



Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN4199A Install, configure and test a router

Release: 1

ICTTEN4199A Install, configure and test a router

Modification History

Not Applicable

Unit Descriptor

<p>Unit descriptor</p>	<p>This unit describes the performance outcomes, skills and knowledge required to undertake router installation and configuration as part of the upgrade in an existing network or the implementation of a new network.</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

<p>Application of the unit</p>	<p>Officers who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit. They would be employed by telecommunications companies and IT networking provisioning companies.</p> <p>They will gain knowledge of routing protocols and routing diagnostics required for integrating new and converging functionalities to the network.</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. Prepare to install a router	1.1. Prepare for given work according to relevant legislation, occupational health and safety (OHS), codes, regulations and standards 1.2. Arrange access to the site according to required procedure 1.3. Ascertain network topology from technical requirements 1.4. Determine the internet protocol (IP) addressing scheme for the network topology 1.5. Evaluate network management and security requirements , with reference to current and future requirements 1.6. Select a router with appropriate features according to technical requirements 1.7. Choose cables , wireless application protocol (WAP), wide area network (WAN) connectors and other peripherals according to network and router specification, and WAN protocols
2. Install and configure a router	2.1. Assemble router and peripherals according to manufacturer's requirements, enterprise guidelines and protocols 2.2. Connect communications cables and WAN connectors to the router and to the network 2.3. Configure router according to manufacturer's instructions and technical requirements, taking into account interoperability requirements with network components
3. Test the router and reconfigure the network	3.1. Test the router for connectivity across the network and for routing protocol functions 3.2. Adapt or modify the predetermined router configuration, depending on outcome of tests 3.3. Review router in line with organisational requirements 3.4. Test router and peripherals according to manufacturer's instructions and technical requirements 3.5. Test hardware and router to ensure full functionality and interoperability 3.6. Reconfigure additional hardware as required 3.7. Make adjustments to network depending on test

ELEMENT	PERFORMANCE CRITERIA
	results
4. Complete documentation and clean up worksite	4.1. Tabulate test results and complete all user reports 4.2. Complete report and notify client of status of the network 4.3. Clean up and restore worksite to client's satisfaction 4.4. Secure sign off from <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

- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to interpret technical documentation and write reports in required formats
- numeracy skills to take test measurements, interpret results and evaluate performance and interoperability of network
- planning and organisational skills to plan, prioritise and monitor own work and coordinate the process in liaison with others
- problem solving and contingency management skills to adapt configuration procedures to requirements of network and reconfigure depending on differing operational contingencies, risk situations and environments
- research skills to interrogate vendor databases and websites to implement different configuration requirements to meet security levels
- technical skills to select and use router test software and hardware to suit different network applications

Required knowledge

- Australian Computer Society Code of Ethics
- effect of a router on delimiting broadcast traffic and on conserving bandwidth
- how dynamic routing algorithms or protocols create and maintain routing tables
- providing the network with redundant paths for reliability and the way routers manage these paths
- router:
 - basic router commands
 - configuration:

REQUIRED SKILLS AND KNOWLEDGE

- clock rate
- password protection of router
- routing protocol
- dynamic routing
- firewalls
- functions
- routing protocols and how they operate
- tables
- router-based network architectures
- use of routing tables in intelligent packet routing and switching

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 and prepare for the router installation task • select a router to meet the client business specifications • install and test the router that ensures interoperability within the network and applying router principles and technologies • report on the status of the completed installation and seek sign off and customer satisfaction • use routers • apply solutions to defined routing problems.
Context of and specific resources for assessment	<p>Assessment must ensure:</p> <ul style="list-style-type: none"> • site where router installation may be conducted • use of field measurement equipment currently used in industry • relevant router specifications • technical requirements for a network • router • cabling • networked (LAN) computers • WAN service point of presence • relevant equipment and organisational documentation.
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"> • direct observation of the candidate installing, configuring and testing a router • oral or written questioning of underpinning skills and knowledge • evaluation of report prepared by the candidate outlining testing procedures, results, recommendations to network changes and

EVIDENCE GUIDE	
	completion records.
Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:</p> <ul style="list-style-type: none"> • ICTTEN4198A Install, configure and test an internet protocol network. <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 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>

RANGE STATEMENT	
Network may include:	<ul style="list-style-type: none"> • data • internet • internet protocol private branch exchange (IP PBX) • internet protocol TV (IPTV) • large and small LANs • national WANs • radio frequency identification (RFID) • storage area network (SAN) • voice • voice over internet protocol (VoIP) • virtual private network (VPN).
Requirements may be in reference to:	<ul style="list-style-type: none"> • application • business • network • employees in the organisation • system.
Router may include:	<ul style="list-style-type: none"> • 3Com OfficeConnect Remote 810 ADSL • 3Com SuperStack 400 • Cisco 800 and ISR Series routers • Cisco uBR7200 universal broadband routers • Cisco wireless access points • D-Link routers • Intel Express series • Juniper routers • Linksys routers • Motorola Vanguard series • Netopia routers.
Cables may include:	<ul style="list-style-type: none"> • Category 5e, 6 or 7 • crossover • fibre • shielded twisted pair (STP) • straight through • unshielded twisted pair (UTP).
Peripherals may include:	<ul style="list-style-type: none"> • Bluetooth devices • fax • Firewire (IEEE 1394) • input equipment: <ul style="list-style-type: none"> • keyboard • mouse

RANGE STATEMENT	
	<ul style="list-style-type: none"> • pens • touch pad • laptops and desktop computers • mobile phones • modems • multimedia kits • palmtops and personal digital assistants (PDAs) • personal computer • printers • scanners • speakers • tape cartridges • universal serial bus (USB).
<i>WAN protocols</i> may include:	<ul style="list-style-type: none"> • advanced data communications protocol (ADCP) • binary synchronous control (BSC) • high-level data link control (HDLC) • point to point protocol (PPP) • synchronous data link control (SDLC) • transmission of IP datagrams over X.25, Frame Relay or ATM.
<i>Protocols</i> may include:	<ul style="list-style-type: none"> • AppleTalk protocol - Phase 2 (1989) • dynamic host configuration protocol (DHCP) • novell protocol suite: <ul style="list-style-type: none"> • internetwork packet exchange (IPX) • NetBIOS emulator • netware core protocol • sequenced packet exchange (SPX) • TCP/IP: <ul style="list-style-type: none"> • internet control message protocol (ICMP) see router protocols above • Net BT • WAN protocols (encapsulations): <ul style="list-style-type: none"> • advanced data communications protocol (ADCP) • binary synchronous control (BSC) • high-level data link control (HDLC) • point-to-point protocol (PPP) • synchronous data link control (SDLC).
<i>Routing protocol</i> may include:	<ul style="list-style-type: none"> • Cisco discovery protocol (CDP) • dynamic routing

RANGE STATEMENT	
	<ul style="list-style-type: none"> • enhanced interior gateway routing protocol (EIGRP) • exterior gateway protocol and border gateway protocol (superseded by BGP) • netWare link state protocol (NLSP) • open shortest-path first interior gateway protocol (OSPF) • routing information protocol (RIP) • static routing.
<i>Hardware</i> may include:	<ul style="list-style-type: none"> • DSL modems • modems and other connectivity devices • networks • personal computers • remote sites • servers • workstations.
<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	Telecommunications networks engineering
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