



**Australian Government**

# **ICTNWK617 Configure and manage a storage area network**

**Release: 1**

# ICTNWK617 Configure and manage a storage area network

## Modification History

| Release   | Comments                                                                                                     |
|-----------|--------------------------------------------------------------------------------------------------------------|
| Release 1 | This version first released with ICT Information and Communications Technology Training Package Version 2.0. |

## Application

This unit addresses the knowledge, processes and techniques necessary to configure and manage a Storage Area Network (SAN) which are widely used in the enterprise datacenter space and when coupled with server virtualisation technology, form the basis for highly available datacentres.

It applies to specialist technicians and storage engineers who manage and maintain highly available data storage in a networked environment.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

## Unit Sector

Networking

## Elements and Performance Criteria

| ELEMENT                                                | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes.</i>       | <i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>                                                                                                                                                                                                                                                                                                                                                                                            |
| 1. Determine specifications for a Storage Area Network | <p>1.1 Analyse and document client requirements.</p> <p>1.2 Analyse and document the required topology to support a storage area network.</p> <p>1.3 Analyse and determine the required storage capacity according to current and future business requirements.</p> <p>1.4 Determine the storage protocols to be used to meet organisational requirements.</p> <p>1.5 Determine the requirements for network management, backup, security and redundancy, according to organisational policy.</p> |

| ELEMENT                                                             | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                     | 1.6 Analyse and recommend a SAN model based on client design requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 2. Configure network settings on a Storage Area Network filer/node. | 2.1 Configure the initial SAN Network settings to facilitate network communication using the recommended process.<br>2.2 Configure Management Interface address to allow configuration of remaining network interfaces.<br>2.3 Create logical interfaces to support network-attached storage (NAS) protocols<br>2.4 Create logical interfaces to support SAN protocols<br>2.5 Configure virtual local area networks (VLAN) to segment the network according to the design brief                                |
| 3. Provision storage                                                | 3.1 Create aggregate/s using recommended redundant array of independent disks (RAID) levels in accordance with the documented design brief.<br>3.2 Create logical volume/s in accordance with the documented design brief.<br>3.3 Create logical unit number/s (LUN) in accordance with the documented design brief.<br>3.4 Provision a share using NAS protocols in accordance with the documented design brief.<br>3.5 Provision storage using SAN protocols in accordance with the documented design brief. |
| 4. Connect client and/or server to provisioned storage.             | 4.1 Connect client and/or server to shared storage using NAS protocols and verify operations.<br>4.2 Connect client to shared storage using SAN protocols and verify operations.                                                                                                                                                                                                                                                                                                                               |
| 5. Configure advanced Storage Area Network Features.                | 5.1 Provision and test SAN based volume snapshot operations.<br>5.2 Provision and test SAN based data deduplication operations.                                                                                                                                                                                                                                                                                                                                                                                |
| 6. Configure Backup and Disaster recovery features.                 | 6.1 Provision and test SAN based data replication operations.<br>6.2 Provision and test SAN based backup and restore operations.                                                                                                                                                                                                                                                                                                                                                                               |

## Foundation Skills

*This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.*

| Skill                      | Performance Criteria                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reading                    | 1.1, 2.1, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2                                    | <ul style="list-style-type: none"> <li>Recognises and interprets technical and organisational documentation to determine and confirm job requirements.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Writing                    | 1.1, 2.2, 3.1, 3.3                                                             | <ul style="list-style-type: none"> <li>Develops a range of workplace documentation for a specific audience using clear and detailed language in order to convey explicit information, requirements and recommendations.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Oral Communication         | 1.1, 3.1                                                                       | <ul style="list-style-type: none"> <li>Uses listening and questioning skills to confirm understanding for requirements</li> <li>Establishes and maintains complex and effective spoken communication in a broad range of contexts</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Navigate the world of work | 1.4, 1.5                                                                       | <ul style="list-style-type: none"> <li>Recognises and responds to both explicit and implicit protocols within familiar work contexts and appreciates the importance of identifying and responding to protocols in new situations</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Get the work done          | 1.2, 2.1, 2.2, 2.4, 2.5, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 5.1, 5.2, 6.1, 6.2 | <ul style="list-style-type: none"> <li>Demonstrates a sophisticated understanding of principles, concepts, language and practices associated with the digital world</li> <li>May operate from a broad conceptual plan, developing the operational detail in stages, regularly reviewing priorities and performance during implementation, identifying and addressing issues</li> <li>Actively identifies systems, devices and applications with potential to meet current and/or future needs</li> <li>Uses nuanced understanding of context to recognise anomalies in a virtualised machine environment and subtle deviations to normal expectations, focussing attention and remedying problems promptly</li> </ul> |

## Unit Mapping Information

| Code and title current version | Code and title previous version | Comments | Equivalence status |
|--------------------------------|---------------------------------|----------|--------------------|
| ICTNWK617 Configure and        | Not applicable                  | New unit | No Equivalent unit |

| <b>Code and title<br/>current version</b> | <b>Code and title<br/>previous version</b> | <b>Comments</b> | <b>Equivalence status</b> |
|-------------------------------------------|--------------------------------------------|-----------------|---------------------------|
| manage a storage<br>area network          |                                            |                 |                           |

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

# Assessment Requirements for ICTNWK617 Configure and manage a storage area network

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## Performance Evidence

Evidence of the ability to:

- determine and document the specifications for a Storage Area network (SAN) solution
- select the appropriate SAN solution to meet the client requirements
- document and design a SAN solution that includes backup, security and redundancy
- install and configure a storage cluster, either physically or in a simulated/virtualised environment
- configure network settings to facilitate management of a SAN
- verify and troubleshoot network connectivity
- configure network protocols to facilitate storage access via a client/server environment
- provision shared storage using suitable protocols
- configure and use advanced SAN features if available
- monitor and report on capacity utilization
- resize existing storage to increase the size of existing datastores
- create new datastores utilising capacity on a storage system.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

## Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe the function and applications of the following network protocols:
  - common internet file system CIFS
  - sever message block (SMB)
  - network file system (NFS)
  - internet small computer system interface (iSCSI)
  - fibre channel (FC)
  - fibre channel over Ethernet (FCOE)

- describe the advanced SAN features including:
  - snapshots
  - data deduplication
  - flexible volumes
  - replication
  - backup and restore
- describe the advantages and disadvantages of storage area networks (SAN) versus direct attached storage (DAS) devices
- identify and describe common hard drive types including:
  - serial attached SCSI (small computer system interface) -SAS
  - serial ATA (SATA)
  - solid state disk (SSD)
- identify and describe common network cable types and connectors
- outline the common network topologies
- describe the implementation and configuration of SANs
- recognise and describe redundant array of independent disks (RAID) configurations and state their application in data storage
- describe which features of advanced storage systems can be applied in server and/or virtualized environments
- describe the functional and interconnection relationship between storage systems and servers in server and/or virtualized environments
- describe how storage systems can protect against data storage failures and the functional process for recovering data.

## Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the networking field of work and include access to:

- site or prototype where a storage area network may be implemented
- storage area network appliance or simulated appliance
- network technical requirements
- appropriate software.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

## Links

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