Title | Demonstrate knowledge of and install wireless local area computer networks
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Level | 6
Credits | 15

**Purpose**

This unit standard covers installation of wireless local area networks including setting up access points, wireless bridges and wireless network interface cards.

People credited with this unit standard are able to:
- demonstrate knowledge of wireless technologies;
- apply appropriate configuration and installation techniques to wireless access points, bridges, adapters, and antennae;
- demonstrate knowledge of security in relation to wireless networks;
- apply security to a wireless network;
- apply site survey techniques and safety practices;
- demonstrate knowledge of and apply configurations to enable monitoring technologies; and
- fault-find and repair wireless installation and configuration problems.

**Classification**

Electronic Engineering > Computer Engineering

**Available grade**

Achieved

**Prerequisites**

Unit 22717, *Demonstrate and apply intermediate knowledge of computer network engineering principles*, or demonstrate equivalent knowledge and skills.

**Guidance Information**

1. This unit standard is intended for use in engineering courses at diploma level.

2. References
   
   Fundamentals of Wireless LANs Companion Guide (Cisco Networking Academy Program), Cisco Systems;
   Health and Safety at Work Act 2015;
   and all subsequent amendments and replacements.
3 Definitions

- 802.1x – IEEE 802.1x standard.
- AP – access point.
- CLI – command line interface.
- DSSS – direct sequence spread spectrum.
- EAP – extensible authentication protocol.
- EIRP – effective isotropic radiated power.
- FHSS – frequency hopping spread spectrum.
- Industry practice – practice used and recommended by organisations involved in the electrotechnology industry.
- LAN – local area network.
- LEAP – lightweight EAP.
- MAC filtering – media access control address filtering.
- OFDM – orthogonal frequency division multiplexing.
- SNMP – simple network management protocol.
- Syslog – a TCP/IP protocol for sending system messages to a central logging server.
- WEP – wired equivalent privacy.
- WLAN – wireless LAN.

4 All measurements are to be expressed in Système International (SI) units, and, where required, converted from Imperial units into SI units.

5 All activities must comply with: any policies, procedures, and requirements of the organisations involved; the standards of relevant professional bodies; and any relevant legislative and/or regulatory requirements.

6 Range

a performance in relation to the outcomes of this unit standard must comply with the Health and Safety at Work Act 2015;

b laboratory and workshop safety practices are to be observed at all times.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of wireless technologies.

Performance criteria

1.1 Technologies and topologies used with WLANs are identified in accordance with industry practice.

Range FHSS, DSSS, OFDM, Basic Service Set (BSS), Independent BSS (IBSS) or peer-to-peer, Extended Service Set (ESS), point-to-point.

1.2 The relationship of the IEEE 802.11 standards to other 802 standards is explained, and the key characteristics in the 802.11 standards are identified.

Range IEEE 802.11 a, b and, g operating characteristics.
Outcome 2

Apply appropriate configuration and installation techniques to wireless access points, bridges, adapters, and antennae.

Performance criteria

2.1 Wireless adapters are installed in accordance with industry practice.

2.2 Wireless access points and bridges are configured using the CLI and a web based device manager.

2.3 Antennae are selected and installed according to industry practice.

Range may include but is not limited to – omnidirectional dipole, mast, directional patch, Yagi, cables, EIRP rules.

Outcome 3

Demonstrate knowledge of security in relation to wireless networks.

Performance criteria

3.1 Security threats and vulnerabilities to wireless networks are discussed in terms of likelihood, impact, likely perpetrators, and targets.

3.2 Measures that may be applied to reduce the risk of security breaches are discussed in terms of their application and practicability.

Range may include but is not limited to – WEP, EAP, LEAP, 802.1x.

Outcome 4

Apply security to a wireless network.

Performance criteria

4.1 MAC filtering is used in accordance with industry practice.

4.2 Security technologies are applied in accordance with industry practice.

Range may include but is not limited to – WEP, LEAP, EAP, and 802.1x.

Outcome 5

Apply site survey techniques and safety practices.
Performance criteria

5.1 The best position for access points is determined using site survey techniques.

Range may include but is not limited to – site survey tools, access points and cards, antennae and attenuators, site drawings.

5.2 Appropriate safety practices in a wireless network are used in accordance with industry practice.

Range may include but is not limited to – building codes, fire codes, OSH, proximity to operating antennae.

Outcome 6

Demonstrate knowledge of and apply configurations to enable monitoring technologies.

Range may include but is not limited to – SNMP and Syslog.

Performance criteria

6.1 The principles of management and data logging are identified in accordance with industry practice.

6.2 An AP is configured to provide monitoring and logging functions in accordance with industry practice.

Outcome 7

Fault-find and repair wireless installation and configuration problems.

Performance criteria

7.1 Wireless installation and configuration problems are determined and corrected using troubleshooting techniques in accordance with industry practice.

Range may include but is not limited to – cable testers, network monitors, sniffers, spectrum analysers, logs.

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**Status information and last date for assessment for superseded versions**

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Consent and Moderation Requirements (CMR) reference 0003

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.