM, Flash, RAM, NVRAM
- Cisco Internetworking Operating System
- Feature Sets
- IOS Image File Naming
- Cisco Router and Switch Models and Features

CHAPTER 7: Foundation Cisco IOS Operations

- Introduction
- Terminal Options Console Port, Auxiliary Port, Telnet, HTTP and HTTPS, SSH
- Router/Switch Startup Procedures
- POST/ Bootstrap Sequence
- IOS Loading / Configuration Loading
- Navigating the IOS : EXEC mode, Privileged EXEC mode
- Global Configuration
- Context-Sensitive Help / Common Syntex Error
- Abbreviations / Shortcut Keys

CHAPTER 8: Advanced Cisco Configurations

- Introduction
- Global Configuration
- Altering the Boot Sequence
- Changing the Hostname
- Creating a Login Banner
- Assigning a Password for Privileged EXEC Mode
- Domain Name–Specific Commands
- Enabling SSH / Line Configurations
- Securing Console, Auxiliary and Telnet Access to User EXEC
- Router Interface Configurations
- Assigning an IP Address and Enabling the Interface
- LAN / WAN Specific Commands
- Saving Configurations
- Using the show Command to Get Information
- Verifying Your Configurations
- Viewing Interface Statuses and Statistics
- IOS File Version show Commands
- Troubleshooting Commands
- Backing Up and Restoring Configurations and IOS Using TFTP
- Neighbor Discovery with CDP
- Using Telnet for Virtual Terminal Access
- Terminal Monitor

CHAPTER 9 : Introduction to Routing and Routing Protocols

- Introduction
- The Default Gateway
- Verifying and Troubleshooting the Default Gateway
- Routing Sources
- Administrative Distance
- Static Routes / Default Routes/ Floatig Static Routes
- Configuring Static and Default Routes with SDM
- Verifying Static and Default Routes
- Dynamic Routing Protocols
- Routing Metrics
- Classful and Classless Routing Updates
- VLSM
- Interior and Exterior Gateway Routing Protocols : Distance Vector, Link-State, EIGRP, OSPF
- The Routing Table Revisited

- Routing Redistribution

CHAPTER 10 : Distance Vector Routing Protocols

- Introduction
- Distance Vector Operations
- Routing Loops and how to mitigate
- Counting to Infinity
- Split Horizon
- Route Poison, Poison Reverse, and Hold-Down Timers
- Triggered Updates
- Invalid/Dead Timers
- RIP Characteristics & Configuration
- Passive Interfaces
- RIPv2 Characteristics & Configuration
- RIPv2 Update Authentication
- Configuring RIP with SDM
- RIP Verification
- Troubleshooting RIP

CHAPTER 11: Link-State and Hybrid Routing Protocols

- Introduction
- Link-State Operations
- OSPF Characteristics, Configuration, Verification, Troubleshooting
- Balanced Hybrid Operations
- EIGRP Characteristics, Configuration, Verification, Troubleshooting

CHAPTER 12: Foundation Switching Operations

- Introduction
- Switching Functionality
- Frame Transmission Methods Store-and-Forward, Cut-Through, Fragment-Free
- Half- and Full-Duplex Connections
- Switching Design
- Spanning Tree Protocol: Root Bridge, Root Ports, Designated Ports. Blocked Ports
- Port State Transitions
- Initial Switch Configurations : IP Assignment, Default Gateway
- Configuring Multiple Switch Interfaces
- Configuring and Verifying Spanning Tree Protocol
- Changing Priority and Port Cost
- Verifying Spanning Tree Protocol
- Troubleshooting Basic Switch Connectivity

CHAPTER 13: Enhanced Switching Operations

- Introduction
- Cisco Enhancements to Spanning Tree Protocol
- PortFast and BPDU Guard
- UplinkFast
- BackboneFast
- Configuring Cisco STP Enhancements
- EtherChannel
- Rapid Spanning Tree Protocol
- Spanning Tree Similarities
- RSTP Port States and Roles
- RSTP Link and Edge Types
- BPDUs and Topology Changes
- Rapid Transition

CHAPTER 14: Virtual LANs

- Introduction
- Overview of VLANs
- VLAN Membership Methods
- The Management VLAN
- Configuring and Verifying VLANs
- VLAN Trunking Protocol : ISL, 802.1Q
- Configuring and Verifying ISL and 8021Q Trunks
- VTP Modes
- VTP Pruning
- Configuring and Verifying VTP
- InterVLAN Routing
- Router on a Stick
- Switched Virtual Interfaces
- Voice VLANs

CHAPTER 15: Implementing Switch Security

- Introduction
- Securing Physical Access to the Catalyst Switch
- Securing Terminal Access to the Catalyst Switch
- Should we allow Telnet or Not to Telnet
- Additional IOS Security Practices
- Layer 2 Security
- Port Security
- VLAN Security
- VTP Passwords

CHAPTER 16: Understanding Wireless Networking

- Introduction
- The Business Case
- The Players in the 802.11 Market
- Entering the Radio Frequency World
- Understanding Wireless Transmission
- Unlicensed RF Bands
- The Key to Successful Wireless: Channel Surfing
- The 802.11 Standards Family
- Wireless Standard : 802.11a, 802.11b, 802.11g
- The Next Generation: 802.11n

CHAPTER 17: Wireless Security and Implementation Considerations

- Introduction
- Understanding the Threats
- War Driving
- Direct Hacking
- Employee Ignorance
- Deploying a Secure Wireless Network
- Wireless Encryption
- Wireless Authentication (802.1x)
- Wireless Intrusion Prevention System (IPS)
- Wireless Implementation Guidelines
- Understanding Wireless Topologies
- Understanding Wireless Data Rates
- General Wireless Implementation Steps
- Wireless Troubleshooting

CHAPTER 18: Using Cisco Access Lists

- Introduction
- Access List Concepts
- Functions of an Access List : Packet Filtering, Quality of Service, Dial-on-Demand Routing
- Network Address Translation
- Standard / Extended Access Lists : Configuration and Placement
- Named Access List
- Verifying Access Lists

CHAPTER 19: Enabling Internet Connectivity with NAT

- Introduction
- NAT Concepts
- NAT Terminology
- Static/Dynamic NAT
- NAT Overload and Port Address Translation
- Configuring NAT Overload
- Verifying NAT Configuration
- Troubleshooting NAT

CHAPTER 20: Wide Area Network Connections

- Introduction
- WAN Connection Types
- Leased Lines
- Circuit-Switched Networks vs. Packet-Switched Networks
- Broadband Connection
- Virtual Private Networks (VPNs)
- Metropolitan Ethernet (Metro Ethernet)
- The WAN Physical Layer
- WAN Data Link Encapsulations
- Serial Line Internet Protocol (SLIP)
- Point-to-Point Protocol (PPP)
- Cisco High-Level Data Link Control (HDLC)
- X25 Link Access Procedure, Balanced (LAPB)
- Frame Relay
- Asynchronous Transfer Mode (ATM)
- PPP over Ethernet (PPPoE) and PPP over ATM (PPPoA)
- Cisco HDLC
- PPP : ISO HDLC, Link Control Protocol (LCP), Network Control Protocol (NCP)
- Configuring PPP
- Authentication
- Compression
- Verifying & Troubleshooting PPP

CHAPTER 22: Frame Relay

- Introduction
- Frame Relay Overview
- Virtual Circuits
- Topology of Frame Relay : Hub and Spoke, Partial Mesh, Full Mesh Design
- Frame Relay Terminology
- Permanent Virtual Circuit / Switched Virtual Circuit
- Local Management Interface / Data Link Connection Identifier
- Local Access Rate / Committed Information Rate
- Backwards Explicit Congestion Notification / Forward Explicit Congestion Notification
- Discard Eligible
- The Nature of NBMA Networks : Subinterfaces/ Multipoint Subinterfaces/ Point-to-Point Subinterfaces
- Address Mapping in Frame Relay : Inverse ARP
- Static Mappings
- Configuring Frame Relay