Introduction

The CWAP™ certification, covering the current CWAP-402 exam objectives, will certify that the successful candidate understands the frame structures and exchange processes for each of the 802.11 series of standards and how to use the tools that are available for analyzing and troubleshooting today’s wireless LANs. This certification exam will cover the details of these topics and will have a strong inclination towards real-world applicability of this knowledge. The CWAP candidate must have obtained the CWNA certification prior to earning the CWAP certification. When you pass the CWAP-402 exam, you earn credit towards the CWNE certification.

The skills and knowledge measured by this examination are derived from a survey of wireless networking professionals and analyzer product manufacturers from around the world. The results of this survey were used in weighing the subject areas and ensuring that the weighting is representative of the relative importance of the content.

The following chart provides the breakdown of the CWAP exam as to the weight of each section of the exam.

<table>
<thead>
<tr>
<th>Wireless LAN Analysis Subject Area</th>
<th>% Of Exam</th>
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<tbody>
<tr>
<td>Troubleshooting Processes</td>
<td>5%</td>
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<tr>
<td>802.11 Communications</td>
<td>25%</td>
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<tr>
<td>WLAN Hardware</td>
<td>15%</td>
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<tr>
<td>Protocol and Spectrum Analysis</td>
<td>35%</td>
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<tr>
<td>Troubleshooting Common Problems</td>
<td>20%</td>
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<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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CWNP Authorized Materials Use Policy

CWNP does not condone the use of unauthorized 'training materials', aka 'brain dumps'. Individuals who utilize such materials to pass CWNP exams will have their certifications revoked. In an effort to more clearly communicate CWNP's policy on use of unauthorized study materials, CWNP directs all certification candidates to the CWNP Candidate Conduct Policy at:

http://www.cwnp.com/exams/CWNPCandidateConductPolicy.pdf

Please review this policy before beginning the study process for any CWNP exam. Candidates will be required to state that they understand and have abided by this policy at the time of exam delivery. If a candidate has a question as to whether study materials are considered "brain dumps", he/she should perform a search using CertGuard's engine, found here: http://www.certguard.com/search.asp
1.0 Troubleshooting Processes – 5%

1.1 Understand industry and vendor recommended troubleshooting processes and implement the same to resolve common 802.11 wireless networking problems.

1.2 Apply the OSI Model to the troubleshooting processes and problem resolution methods used in 802.11 wireless networks.

1.3 Use the appropriate tools (network analysis tools and operating system tools) to troubleshoot specific problems including no network connectivity, slow network performance, unavailable resources, and unavailable services.

2.0 802.11 Communications – 25%

2.1 Explain the 802.11 communications processes including authentication, association, security negotiation, frame transmission and factors impacting data rates.

2.2 Understand the different WLAN architectures in use and their impact on performance and operations.

2.3 Understand and explain the 802.11 frames including general frame format, management frames, control frames and data frames and how they apply to WLAN analysis.

2.4 Understand and explain the 802.11 PHY header and preamble and the indications for WLAN performance and operations.

3.0 WLAN Hardware – 15%

3.1 Understand client devices and operations including radios, drivers, supplicants and implementations.

3.2 Describe and discover access point (AP) options, configurations and behaviors, including internal and external antennas, Ethernet connections, power options and management options.

3.3 Explain the functionality of WLAN controllers and managers including protocols used, installation locations and supported data communication options.

3.4 Describe and implement WLAN analysis hardware for protocol analysis and spectrum analysis.

3.5 Describe and analyze wired infrastructure hardware including routers and switches as well as servers and services.

4.0 Protocol and Spectrum Analysis – 35%

4.1 Describe the common functionality and features of protocol analyzers.

4.2 Demonstrate the ability to install, configure and use a protocol analyzer to capture and analyze WLAN traffic.

4.3 Demonstrate the ability to use a protocol analyzer to capture the appropriate wired traffic related to WLAN operations.
4.4 Define terminology related to spectrum analysis including SNR, duty cycle, sweep cycles, signal strength, resolution bandwidth and utilization.

4.5 Understand the common functions and features of a protocol analyzer as it relates to WLAN analysis.

4.6 Demonstrate the ability to install, configure and use a PC-based spectrum analyzer to analyze RF activity in an area.

4.7 Recognize RF patterns of common devices including 802.11 devices, Bluetooth devices, microwave ovens, wireless video devices and cordless phones.

5.0 Troubleshooting Common Problems – 20%

5.1 Understand and explain common wired problems that impact the WLAN including DNS, DHCP, switch configuration, WLAN controller access and PoE.

5.2 Demonstrate the ability to troubleshoot wired issues using protocol analyzers, operating system commands and hardware troubleshooting.

5.3 Select the appropriate location for placement of a protocol analyzer on the wired network and use it to troubleshoot common issues including DHCP, DNS and data communications issues.

5.3 Analyze and repair Quality of Service issues on the wired side of the network.

5.4 Recognize and repair common WLAN issues including insufficient capacity, lack of connectivity, interference and QoS problems.

5.5 Diagnose and repair roaming problems including dropped VoIP calls, broken connections and lack of reconnect.

5.6 Understand and repair issues related to WLAN security including authentication, encryption and mobile device management (MDM).

5.7 Recognize and repair common client-side problems including unstable drivers, configuration errors, incompatible supplicants and operating system bugs and vulnerabilities.

CWAP Terms
The following terms should be understood for the CWAP-402 exam:

2.4 GHz
4-way Handshake
5 GHz
802.11a
802.11ac
802.11b
802.11e
802.11g
802.11i
802.11n
802.11w
802.1p
802.1X
Access Category (AC)
AES
AIFS
Analysis
AP
APSD
Association
Authentication
Beacon
CCA
CCMP
Channels
Coding
Contention Window
Control Frame
Controller
CoS
CSMA/CA
Data Frame
DCF
Deauthentication
Decode
Delay
DFS
DHCP
DIFS
Disassociation
DNS
DSCP
DSSS
DTIM
Duty Cycle
EAP
EDCA
Energy Detect
ERP
Frame
Header
HR/DSSS
HT
Jitter
Latency
MAC
Management Frame
Management Frame Protection (MFP)
MCA
MCS
MIMO
Modulation
MPDU
MSDU
NTP
OFDM
OKC
PHY
PLCP
PMD
PMK Caching
Power Save
PPDU
Preamble
Preauthentication
Probe Request
Probe Response
Protected Management Frame (PMF)
Protocol
PSDU
PSMP
QoS
RBW
Real Time FFT
RSSI
RTS/CTS
S-APSD
SCA
SIFS
SISO
Slot Time
SMPS
SNR
Spatial Multiplexing
Spectrum
Sweep Cycle
Swept Spectrograph
ToS
TPC
U-APSD
Utilization
VHT
VoIP
WIPS
WMM
WPA
WPA2