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Cisco CCNA Wireless Certification



Course Outline

Module 1: Wireless Fundamentals

Lesson 1: Explain Wireless Fundamentals

- Wireless Topologies
- Ad Hoc Networks
- Wi-Fi Direct
- Piconets
- Bluetooth
- iBeacon
- Near Field Communication
- ZigBee
- Infrastructure Mode
- Service Set Identifiers
- Workgroup Bridges
- Repeaters
- Outdoor Wireless Bridges
- Outdoor Mesh Networks
- Cordless Phones
- Other Non-802.11 Radio Interferers
- Summary

Lesson 2: Describe RF Principles

- RF Spectrum
- Frequency
- Wavelength
- Amplitude
- Free Path Loss
- Absorption
- Reflection
- Multipath
- Scattering and Diffusion
- Refraction

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Line of Sight

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- Fresnel Zone
- RSSI and SNR and SNIR
- Summary

Lesson 3: Understand RF Mathematics

- Watts, Milliwatts, and Decibels
- Decibel Referenced to 1 Milliwatt
- Calculations Using the Rules of 3 and 10
- Decibel Referenced to Isotropic Antenna
- Effective Isotropic Radiated Power
- Discovery 1: Practice RF Math
- Answer Key: Practice RF Math
- Summary

Lesson 4: Describe Antenna Characteristics

- RF Antenna Principles
- Common Antenna Types
- Omnidirectional Antennas
- Directional Antennas
- Antenna Connectors
- Attenuators and Amplifiers
- Lightning Arrestors
- Splitters
- Antennas and EIRP
- Discovery 2: Calculate EIRP and Choose the Correct Antenna
- Answer Key: Calculate EIRP and Choose the Correct Antenna
- Summary

Lesson 5: Describe the Basics of Spread Spectrum

- Spread Spectrum Transmission Technologies
- Frequency Spectrums
- Channel Width and Overlap
- Discovery 3: Explore the RF Spectrum
- Summary

Lesson 6: Describe Wireless Media Access

- Wireless Frame Transmission
- Management Frames: Discovering the Network
- Control Frames: Improving the Network
- Data Frames Using the Connection
- Discovery 4: Analyze Wireless Frames
- Answer Key: Analyze Wireless Frames
- Summary

Lesson 7: Describe Wireless Governance

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- IEEE Wireless Standards
- WiFi Alliance

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- Regulatory Bodies
- European Telecommunication Standards Institute
- 802.11 Standards for Channels and Data Rates
- 802.11a Protocol
- 802.11n Protocol
- 802.11ac Protocol
- Common WiFi Benefits of 802.11n/ac
- 802.11b/g/n/ac Coexistence
- Summary

Lesson 8: Module Summary

Lesson 9: Module Self-Check

Module 2: Security and Client Access

Lesson 1: Describe Wireless Security Components

- WiFi Security Issues
- Authentication and Encryption
- Key Management
- Summary

Lesson 2: Explain 802.11 Security

- Authentication
- Encryption
- Additional Security Measures
- Summary

Lesson 3: Explain 802.1X/EAP Framework

- IEEE 802.1x and Its Components
- Summary

Lesson 4: Describe EAP Authentication

- Certificates and Digital Signatures
- PKI Terminology and Components
- PKI in the WLAN
- EAP-Transport Layer Security
- Protected Extensible Authentication Protocol
- EAP-FAST
- Summary

Lesson 5: Describe WPA and WPA2 Security

- WPA Authentication Modes
- Discovery 5: Review Centralized Authentication
- Answer Key: Review Centralized Authentication
- Summary

Lesson 6: Provide Guest Access

- Authentication Methods
- Local Web AuthenticationLWA
- Summary

Lesson 7: Native Operating Systems for WLAN Connectivity



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- Windows 7 Configuration
- WLAN AutoConfig Service Scan Logic
- Windows 8.1 Configuration
- Mac OS X Configuration
- Summary

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Lesson 8: Configure Smart Handheld Clients

- Configure Apple iOS Handheld Devices
- Configure Google Android 4.4 Clients
- Summary

Lesson 9: Module Summary Lesson 10: Module Self-Check

Module 3: Define the Cisco Wireless Network Architecture

Lesson 1: Define Cisco Wireless Network Deployment Options

- Cisco Unified Access Architecture
- Summary

Lesson 2: Define One Management

- Cisco Enterprise and Cloud Managed Unified Access
- Cisco Prime Infrastructure
- Meraki Cloud Based Management
- Summary

Lesson 3: Define One Policy

- Cisco ISE Personas
- ISE Licensing Model
- Summary

Lesson 4: Define the Cisco One Network

- Wireless Controllers as a Function
- Appliance Based Wireless Controllers Products
- AireOS Controllers
- Meraki Cloud Managed Indoor Access Points
- Cisco Aironet Access Points
- Summary

Lesson 5: Mobility Architecture Concepts

- Understanding the Cisco WLAN Architecture
- Summary

Lesson 6: Optimize RF Conditions and Performance for Clients

- Radio Resource Management and RF Groups
- Cisco CleanAir
- Band Select
- Cisco ClientLink
- Summary

Lesson 7: Describe Layer 2 Infrastructure Support

- Mapping SSIDs to VLANs
- Describe Link Aggregation for AireOS and IOS-XE WLCs
- Summary

Lesson 8: Describe Protocols Used in Wired Infrastructure to Support Wireless

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- Function of Dynamic Host Configuration Protocol
- Function of Domain Name Services
- Function of Network Time Protocol
- Function of Authentication Authorization and Accounting
- Function of Management Protocols
- Control and Provisioning of Access Points
- Summary

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Lesson 9: Module Summary Lesson 10: Module Self-Check

Module 4: Implement Centralized Wireless Access

Lesson 1: Initialize a Centralized WLC

- Centralized WLC Deployment and ConfigurationCentralized with AireOS WLC
- WLC Command Line Interface
- WLC AireOS CLI Setup Wizard
- WLC AireOS GUI Setup Wizard
- WLAN Express Setup (WES)
- WLC Advanced Menu Tabs
- Controller Ports, Interfaces, and Mapping
- Interfaces
- Prime Infrastructure 2.2 and the WLC
- Summary

Lesson 2: Describe AP Initialization

- Explain the AP Discovery Process
- Explain Universal AP Priming
- AP Failover Process
- AP Failover Priority
- Explain High Availability
- AP Modes of Operation
- Discovery 6: Initialize a Centralized WLAN Deployment
- Summary

Lesson 3: Explore Additional WLC Features

- Explain and Configure Client Link
- Summary

Lesson 4: Implement IPv6 in a Cisco Wireless Environment

- IPv6 Addressing Overview
- IPv6 Bridge Mode
- IPv6 Client Mode
- IPv6 in Infrastructure Mode
- Other IPv6 Services on the WLC
- Summary

Lesson 5: Configure Client Access

- WLAN Open Authentication
- WLAN PSK Authentication
- WLAN EAP and RADIUS Authentication
- WLAN WebAuth Authentication
- Summary

Lesson 6: Implement Roaming in the Centralized Architecture

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- Intra-Controller or Inter-Controller Roaming
- Mobility Groups
- Layer 2 Dynamic Roaming in a Centralized AireOS Deployment
- Layer 3 Dynamic Roaming in a Centralized AireOS Deployment
- Roaming with Mobility Anchors
- Summary

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Lesson 7: Module Summary Lesson 8: Module Self-Check

Module 5: Implement Converged Wireless Access

Lesson 1: Initialize a Converged WCM

- WLC/WCM CLI Initialization
- Catalyst 3850/3650 Switches GUI Setup and Configuration
- Web GUI Setup for Wired Network
- Wireless Web GUI
- Switch Ports, Interfaces, and Mapping
- Cisco Prime Infrastructure Management of WLCs/WCMs
- Summary

Lesson 2: Describe AP Connectivity

- Access Point Connectivity
- Unsupported Features of Converged WCMs
- License Requirements of Converged WCMs
- Summary

Lesson 3: Explore Additional Wireless Features

- Review and Configure Client Link
- Review and Configure Band Select
- Local Profiling and Local Policies
- Summary

Lesson 4: Configure Client Access

- WLAN Open Authentication
- WLAN PSK Authentication
- Local-EAP Authentication
- WLAN Local-EAP Authentication
- Configuration of RADIUS Authentication
- WebAuth Authentication
- Summary

Lesson 5: Implement Roaming in the Converged Architecture

- Converged MobilityOverview
- Describe L2/L3 Roaming
- WebAuth Deployments
- Design and Scaling Best Practices
- Mobility Deployment ModelsCentralized with AireOS WLC or IOS-XE WLC
- Summary

Lesson 6: Module SummaryThis lesson includes these topics:Lesson 7: Module Self-Check

Module 6: Implement Small and Remote Wireless Access

Lesson 1: Overview of the FlexConnect Architecture

Overview of FlexConnect

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- FlexConnect Groups
- FlexConnect Requirements
- Configure Client Access
- Summary

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Lesson 2: Overview of the Autonomous Architecture

- Autonomous AP Management Options
- Autonomous AP Initialization
- Autonomous AP Configuration
- Explore Additional Autonomous AP Features
- Summary

Lesson 3: Overview of the Cloud Architecture

- Overview of the Cloud Products
- Infrastructure Requirements for Cloud APs
 - Cloud AP Initialization
 - Cloud AP Management
 - RF/802.11 Access
 - Client Access
 - Summary

Lesson 4: Module Summary Lesson 5: Module Self-Check

Module 7: WLAN Maintenance and Troubleshooting

Lesson 1: Describe Wireless Maintenance

- Licensing Options
- Image Updates Methods
- Backup and Restore Process
- Summary

Lesson 2: Explain Troubleshooting Tools

- Overview of Third-Party Tools
- Cisco Troubleshooting Tools
- Summary

Lesson 3: Describe Troubleshooting Methodology

- Overview of Troubleshooting Techniques
- Overview of Best Practices
- Common Wireless Issues
- Summary

Lesson 4: Module Summary Lesson 5: Module Self-Check

Module 8: WLAN Design

Lesson 1: Predictive WLAN Design Process

- Predictive WLAN Design Process Overview
- Summary

Lesson 2: WLAN Site Survey Process

- Off-Premise Predictive Site Surveys
- Initial Walk Through
- Pre Deployment Site Survey: Active Site Survey

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- Post-Deployment Survey
- Summary

Lesson 3: Module Summary

References

Lesson 4: Module Self-Check