

What is COGENT...

The Geological Survey of NSW is a Division of the NSW Department of Mineral Resources. In 1997 the Department awarded a contract to ESRI Australia to develop a corporate geoscientific data repository with associated data view and loading applications. This is COGENT - the Common Geoscientific Environment.

The project started in August 1997 and was completed on time and on budget in February 1999.

Aim...

- Develop a common data repository for all corporate geoscientific data.
- Provide software tools that will allow easy access to the data repository by all personnel, thus improving communication, co-operation and efficiency within the Department.
- Providing a foundation for future deployment of data via the Internet.

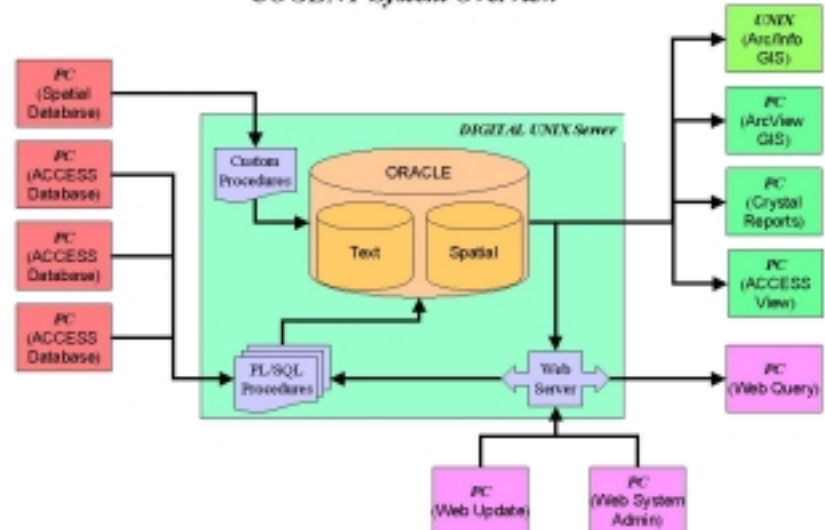
Data Sources...

As with many organisations, the Department has a plethora of specialised applications and stand alone databases. These have been developed by individual custodians with the aim of meeting their immediate needs for data management, analysis and display.

The Department manages two distinct types of data; **Spatial** (map-based data) and **Attribute** (descriptive data).

Most of the **attribute** datasets are managed within Microsoft ACCESS. Others exist in legacy mainframe systems while some units within the Department had no structured manner for managing their data.

COGENT System Overview



Most of the **spatial** data is held in ESRI or ER Mapper formats.

Data Repository...

In line with the Departments Information Systems Strategy, all data is to be held in ORACLE RDBMS with ESRI's Spatial Database Engine (SDE) being used to hold and manage spatial data, also within ORACLE.

The COGENT data model is partitioned into individual modules, where each module represents the data model for a particular dataset. Wherever subsets of the data resemble data in other modules common field names have been used. This is particularly the case with locational data, where common attributes are used to describe where the data was collected.

Where an ORACLE dataset is derived from an ACCESS dataset, the ORACLE data model resembles that used in ACCESS but does not duplicate it.

Lookup tables (tables that contain descriptive information for database codes) are either unique to a single module or shared across multiple modules.

Ongoing consultation between dataset custodians will occur to determine mutually acceptable values for shared lookup tables.

Data Access...

General Access:

Non-confidential data is made available on the Department's intranet so that anyone with a standard web browser is able to view it. Initially a basic set of functionality has been provided, but this may be expanded in time.

Specialist Access:

Users with skills in using third-party products to access data (eg, ArcView or Crystal Reports) have access to non-confidential data tables in order to perform ad-hoc queries and analysis. Custodians can also view confidential data.

Specialist intranet applications such as Boreholes, Seismic Data and parts of the Stratigraphic Names database are only accessible if the user enters a valid username and password.

Custodial Access:

Data custodians continue to use their existing ACCESS systems for the day-to-day management of local datasets. However they may also choose to use the specialist tools or the COGENT intranet

COGENT Database

system for accessing the corporate repository.

Spatial Data

Spatial data is a combination of AUSLIG "background" data (roads, rivers, Local Government Areas etc.), data from the Department's Titles Administration System (TAS) and site coordinate data that is maintained by the various COGENT data custodians in SDE.

Attribute data...

It was decided that custodians currently using ACCESS databases would continue to use them as many had developed complex applications, performing high level analysis.

However, the ACCESS data must be uploaded to ORACLE at regular intervals so that non-custodial personnel can access and make use of the data.

Where ACCESS databases were not available, (eg, Coal and Petroleum Boreholes and Stratigraphic Names) specific intranet applications were developed that allow data entry and editing in ORACLE.

Benefits ...

The Geological Survey's core business includes Regional Mapping, Landuse Enquiries and answering client queries, in particular from the exploration industry. By providing an easy to use tool to access all geoscientific data held throughout the Department, COGENT facilitates much of the Survey's business. Being able to easily determine what data is available will be of particular benefit to personnel handling client queries. Turnaround time should be significantly improved.

Industry will benefit by having better access to the Department's data, thus facilitating exploration in New South Wales.

All data managed within COGENT conforms to agreed departmental standards.

Who will use it...

The system is primarily intended for use by geologists, geophysicists, cartographers and other departmental personnel. However, a wide range of people will benefit from the ability to clearly and unambiguously determine what data is available for a specific spatial area or for a specific topic.

The system is currently available on the Department's intranet and has been designed for inhouse use. However, future Internet deployment is being considered.

Major components...

HTML Forms:

Active HTML pages with embedded forms are used for all text search activities with results displayed as HTML reports.

Spatial Java Applet:

This allows the user to interactively specify an area of interest to spatially limit the retrieval of data.

Text Java Applet:

Displays the attribute data held in ORACLE.

SQL Web engine:

PL/SQL code performs the bulk of operations within the system. Routines generate the HTML pages, query the database and control access.

Map Engine:

Written in C, the Map Engine retrieves spatial and attribute data from the SDE database and displays it on the Spatial Java Applet and on HTML pages.

Spatial Update:

Also written in C, this code automatically updates the spatial data following an update from ACCESS or from a specialised application.

Hub Loader:

Java and PL/SQL code on the server that initiates a communication with the Node Server, receives data from the ACCESS database, loads it into ORACLE and maintains administrative information. Business rules are enforced and

data validation is performed. The Hub Loader is initiated on a schedule or manually. If a schedule is set the custodian can choose to have no input, simply allowing the server to upload data from the PC on a regular basis.

Node Server:

Java code on the custodians PC that extract data from the ACCESS database and passes it to the Hub Loader. Communication with the Hub Loader is via HTTP.

Technology...

The COGENT system is implemented as an intranet solution on the Department's Local and Wide Area Networks (LAN/WAN).

The Department operates a Digital 8200 server running the Digital UNIX operating system.

The data resides in an ORACLE 7.3 database and related spatial data resides in the Spatial Database Engine Version 3.0 (SDE) from ESRI.

Web serving is performed with the Apache Web Server. This is the Department's preferred web server, although other web servers can be supported.

COGENT programs are written using PL/SQL, Java, C, and Perl.

Java programming for COGENT makes use of the Symantec development tools.

All ORACLE database design and data modeling was performed using ORACLE's DESIGNER 2000 tools, except the spatial modeling, which is not supported by this ORACLE product.

A version 4 or higher browser from Microsoft or Netscape is required. This is principally to cater for the use of Java applets.

Contacts...

Dept of Mineral Resources:

Mr Peter Lewis (02) 9901 8372

ESRI Australia:

Mr Quill Williams (02) 9241 2138