Cisco CCNP 642-812 Building Cisco Multilayer Switched Networks (BCMSN)

- **Course Number:** 642-812
- **Length:** 5 Day(s)

Certification Exam

This course will help you prepare for the following exams:

- **Cisco CCNP Exam 642-812:** Building Cisco Multilayer Switched Networks (BCMSN)

Course Overview

The Building Cisco Multilayer Switched Networks (BCMSN) course covers topics on switching technology, implementation and operation, planning and design, and troubleshooting enterprise networks with 100 to over 500 nodes.

Prerequisites

- Cisco CCNA 640-801
- Cisco CCNP 642-901 (BSCI)

Audience

The BCMSN course is geared towards IT professionals with an advanced or journeyman knowledge of networks.

Course Outline

- Module 1
- 1.1 Introduction
- 1.2 Campus Network
- 1.3 Emerging Campus Network Technologies
- 1.4 Switching Technologies
- 1.5 The Hierarchical Model
- 1.6 Building Block Approach
- 1.7 Review
- Module 2
- 2.1 Overview
- 2.2 Connecting the Switch Block
- 2.3 Cable Media Types
- 2.4 Lab - Enable and Hostname Commands
- 2.5 Lab - Configuring Remote Accessibility
- 2.6 Lab - Port and Speed Settings
- 2.7 Lab - Overview

- 2.8 Review
- Module 3
- 1.1 VLANs
- 1.2 Boundaries
- 1.3 Memberships
- 1.4 VLAN Identification
- 1.5 Lab VLAN Creation and Configuration
- 1.6 VLAN Trunk Links
- 1.7 VLAN Trunk Configuration
- 1.8 VLAN Trunk Protocols
- 1.9 Lab - VTB Configuration
- 1.10 Lab - Overview
- Module 4
- 1.1 Tranparent Bridging
- 1.2 Switching
- 1.3 STP Components
- Module 5
- 1.1 Inter VLAN Routing
- 1.2 Lab - Configuration
- 1.3 Lab Review
- 1.4 EtherChannel
- 1.5 Lab - Trimmers and Etherchannel
- 1.6 Port Fast and Uplink Fast
- Module 6
- 1.1 Issues and Solutions
- 1.2 Lab - Configuring Inter-VLAN Routing
- Module 7
- 1.1 Multi Layer Switching Fundamentals
- 1.2 Review
- Module 8
- 1.1 Introduction to Multicasting
- 1.2 Addresses in Multicast Network
- 1.3 IGMP
- 1.4 CGMP Protocol
- 1.5 Routing Multicast Traffic
- 1.6 Shared Distribution Tree
- 1.7 Managing the Scope Delivery
- 1.8 Multicast Protocols
- Module 9
- 1.1 Quality of Service
- 1.2 Lab QOS
- 1.3 HSRP Hot Standby Routing Protocol
- 1.4 HSRP Required Features
- 1.5 Lab - HSRP
- Module 10 - Implementing Spanning Tree
- Describing the STP

- Transparent Bridging
- What Is a Bridge Loop?
- Preventing Bridge Loops
- 802.1D STP
- Bridge Protocol Data Unit
- The STP Root Bridge
- Root Bridge Selection Criteria
- Extended System ID in Bridge ID Field
- 802.1D 16-bit Bridge Priority Field Using the Extended System ID
- Configuring the Root Bridge
- Root Bridge Selection
- Spanning Tree Operation
- Spanning Tree Port States
- Local Switch Root Port Election
- Spanning Tree Path Cost
- Spanning Tree Protocol Root Port Selection
- STP Designated Port Selection
- Example: Layer 2 Topology Negotiation
- Enhancements to STP
- Describing PortFast
- Configuring PortFast
- IEEE Documents
- Section 1 Review
- Implementing RSTP
- Rapid Spanning Tree Protocol
- RSTP Port Roles
- What Are Edge Ports?
- RSTP Link Types
- RSTP BPDU Flag Byte Use
- RSTP Proposal and Agreement Process
- Downstream RSTP Proposal and Agreement
- RSTP Topology Change Mechanism
- PVRST Implementation Commands
- How to Implement Rapid PVRST
- Verifying PVRST
- Section 2 Review
- Implementing MSTP
- Multiple Spanning Tree Protocol
- MST Regions
- Extended System ID in Bridge ID Field
- Interacting Between MST Regions and 802.1D
- Configuring MSTP
- Verifying MSTP
- Section 3 Review
- Configuring Link Aggregation with EtherChannel
- EtherChannel

- Dynamic Trunk Negotiation Protocols
- EtherChannel Configuration Commands
- Configuring Layer 2 EtherChannel
- Configuring Layer 3 EtherChannel
- Verifying EtherChannel
- Guidelines for Configuring EtherChannel
- EtherChannel Guidelines
- EtherChannel Load Balancing
- Configuring EtherChannel Load Balancing
- Section 4 Review
- Module 11 - Wireless LANs
- Introducing WLANs
- Wireless Data Technologies
- Wireless LAN (WLAN)
- WLAN Evolution
- What Are WLANs?
- Similarities Between WLAN & LAN
- Differences Between WLAN & LAN
- Section 1 Review
- Describing WLAN Topologies
- WLAN Topologies
- WLAN and LAN
- Service Set Identifier (SSID)
- WLAN Access Topology
- Wireless Repeater Topology
- Workgroup Bridge Topology
- Alternative Peer-to-Peer Topology
- Service Sets and Modes
- Roaming Through Wireless Cells
- Client Roaming
- Layer 2 vs. Layer 3 Roaming
- Wireless VLAN Support
- Enterprise Voice Architecture
- Wireless Mesh Networking
- Adaptive Wireless Path Protocol (AWP)
- Wireless Mesh Networking
- Key Market Segments for Outdoor Wireless
- Section 2 Review
- Explaining WLAN Technology and Standards
- Unlicensed Frequency Bands
- Radio Frequency Transmission
- WLAN Regulation and Standardization
- 802.11b Standard
- 2.4-GHz Channels
- 2.4-GHz Channel Use
- 802.11b/g (2.4 GHz) Channel Reuse

- 802.11b Access Point Coverage
- 802.11a Standard
- 802.11g Standard
- 802.11g Protection Mechanism
- 802.11 RF Comparison
- 802.11 Standards Comparison
- Range Comparisons
- Ratified IEEE 802.11 Standards
- Worldwide Availability
- General Office WLAN Design
- Why WLAN Security?
- WLAN Security Threats
- Mitigating the Threats
- Evolution of WLAN Security
- Wireless Client Association
- WPA and WPA2 Authentication
- WPA and WPA2 Encryption
- WLAN Security Summary
- Security Evaluation
- Section 3 Review
- Configuring Cisco WLAN Clients
- Cisco 802.11a/b/g WLAN Client Adapters
- Client Adapter Installation Wizard
- Cisco ADU Installation
- Install Cisco Aironet Site Survey Utility
- Choose Configuration Tool
- ADU Main Screen
- Advanced Status Information
- ADU: Main Profile Screen
- ADU: General Settings
- ADU: Security Settings
- ADU: Advanced Settings
- ADU Diagnostics: Advanced Statistics
- ADU Diagnostics: Adapter Information
- ADU Troubleshooting
- Cisco Aironet System Tray Icon
- Cisco Aironet Site Survey Utility
- Windows XP WLAN Configuration
- Comparison of Windows XP and Cisco ADU
- Aironet Client Administration Utility (ACAU)
- Aironet Configuration Administration Utility
- Cisco Wireless IP Phone
- Cisco Compatible Extensions
- Cisco Compatible Extensions Features
- Cisco Compatible Extensions Program
- Section 4 Review

- Implementing WLANs
- Cisco WLAN Implementation
- Autonomous WLAN Solution
- Lightweight WLAN Solution
- Lightweight Access Point Protocol
- LWAPP
- Association of Access Point to WLAN Controller
- Cisco Aironet WLCs
- Comparison of the WLAN Configuration
- WLAN Components
- Cisco Unified Wireless Network
- Cisco Aironet Access Points and Bridges
- Power over Ethernet (PoE)
- PoE Delivery
- Midspan Power Injection
- Power-Sourcing Equipment
- PoE Switch
- PoE Switch Port Status
- Antenna Concepts
- Antenna Theory
- Omnidirectional Antenna: Dipole
- Directional Antenna
- Connectorized 5-GHz Antennas
- Cisco Access Point/Bridge Antennas
- Multipath Distortion
- Section 5 Review
- Configuring WLANs
- Autonomous Access Point Configuration
- Autonomous Access Point IP Address
- Role of Autonomous Acess Points in a Radio Network
- Access Point Homepage
- Express Setup
- Lightweight WLAN Controller Configuration
- Lightweight WLAN Controller Interfaces
- WLAN Controller Boot Menu
- CLI Wizard Configuration Tool
- WLAN Controller CLI Commands
- Section 6 Review
- Module 12 - Configuring Campus Switches to Support Voice
- Planning for Implementation of Voice in a Campus Network
- Benefits of a Converged Network
- Describing VoIP Network Components
- Characteristics of Voice and Data
- Describing VoIP Call Flow
- Auxiliary VLANs
- QoS Basics

- High Availability for VoIP
- Power Requirements in Support of VoIP
- Section 1 Review
- "Accommodating Voice Traffic on Campus Switches"
- QoS and Voice Traffic in the Campus Model
- LAN-Based Classification and Marking
- Layer 2 Marking: 802.1p, CoS
- Layer 3 Marking: IP Precedence, DSCP
- Classification Tools: Trust Boundaries
- Configuring a Switch for Attachment of a Cisco IP Phone
- Switch Commands to Support Attachment of a Cisco IP Phone
- Configuration Example
- Cisco AutoQoS
- Configuring Cisco AutoQoS
- Configuring Cisco AutoQoS: Cisco Catalyst OS
- Configuring Cisco AutoQoS: Native OS
- Monitoring Cisco AutoQoS
- Automation with Cisco AutoQoS
- Section 2 Review
- Module 13 - Minimizing Service Loss and Data Theft in a Campus Network
- Understanding Switch Security Issues
- Overview of Switch Security
- Rogue Access Points
- Switch Attack Categories
- MAC Flooding Attack
- Port Security
- Configuring Port Security on a Switch
- Verifying Port Security
- Port Security with Sticky MAC Addresses
- AAA Network Configuration
- Authentication Methods
- 802.1x Port-Based Authentication
- Configuring 802.1x
- Section 1 Review
- Protecting Against VLAN Attacks
- Explaining VLAN Hopping
- VLAN Hopping with Double Tagging
- Mitigating VLAN Hopping
- Types of ACLs
- Configuring VACLs
- Private VLANS
- PVLAN Port Types
- Configuring PVLANs
- Configuring PVLAN Ports
- Section 2 Review
- Protecting Against Spoof Attacks

- DHCP Spoof Attacks
- DHCP Snooping
- Securing Against DHCP Snooping Attacks
- Verifying DHCP Snooping
- IP Source Guardv
- Configuring IP Source Guard on a Switch
- ARP Spoofing
- Dynamic ARP Inspectionv Configuring DAI
- Protection from ARP Spoofing
- Section 3 Review
- Describing STP Security Mechanisms
- Protecting the Operation of STP
- Enabling & Verifying BPDU Guard
- Describing BPDU Filtering
- Describing Root Guard
- Describing Root Guard Configuration Commands
- Verifying Root Guard
- Section 4 Review
- Preventing STP Forwarding Loops
- Unidirectional Link Failure Loop Guard
- Before Loop Guard
- With Loop Guard
- UDLD and Loop Guard Configuration Commands
- Configuring UDLD
- Resetting and Verifying UDLD
- Configuring Loop Guard
- Comparing Loop Guard and UDLD
- Section 5 Review
- Securing Network Switches
- Describing Vulnerabilities in CDP
- Describing Vulnerabilities in the Telnet Protocol
- Describing the Secure Shell Protocol
- Describing vty ACLs
- Describing Commands to Apply ACLs
- Best Practices: Switch Security
- Section 6 Review
- Course Closure