



Cisco Training - HD Telepresence

IUWNE: Implementing Cisco Unified Wireless Networking Essentials v2.0 (IUWNE)

Install, configure and troubleshoot Cisco WLANs and prepare for the CCNA Wireless certification

\$3,295.00

- 5 Days
- Promotional and package discounts may apply

Upcoming Dates

Course Description

Implementing Cisco Unified Wireless Networking Essentials (IUWNE) v2.0 is a five-day instructor-led course that is designed to help students prepare for the CCNA®_ wireless certification, an associate-level certification specializing in the wireless field. The goal of the course is to provide students with information and practice activities to prepare them to help design, install, configure, monitor, and conduct basic troubleshooting tasks for a Cisco wireless LAN (WLAN) in small and medium-size business (SMB) and enterprise installations. This course provides entry-level information, and it does not specialize in any of the advanced features of the Cisco WLAN network solutions.

Course Outline

Module 1: Wireless Fundamentals

Lesson 1: Describing Wireless Networks and Topologies

- Wireless Today
- Wireless Usage and Topologies
- Ad Hoc Networks
- Infrastructure Mode
- Service Set Identifiers
- Workgroup Bridge
- Repeaters
- Outdoor Wireless Bridges
- Outdoor Mesh Networks

Lesson 2: Describing WLAN RF Principles

- RF Spectrum
- Frequency
- Wavelength
- Amplitude
- Free Path Loss
- Absorption
- Reflection
- Multipath

- Scattering
- Refraction
- Line of Sight
- Fresnel Zone
- RSSI and SNR

Lesson 3: Describing RF Mathematics

- Watts, Milliwatts, and Decibels
- Decibel Referenced to 1 Milliwatt
- Decibel Referenced to Isotropic Antenna
- Effective Isotropic Radiated Power

Lesson 4: Describing Antennas

- Antenna Principles
- Polarization
- Diversity
- Antenna Types
- Omnidirectional Antennas
- Directional Antennas
- Antenna Accessories: Connectors
- Attenuators and Amplifiers
- Lightning Arrestors
- Splitters

Lesson 5: Describing Spread Spectrum Technologies

- Spread Spectrum Concept
- DSSS: Encoding
- DSSS Modulations: DBPSK and DQPSK
- DSSS Modulation: CCK
- Orthogonal Frequency-Division Multiplexing
- OFDM Modulations: BPSK and QPSK
- OFDM Modulations: QAM
- Channels and Overlapping Issues

Lesson 6: Describing Wireless Regulation Bodies, Standards, and Certifications

- IEEE Wireless Standards
- Wi-Fi Alliance
- Regulatory Bodies
- 802.11d Protocol
- IEEE 802.11 Family of Protocols
- 802.11 Standards for Channels and Speeds
- 802.11 Original Protocol
- 802.11b Protocol
- 802.11g Protocol
- 802.11b and 802.11g Coexistence
- 802.11a Protocol
- 802.11n Protocol
- 802.11n Components
- 802.11n Channel Aggregation
- 802.11n MAC Efficiency
- 802.11n MIMO: Spatial Multiplexing

- 802.11n MIMO: Transmit Beamforming
- 802.11n MIMO: MRC
- 802.11n MIMO Benefits
- Cisco Enhancements to 802.11n
- Getting the Desired Throughput

Lesson 7: Examining Wireless Media Access

- Sending Data Frames
- Frame Format and Speeds
- Management Frames: Discovering the Network
- Management Frames: Connecting
- Management Frames: Managing the Connection
- Control Frames: Improving the Connection
- Power-Save Mode

Lesson 8: Examining Non-802.11 Wireless Technologies and Their Impact on WLANs

- Bluetooth
- Cordless Phones
- ZigBee
- Other Non-802.11 Radio Interferers
- WiMax Technology

Lesson 9: Reviewing the Wireless Frame Journey: End to End

- Journey of a Wireless Frame
- VLANs
- VLAN Operation
- Trunking with 802.1Q
- Native VLANs
- Configuring VLANs and Trunks
- VLAN Membership Modes

Lesson 10: Identifying Design and Site-Survey Considerations

- Building Materials and Interference
- Sources of Interference
- Cisco CleanAir Technology
- Cells and Usage

Module 2: Basic Cisco WLAN Installation

Lesson 1: Understanding Cisco Unified Wireless Network Basic Architecture

- Cisco Unified Wireless Network Basics
- CAPWAP Fundamentals
- CAPWAP Benefits
- Cisco Unified Wireless Network Hardware Components
- Cisco Unified Wireless Network Hardware: Access Points
- Cisco Unified Wireless Network Hardware: Controllers
- Cisco Unified Wireless Network Management Layer

Lesson 2: Configuring a Controller

- Controller Ports and Interfaces

- Controller Initial Setup
- CLI Wizard Configuration Tool
- Web Wizard Configuration Tool
- Controller Web Interface
- Example Configuration
- Controller Files

Lesson 3: Discovering and Associating with a Controller

- CAPWAP Layer 3 Mode
- AP CAPWAP Discovery Phase
- AP CAPWAP Join Order
- Configuration Phase
- Differences Between LWAPP and CAPWAP
- Design Precautions

Lesson 4: Describing Access Point Operational Modes

- Access Point Mode
- AP Local Mode
- AP Monitor Mode
- AP Sniffer Mode
- AP Rogue Detector Mode
- AP Bridge Mode
- AP SE-Connect Mode
- H-REAP Mode
- OEAP Mode

Lesson 5: Roaming

- Mobility Groups
- Roaming Concepts
- Cisco Wireless Layer 2 Roaming
- Layer 3 Roaming
- Mobility Anchor
- Static IP Tunneling

Lesson 6: Managing the Network from the Controller

- Controller Monitor Page
- Managing APs
- Monitoring and Managing Rogues
- Monitoring and Managing Clients
- DHCP Service

Lesson 7: Configuring and Migrating Standalone Access Points

- Connecting and Managing a Standalone Access Point
- Standalone Access Point Express Setup and Security
- Converting a Standalone AP Using an Upgrade Tool Utility
- Converting an AP to CAPWAP Using Cisco WCS

Module 3: Wireless Clients

Lesson 1: Using Default Configuration Tools

- Client WLAN Configurations
- Network Profile
- Intel PROSet
- Mac AirPort Extreme Configuration Utility
- Windows WLAN AutoConfig Service
- Apple iOS and Google Android Clients

Lesson 2: Configuring the Cisco AnyConnect Secure Mobility Client

- Cisco AnyConnect
- System Licensing
- Installing Cisco AnyConnect
- Configuring a Profile Using the Cisco AnyConnect Mobility Client: PSK Authentication
- Using DART

Lesson 3: Understanding the Cisco Compatible Extensions Program

- Cisco Compatible Extensions Program
- Cisco Compatible Extensions Examples
- Cisco Compatible Extensions Features and Versions Summary

Module 4: WLAN Security

Lesson 1: Describing WLAN Security Components

- Authentication and Encryption
- Authentication
- Encryption
- Key Management
- Cisco IPS for Wireless
- Management Frame Protection

Lesson 2: Establishing IEEE 802.11 Security

- Open Authentication
- WEP Authentication
- MAC Filtering

Lesson 3: Centralizing WLAN Authentication:

- IEEE 802.1X
- Extensible Authentication Protocol
- Sources of Authentication: RADIUS
- Local EAP

Lesson 4: Describing EAP Authentications

- Certificates
- Public Key Infrastructure
- EAP-Transport Layer Security
- EAP-Flexible Authentication via Secure Tunneling
- Protected Extensible Authentication Protocol
- LEAP and Other EAP Types

Lesson 5: Managing Authentication and Encryption Through WPA and WPA2

- Wi-Fi Protected Access
- WPA Authentication
- WPA Encryption
- WPA2 and 802.11i
- WPA, WPA2, and 802.11i Comparison
- Key Caching

Lesson 6: Configuring Wireless Security on Controllers and Clients

- Security Options
- IEEE 802.1X
- WPA and WPA2
- Client Configuration
- Web Authentication

Module 5: Cisco WCS Basics

Lesson 1: Introducing Cisco WCS and Cisco WCS Navigator

- Cisco WCS Position in the Management Layer
- Cisco WCS License Systems and Versions
- Cisco WCS Navigator

Lesson 2: Navigating the Cisco WCS Interface

- Log In to Cisco WCS and Discover the Interface
- Administration Menu
- Manage Background Tasks
- Manage Passwords and Understand How Users Are Grouped and Created
- Configure Cisco WCS Logs
- Configure Cisco WCS Files and Settings
- Define Alarm Frequency and Preferences

Lesson 3: Working with Controllers from Cisco WCS

- Adding Controllers
- Configure the Controller
- Configure APs

Lesson 4: Working with Preconfigured Maps

- Add, Relocate, and Remove Access Points
- Display Heat Maps
- Display Client Locations

Lesson 5: Monitoring the Network with Cisco WCS

- Customizing the Monitor Page
- Displaying the Alarm Dashboard
- Using Alarms to Display Events and Track Devices
- Generating Reports in Cisco WCS

Lesson 6: Working with Cisco CleanAir in Cisco WCS

- Cisco CleanAir Technology
- Cisco CleanAir Concepts
- Modes of Operation for Cisco CleanAir APs
- Configuring Cisco CleanAir on the WLC
- View Cisco CleanAir Zones on a Map in Cisco WCS

Module 6: WLAN Maintenance and Troubleshooting

Lesson 1: Maintaining the System

- Saving and Restoring Cisco WLC Configuration Files
- Cisco WLC Configuration Backup
- Cisco WLC Code Upgrade
- Management Access Methods

Lesson 2: Troubleshooting a Wireless Network

- Layer 2 and Layer 3 Troubleshooting
- Common Connectivity Issues
- Visual Elements
- Third-Party Tools
- Logs and SNMP
- Useful show and debug Commands
- Monitoring Pages and Alarm Dashboard
- Cisco WCS Client Troubleshooting
- Cisco WCS Client Troubleshooting Tool

Labs:

- Lab 1-1: Becoming Familiar with Antennas and Ranges
- Lab 1-2: Creating an Ad Hoc (IBSS) Network and Analyzing the Communication
- Lab 2-1: Configuring a Cisco 2504 WLC
- Lab 2-2: Downgrading a Controller-Based AP to an Autonomous AP
- Lab 3-1: Configuring Cisco AnyConnect Secure Mobility Client
- Lab 3-2: Experiencing Connections and Roaming
- Lab 4-1: Configuring WLC PSK Authentication
- Lab 4-2: Configuring Cisco Autonomous Access Point PSK Authentication
- Lab 4-3: Configuring EAP-FAST Authentication with WPA
- Lab 4-4: Configuring 802.1Q and Web Authentication
- Lab 5-1: Configuring Controllers and APs from Cisco WCS
- Lab 5-2: Working with Cisco WCS
- Lab 5-3: Monitoring the Network and Containing Devices
- Lab 6-1: Backing Up the Cisco WLC Configuration Files
- Lab 6-2: Troubleshooting
- Lab 6-3 Troubleshooting with Wireshark and Converting an Autonomous AP to WLC Mode

Audience

The primary audience for this course is as follows:

- Network engineers
- Network administrators
- Network managers
- Systems engineers

The primary audience includes individuals who are involved in the technical management of Cisco platforms and solutions, which involves installing, configuring, operating, and troubleshooting. Network planning and design are covered in other Cisco courses. In this course, the target audience will be referred to generically as “technicians.”

Prerequisites

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

[CCNA215: Interconnecting Cisco Networking Devices Part 1 \(ICND1\)](#)

- Cisco CCENT® certification

Learners who are considered for this training will have a basic knowledge of the following:

- The Cisco lifecycle deployment
- The Cisco Service-Oriented Network Architecture (SONA)

It is also recommended that learners considered for this training have a basic knowledge of the following:

- Wireless standards (IEEE)
- Wireless regulator environment (FCC, European Telecommunications Standards Institute [ETSI], and so on)
- Wireless certification organization (Wi-Fi Alliance)

Learners who are considered for this training will have demonstrated competencies (knowledge, skills, and attitudes) equivalent to the following:

- Basic computer literacy, including the use of general office software such as
- Microsoft Word and Microsoft Excel
- Basic Windows navigation and keyboard literacy skills
- Basic Internet usage skills
- Basic email usage skills

What You Will Learn

After completing this course, students will be able to:

- Describe the fundamentals of wireless networks
- Install a Cisco Unified Wireless Network
- Describe and configure a basic wireless client using either the default operating system or Cisco Wireless LAN (WLAN) adapter configuration utilities
- Configure wireless security
- Manage the wireless network with Cisco WCS
- Maintain and troubleshoot a wireless network