CWNA – Certified Wireless Network Administrator

Days: 5

Description: Get a head start right out of the gate with a Certified Wireless Network Administrator (CWNA) certification. It is the base certification for Enterprise Wi-Fi within the CWNP family of certifications and a springboard toward earning your security, design, analysis, and network expert certifications. Achieving it enhances your networking career profile, providing evidence that you have sought after Wi-Fi knowledge and skills.

The goal of this course is to add Wi-Fi expertise to a networking professional's skill set while covering all CWNA-107 exam topics. The course begins with discussion topics and hands-on lab exercises covering the basic operation of 802.11 Wi-Fi technology. Once a base of Wi-Fi knowledge is established, enterprise relevant topics such as Wi-Fi design, security, and troubleshooting are covered. You will use enterprise-class hardware and software tools during live lab exercises, all accessible remotely for any instructor-led or virtual class. As an added bonus, you will receive a free exam voucher.

Course Objectives:

- What You'll Learn attending the Enterprise Wi-Fi Administration course:
- Background and roles of Wi-Fi governing bodies, including the IEEE and Wi-Fi Alliance
- Radiofrequency properties and behaviors
- Wireless signal fundamentals, including measurement principles
- Antenna information, including types and installation best practices
- Wi-Fi standards, including 802.11 extensions ac, ad, af, and ah
- Wi-Fi device types and infrastructure options
- Wi-Fi communications processes, including connection, roaming, and data transfer
- General troubleshooting tips to common real-world 802.11n issues
- Wi-Fi architecture best practices, including both network and wireless design
- Similarities, differences, and peculiarities about Wi-Fi deployments in differing environments (offices, K-12 education, health care facilities, and more)
- Security standards, best practices, known vulnerabilities, and remediation techniques for Wi-Fi networks
- Site surveying, including requirements gathering, design, installation, and validation
- Troubleshooting methodology, tools, and techniques, along with common issues

OUTLINE

WLAN AND NETWORKING INDUSTRY ORGANIZATIONS

- Wi-Fi Related Organizations
- The IEEE
- PHY Amendments
- 802.11 Amendments
- Wi-Fi Alliance
- PoE (802.3)

RF CHARACTERISTICS AND BEHAVIOR

- Electromagnetic Spectrum
- Wavelength, amplitude, and other RF characteristics
- Reflection, refraction, and other RF behavior
- RF Propagation
- Basic Types of Modulation

CWNA – Certified Wireless Network Administrator

RF MATHEMATICS AND MEASUREMENTS

- RF units of measure
- Basic RF mathematics
- RF signal measurements
- Understand link budgets

RF ANTENNAS AND HARDWARE

- RF Units of Measure
- Types of Antennas and Antenna Systems Commonly Used With 802.11 WLANs
- Antenna Polarization and Gain
- Antenna Implementation
- Types of Antenna Cables, Connectors, and Other Accessories

802.11 PHYS AND NETWORK TYPES

- 802.11 PHYs and Network Types
- 802.11 Frequency Bands
- 802.11 Channels Explained
- OSI Model Layers and Wi-Fi
- 802.11 Physical Layers (PHYs)
- Throughput vs. Data Rate
- RF Modulation Methods
- 802.11 Use Case Scenarios
- WLAN Operating Modes including BSS. ESS and Roaming

802.11 NETWORK DEVICES

- Access Point Features and Capabilities
- AP and WLAN Management Systems
- Wireless Monitoring Systems (Analytics)
- WLAN Controller Functionality
- Network Architecture Planes
- WLAN Bridging
- Client Devices
- Client Device OS Configuration

- Power over Ethernet (PoE) Functionality

802.11 MAC OPERATIONS

- 802.11 Frames
- Frame Aggregation
- Guard Interval
- General Frame Format
- PHY Preamble
- Management, Control, and Data Frames
- Locating WLANs

802.11 CHANNEL ACCESS METHODS

- Differences between CSMA/CD and CSMA/CA • Distributed Coordination Function (DCF)
- Network Allocation Vector (NAV)
- Clear Channel Assessment (CCA)
- Interframe Spacing (IFS)
- Contention Window (CW)
- Quality of Service in 802.11 WLANs
- Hybrid Coordination Function (HCF)
- Additional Control Frames and Protection Modes

WLAN NETWORK ARCHITECTURES

- Control, Management, and Data Planes
- WLAN Controller Solutions
- Network Architectures
- RF Channel Planning
- Service Set Configurations
- Cell Sizing and Interference

WLAN REQUIREMENTS AND SOLUTIONS

- Explore WLAN Deployment Scenarios
- BYOD and Guest Access
- Mobile Device Management
-

CWNA – Certified Wireless Network Administrator

- Radio Resource Management (RRM) and other automatic RF management solutions
- Additional Management Features

SECURITY SOLUTIONS FOR WLANS

- Additional Authentication Features
- Deprecated Standard Security
- Weak Security Mechanisms
- Pre-shared Key and IEEE 802.1X/EAP
- Wireless Intrusion Prevention Systems (WIPS) • Protocol and Spectrum Analysis for Security
- Using Secure Protocols

SITE SURVEYS, NETWORK DESIGN, AND VALIDATION

- Survey Processes
- Understanding Requirements
- Verify Design Requirements
- Documentation
- Locating Interference
- Spectrum Analysis
- Application and Throughput Testing
- Protocol Analysis

WLAN TROUBLESHOOTING

- CWNP Troubleshooting Methodology
- Protocol Analysis Troubleshooting Features
- Spectrum Analysis Troubleshooting Features
- RF Interference
- Hidden Nodes
- Connectivity Problems

CLASSROOM LIVE LAB

REMOTE LAB FAMILIARIZATION

- Overview

- Task 1: Navigate the GigaWave Remote Lab
- Task 2: Navigate the Interactive Diagram Page
- Task 3: Closing the Lab

LAB 1: VISUALIZING RF PRINCIPLES

- Activity Objective
- Visual Objective
- Required Resources
- Task 1: Prepare the Client Laptop in the Remote Lab
- Task 2: Use Ekahau to visualize Free Space Path Loss
- Task 3: Use Ekahau to Visualize Attenuation
- Task 4: Closing the Lab

LAB 2: RF MATHEMATICS

- Activity Objective
- Required Resources
- Task 1: Complete These Power Conversions
- Task 2: Calculate EIRP
- Task 3: Calculate a Link Budget

LAB 3: VISUALIZING ANTENNA PATTERNS

- Activity Objective
- Required Resources
- Task 1: Open the FSPL File in Ekahau
- Task 2: Use Various 2.4 Antenna and Observe the Change in RF Coverage
- Closing the Lab

LAB 4: 802.11 BASICS

- Activity Objective
- Task 1: Analyze Wireless Frames
- Task 2: Closing the Lab

CWNA – Certified Wireless Network Administrator

LAB 5: INITIALIZE AN AUTONOMOUS WLAN DEPLOYMENT

- Activity Objective
- Task 1: Configure an Autonomous AP via CLI
- Task 2: Configure Your Standalone AP from the GUI
- Task 3: Closing the Lab

LAB 6: CONFIGURE SECURITY ON AUTONOMOUS AP WLAN DEPLOYMENT

- Activity Objective
- Task 1: Configure the Autonomous AP for PSK
- Task 2: Configure Windows 7 Client to Connect to the Pod-X-Auto Using PSK
- Task 3: Add a Local Radius Client to the Autonomous AP
- Task 4: Configure Local RADIUS Server on the Autonomous AP
- Task 5: Configure an SSID for Local EAP on the Autonomous AP
- Task 6: Configure the Windows Supplicant
- Task 7: Closing the Lab

LAB 7: CONFIGURING THE WLC CENTRAL SWITCH WLAN DEPLOYMENT

- Activity Objective
- Task 1: Prepare the Client Laptop in the Remote Lab
- Task 2: Review and Modify Management Access
- Task 3: Review AP Status
- Task 4: Configure a WLAN
- Task 5: Associate the Client
- Task 6: Disassociate the Client
- Task 7: Closing the Lab

LAB 8: CONFIGURING SECURITY IN A CENTRALIZED WLAN DEPLOYMENT

- Activity Objective
- Task 1: Configure the Data WLAN for PSK
- Task 2: Configure the Wireless Client to Connect to the PSK WLAN
- Task 3: Modify the WLAN to Support WPA2 with 802.1X Authentication
- Task 4: Configure the Client and Access the Network
- Task 5: Modify the WLAN to Support WebAuth
- Task 6: Create a Local Net User
- Task 7: Connect the Client to the WebAuth WLAN
- Task 8: Closing the Lab

LAB 9: IMPLEMENT A WLC LOCAL SWITCH WLAN DEPLOYMENT

- Activity Objective
- Task 1: Configure the Controller
- Task 2: Connect to the WLAN
- Task 3: Closing the Lab

LAB 10: CONFIGURE SECURITY ON A CLOUD WLAN DEPLOYMENT

- Activity Objective
- Task 1: Implement PSK Authentication on a Cloud WLAN Deployment
- Task 2: Implement Local EAP-PEAP on a Cloud WLAN Deployment
- Task 3: Implement WebAuth on a Cloud WLAN Deployment
- Task 4: Disable SSIDs on the Cloud WLAN Deployment

CWNA – Certified Wireless Network Administrator

LAB 11: PERFORM WI-FI SCANNING

- Activity Objective
- Topology
- Task 1: Enable Metageek insider
- Task 2: Review 2.4 GHz Activity
- Task 3: Review 5 GHz Activity
- Task 4: Close the Lab

LAB 12: PERFORM A PREDICTIVE WLAN DESIGN

- Activity Objective
- Task 1: Familiarization with Ekahau Site Survey Pro + Planner
- Task 2: Perform a Basic Predictive WLAN Design using a Single Floor Layout
- Task 3: Closing the Lab

LAB 13: PERFORM PASSIVE SITE SURVEY

- Activity Objective
- Task 1: Configure AP for Spectrum Expert AP Mode of Operation
- Task 2: Configure Cisco Spectrum Expert – Spectrum Analyzer Software
- Task 3: Closing the Lab