



Australian Government

Department of Education, Employment and Workplace Relations

ICANWK418A Implement backbone technologies in a local area network

Release: 1

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Modification History

Release	Comments
Release 1	This Unit first released with <i>ICAI1 Information and Communications Technology Training Package version 1.0</i>

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to implement core layer (backbone) connectivity in a local area network (LAN) for applications between floors in a multi-storey building or between separate buildings.

This unit focuses on configuring high-speed (high-bandwidth) channels between high-end switches.

Application of the Unit

This unit applies to individuals in the network area who are required to enable backbone connectivity in a LAN.

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

Required Skills and Knowledge

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

Required skills

- analytical skills to analyse organisation's current technical environment and requirements
- communication skills to liaise with clients and team members
- literacy skills to write technical reports
- numeracy skills to subnet a network
- planning and organisational skills to prioritise tasks and contingency arrangements
- technical skills to:
 - configure trunking on uplink ports
 - implement optic fibre and ether-channel technologies
 - install ethernet switches with gigabit and 10 gigabit interfaces
 - undertake basic cabling.

Required knowledge

- current and emerging industry practice associated with:
 - bandwidth limitations, measuring and testing
 - ethernet switch functions (frame switching: store-and-forward, fast-forward, fragment-free)
 - ethernet switches
 - internetworking protocol suites, such as TCP/IP, IPX, DECnet, AppleTalk and IPv6
 - LAN and WAN network topologies (three-layer LAN hierarchy: core distribution and access)
 - MAC addresses, network layer protocols
 - NICs (fast ethernet, gigabit and 10-gigabit ethernet)
 - OSI layer modelling
 - routers
 - virtual LANs.

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	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • build an ATM LAN that provides the required services and communication standards • document resource requirements and network performance.
Context of and specific resources for assessment	<p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> • local area network infrastructure • switches with various interfaces: fast-, one-, 10 gigabit-ethernet • appropriate learning and assessment support when required • modified equipment for people with special needs.
Method of assessment	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> • verbal or written questioning to assess candidate's knowledge of: <ul style="list-style-type: none"> • network hardware • LAN and WAN topologies • VLANs • TCP/IP • internet protocol version 4 (IPv4) • internet protocol version 6 (IPv6) • review of completed documentation of a network's performance • direct observation of candidate installing and testing backbone technology.
Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, where appropriate.</p> <p>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.</p> <p>Indigenous people and other people from a non-English speaking</p>

	<p>background may need additional support.</p> <p>In cases where practical assessment is used it should be combined with targeted questioning to assess required knowledge.</p>
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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.

<i>Network</i> may include:	<ul style="list-style-type: none"> • data • large and small LANs • private lines • use of the PSTN for dial-up modems only • voice • VPNs.
<i>Technical requirements</i> may relate to:	<ul style="list-style-type: none"> • application • business • database • network • people in the organisation • platform • system.
<i>Client</i> may include:	<ul style="list-style-type: none"> • external organisations • individuals • internal departments • internal employees.
<i>Network protocol suites</i> may include:	<ul style="list-style-type: none"> • IPv6 (layer 3 protocol only) • TCP/IP (IPX/SPX, DECnet, AppleTalk are legacy protocols).

Unit Sector(s)

Networking