ICTNPL4109A Evaluate the capability of access networks

Release: 1

ICTNPL4109A Evaluate the capability of access networks

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to gather information on the types of access networks and evaluate their capability to meet present and future demands. It involves the evaluation and comparison of competing access network technologies.
	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	Technical officers or engineers from private and public organisations apply the skills and knowledge in this unit. They combine technical design skills with broader organisational skills to assess planning requirements of various access network technologies within a telecommunications network to meet future customer demands.
	Technical officers or engineers may be responsible for small projects or parts of larger projects and for the operation and engineering work in the deployment or conversion to internet protocol (IP) based technologies of the telecommunications network in general.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

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. Scope the project	1.1. Prepare for given work according to site specific safety requirements and enterprise occupational health and safety (OHS) processes and procedures
	1.2. Determine the *types of access networks* currently deployed by accessing and using *network information sources*
	1.3. Determine the nature, quantity, architecture and condition of existing network equipment and their *attributes*
	1.4. Produce a brief on the deployment scope of current access networks, including geographical limitations and their contribution to the larger network
2. Assess capability and technologies of current and future access networks	2.1. Produce the layout of the topology of the identified types of Access Networks with the *network elements* clearly indicated
	2.2. Evaluate the *equipment type* and *technologies* of the access network to determine compatibility with existing network equipment and interoperability with other networks
	2.3. Assess the current and future capability and limitations of the network to ensure potential growth of the network
	2.4. Determine future offerings of product and services outlining the product offerings allowable over each network
3. Document capability evaluation	3.1. Assess the capability of current access networks to deliver products and services to customers
	3.2. Recommend preferred solutions for network growth with future capabilities

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• analytical skills to outline the product offerings allowable across all competing

REQUIRED SKILLS AND KNOWLEDGE

Access Network technologies

- communication skills to liaise with internal and external personnel on technical and non-technical matters
- literacy skills to:
    - interpret technical and non-technical documentation
    - write summary reports in required formats
- numeracy skills to interpret data results and evaluate different types of technical data
- planning and organisational skills to plan, prioritise and monitor own work
- research skills to:
    - assess the elements and architectures of the various access network technologies
    - assess the capability and limitations of the various Access Network technologies (present and future needs)
    - explain the key technologies that make up the access network
    - interrogate databases and investigate different audit requirements
    - source the equipment that will be used across the spectrum of access network technologies
- technical skills to select and compare benefits and limitations of access network technologies

Required knowledge

- detailed knowledge of:
    - typical access network technologies
    - the elements and architecture of the various access networks
- typical problems and challenges that describe the capabilities of the various access networks

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: • evaluate the capability and limitations of the various access network technologies for present and future needs • source the equipment that will be used across the spectrum of access network technologies • outline the product offerings allowable across all competing access network technologies.
Context of and specific resources for assessment	Assessment must ensure: • network design documentation and other site related documentation • equipment specifications • live network or training facilities • organisational guidelines • networked computers • networked telecommunications components.
Method 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 evaluating the capability of an access network • review of reports completed by the candidate for differing access network equipment and technologies • oral or written questioning to assess knowledge of equipment, technologies and the various product offerings as used within the access network.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTNPL4108A Plan the deployment of access network architectures.

EVIDENCE GUIDE	
	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.

Types of access networks may include:	- access fibre network - copper - fibre to the premises (FTTP) - hybrid fibre coaxial (HFC) - Next Generation Networks (NGN) - wireless networks.
Network information sources	network management databases for :

RANGE STATEMENT	
may include:	- capacity assessment data - network performance data - traffic dimensioning data - network management tools.
Attributes may include:	- capacity - condition - layout - limitations - occupancy - performance - type.
Network elements may include:	- for the current copper network: - copper cable - cross connect unit - exchange - lead-in cable - lightning protection - loading coils - main distribution frame (MDF) - manhole - pair gain system - pits - for the current fibre network: - exchange - fibre access points - high density/optical fibre distribution frame (HD/OFDF) - joint enclosure - manhole - optical fibre - pits - transmission hub - for the FTTP network: - broadband passive optical network (BPON) - conduit - distribution/lead in multi-port (DLM/LM) - Ethernet broadband remote access server (EBRAS)

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RANGE STATEMENT	
	- exchange - fibre distribution hub (FDH) - gigabit passive optical network (GPON) - head end - HD/OFDF - home optical network terminal - lead in - manhole - optical distribution network - optical fibre - packet optical line terminal (P-OLT) - pits - video optical line terminal (V-OLT) - wave division multiplexer (WDM) - for the HFC network: - coaxial cable - exchange - headend - hub - IP edge - line power supply - node - optical fibre - optical receiver - radio frequency (RF) amplifier - tap - video service centre - for the wireless network: - access points - antennas - dish - exchange - RFamplifiers - radio towers and huts - RF receivers - RF transmitters - satellite - waveguide.

RANGE STATEMENT	

Equipment type may include:	• digital
	• IP based
	• optical:
	    • add/drop multiplexers
	    • amplifiers
	    • filters
	    • receivers
	    • splitters/combiners
	    • switches
	    • transmitters
	• wireless:
	    • amplifiers
	    • filters
	    • microwave
	    • receivers
	    • RF broadband
	    • satellite
	    • transmitters.

Technologies may include:	• DSL:
	    • ADSL, ADSL2+
	    • xDSL
	• IP broadband:
	    • IPTV
	    • VoIP
	    • WiFI
	    • WiMAX
	• optical transmission systems:
	    • WDM systems
	    • DWDM systems
	• mobile radio.

Unit Sector(s)

Unit sector	Telecommunications

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Co-requisite units

Co-requisite units		

Competency field

Competency field	Network planning