Training: CWNP
CWIDP Certified Wireless IoT Design Professional

TRAINING GOALS:

The Certified Wireless IoT Design Professional (CWIDP) has the knowledge and skill set required to define, design, validate and assess 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 CWIDP creates design documentation to support the deployment of the required system components and future operations.

CWIDP is built on the CWISA certification, which is a prerequisite to CWIDP. This certification covers:

- Assessing existing IoT solutions
- Gathering and definined requirements and constraints for a wireless IoT solution
- Business and technical requirements
- Documentation of requirements analysis results
- Designing a wireless IoT solution to meet requirements
- Selecting appropriate topologies
- Designing appropriate channel and RF plans
- Using wireless IoT design tools
- Producing design and configuration documentation
- Validating and optimizing the wireless IoT solution

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CONSPECT:

- Assess an Existing IoT Solution
  - Evaluate an existing IoT implementation and understand its impact on a new wireless IoT deployment
  - Use appropriate tools to analyze existing IoT implementations
    - Protocol analyzers (wired and wireless)

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ul. Tatarska 5, 30-103 Kraków, tel.: (12) 298 47 77
ul. Bielska 17, 02-394 Warszawa, tel.: (22) 417 41 70

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- Spectrum analyzers
- Network diagrams
- Gather system documentation for the existing IoT solution
- Evaluate operational parameters
  - Wireless signal coverage
  - Frequencies used
  - Functionality
    - Network servers and services used
    - Protocols implemented
  - Potential impact on new deployments
- Document findings for use in the design of the new wireless IoT solution

- Gather and Define Requirements and Constraints
  - Gather business requirements and constraints
    - Use cases and justification
    - Identify coverage areas
    - Budget and schedule
    - Architectural and aesthetic constraints
    - Industry and regulatory compliance
      - Government organizations
      - Standards organizations
      - Certification bodies
      - Occupational Health and Safety
      - Building codes and safety codes
      - Data privacy regulations
    - Data/event collection and control requirements
    - Integration requirements
  - Gather technical requirements and constraints
    - Obtain, create, and validate site plans
    - Gather environment characteristics and RF measurements
    - Define device and application data requirements for each area (requirement areas)
    - 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

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        - Security requirements
        - Environment conditions
        - Node and tag types and capabilities
        - Device mobility
        - Vendor selection
    - Gather and define operational requirements
        - System monitoring
        - Data collection parameters
        - IoT upgrade requirements, when applicable
    - Gather and define network infrastructure requirements of the planned wireless IoT solution
    - Gather and define cabling infrastructure requirements of the planned wireless IoT solution
    - Document existing wireless systems, designs, and related documentation, when applicable
- Design a Wireless IoT Solution to Meet Requirements
    - Design for the selected topologies
        - Mesh
        - PtP
        - PtMP
        - P2P
        - Tree
        - Star
        - Cluster Tree
    - Design for appropriate channel configuration
        - Channel selection
        - Channel and protocol functionality
            - Bandwidth
            - Dwell time
            - Spread factor
            - Superframes
            - Modulation and coding
        - Blocklist or blocked channels
    - Design based on RF requirements and capabilities
        - Use RF measurements and survey tools
        - Use RF modeling tools
        - Perform continuous wave (CW) testing

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- Perform onsite coverage testing/Proof of Concept (PoC)
- Use wireless IoT tools to create and validate the design
  - Generate a predictive RF model using wireless design tools
    - Import and scale plans (floor, map)
    - Import geodata (outdoor design)
    - Model attenuation based on calibration
    - Select and place nodes
    - Define requirement areas and parameters
  - 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
    - Personal Protective Equipment (PPE)
    - PoC kit (customer devices, gateways, coordinators, sensors, actuators, tags, etc.)
  - Utilize validation tools
    - Topology validation
    - RF scanners
    - Survey software
    - Spectrum analyzers
  - Produce or recommend designs and configuration parameters for the IoT-related network infrastructure requirements
    - Required infrastructure hardware and software
      - Application servers
      - Data storage
      - Big data systems
      - Join servers
      - Cloud platforms
      - Containers
      - Switches
      - Gateways/Coordinators
      - Network backhaul
    - Required PoE and power budgets

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- Recommend robust security solutions
  - Authentication
  - Join Keys
  - Encryption
  - Privacy
  - Access Control Lists
  - Firewalls
  - Segmentation
  - Change configuration defaults
- Required QoS configuration based on the selected wireless IoT protocol and supported wired network QoS parameters

- Produce design documentation
  - Bill of Materials (BoM)
  - Design report
    - Heat maps
    - Device placement maps
    - Cabling runs
    - Configuration parameters
  - Physical installation guide

- Validate and Optimize the Wireless IoT Solution
  - Validate that the RF requirements are met by the solution
    - Ensure coverage requirements are met
    - Ensure capacity requirements are met
    - Identify and resolve interference sources, when applicable
  - Validate that the IoT solution is functioning as defined in the solution requirements
    - Conduct device testing
    - Conduct mobility testing
    - Verify proper security configuration and firmware/software support
    - Verify proper node (or asset tag) and antenna installation per design specifications and location
    - Verify power and grounding requirements are met
    - Verify channel selections and transmit power
    - Verify aesthetic requirements are met
  - Recommend and/or perform appropriate corrective actions as needed based on validation results for RF requirements and IoT solution functionality requirements
  - Create a validation and test report including solution documentation and asset inventory/asset documentation

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- Final meeting (Q&A and hand-off)

REQUIREMENTS:

Basic Understanding of topics taught in CWISA.

Difficulty level

CERTIFICATE:

The participants will obtain certificates signed by Compendium CE (course completion).

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.

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TRAINER:

Authorized CWNP Trainer.

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