Certified Wireless Network Administrator (CWNA)

Zetlan Technologies

Online Course

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Course Modules

1. WLAN and Networking Industry Organizations

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

2. RF Characteristics and Behavior

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

3. RF Mathematics and Measurements

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

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4. RF Antennas and Hardware

- RF Units of Measure
- Typs of Antennas & Antenna Systms Cmnly Usd Wth 802.11 WLANs
- Antenna Polarization and Gain
- Antenna Implementation
- Types of Antenna Cables, Connectors, and Other Accessories

5. 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

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6.802.11 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

7.802.11 MAC Operations

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

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8.802.11 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

9.WLAN Network Architectures

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

10. WLAN Requirements and Solutions

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

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11. Security Solutions for WLANs

- Additional Authentication Features
- Deprecated Standard Security
- Weak Security Mechanisms
- Pre-shared Key and IEEE 802.1X/EAP
- WPA3-Simultaneous Authentication of Equals (SAE)
- WPA3 Opportunistic Wireless Encryption (OWE)
- 6GHz 802.11ax Security Requirements
- Wireless Intrusion Prevention Systems (WIPS)
- Protocol and Spectrum Analysis for Security
- Using Secure Protocols

12. Site Surveys, Network Design and Validation

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

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13. WLAN Troubleshooting

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

LAB

14. Remote Lab Familiarization

- Overview
- Task 1: Navigate the Sunset Learning Institute Remote Lab
- Task 2: Closing the Lab

15. Lab 1: Visualizing RF Principles

- Activity Objective
- Task 1: Download files to the Pod-AdminPC in the Remote Lab.
- Task 2: Use Ekahau Pro to visualize Free Space Path Loss
- Task 3: Use Ekahau Pro to Visualize Attenuation
- Task 4: Closing the Lab

16. Lab 2: RF Mathematics

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

17. Lab 3: Visualizing Antenna Patterns

- Activity Objective
- Required Resources
- Task 1: Open the FSPL File in Ekahau Pro
- Task 2: Use Various 2.4 Antenna & Observe the Chng in RF Covrge
- Closing the Lab

18. Lab 4: 802.11 Basics

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

19. 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

20. Lab 6: Configuring the WLC Central Switch WLAN Deployment

- Activity Objective
- Task 1: Retrieving the Access Point's MAC Address
- Task 2: Configuring the C9800 using the WLC Setup Wizard
- Task 3: Config an AP MAC Adrs Authorztn Filter on the C9800 Ctrlr
- Task 4: Configuring the Access Points for a Primary C9800 Controller.
- Task 5: Configuring VLANs on the C9800 Controller.
- Task 6: Lab Close Out Procedures

21. Lab 7: Config Security in a Centralized WLAN Deployment

- Activity Objective
- Task 1: Configuring a WPA2-PSK WLAN
- Task 2: Associate the Client with the C9800 WPA2-PSK WLAN
- Task 3: Configuring a WPA2-802.1X Local EAP WLAN
- Task 4: Configuring a WPA2-802.1X Local EAP WLAN (Cont.)
- Task 5: Associate the Client with the C9800 Local-EAP WLAN
- Task 6: Lab Close Out Procedures
- Task 3: Closing the Lab

22. Lab 8: Perform Wi-Fi Scanning

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

23. Lab 9: Perform a Predictive WLAN Design

- Activity Objective
- Task 1: Familiarization with Ekahau Pro
- Task 2: Basic Predictive WLAN Design usg a Sngl Floor Layout
- Task 3: Closing the Lab

24. Lab 10: Perform Passive Site Survey

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

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