Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN2209A Build and maintain a secure network

Release: 1

INDUSTRY SKILLS COUNCILS

Creating Australia's Future

ICTTEN2209A Build and maintain a secure network

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to build a simple and secure wired local area network (LAN) or wide area network (WAN).
	No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority.

Application of the Unit

Application of the unit	The unit applies to simplified network environments demonstrating the use of network and internetwork connectivity using a range of client server applications and services.
	Relevant job roles include installer of internet protocol (IP) networks, WAN and LAN network technician and WAN and LAN network support.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to build a LAN or WAN	1.1. Prepare for given work confirming site-specific occupational health and safety (**OHS**) and *environmental requirements* with *appropriate personnel*
	1.2. Identify safety hazards and implement risk control measures in consultation with appropriate personnel
	1.3. Determine network design specification from job briefs or appropriate personnel
	1.4. Determine *network addressing scheme* for network connectivity and confirm using *calculations*
	1.5. Select and obtain *network hardware* according to *established procedures*
	1.6. Obtain operating instructions, manuals, hardware and software testing methodologies
	1.7. Consult appropriate personnel to ensure the task is coordinated effectively with others involved at the worksite
2. Build and verify a network	2.1. Establish connections between network hardware according to manufacturer's specifications and established procedures
	2.2. Verify network routing and switching to conform to network design specification
	2.3. Set up, configure and share *network resources* between network devices
3. Monitor network performance and troubleshoot network	3.1. Monitor network traffic and assess performance metrics against manufacturer's specifications and established procedures
	3.2. Identify security threats and initiate control measures according to enterprise procedures
	3.3. Troubleshoot network and internet connectivity according to manufacturer's specifications and enterprise procedures
4. Complete and document network build	4.1. Restore work site to safe condition according to established safety procedures
	4.2. Record and store network schematics and network addressing scheme
	4.3. Notify appropriate personnel about the completion of the task
	4.4. Notify customer and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to liaise with customers and peers to achieve outcomes
- literacy skills to:
  - read and interpret enterprise procedures, manuals and specifications
- numeracy skills to interpret technical data and devise addressing schemes
- planning and organisational skills to plan and prioritise own work
- problem solving skills to:
  - deal with unexpected situations on the basis of safety and specified work outcomes
  - troubleshoot common network problems according to help desk procedures
- safety awareness skills to:
  - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
  - follow enterprise OHS procedures
  - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
  - configure applications and verify their connection to provide network services
  - configure interfaces, test and verify correct functionality
  - configure the security features of a network to minimise risk of security breach
  - plan, build, configure, test and analyse the performance of a network
  - use appropriate tools to develop and test network addressing
  - use appropriate tools to monitor and analyse the routing of packets in a network

Required knowledge

- enterprise OHS procedures
- internet and computer network communication
- network addressing schemes
- open systems interconnect (OSI) and transmission control protocol (TCP)/IP model
- planning the cabling of Ethernet networks
- seven layer OSI model
- tool and equipment correct usage
- troubleshooting procedures

Evidence Guide

EVIDENCE GUIDE	
The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: • implement OHS workplace procedures and practices • develop a network addressing scheme • determine required network components to build the network • plan, build, configure, test and analyse the performance of a network • troubleshoot network problems.
Context of, and specific resources for assessment	Assessment must ensure: • a site where building and maintenance of a secure network may be conducted • use of tools, equipment and materials currently used in industry • relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Methods of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: • direct observation of the candidate building configuring and testing a secure wired LAN or WAN network • direct observation of the candidate troubleshooting network problems • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4212A Apply advanced routing protocols to network design • ICTTEN4213A Configure and troubleshoot advanced network switching

EVIDENCE GUIDE	
	• ICTTEN4214A Install and maintain a wide area network.
	Aboriginal people and other people from a non-English speaking background may have second language issues.
	Access must be provided to appropriate learning and assessment support when required.
	Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed.
	In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency.
	Where applicable, physical resources should include equipment modified for people with special needs.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
OHS may include:	• awards provisions • hazardous substances and dangerous goods code • legislation

RANGE STATEMENT

	• local safe operation procedures • material safety management systems • protective equipment.
Environmental requirements may include:	• dust • excessive energy and water use • excessive noise • fume • gas • liquid waste • smoke emissions • solid waste • vapour.
Appropriate personnel may include:	• customer • manager • network manager • site engineer • supervisor.
Network addressing scheme may include:	• dynamic • static • subnet.
Calculations may include:	• binary addition • binary conversion • binary division • binary multiplication • binary number system • binary subtraction.
Network hardware may include:	• cables • routers • switches.

Established procedures may include:	• instructions:
	  • designs
	  • drawings
	  • job sheets
	  • plans
	• manufacturer's specifications
	• operational procedures
	• reporting and communication
	• use of tools and equipment.

RANGE STATEMENT	
Network resources may include:	• dynamic host configuration protocol (DHCP) server • domain name system (DNS) server • files • software • web browser.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering