Australian Government
Department of Education, Employment and Workplace Relations

ICAPRG412A Configure and maintain databases

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

ICAPRG412A Configure and maintain databases

Modification History

Release	Comments
Release 1	This Unit 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 install a database, manage data, data access and data security, and improve database performance.

Application of the Unit

This unit applies to individuals responsible for the maintenance and coordination of database operations. They usually work in a company or organisation to provide daily services related to databases.

These individuals may work as database administrators, database developers, database coordinators, or application developers.

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. Determine requirements of database administration	1.1 Identify **components** of a **database** instance 1.2 Define and use tools to administer database
2. Install and configure database system	2.1 Verify database software installation prerequisites 2.2 Install database software and related services 2.3 Configure database instance, components and services 2.4 Perform **data-management tasks**
3. Manage database security and integrity	3.1 Create and administer users 3.2 Create and manage **permissions** to perform database operations 3.3 Create and manage **roles**
4. Optimise and back up database	4.1 Configure database for backup and recovery operations 4.2 Create and manage database **backups** 4.3 Restore and perform database **recovery** 4.4 Tune and perform database **optimisation**
5. Document database	5.1 Document maintenance and tuning work performed on database 5.2 Document users added to system

Required Skills and Knowledge

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

Required skills

- analytical skills to:
    - evaluate interdependencies between data fields
    - examine and define system requirements for data
    - review requirements and determine the availability of information
- communication skills to:
    - interact with developer to determine data requirement
    - interact with end user personnel to determine data requirement
    - liaise with management on report and result matters
- literacy skills to:
    - read and interpret specifications developed by business and technical experts
    - write a report
- problem-solving skills to:
    - address common issues relating to the operation of a computer system
    - perform basic troubleshooting to diagnose system problems
- technical skills to:
    - perform basic data-management operations, such as insert, update and delete operations
    - perform basic operations of a computer system.

Required knowledge

- basic knowledge of:
    - database design
    - desktop operating systems
    - relational databases
    - computer hardware and components
    - computer networking and components
    - structured query language (SQL).

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: • install and configure database software • manage database files, integrity, users and security • create backup and restore databases • monitor database performance.
Context of and specific resources for assessment	Assessment must ensure access to: • database-management system software • database instance • tools in administering database • specific requirements, including client and functionality requirements • policy and naming standard • appropriate learning and assessment support when required • 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:
	
	• direct observation of candidate performing:
	   • the installation, configuration and troubleshooting of a database management system software
	   • database tuning for performance using appropriate techniques and tools
	   • database backup creation and restore using the backup file
	   • data-management tasks, such as importing and exporting data, and instance creation
	   • database security tasks, such as creating users, and assigning roles and permissions to database users
	• verbal or written questioning to determine candidate's knowledge of database tuning and database security
	• review of candidate's database documentation.

Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, where appropriate. 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.

Components may include:	- memory structure - relational database management system (RDBMS) software - stored procedures - table structure.
Database may include:	- MS Access - MySQL - Oracle - structured query language (SQL) server.
Tools may include:	- MySQL Workbench - Oracle Enterprise Manager Database Control - phpMyAdmin - SQL Server Management Studio.
Data-management tasks may include:	- implement data compressions - import and export data - maintain indexes - manage collations - manage data partitions.
Permissions may include:	- implied - object - statement.
Roles may include:	- application - database: - fixed - public - defined - server, such as fixed-server roles.
Backups may include:	- compressed - differential - file - full database - online and offline database - transaction log.

Recovery may include:	• bulk-logged • full • simple.
Optimisation may include:	• cache mechanism • data compression • indexing.

Unit Sector(s)

Programming and software development