



Australian Government

Department of Education, Employment and Workplace Relations

ICAA5144B Determine best-fit topology for a local network

Release: 1

ICAA5144B Determine best-fit topology for a local network

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit defines the competency required to determine the most appropriate way of networking computers to meet user needs and business requirements. The following units are linked and form an appropriate cluster: • ICAA5140C Design a server • ICAA5145B Identify best fit topology for a wide area network • ICAI5172B Implement backbone technologies in a local area network • ICAI5174B Install high end switches in multi switched local area networks • ICAI5176C Install and configure router • ICAS5192B Configure an internet gateway Network topologies include large and small local area networks (LANs), wide area networks (WANs), virtual private networks (VPNs), virtual local area networks (VLANs) and wireless local area networks (WLANs). No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	
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Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine user needs	1.1. Identify the different segments of the proposed network based on business requirements 1.2. Determine segment needs, using network functional analysis 1.3. Estimate traffic content and volumes based on business requirements 1.4. Develop a prioritised organisational network functional matrix
2. Develop local area network specification	2.1. Determine the resource requirements for each network segment on the basis of functional analysis 2.2. Analyse features of the physical environment for the effect on network design 2.3. Conduct a costing process for possible topology options 2.4. Consider topology options with reference to available resources and network functional matrix 2.5. Select and document appropriate network topology based on business requirements and functional analysis

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Use of LAN functional matrices
- Use of traffic simulation tools
- Basic traffic analysis
- Use of network protocols
- Basic skills in connecting networks and keeping cables tidy

Required knowledge

- Characteristics and relative strengths and weaknesses of LAN network topologies
- Line sharing protocols
- Scope of operation, redundancy paths, high/low-speed links, protocols, security, traffic flow patterns, traffic load, response time and reliability requirements, types

REQUIRED SKILLS AND KNOWLEDGE

- of user/applications, growth projections and capacity planning, constraints (costs, queuing)
- Detailed knowledge of bridges, routers, gateways, TCP/IP, Ethernet, hubs, adaptor cards
- Basic knowledge of cabling, particularly UTP (unshielded twisted pair), STP (shielded twisted pair) or optic fibre
- Current industry-accepted hardware and software products, including broad knowledge of general features and capabilities

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 clearly identify the best LAN, VPN or WLAN topology based on business or organisational needs.

To demonstrate competency in this unit the learner will need access to:

- Business requirements
- Equipment specifications

Context of and specific resources for assessment

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:

- 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 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

EVIDENCE GUIDE

	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 to 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: • ICAA5140C Design a server • ICAA5145B Identify best-fit topology for a wide area network • ICAI5172B Implement backbone technologies in a local area network • ICAI5174B Install high-end switches in multi-switched, local area networks • ICAI5176C Install and configure router • ICAS5192B Configure an internet gateway An individual demonstrating this competency would be able to: • Demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas

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	- 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
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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.

<i>Traffic</i> may include:	- data - voice - video
<i>Network</i> may include but is not limited to:	- large and small local area networks (LANs) - wide area networks (WANs) - virtual private networks (VPNs) - virtual local area networks (VLANs) - wireless local area networks (WLANs) - as well as the use of the public standard telephone network (PSTN) for dial-up modems only - private lines - data - voice
<i>Requirements</i> may be in reference to:	- business - system

RANGE STATEMENT

	• application • network • people in the organisation
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Unit Sector(s)

Unit sector	Analyse and Design
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Co-requisite units

Co-requisite units		

Competency field

Competency field	
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