

Certified Wireless IoT Design Professional (CWIDP-402) Objectives

Introduction

When you pass the CWIDP exam and hold a valid CWISA certification, you earn the CWIDP certification and credit towards the CWISE certification should you choose to pursue it.

The Certified Wireless IoT Design Professional (CWIDP) has the knowledge and skill set required to assess and validate wireless IoT solutions. This professional gathers and defines requirements in collaboration with the appropriate stakeholders in order to design wireless IoT networks and related infrastructure with appropriate security considerations.

The skills and knowledge measured by this examination are derived from a Job Task Analysis (JTA) involving wireless networking experts and professionals. The results of this JTA were used in weighing the subject areas and ensuring that the weighting is representative of the relative importance of the content.

Subject matter experts involved in the development of these objectives and/or JTA included:

Mae Lessard, Daniel Koczwar, Scott McNeil, Robert Bartz, Darrell DeRosia, Phil Morgan

The following table provides the breakdown of the exam as to the distribution of questions within each knowledge domain.

Knowledge Domain	Percentage
Assess an Existing IoT Solution	10%
Gather and Define Requirements and Constraints	30%
Design a Wireless IoT Solution to Meet Requirements	40%
Validate and Optimize the Wireless IoT Solution	20%

1.0 Assess an Existing IoT Solution – 10%

1.1 Evaluate an existing IoT implementation and understand its impact on a new wireless IoT deployment

1.2 Use appropriate tools to analyze existing IoT implementations

1.2.1 Protocol analyzers (wired and wireless)

1.2.2 Spectrum analyzers

1.2.3 Network diagrams

1.3 Gather system documentation for the existing IoT solution

1.4 Evaluate operational parameters

1.4.1 Wireless signal coverage

1.4.2 Frequencies used

1.4.3 Functionality (Network servers and services used; Protocols implemented)

1.4.4 Potential impact on new deployments

1.5 Document findings for use in the design of the new wireless IoT solution

2.0 Gather and Define Requirements and Constraints – 30%

2.1 Gather business requirements and constraints

2.1.1 Use cases and justification

2.1.2 Identify coverage areas

2.1.3 Budget and schedule

2.1.4 Architectural and aesthetic constraints

2.1.5 Industry and regulatory compliance

2.1.6 Data/event collection and control requirements

2.1.7 Integration requirements

2.2 Gather technical requirements and constraints

2.2.1 Obtain, create, and validate site plans

2.2.2 Gather and understand environmental characteristics including:

- Signal measurements
- Noise floor
- Attenuation factors
- Interferers
- Signal to Noise Ratio
- Signal to Interference/Noise Ratio

- 2.2.3 Define device and application data requirements for each area
- 2.2.4 Gather and define system requirements
 - Network topology, capacity, and redundancy
 - Wireless IoT architecture
 - IoT technologies aligned with requirements
 - Location services (geofencing, asset tracking, etc.)
 - Duty cycle, power consumption, and energy harvesting requirements
 - Security requirements
 - Environmental requirements
 - Node and tag types and capabilities
 - Device mobility
 - Vendor selection
- 2.2.5 Gather and define operational requirements
 - System monitoring
 - Data collection parameters
 - IoT upgrade requirements, when applicable
- 2.2.6 Gather and define network infrastructure requirements of the planned wireless IoT solution
- 2.2.7 Gather and define cabling infrastructure requirements of the planned wireless IoT solution
- 2.2.8 Document existing wireless systems, designed, and related documentation, when applicable

3.0 Design a Wireless IoT Solution to Meet Requirements – 40%

3.1 Design for selected topologies

- 3.1.1 Mesh
- 3.1.2 PtP (Point to Point)
- 3.1.3 PtMP (Point to Multi-Point)
- 3.1.4 P2P (Peer-to-Peer)
- 3.1.5 Tree
- 3.1.6 Star
- 3.1.7 Cluster tree

3.2 Design for appropriate channel configuration

- 3.2.1 Channel selection
- 3.2.2 Channel and protocol functionality
 - Bandwidth
 - Dwell time
 - Spread factors
 - Superframes
 - Modulation and coding

3.2.3 Blocklist or blocked channels

3.3 Design based on RF requirements and capabilities

- 3.3.1 Use RF measurements and survey tools
- 3.3.2 Use RF modeling tools
- 3.3.3 Perform continuous wave (CW) testing
- 3.3.4 Perform onsite coverage testing/Proof of Concept (PoC)

3.4 Explain and use wireless IoT tools to create and validate the design

- 3.4.1 Generate a predictive RF model using wireless design tools
- 3.4.2 Use additional tools to assist in the design process
 - RF modeling tools
 - Distance measuring tools
 - Cable testers
 - Protocol capture and analysis tools
 - Cameras
 - Power kits
 - Diagramming tools
 - PPE
 - Proof-of-Concept kits
- 3.4.3 Utilize validation tools
 - RF scanners
 - Survey software
 - Spectrum analyzers
 - Protocol-specific validation tools

3.5 Produce or recommend designs and configuration parameters for the IoT-related network infrastructure requirements

- 3.5.1 Infrastructure hardware and software
 - Application servers
 - Data storage
 - Big data systems
 - Join servers
 - Cloud platforms
 - Containers
 - Switches
 - Gateways/coordinators
 - Network backhaul
- 3.5.2 PoE and power budgets

- 3.5.3 Robust security solutions
 - Authentication
 - Join keys
 - Encryption
 - Privacy
 - Access control lists
 - Firewalls
 - Segmentation
 - Security configuration parameters
- 3.5.4 Appropriate QoS configuration based on the selected wireless IoT protocol and supported wired network QoS parameters

3.6 Produce design documentation

- 3.6.1 Bill of Materials (BoM)
- 3.6.2 Design report
 - Heat maps
 - Device placement maps
 - Cabling runs
 - Configuration parameters
- 3.6.3 Physical installation guide

4.0 Validate and Optimize the Wireless IoT Solution – 20%

4.1 Validate that the RF requirements are met by the solution

- 4.1.1 Ensure coverage requirements are met
- 4.1.2 Ensure capacity requirements are met
- 4.1.3 Identify and resolve interference sources, when applicable

4.2 Validate the IoT solution is functioning as defined in the solution requirements

- 4.2.1 Conduct device testing
- 4.2.2 Conduct mobility testing, if applicable
- 4.2.3 Verify proper security configuration and firmware/software support
- 4.2.4 Verify proper node (or asset tag) and antenna installation per design specifications and location
- 4.2.5 Verify power and grounding requirements are met
- 4.2.6 Verify channel selections and transmit power
- 4.2.7 Verify aesthetic requirements are met

- 4.3 Recommend and/or perform appropriate corrective actions as needed based on validation results for RF requirements and IoT solution functionality requirements
- 4.4 Create a validation and test report including solution documentation and asset inventory information
- 4.5 Final meeting (Q&A and hand-off)