



Australian Government

Department of Education, Employment and Workplace Relations

ICANWK506A Configure, verify and troubleshoot WAN links and IP services in a medium enterprise network

Release: 1

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Modification History

Release	Comments
Release 1	This Unit first released with <i>ICA11 Information and Communications Technology Training Package version 1.0</i>

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to use appropriate tools, equipment, software and protocols to install, operate, and troubleshoot medium enterprise switches.

Application of the Unit

This unit applies to the installation, operation and troubleshooting of medium enterprise networks. Job roles include help-desk technician and network support technician.

Licensing/Regulatory Information

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.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Element	Performance Criteria
<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>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.</i>

Elements and Performance Criteria

1. _Prepare to install medium enterprise WAN links	1.1 Prepare for given work according to legislation, OHS codes, regulations and standards 1.2 Arrange access to the site according to required procedure 1.3 Review existing network design documentation to ensure it is current and complete 1.4 Select the network elements required to be installed to meet the technical requirements 1.5 Contact vendors and service suppliers to obtain specifications and availability of identified components 1.6 Develop plans, with prioritised tasks and contingency arrangements, for installation of components with minimum disruption to client 1.7 Liaise with appropriate person to obtain approval for the plans, including security clearance and timing
2. Configure WAN links	2.1 Describe different methods for connecting to a wide area network (WAN) 2.2 Configure and verify a basic serial WAN configuration 2.3 Configure and verify at least two WAN protocols 2.4 Describe virtual private network (VPN) technology 2.5 Configure and verify a site to site VPN 2.6 Describe asymmetric digital subscriber line (ADSL) technology 2.7 Configure and verify an ADSL connection
3. Configure and verify IP services on a router	3.1 Explain the operation and benefits of using dynamic host configuration protocol (DHCP) 3.2 Configure and verify DHCP operation on a router 3.3 Implement static and dynamic addressing services for hosts in a local area network (LAN) environment 3.4 Explain the basic operation of network address translation (NAT) 3.5 Configure NAT for given network requirements 3.6 Implement and verify NAT in a medium-sized enterprise branch office network 3.7 Describe the basic operation and configuration of internet protocol version 6 (IPv6)
4. Secure a network	4.1 Describe the purpose and types of access control lists

using router services	(ACLs) 4.2 Configure and apply ACLs based on network filtering requirements 4.3 Configure and apply ACLs to provide secure access to the router
5. Troubleshoot medium enterprise WAN links	5.1 Troubleshoot WAN implementation issues 5.2 Rectify WAN problems 5.3 Document solutions

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
 - write reports as required
- numeracy skills to:
 - take test measurements
 - interpret results
 - evaluate performance and interoperability of network
- planning and organisational skills to:
 - coordinate the process in liaison with others
 - plan, prioritise and monitor own work
- problem-solving and contingency-management skills to:
 - adapt configuration procedures to requirements of network
 - reconfigure depending on differing operational contingencies, risk situations and environments
 - troubleshoot and debug WAN issues
- research skills to investigate appropriate hardware to meet requirements
- technical skills to select and configure networking devices and assess and implement security requirements.

Required knowledge

- overview knowledge of IPv6
- detailed knowledge of:
 - ACLs
 - router calling line identification (CLI) configuration
 - router debug commands.

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 WAN link installation task • install and configure WAN links • configure and troubleshoot the following IP services: • NAT • DHCP • ACLs • configure and troubleshoot ADSL links • configure and troubleshoot VPNs.
Context of and specific resources for assessment	Assessment must ensure access to: • site where network installation may be conducted • hardware and software • organisational guidelines • computers • WAN service point of presence • appropriate learning and assessment support when required. Where applicable, physical resources should include equipment modified for people with special needs.
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 new or updated network • evaluation of prepared documentation that outlines testing procedures, test results, recommendation to network changes and completion records • verbal or written questioning of required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, where appropriate. Assessment processes and techniques must be culturally appropriate, and suitable to the communication skill level, language, literacy and numeracy capacity of the candidate and

	the work being performed. Indigenous people and other people from a non-English speaking background may need additional support. In cases where practical assessment is used it should be combined with targeted questioning to assess required knowledge.
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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.

Network may include:	• data • internet • large and small LAN • national WAN • VPN.
Documentation may include:	• equipment inventory • International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) and Australian Standards (AS) standards • naming standards • project management templates and report writing • satisfaction reports • version control.
Network elements may include:	• adaptors • communications cables and connectors • hubs • routers • servers • switches.
Requirements may refer to:	• application • business • network • people in the organisation • system.

Client may include:	- external organisations - individuals - internal departments - internal employees.
Appropriate person may include:	- authorised business representative - client - supervisor.
Basic serial WAN configuration may include:	- high-level data link control (HDLC) - link control settings - point-to-point protocol (PPP) - usernames and passwords.
WAN protocols may include:	- frame relay - HDLC - PPP.
VPN technology may include:	- benefits - components - affect - importance - role.
VPN may include:	IPSec site to site VPN with pre-shared key authentication.
IPv6 concepts may include:	- dual stack - routing information protocol next generation (RIPng) - tunnelling.
WAN implementation issues may include:	- DHCP - NAT - ACL - VPN - ADSL.

Unit Sector(s)

Networking