Australian Government

Department of Education, Employment and Workplace Relations

ICANWK507A Install, operate and troubleshoot medium enterprise routers

Release: 1

INDUSTRY
SKILLS
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ICANWK507A Install, operate and troubleshoot medium enterprise routers

Modification History

Release	Comments
Release 1	This Unit first released with *ICA11 Information and Communications Technology Training Package version 1.0*

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 routers.

Application of the Unit

This unit applies to the installation, operation and troubleshooting of medium enterprise routers. Job roles include network technician, network administrator and network support.

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
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

1. Prepare to install a medium enterprise router	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 **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 basic router operation	2.1 Describe **basic routing concepts**
	2.2 Describe the **operation** of routers
	2.3 Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts
	2.4 Access and use the router to set basic parameters
	2.5 Upgrade firmware on a router
	2.6 Save and back up router configuration files
	2.7 Implement **basic router security**
	2.8 Configure static and default routes
3. Configure and verify dynamic classless routing protocols	3.1 Determine the appropriate classless addressing scheme using VLSM and summarisation to satisfy addressing requirements in a LAN or WAN environment
	3.2 Calculate and apply an addressing scheme, including VLSM internet protocol (IP) addressing design to a network
	3.3 Configure and verify **classless routing protocols**
4. Troubleshoot medium enterprise routers	4.1 Troubleshoot device configuration and network connectivity using **basic utilities**
	4.2 Identify and correct common problems associated with IP addressing and host configurations
	4.3 Troubleshoot router hardware and software operation

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 process in liaison with others
    - plan, prioritise and monitor own work
- problem-solving skills to:
    - adapt configuration procedures to requirements of network and reconfigure depending on differing operational contingencies, risk situations and environments
    - troubleshoot and debug router network 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

- basic routing concepts for small enterprise network switches and routers
- classless routing protocols, including:
    - enhanced interior gateway routing protocol (EIGRP)
    - open shortest path first (OSPF)
    - routing information protocol (RIPv2)
- debug commands
- internet protocol version 4 (IPv4)
- purpose and basic operation of the protocols in the open system interconnection (OSI) and transmission control protocol or internet protocol (TCP/IP) models
- router calling line identification (CLI) configuration.

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 installation of an enterprise router • design a classless IP addressing scheme to suit requirements • install, configure and test the network elements to ensure interoperability within the network • apply network topologies, routing protocols and security issues • apply solutions and troubleshoot defined network problems.
Context of and specific resources for assessment	Assessment must ensure access to: • site where network installation may be conducted • enterprise routers and operating systems • hardware and software • organisational guidelines • computers • 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 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. |

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 local area networks (LANs) - national wide area networks (WANs) - virtual private network (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 routing concepts may include:	- packet forwarding - router lookup process.

Operation may include:	• power on self-test (POST) • router bootup process • router components.
Basic router security may include:	• configuration security • implement password • physical security.
Classless routing protocols may include:	• EIGRP • OSPF • RIPv2.
Basic utilities may include:	• debug commands • ipconfig • ping • secure shell (SSH) • Telnet • traceroute.

Unit Sector(s)

Networking