Australian Government

Department of Education, Employment and Workplace Relations

ICAI5172B Implement backbone technologies in a local area network

Release: 1

ICAI5172B Implement backbone technologies in a local area network

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit defines the competency required to implement core layer (backbone) connectivity in a LAN for applications between floors in a multi-storey building or between separate buildings. The following unit is linked and forms an appropriate cluster: • ICAI5152B Implement risk management processes

Application of the Unit

Application of the unit	

Licensing/Regulatory Information

Not Applicable

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. Define network	1.1. Identify current and future ***network*** requirements based on the organisation's business and ***technical requirements*** 1.2. Design an appropriate structure to meet ***client*** requirements, such as video, audio or data application services 1.3. Design a network addressing system with subnet and host identities (IP addressing) and virtual LANs (VLANs) 1.4. Identify and document resource requirements in accordance with ***network*** design
2. Install configure network backbone	2.1. Install and configure switches and routers according to ***network*** requirements and ***resources*** 2.2. Install ***network protocol suites*** using configurations on switch uplink ports as required by ***network*** design specifications 2.3. Configure hosts and workstations for ***network*** access
3. Test and validate network	3.1. Test ***network*** connectivity to ensure operation parameters are met between hosts on all relevant segments or VLANs 3.2. Make adjustments as required 3.3. Validate and document ***network*** performance

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• Implementing optic fibre and Ether-Channel technologies • Installation of Ethernet switches with gigabit and 10 gigabit interfaces • Configuring trunking on uplink ports • Basic cabling
Required knowledge
• OSI layer model • LAN and WAN network topologies (three-layer LAN hierarchy: core distribution

REQUIRED SKILLS AND KNOWLEDGE
and access) • Routers • Ethernet switches • Bandwidth limitations, measuring and testing • NICs (Fast Ethernet, gigabit and 10-gigabit Ethernet (token ring is less common)) • Ethernet switch functions (frame switching: store-and-forward, fast-forward, fragment-free) • Virtual LANs • Internetworking protocol suites, such as TCP/IP, IPX, DECnet, AppleTalk, IPV6 • MAC addresses, network layer protocols

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 following is essential: • Assessment must confirm the ability to build an ATM LAN that provides the required services and communication standards. To demonstrate competency in this unit the person will require access to: • Local area network infrastructure • Switches with various interfaces: fast-, one-, 10 gigabit- Ethernet
Context of and specific resources for assessment	This Unit focuses on configuring high-speed (high-bandwidth) channels between high-end switches. The two main methods in current use are to use One- or 10-Gigabit Ethernet connections and Ether-Channel architecture, in which up to eight Fast Ethernet or Gigabit channels (cables), are configured or trunked as a single logical channel. The breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and coordination would be characteristic. Assessment must ensure: • The demonstration of competency may also require self-directed application of knowledge and skills, with substantial depth in some areas where judgement is required in planning and selecting appropriate equipment, services and techniques for self and others. • Applications involve participation in development of

EVIDENCE GUIDE	
	strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team coordination may also be involved.
Method of assessment	The purpose of this unit is to define the standard of performance to be achieved in the workplace. In undertaking training and assessment activities related to this unit, consideration should be given to the implementation of appropriate diversity and accessibility practices in order to accommodate people who may have special needs. Additional guidance on these and related matters is provided in ICA05 Section 1. • Competency in this unit should be assessed using summative assessment to ensure consistency of performance in a range of contexts. This unit can be assessed either in the workplace or in a simulated environment. However, simulated activities must closely reflect the workplace to enable full demonstration of competency. • Assessment will usually include observation of real or simulated work processes and procedures and/or performance in a project context as well as questioning on underpinning knowledge and skills. The questioning of team members, supervisors, subordinates, peers and clients where appropriate may provide valuable input to the assessment process. The interdependence of units for assessment purposes may vary with the particular project or scenario.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICAI5152B Implement risk management processes An individual demonstrating this competency would be able to: • Demonstrate understanding of a broad knowledge

EVIDENCE GUIDE	
	base incorporating theoretical concepts, with substantial depth in some areas • Analyse and plan approaches to technical problems or management requirements • Transfer and apply theoretical concepts and/or technical or creative skills to a range of situations • Evaluate information, using it to forecast for planning or research purposes • Take responsibility for own outputs in relation to broad quantity and quality parameters • Take some responsibility for the achievement of group outcomes • Maintain knowledge of industry products and services Additionally, an individual demonstrating this competency would be able to: • Demonstrate understanding of ATM transfer modes, with depth in some areas • Apply solutions to a clearly defined range of problems • Identify and apply skill and knowledge to install and configure ATM infrastructure • Identify, analyse and evaluate information related to ATM • Take responsibility for outputs in relation to ATM configuration

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.	
Client may include but is not	• internal departments • external organisations

RANGE STATEMENT	
limited to:	• clubs • individual people • internal employees
Technical requirements may be in reference to:	• business • system • platform • application • database • network • people in the organisation
Network may include but is not limited to:	• large and small LANs • the use of the PSTN for dial-up modems only • private lines • VPNs • Data • voice
Network protocol suites may include:	• TCP/IP (IPX/SPX, DECnet, AppleTalk are legacy protocols) • IPV6 (layer 3 protocol only)

Unit Sector(s)

Unit sector	Implement

Co-requisite units

Co-requisite units		

Competency field

Competency field	