



Australian Government

Department of Education, Employment and Workplace Relations

ICTOPN6124A Manage optical ethernet transmission

Release: 1

ICTOPN6124A Manage optical ethernet transmission

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	<p>This unit describes the performance outcomes, skills and knowledge required to manage an ethernet optical transmission system. It includes analysis of fault conditions that may occur.</p> <p>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.</p>
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Application of the Unit

Application of the unit	<p>Field officers working with carrier telecommunications networks using optical technologies apply the skills and knowledge in this unit.</p>
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan to test optical ethernet link	1.1. Make worksite safe by identifying existing and potential site <i>hazards</i> 1.2. Determine the <i>technical environment</i> and network components 1.3. Report on infrastructure to ensure that link is designed to meet performance requirements
2. Specify architecture requirements	2.1. Follow site specific safety requirements and enterprise occupational health and safety (OHS) procedures 2.2. Determine <i>architecture components</i> 2.3. Determine <i>functions</i> and <i>framework</i> for the system to operate across network boundaries, taking into account performance criteria
3. Manage optical ethernet link	3.1. Conduct work in the context of <i>appropriate tests</i> 3.2. Analyse test results 3.3. Provide a report on test results and compare with expected outcomes 3.4. Document test results and refer to the <i>appropriate person</i>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
<ul style="list-style-type: none"> • analytical skills to identify and rectify faults in Ethernet transmission • communication skills to: <ul style="list-style-type: none"> • liaise with internal and external personnel on technical and operational matters • relate to work associates, supervisors, team members and clients • literacy skills to: <ul style="list-style-type: none"> • interpret technical documentation, such as equipment manuals, specifications and service orders • write reports using standard formats • research skills to gather data, observation and analysis of transmission issues • technical skills to conduct tests and operate test equipment

REQUIRED SKILLS AND KNOWLEDGE**Required knowledge**

- ethernet:
 - applications of ethernet in optical systems
 - architecture of ethernet systems
 - operation of ethernet within a telecommunications environment
 - organisational policy and procedures
 - testing techniques
- familiarity with workplace and industry environment
- specific OHS requirements relating to:
 - handling of optical fibre
 - personal safety issues
 - use of laser light sources

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • plan to test an optical ethernet link • select and perform a testing regime on ethernet optical transmissions • analyse and document test results • comply with all related OHS requirements and work practices.
Context of and specific resources for assessment	<p>Assessment must ensure:</p> <ul style="list-style-type: none"> • a telecommunications operations site with ethernet optical transmission system • test equipment currently used in industry.
Method of assessment	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> • oral or written questioning of the candidate • direct observation of the candidate carrying out relevant measurements within an ethernet optical communication system • evaluation of written report prepared by the candidate outlining architecture components, testing regime and analysis of test results.
Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplaces and job role is recommended, for example:</p> <ul style="list-style-type: none"> • ICTOPN4116A Use advanced optical test equipment • ICTOPN6129A Analyse optical transmission systems. <p>Aboriginal people and other people from a non-English speaking background may have second language issues.</p> <p>Access must be provided to appropriate learning and</p>

EVIDENCE GUIDE	
	<p>assessment support when required.</p> <p>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.</p> <p>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.</p> <p>Where applicable, physical resources should include equipment modified for people with special needs.</p>

Range Statement

RANGE STATEMENT	
<p>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.</p>	
<i>Hazards</i> may include:	<ul style="list-style-type: none"> • optical cable: <ul style="list-style-type: none"> • hazardous laser light.
<i>Technical environment</i> may include:	<ul style="list-style-type: none"> • Ethernet frame structure • medium access control • physical media.
<i>Architecture components</i> may include:	<ul style="list-style-type: none"> • entire fibres • Lambda • time division multiplexing • waveband.

RANGE STATEMENT	
Functions may include:	<ul style="list-style-type: none"> • bandwidth profile parameters • class-of-service labels • network service parameters • service attributes • service performance parameters.
Framework may include:	<ul style="list-style-type: none"> • auto-negotiation • physical coding sub-layer • physical medium attachment • physical medium dependent.
Appropriate tests may include:	<ul style="list-style-type: none"> • approval and acceptance tests: <ul style="list-style-type: none"> • 1000BASE-T PMA • 1000BASE-X PCS • auto-negotiation • electrical interfaces • ethernet testing suite • flow control test • jitter measurements • media access control (MAC) layer • operating wavelength • optical interfaces • phase fluctuation and jitter • physical interface • physical-layer interoperability • media tests: <ul style="list-style-type: none"> • advanced cable testing • characteristic impedance • crosstalk • delay • insertion loss or attenuation • media categories • return loss • wiremap • performance tests: <ul style="list-style-type: none"> • back-to-back frames • frame loss ratio • latency • reset • RFC 2544 Test

RANGE STATEMENT	
	<ul style="list-style-type: none"> • system recovery • throughput • traffic generation.
<i>Appropriate person</i> may include:	<ul style="list-style-type: none"> • authorised business representative • client • supervisor.

Unit Sector(s)

Unit sector	Telecommunications
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Optical networks
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