**Australian Government**

**Department of Education, Employment and Workplace Relations**

# ICADBS402A Complete database backup and restore

**Release: 1**

**INDUSTRY SKILLS COUNCILS**

Creating Australia's Future

## ICADBS402A Complete database backup and restore

## Modification History

| Version | Comments |
|---------|----------|
| ICADBS402A | This version first released with *ICA11 Information and Communications Technology Training Package version 1.0* |

## Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to back up and restore a database.

## Application of the Unit

This unit applies to experienced technical support personnel, such as help-desk supervisors, IT support technicians, database support technicians and user-support specialists who are responsible for maintaining a backup schedule for one or more databases, and may also need to restore backups to the live system.

## 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 |
|---|---|
| *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

| 1. Review database architecture to plan backup and recovery | 1.1 Examine *architecture* of *database* file system |
| --- | --- |
| | 1.2 Determine most appropriate methods for *backup* and recovery |
| | 1.3 Identify and examine likely or possible risk and failure scenarios |
| | 1.4 Prepare a backup maintenance schedule |
| | 1.5 Prepare a contingency plan |
| 2. Determine backup methods appropriate to database requirements | 2.1 Evaluate range of backup and restoration methods based on organisational and security *standards* and on the assessment of likely or possible failure scenarios |
| | 2.2 Complete full off-line backups according to organisational and security standards with minimal down time |
| | 2.3 Complete online file backups as determined by organisational and security standards and with minimal down time |
| | 2.4 Employ disk mirroring and redundant array of inexpensive disks (RAID) hard disk configurations to keep copies of files |
| | 2.5 Arrange off-site copies of backup files |
| 3. Establish recovery points and disaster-recovery procedures | 3.1 Determine database recovery points based on the backup arrangements according to *organisational guidelines* |
| | 3.2 Test the restore process to ensure that the database can be restored to a given recovery point, with minimal down time |
| | 3.3 Complete the restoration of the database to the point of failure, without loss of committed transactions |
| 4. Create and deploy standby database | 4.1 Create or set up a standby database to meet organisational guidelines |
| | 4.2 Implement standby database to support critical business functions |
| | 4.3 Prepare *documentation* for standby database |

# Required Skills and Knowledge

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

## Required skills

- analytical skills to:
    - evaluate a range of backup and restoration methods
    - undertake non-routine work processes
- literacy skills to:
    - prepare documentation
    - read and interpret technical manuals
    - set benchmarks and identified scope
- planning and organisational skills to:
    - develop plans with prioritised tasks
    - minimise disruption to client
- problem-solving skills in non-routine work processes
- research skills for identifying, analysing and evaluating broad features of a particular business domain and best practice in backup and recovery strategies
- technical skills to:
    - run backup process
    - set backup schedule
    - test restore process.

## Required knowledge

- broad knowledge of:
    - diagnostic tools
    - structured query language (SQL)
    - principles of databases
    - tuning methodologies
- detailed knowledge of:
    - backup and recovery methods
    - database administration
    - database security
    - open file backup procedures and restore operations.

# 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 ability to:<br><br>determine the most appropriate methods for backup and recovery<br><br>• implement backup and restore procedures with minimum disruption to the business, following contingency plan if necessary. |
| **Context of and specific resources for assessment** | Assessment must ensure access to:<br><br>• documentation standards<br>• backup and recovery policies<br>• sites with a representative range of current industry standard software and diagnostic tools<br>• database package with data<br>• technical records<br>• organisational guidelines<br>• vendor documentation<br>• server and networked personal computer on which to conduct backup and restore procedures<br>• appropriate learning and assessment support when required<br>• modified equipment for people with special needs. |
| **Method of assessment** | A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:<br><br>• direct observation of candidate performing backup and restore procedures<br>• review of candidate's documentation containing:<br>  • planning<br>  • backup schedule<br>  • contingency plan<br>• verbal or written questioning to assess candidate's knowledge of:<br>  • backup and restore techniques and procedures<br>  • risks and failure scenarios that are likely or possible. |
| **Guidance information for assessment** | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, where appropriate.<br><br>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. |
| --- | --- |
| | Indigenous people and other people from a non-English speaking background may need additional support. |
| | In cases where practical assessment is used it should be combined with targeted questioning to assess required knowledge. |

# 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.*

| | |
|---|---|
| ***Architecture*** may include: | • configuration:<br>   • large memory model<br>   • requests per second<br>   • small memory model<br>• database software:<br>   • DB2<br>   • Informix<br>   • Ingres<br>   • Microsoft SQL (MS SQL) server<br>   • Mini SQL (mSQL)<br>   • MySQL<br>   • Oracle<br>   • Sybase<br>• operating system:<br>   • Linux<br>   • Mac<br>   • multi-user ability<br>   • Windows 2000 or above<br>   • Novell NetWare 5 or above. |
| ***Database*** may include: | • commercial off-the-shelf (COTS) database packages<br>• object-relational databases<br>• proprietary databases<br>• relational databases. |
| ***Backup*** may include: | • DVD or CD backup<br>• more comprehensive and complex backup facilities across the network or the internet<br>• multiple tape units<br>• single tape units. |
| ***Standards*** may include: | • International Organization for Standardization (ISO), International Electrotechnical Commission (IEC) and Australian Standards (AS) standards<br>• organisational standards<br>• project standards. |

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| *Organisational guidelines* may include: | • communication methods<br>• content of emails<br>• dispute resolution<br>• document procedures and templates<br>• downloading information and accessing particular websites<br>• financial control mechanisms<br>• opening mail with attachments<br>• personal use of emails and internet access<br>• virus risk. |
|---|---|
| *Documentation* may include: | • audit trails<br>• client training<br>• ISO, IEC and AS standards<br>• maintaining equipment inventory<br>• naming standards<br>• project management templates and report writing<br>• satisfaction reports<br>• version control. |

# Unit Sector(s)

Database