Introduction

The CWDP-302 exam, covering the 2015 CWDP certification objectives, will certify that the successful candidate possesses the skills necessary to design a high-performing, reliable, and secure enterprise WLAN in a broad range of applications. As a professional-level certification, this exam requires a detailed understanding of the material and will test these concepts in depth. Exam CWDP-302 is one of two exams that are required to earn the CWDP certification:

1. Certified Wireless Network Administrator (CWNA)
2. Certified Wireless Design Professional (CWDP)

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

Knowledge Domains	**% of Exam**
Requirements Analysis	20 %
Site Survey Procedures	20 %
WLAN Design	40 %
WLAN Deployment	5 %
Design Validation	15 %
Total	**100%**

In addition to the CWDP-specific knowledge domains, as with all professional level CWNP certifications (CWDP, CWSP and CWAP), CWNA-level knowledge is assumed and testable on the exam.

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

Requirements Analysis – 20%

1.1 Understand the requirements analysis and documentation procedures required to design a WLAN including information gathering, business justification, business requirements, user requirements, technical requirements, regulatory requirements and budgetary procedures.

1.2 Determine the client device types to be used and understand the impact they will have on the WLAN design related to coverage and capacity including laptops, tablets, mobile phones, 802.11 VoIP handsets and additional mobile and non-mobile computing devices such as Internet of Things (IoT).

1.3 Discover the planned applications and document the impact they will have on the WLAN related to coverage and capacity including web-based applications, mobile apps, real-time applications and high data volume applications.

1.4 Define the security requirements of the WLAN including security solutions, BYOD/MDM, guest access, roaming and monitoring.

1.5 Document the physical coverage requirements of the WLAN including common areas, industrial areas, outdoor areas, service areas and guest areas.

1.6 Determine requirements for bridge links and other link types including point-to-point, point-to-multipoint and mesh connections.

1.7 Understand and implement the knowledge require to upgrade existing WLANs including phased upgrades, forklift upgrades, modular upgrades, software upgrades, performance testing, compatibility testing and security testing.

1.8 Discover and document the building factors impacting the WLAN design including building materials, square footage, ceiling heights, multi-floor structures, wiring and power limitations, blueprints and facility access requirements for onsite planning work.

1.9 Demonstrate knowledge of documentation generated as the output of the WLAN requirements analysis processes including scope of work, NDA, hold harmless, network diagrams, site survey deliverables, bill of materials and network design acceptance criteria.

Site Survey Procedures – 20%

2.1 Explain and perform the different types of site surveys commonly used including manual (active and passive), predictive and hybrid.

2.2 Understand and utilize site survey tools including protocol analyzers, spectrum analyzers, site survey software (predictive and manual), throughput testers and various hardware used in the process including laptops, tablets, mobile phones, batteries, APs, PoE injectors, carts and cabling.

2.3 Ensure that proper site survey procedures are followed including gaining access clearance, acquiring floor mappings with application- and user-specific needs notations and approval to perform the site survey.

2.4 Define metrics and other information collected and reported during a site survey including signal metrics (RSSI, SNR, noise floor, interference), cell coverage, application and connectivity data (data rates, throughput, latency, jitter, loss, retries).

2.5 Ensure scenario-specific requirements are met and appropriate plans are in place including arranging escorts, performing training (safety and operations), provisioning equipment (lifts, ladders, tools), meeting access requirements (clearance and badges), single floor versus multiple floor installations, and abiding by industry specific requirements such as union assistance and patient privacy.

2.6 Understand the different methodologies used in site surveys for varying applications and architectures including VoIP, video, data, location services, multiple channel architecture (MCA) and single channel architecture (SCA).

2.7 Explain and perform procedures required for outdoor site surveys including outdoor client access WLANs and bridge links.

WLAN Design – 40%

3.1 Demonstrate a knowledge of WLAN architectures and solutions including management solutions, communication protocols, data forwarding models, scalability, redundancy, encryption methods, controller-based solutions, cloud-based solutions, autonomous solutions, centralized data forwarding, distributed data forwarding and the advantages and limitations of various architectures.

3.2 Plan for RF management including channel usage, MCA and SCA, RRM, solutions for co-channel interference, non-overlapping adjacent-channel interference, overlapping adjacent-channel interference and non-802.11 interference all within regulatory constraints and including client station considerations (interference at client locations, high density of clients, mobile and non-mobile clients).

3.3 Design appropriate 802.11 channel plans including channel widths, frequency bands, output power levels (including DFS and TPC requirements), channel reuse, 802.11n and 802.11ac channels and advanced channel features (80+80, RTS/CTS enhancements, etc.).

3.4 Select access points (APs) and define configuration and installation parameters for them including indoor APs, outdoor APs, internal antennas, external antennas, PoE-powered APs, wall outlet-powered APs, mounting solutions and staging procedures.

3.5 Understand and explain the varied configuration processes for different AP deployment models including MCA, SCA, controller-based, cloud-based, distributed, autonomous and additional models commonly used in modern WLANs.

3.6 Design infrastructure services and connectivity to existing services required to support WLANs including RADIUS services, LDAP connections, DHCP provisioning, PKI implementation, NTP availability, DNS services, firewall configuration, ACL management, RBAC implementation, VLAN management, BYOD/MDM, onboarding and NAC integration.

3.7 Ensure availability of appropriate cabling and power provisioning including backhaul speeds, PoE, redundant connections and connectivity to required services.

3.8 Design branch and remote office WLAN deployments including authentication services, WAN connections, VPNs, split tunnel forwarding and AP selection and configuration.

3.9 Design mesh networks including mesh access networks, mesh backhaul solutions, channel planning, band selection and redundancy.

3.10 Design bridge links including determination of appropriate line of sight (visual and RF), band selection, channel selection, output power levels required, data rate requirements, antenna selection, link budgets, PtP and PtMP links.

3.11 Design for varied client devices including tablets, mobile phones, laptops, stationary devices, supported PHYs, data rates, channels allowed, channel widths, DFS support and receive sensitivity levels.

3.12 Design for varied application types including roaming requirements, latency requirements, data throughput demands, specialty devices (barcode scanners, healthcare devices, ID badges, location tracking systems, wireless cameras) and voice/video.

3.13 Design end-to-end QoS solutions including 802.11 QoS, wired QoS, WMM, airtime fairness, band steering, load balancing, QoS markings and queues.

3.14 Design standard security solutions including RADIUS server selection, EAP type selection, encryption solutions, passphrase-based implementations, and WPS.

3.15 Design advanced security solutions including Per-User PSK (PPSK), VPN implementation, endpoint security, Wireless Intrusion Prevention Systems (WIPS), BYOD/MDM/guest access and onboarding, captive portals, network segmentation and content filtering.

3.16 Given a scenario, plan for secure roaming including 802.11-2012 roaming methods, Opportunistic Key Caching, SCA roaming, preauthentication, PMK caching and preshared key implementations.

3.17 Design WLANs for specific use cases and vertical markets including high-density design, large public venues (LPV), healthcare, education, retail, hospitality, outdoors, public hotspots and government deployments.

3.18 Understand the use of network planning tools including site survey software design features, network diagramming tools, throughput testing tools and link calculation software/spreadsheets.

WLAN Deployment – 5%

4.1 Perform device staging according to organizational policies and design recommendations and install devices according to vendor specifications and the WLAN design.

4.2 Implement channel plans according to the design recommendations including manual channel assignments through controllers, cloud solutions and autonomous configurations. Configure automated channel management features according to common operational method provided by major vendors.

4.3 Configure infrastructure devices where necessary to support the WLAN including routers, DHCP servers, DNS services and switches.

4.4 Understand the basic installation procedures used for different WLAN architectures including controller-based, cloud-managed, distributed, autonomous and virtual controller.

Design Validation – 15%

5.1 Identify the purpose and methods of post-installation site surveys including application validation, coverage assurance, capacity requirements and load handling.

5.2 Describe remediation processes used when validation fails including channel adjustments, output power adjustments, installing additional hardware, removing hardware and changing additional configuration options.

5.3 Understand and use the appropriate tools in the validation process including spectrum analyzers, protocol analyzers, throughput testers and documentation.

5.4 Understand and implement methods for troubleshooting coverage problems, capacity problems, security configuration issues, roaming delays, low data rate clients, QoS failure and client connectivity issues.

