



Australian Government

UEENED146A Set up and configure basic local area network (LAN)

Release: 2

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Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers setting up, configuring and maintaining operation of a basic local area network (LAN) of up to 20 connected devices. It encompasses safe working practices, installing network hardware, installing and configuring network software, establish user accounts, configure shared Internet connection and documenting set up parameters and LAN topology.

Note:

This unit applies to all aspects of Electrotechnology – engineering applications only. For general competencies related to Information Technologies refer to the latest endorsed IT Training Package.

Application of the Unit

Application of the Unit 2)

This unit is intended for competency development entry-level employment-based programs incorporated in approved contracts of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit do not require a license to practice in the workplace. However,

License to practice 3)

practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Pre-Requisites**Prerequisite Unit(s) 4)****Competencies 4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEED1 02A Assemble, set up and test computing devices

UEENEEE1 01A Apply Occupational Health Safety regulations, codes and practices in the workplace

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information**Employability Skills 5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged

Employability Skills 5)

will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit
 Performance Criteria describe the required performance needed to demonstrate achievement of the element.
 Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to set up and configure basic local area network.	1.1 OHS processes and procedures for a given work area are identified, obtained and understood.
	1.2 The extent of set-up and configuration work is determined from job specifications and in consultation with appropriate person(s).
	1.3 Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site.
	1.4 Hardware and software needed for the work is obtained in accordance with established procedures and checked against job requirements.
	1.5 Preparatory work is checked to ensure no damage has occurred and complies with requirements.
2 Set up, configure and maintain basic local area network.	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Layout of network hardware, cabling and outlets is determined from job specifications or in consultation with appropriate person(s).

ELEMENT**PERFORMANCE CRITERIA**

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|-----|--|
| 2.3 | Hardware is installed in accordance with network requirements. (See Note 1) |
| 2.4 | Network software and protocols are installed and configured in accordance with network requirements. (See Note 2) |
| 2.5 | Network operations are tested and anomalies identified and corrected. |
| 2.6 | Reported network failures and faults are responded to and appropriate tools and methods are used to |
| 2.7 | Identified causes of reported problems are rectified and network is tested in accordance with established procedures. |
| 2.8 | Unexpected situations are dealt with safely and with the approval of an authorised person. |
| 2.9 | Set-up configuration and maintenance are carried out efficiently without waste of materials or damage to apparatus and the surrounding environment or services and using sustainable energy practices. |
| 3 | Complete work and document activities. |
| 3.1 | OHS risk control work completion measures and procedures are followed. |
| 3.2 | Work site is cleaned and made safe in accordance with established procedures. |
| 3.3 | Network configuration and maintenance records are maintained in accordance with established procedures. |
| 3.4 | Service report is completed and forwarded to appropriate person(s) in accordance with established procedures. |

Notes.

1. Examples of hardware are network card, server, router, hub.
2. Examples of configuration are network protocols, user accounts and permissions, shared devices and security.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and to setting up and configuring a basic local area network.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

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Local area network fundamentals

Evidence shall show an understanding of local area network fundamentals to an extent indicated by the following aspects:

T1 Analogue and digital signals encompassing:

- How information is carried
- Signal distortion

Note.

Examples include attenuation, reflection, noise, dispersion, jitter, latency and collisions

T2 The OSI model for computer system interconnect

- Physical Layer
- Data Link Layer
- Network Layer
- Transport Layer
- Session Layer
- Presentation Layer
- Application Layer
- Purpose of the each layer of OSI Model
- Comparing TCP and IP
- TCP and UDP
- TCP segment format
- UDP segment format
- TCP Connection Methods

T3 Types of networks, network components and hardware

T4 Local Area Network (LAN) architectures

General principle of Local Area Network (LAN) encompassing:

- benefits of a LAN.
- the elements of a LAN.
- the different types of network topology and their applications.

T5 Cabling and termination arrangements for a LAN system and define all the

REQUIRED SKILLS AND KNOWLEDGE

hardware requirements encompassing:

- Network standards:

Note.

Examples are 10/100 BASE T and 10/100 BASE F.

- Applications of different types of coaxial cable, twisted pair, optical fibre cable and microwave as the transmission medium for a LAN.

T6 Multiple access units and their function

Note.

Examples are hubs, switches, access points, routers and the like

T7 LAN Standards

Note.

Examples are Ethernet (IEEE 802.3) Token Ring (IEEE 802.5) Wireless Ethernet (IEEE 802.11).

T8 Basic principle of medium access methods such as polling, token passing and CSMA/CD.

T9 Current network operating systems available for establishing a LAN encompassing:

- Network protocols
- Concepts of TCP/IP addressing
- Peer-to-peer and server based
- Establishing workgroups.
- File and device sharing

T10 Network hardware installation methods encompassing:

- Installing network card
- Installing hubs, switches and routers

T11 Concepts and the hardware required for internet and worldwide web working LANs

T12 Network software installation and configuration methods encompassing:

- Loading and configuring operating software
- Basic configuration of router operating system
- Setting up user accounts and permissions
- Establishing security

T13 Network testing and diagnostic tools and methods

T14 Networking protocols

T15 Network signal propagation

T16 Basics of Encoding Networking Signals

REQUIRED SKILLS AND KNOWLEDGE

T17 IP addressing and subnetting

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit and must be read in conjunction with the performance criteria and the range statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to

safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit 9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement
 - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
 - Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Set up and configure basic local area network as described in 8) and including:

- A Establishing the extent of work accurately.
- B Obtaining specified hardware and software.
- C Laying out network appropriately.
- D Installing hardware as specified.
- E Installing and configuring software to requirements.
- F Identifying and correcting anomalies.
- G Diagnosing and rectifying the cause of malfunctions effectively.
- H Documenting network activities.
- I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items.

Context of and specific resources for assessment 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.

These should be used in the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to setting up and configuring basic local area network.

Method of assessment 9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units 9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement**RANGE STATEMENT**

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to setting up and configuring basic local area network that include at least:

- 2 personal computers/work stations
- 1 server
- 1 hub or switch or router
- 1 input or output device

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field 11)

Computer Systems