Australian Government

Department of Education, Employment and Workplace Relations

ICTTEN4213A Configure and troubleshoot advanced network switching

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

ICTTEN4213A Configure and troubleshoot advanced network switching

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to perform network switch configuration and troubleshooting, including network management by remote access for wired and wireless networks.
	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	This unit applies to large networks involving wireless local area networks (WLANs), virtual local area networks (VLANs), interVLAN routing, remote access management and operating system management of network devices.
	Relevant job roles include installer of internet protocol (IP) enterprise networks, enterprise network technician, network administrator and network support.

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 work on a switched network	1.1. Prepare for given work according to occupational health and safety (**OHS**) and *environmental requirements* with *appropriate personnel* 1.2. Identify safety hazards and implement risk control measures in consultation with appropriate personnel 1.3. Determine nature and scope of the network and network topology from job briefs or appropriate personnel 1.4. Select and obtain wireless and wired network components requirements according to *enterprise procedures* 1.5. Obtain operating instructions, manuals, hardware and software testing methodologies 1.6. Consult appropriate personnel to ensure the task is coordinated effectively with others involved at the worksite
2. Configure network switches	2.1. Set up and configure network switches according to manufacturer's specifications and enterprise procedures 2.2. Build and configure a routed network using remote access management 2.3. Establish multiple VLANs across the network to manage the access and traffic across the network
3. Troubleshoot network	3.1. Monitor network traffic and assess performance against manufacturer's specifications and established procedures 3.2. Troubleshoot network according to manufacturer's specifications and enterprise procedures 3.3. Identify and rectify faults according to enterprise procedures
4. Complete and document network installation and configuration	4.1. Restore worksite to safe condition according to established safety procedures 4.2. Record and store *essential configuration information* according to enterprise procedures 4.3. Notify appropriate personnel about the completion of the task according to enterprise procedures

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 customers and peers to achieve outcomes
- literacy skills to read and interpret enterprise procedures, manuals and specifications
- numeracy skills to interpret technical data
- planning and organisational skills to plan and prioritise own work
- problem solving skills to:
    - deal with unexpected situations on the basis of safety and specified work outcomes
    - troubleshoot network malfunctions
- safety awareness skills to:
    - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
    - follow enterprise OHS procedures
    - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technical skills to:
    - configure a network to support multiple VLANS
    - configure a switch using VLAN trunking and spanning tree protocols
    - design and build a interVLAN switched network
    - establish LAN switching over a wireless network
    - install switch and remote access security
    - use tools and equipment

Required knowledge

- enterprise OHS procedures
- interVLAN routing
- spanning tree protocol
- switch and remote network security management
- tool and equipment correct usage
- troubleshooting procedures
- VLAN trunking protocol
- wireless LAN setup and access configuration

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: • build and configure a routed network • configure a VLAN on a given network topology • configure VLAN trunking and spanning tree protocols • establish VLANs over a wireless network • design and deploy remote access and network security.
Context of, and specific resources for assessment	Assessment must ensure: • a site where configuring advanced network switching may be conducted • use of tools, equipment and materials currently used in industry • relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Methods 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 performing network switch configuration • direct observation of the candidate troubleshooting network problems • oral or written questioning to assess required knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example with: • ICTTEN2209A Build and maintain a secure network • ICTTEN4212A Apply advanced routing protocols to network design • ICTTEN4214A Install and maintain a wide area network.

EVIDENCE GUIDE	
	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.	
OHS may include:	• awards provisions • hazardous substances and dangerous goods codes • legislation • local safe operation procedures • material safety management systems

RANGE STATEMENT

	• protective equipment.
Environmental requirements may include:	• dust • excessive energy and water use • excessive noise • fume • gas • liquid waste • smoke and fugitive emissions • solid waste • vapour.
Appropriate personnel may include:	• customer • manager • network manager • site engineer • supervisor.

Enterprise procedures may include:	• instructions:
	  • designs
	  • drawings
	  • job sheets
	  • plans
	• manufacturer's specifications
	• operational procedures
	• reporting and communication
	• use of tools and equipment.

Essential configuration information may include:	• installation software • installation and configuration documentation • IP addressing schemes • logical and physical diagrams • network administrator codes • passwords • security access codes • troubleshooting reports.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering