



Australian Government

Department of Education, Employment and Workplace Relations

ICAA5145B Identify best-fit topology for a wide area network

Release: 1

ICAA5145B Identify best-fit topology for a wide area network

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit defines the competency required to identify the best way computers and local area networks (LANs) can be connected to make a wide area network (WAN). Options may involve the purchase of a WAN connection or service from a telecommunications provider. The following units are linked and form an appropriate cluster: • ICAA5144B Determine best fit topology for a local network • ICAA5151B Gather data to identify business requirements 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. Identify WAN needs	1.1. Identify the different local area network (LAN)/wireless local area network (WLAN) or virtual private network (VPN) segments of the proposed wide area network (WAN) 1.2. Determine segment needs using functional analysis 1.3. Estimate traffic content and volumes according to expected organisational usage, by examining telecommunications infrastructure 1.4. Develop an organisational WAN functional matrix
2. Create WAN specification	2.1. Determine resource requirements for each LAN/WLAN or VPN segment on the basis of functional analysis 2.2. Consider and report how features of the physical environment affect WAN design 2.3. Choose a WAN service appropriate to the amount and type of traffic expected to access the WAN 2.4. Include redundant links in the proposed WAN connectivity for link back-up purposes, in case the main link is disrupted

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Use of functional matrices
- Use of LAN functional matrices
- Use of traffic simulation tools
- Basic traffic analysis
- Use of network protocols

Required knowledge

- Telecommunications infrastructure, including the difference between digital and analogue networks
- Modems: concepts and types
- Asynchronous and synchronous communication

REQUIRED SKILLS AND KNOWLEDGE

- Use of microwave and satellite communication in networking
- Packet switching
- Router operations (e.g. DDR)
- TCP/IP protocols
- IP addressing
- Routing protocols (e.g. RIP, EIGRP, OSPF)
- Routed (routable) protocols (e.g. IP, IPX, AppleTalk)

General knowledge so that the learner can define the requirements covering areas such as:

- Scope of operation, redundancy paths, high/low-speed links, protocols, security, traffic flow patterns, traffic load, response time and reliability requirements, types of users/applications, growth projections and capacity planning, constraints and costs

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 configuration for connecting a LAN/WLAN or VPN into a WAN, given budget constraints and business needs. To demonstrate competency in this unit the learner will need access to: - Design documents relating to LANs to be incorporated in the WAN - 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

EVIDENCE GUIDE

	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 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: - ICAA5144B Determine best-fit topology for a local network - ICAA5151B Gather data to identify business requirements 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 - Analyse and plan approaches to technical problems or management requirements

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- 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

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.

Resource requirements includes:

- number of users
- average transaction and file transfer size
- type of applications using the link
- nature of WAN traffic (i.e. constant, steady, flows or communication in bursts)
- telecommunications links

WAN service may include:

- bandwidth
- reliability
- cost structure

Telecommunications infrastructure

- switched circuits (permanent virtual circuits (PVCs) and switched virtual circuits (SVCs)
- leased lines
- T-carriers, synchronous optical network (SONET) technologies
- asymmetrical digital subscriber line (ADSL)
- integrated services digital network (ISDN)
- symmetrical digital subscriber line (SDSL)
- high speed digital subscriber line (HDSL)

RANGE STATEMENT**Traffic** may include:

- data
- voice
- video

Unit Sector(s)**Unit sector**

Analyse and Design

Co-requisite units**Co-requisite units**

Competency field**Competency field**