



Australian Government

ICTTEN517 Plan a wireless mesh network

Release: 1

ICTTEN517 Plan a wireless mesh network

Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

Application

This unit describes the skills and knowledge required to design a scalable wireless access network using mesh technology for growing communities to provide users with secure wireless roaming beyond traditional wireless local area network (LAN) boundaries, and which are readily deployed in areas that lack wired backhaul.

It applies to individuals who have proficient technical skills such as planning and field officers from private and public organisations who undertake work on wireless networking or radio communications equipment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications – Telecommunications Networks Engineering

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Research wireless mesh networks and formulate the system architecture	1.1 Confirm, with regulatory spectrum management authority, the specific regulations regarding radio characteristics 1.2 Contact customer to determine wireless mesh network design specifications 1.3 Evaluate the use of frequency bands for operation of the wireless mesh networks (WMN) 1.4 Evaluate and select wireless technology, internet protocol (IP) version and mesh routing protocol to satisfy design criteria

ELEMENT	PERFORMANCE CRITERIA
	1.5 Specify and source hardware and software requirements
2. Prepare a detailed plan for the mesh network	2.1 Evaluate the maximum line of sight distances achievable between backbone nodes and between mesh nodes 2.2 Plan sites where mesh nodes will be located and plot to scale on a map 2.3 Estimate quantity and length of the links required between mesh nodes to ensure design is within specifications 2.4 Design backbone links in mesh topology for scalability of future deployments 2.5 Select location of the internet gateway for the network 2.6 Allocate operating frequencies at mesh nodes, backbone nodes and wireless access points for optimum network performance with minimal interference from adjacent network routers
3. Plan IP addresses and subnet mask	3.1 Produce an addressing scheme and allocate IP addresses and subnet mask to mesh nodes, backbone nodes and access points 3.2 Produce a configuration scheme to secure network
4. Document the mesh network	4.1 Document plans and drawings for the mesh network 4.2 Produce an installation plan for building the mesh network 4.3 Following installation, configuration and testing of the mesh network, incorporate 'as built' amendments, if appropriate

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	1.3, 1.4, 2.1, 4.1	Critically analyses plans and other documentation from a variety of sources, and consolidates information to evaluate requirements
Writing	1.5, 3.2, 4.1, 4.2	Prepares clear and concise workplace documentation including reports and design solutions incorporating technical language to communicate complex information clearly and effectively

Numeracy	2.1-2.4	Performs calculations, interprets results and evaluates different types of technical data for design solutions
Oral Communication	1.1, 1.2	Uses active listening, observational and questioning techniques to identify different perspectives and confirm, clarify or revise understanding
Interact with others	1.1, 1.2	Recognises and applies protocols governing what to communicate, with whom and how, in own work context
Get the work done	1.3-1.5, 2.1, 2.2, 2.4-2.6, 3.1, 4.3	- Uses a combination of formal, logical planning processes and an increasingly intuitive understanding of context for complex, high-impact activities with strategic implications - Selects and uses digital technologies and systems to achieve work goals and enhance work processes - Implements actions according to a predetermined plan, making adjustments if necessary and addressing unexpected issues - May use formal, analytical and lateral thinking techniques for identifying issues, generating and evaluating possible solutions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN517 Plan a wireless mesh network	ICTTEN5217A Plan a wireless mesh network	Updated to meet Standards for Training Packages.	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTTEN517 Plan a wireless mesh network

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Performance Evidence

Evidence of ability to:

- evaluate and select wireless technology and mesh routing protocol
- plan a wireless mesh network from a project brief
- produce an internet protocol (IP) addressing scheme
- prepare an installation plan.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- evaluate antenna gain and polarisation
- outline cable loss
- conduct calculations for effective isotropic radiated power (EIRP)
- calculate line of site radio range
- explain decibels and related units
- summarise IP addressing and subnet masks
- explain network security and firewalls
- outline a range of network topologies
- summarise radio frequency (RF) bands
- explain routing protocols
- clarify transmission control protocol (TCP)-IP protocols
- explain wireless networking hardware, access points, wireless routers and gateway
- explain wireless protocols.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the telecommunications networks engineering field of work and include access to:

- sites where planning a wireless mesh network may be conducted
- design criteria and other site-related documentation
- equipment specifications and technical documentation.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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