Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN5200A Install, configure and test a local area network switch

Release: 1

ICTTEN5200A Install, configure and test a local area network switch

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to undertake local area network (LAN) switch installation and configuration as part of the upgrade in an existing network or the implementation of a new network. 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	Officers employed by telecommunications companies and IT networking provisioning companies who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit. It involves LAN switch installation, configuration and testing in field work. It also applies to switching protocols and diagnostics required for integrating new and converging functionalities to the network.

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. Prepare to install the network switch	1.1. Prepare for installation in line with site specific safety requirements and enterprise occupational health and safety (OHS) processes and procedures 1.2. Notify customer to arrange access to site 1.3. Document the ***topology*** of the LAN 1.4. Obtain current and future ***network capacity*** predictions according to current and future business requirements from the ***appropriate person*** 1.5. Specify the number and type of ***switch*** required, with reference to future network requirements 1.6. Specify the requirements for network management and security, as prescribed by organisational policy 1.7. Select the switch and switch operating system software version with the appropriate features according to required specifications
2. Install and configure the network switch	2.1. Assemble, rack mount and connect switch and ***peripherals*** according to manufacturer's requirements 2.2. Connect ***user*** to access points using ***cable*** that meets the appropriate ***standard*** 2.3. Establish a valid network connection with other network devices 2.4. Configure a network internet protocol (IP) address for the switch 2.5. Install or configure simple network management protocol (SNMP) agent software, on each switch, to collect network traffic data for the management information base (MIB) from that segment of the network and relay it to the management console 2.6. Install and configure SNMP management console software on a computer designated to be the network manager's main console, to collect network traffic data from the switch acting as agents 2.7. Manually configure the user access ports of the switch for speed and for full or half-duplex operation
3. Test the network switch and reconfigure the network	3.1. Test the switch and other network devices according to manufacturer's requirements and organisational guidelines 3.2. Test to ensure that there is connectivity across the network

ELEMENT	PERFORMANCE CRITERIA
	3.3. Modify the network to verify SNMP management software 3.4. Make adjustments to the network, depending on test and troubleshooting 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 appropriate person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

- research skills to interrogate vendor databases and websites to implement different configuration requirements to meet security levels
- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to read and 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
- 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
- technical skills to:
  - install and configure network switch
  - select switch and switch operating system
  - specify requirements for network management and security
  - test switch and other network devices

Required knowledge

- advantages and disadvantages of switches over hubs
- Australian Computer Society Code of Ethics
- common network cable types and connectors

REQUIRED SKILLS AND KNOWLEDGE
• common network topologies • differences between standard and intelligent (i.e. configurable) switches and between switches and hubs • documentation skills for networks • implementation and configuration of networks • providing the network with redundant paths for reliability and the way routers and switches manage these paths

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: • plan and prepare for the LAN switch installation task • select a LAN Switch to meet the client business specifications • install switches without the network losing connectivity or failing • install and test the switch that ensures interoperability within the network • use a range of switch configurations • apply solutions to a variety of switch-related problems • report on the status of the completed installation and seek sign off and customer satisfaction • use switches • apply solutions to defined switching problems.
Context of and specific resources for assessment	Assessment must ensure: • site where switch installation must be may be conducted • use of field measurement equipment currently used in industry • relevant switch specifications, technical requirements for a network, switch, cabling, networked (LAN) computers, workstations, servers and WAN service point of presence.
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 installing, configuring and testing a LAN switch • oral or written questioning of required skills and knowledge • evaluation of report prepared by the candidate outlining testing procedures, results and recommendations to network changes.

EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN4198A Install, configure and test an internet protocol 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.

RANGE STATEMENT	
Topology may include:	• bus • hierarchical • hybrid • ring • star.

Network capacity may include:	• expandability:
	  • number of available uplink ports
	• hardware reliability
	• LAN topology support:
	  • AppleTalk
	  • Ethernet
	  • FDDI
	  • Token Ring
	• port bandwidth capabilities
	  • 100 megabits per second)
	• redundant power supply (AC/DC).

Appropriate person may include:	• authorised business representative • client • IT support manager • network Administrator • network manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
Switch by vendors may include:	• 3Com • Accton • Bay • Cisco • DLink • Intel • NetGear • System 3000 Ethernet.

Peripherals may include:	• Bluetooth devices
	• fax
	• Firewire (IEEE 1394)
	• input equipment may include:
	  • mouse
	  • pens
	  • touch pad

RANGE STATEMENT	
	• 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).
User may include:	• department within the organisation • person within a department • third party.
Cable may include:	• Category 5e, 6 or 7 • crossover • fibre • shielded twisted pairs (STP) • straight through • unshielded twisted pairs (UTP).
Standard may include:	• EIA/TIA 568A • EIA/TIA 568B.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering