6

Oracle Database Management Tools

Objectives

After completing this lesson, you should be able to:

- Use SQL*Plus to access the Oracle database
- Use Oracle Enterprise Manager Database Express to perform administrative tasks
- Use Oracle Enterprise Manager Cloud Control to manage the database instance

Oracle Database Management Tools: Introduction

- SQL*Plus provides an interface to your database so that you can:
  - Perform database management operations
  - Execute SQL commands to query, insert, update, and delete data in your database
- SQL Developer
  - Is a graphical user interface for accessing your instance of Oracle Database
  - Supports development in both SQL and PL/SQL
  - Is available in the default installation of Oracle Database
- Oracle Enterprise Manager Database Express
- Oracle Enterprise Manager Cloud Control

SQL*Plus is a command-line program that you use to submit SQL and PL/SQL statements to an Oracle database. You can submit statements interactively or as SQL*Plus scripts. SQL*Plus is installed with the database and is located in your `$ORACLE_HOME/bin` directory.

You can start SQL*Plus from the command line, or from the Start menu on a Windows client.

SQL Developer is a graphical user interface for accessing your instance of Oracle Database. SQL Developer supports development in both the SQL and PL/SQL languages. It is available in the default installation of Oracle Database.

With SQL Developer, you can browse database objects, run SQL statements and SQL scripts, and edit and debug PL/SQL statements. You can also run any number of provided reports, as well as create and save your own.

Using SQL*Plus

SQL*Plus is:

- A command-line tool
- Used interactively or in batch mode

```
[oracle@EDRSR11P1 ~]$ sqlplus hr

SQL*Plus: Release 12.1.0.1.0 Production on Tue Jul 9 08:45:39 2013

Copyright (c) 1982, 2012, Oracle.  All rights reserved.

Enter password:
Last Successful login time: Tue Jul 09 2013 08:45:30 +00:00

Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.1.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing options

SQL> SELECT last_name FROM employees;
LAST_NAME
-------------------------
Abel
Ande
…
```

ORACLE

You can use the SQL*Plus command-line interface to execute SQL*Plus, SQL, and PL/SQL commands to:

- Enter, edit, run, store, retrieve, and save SQL commands and PL/SQL blocks
- Format, calculate, store, and print query results
- List column definitions for any table
- Send messages to and accept responses from an end user
- Perform database administration

To start SQL*Plus:

1. Open a terminal window.
2. At the command-line prompt, enter the SQL*Plus command in the following form:

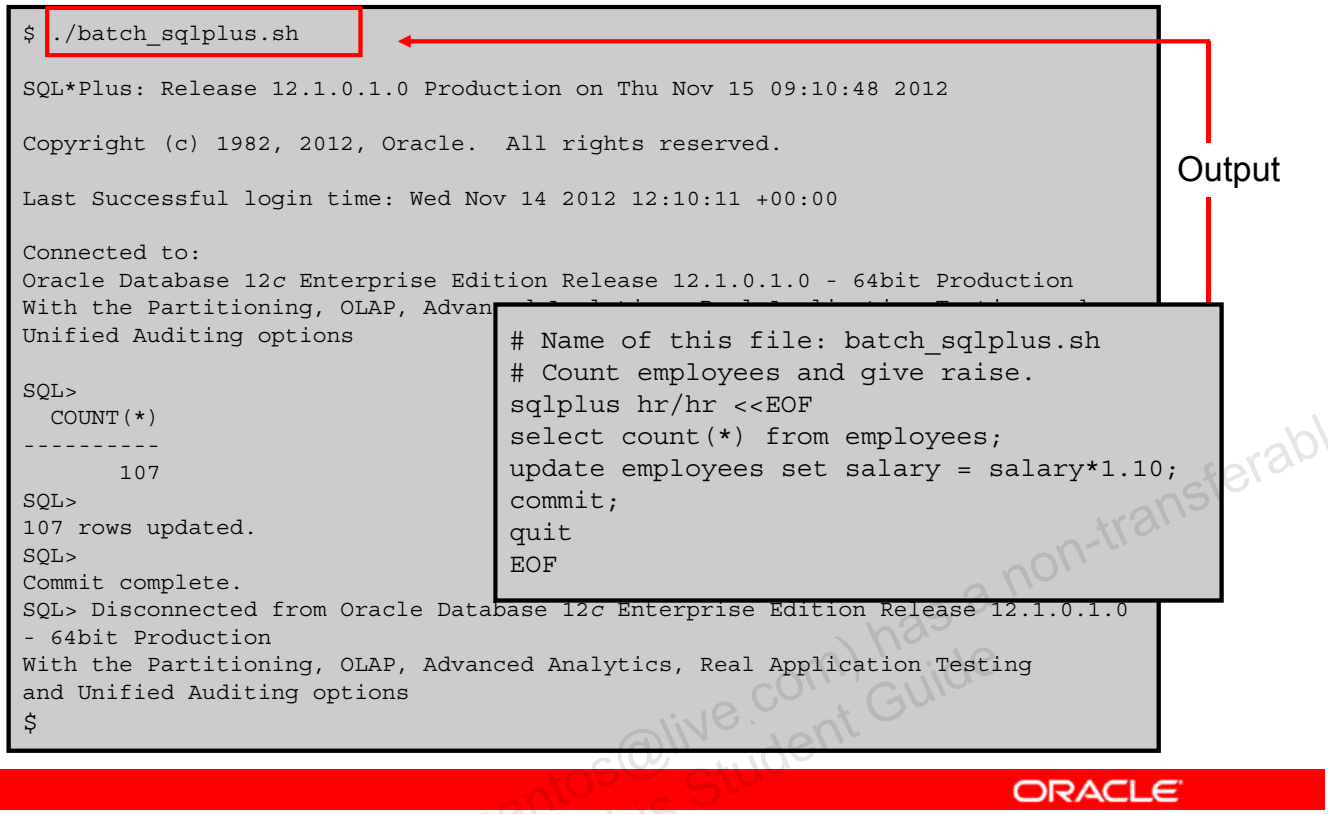
   ```
   $ sqlplus <userid>/<pwd> or /nolog
   ```

3. If you use the `NOLOG` option, you must enter `CONNECT` followed by the username you want to connect as:

   ```
   SQL> connect <username>
   ```

4. When prompted, enter the user's password. SQL*Plus starts and connects to the default database.

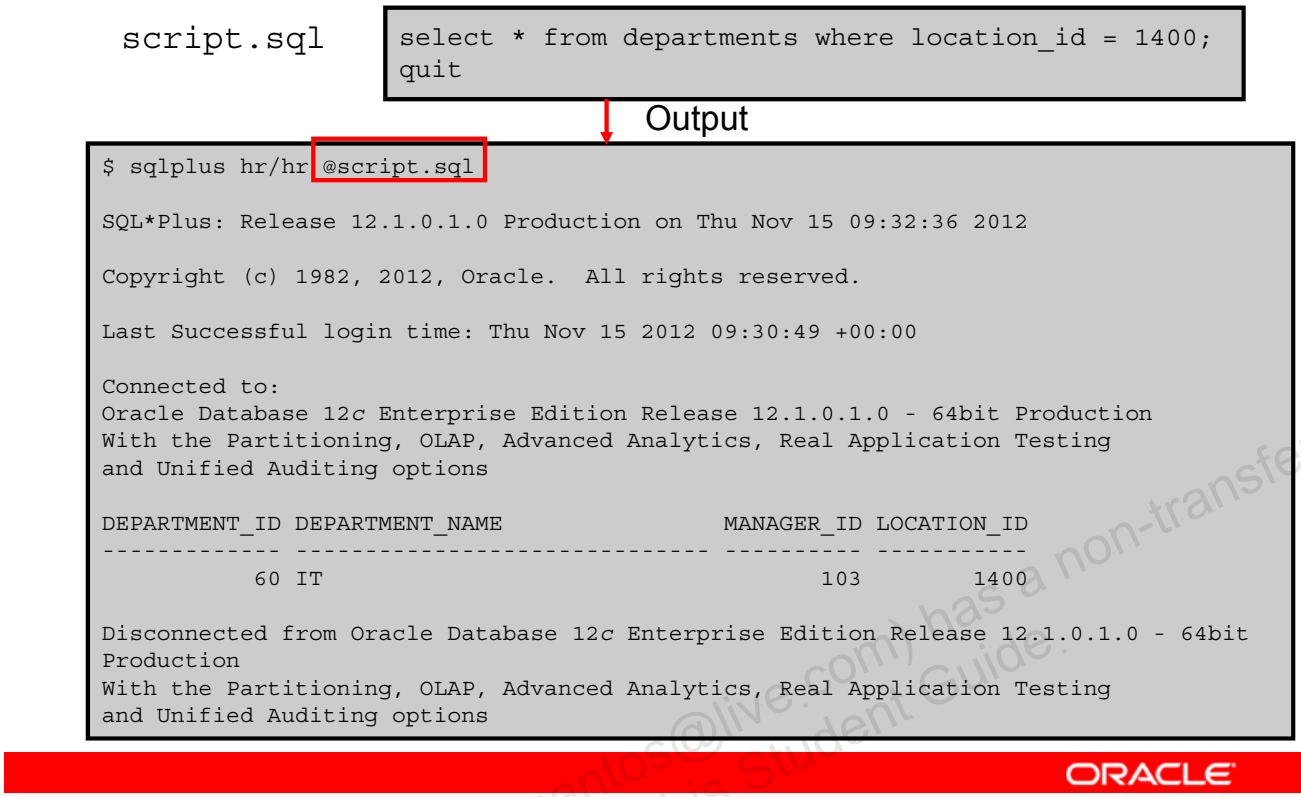
Calling SQL*Plus from a Shell Script



You can call SQL*Plus from a shell script or `BAT` file by invoking `sqlplus` and using the operating system scripting syntax for passing parameters.

In this example, the `SELECT`, `UPATE`, and `COMMIT` statements are executed before SQL*Plus returns control to the operating system.

Calling a SQL Script from SQL*Plus



You can call an existing SQL script file from within SQL*Plus. This can be done at the command line when first invoking SQL*Plus, as shown in the slide. It can also be done from inside a SQL*Plus session simply by using the "@" operator. For example, this example shows executing the script from within an already established SQL*Plus session:

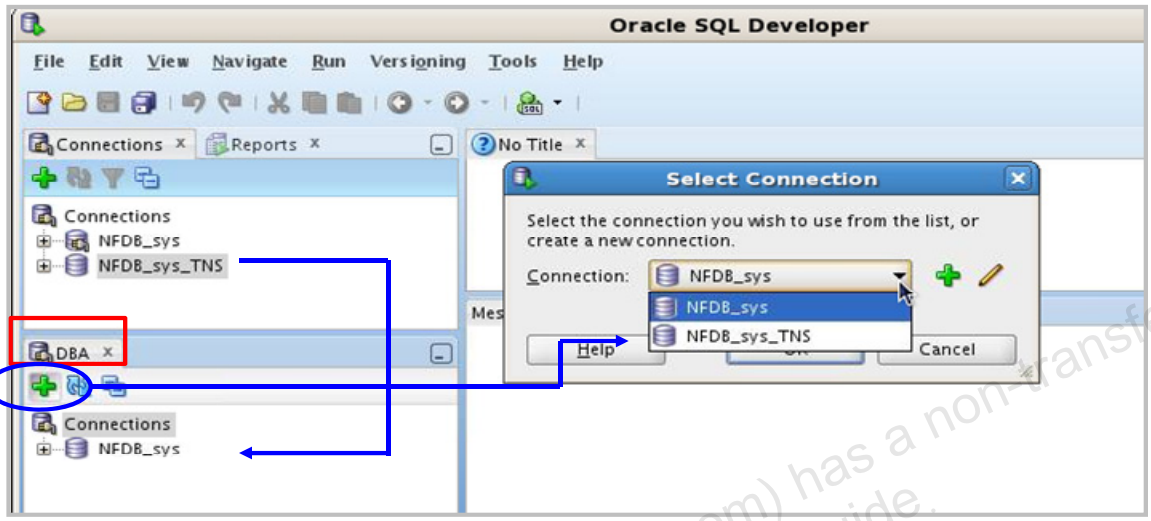
```
SQL> @script.sql
```

Note: The default file extension for script files is `.sql`. When a script is saved from SQL*Plus by using the `SAVE` command, this extension is automatically supplied. Scripts with this extension can be executed without supplying the extension at execution time, as in the following example:

```
SQL> @script
```

Oracle SQL Developer: Connections

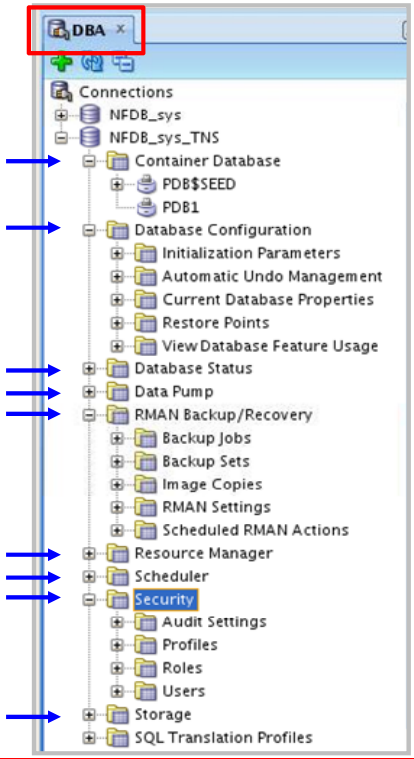
Perform DBA operations in the DBA navigator by using DBA connections:



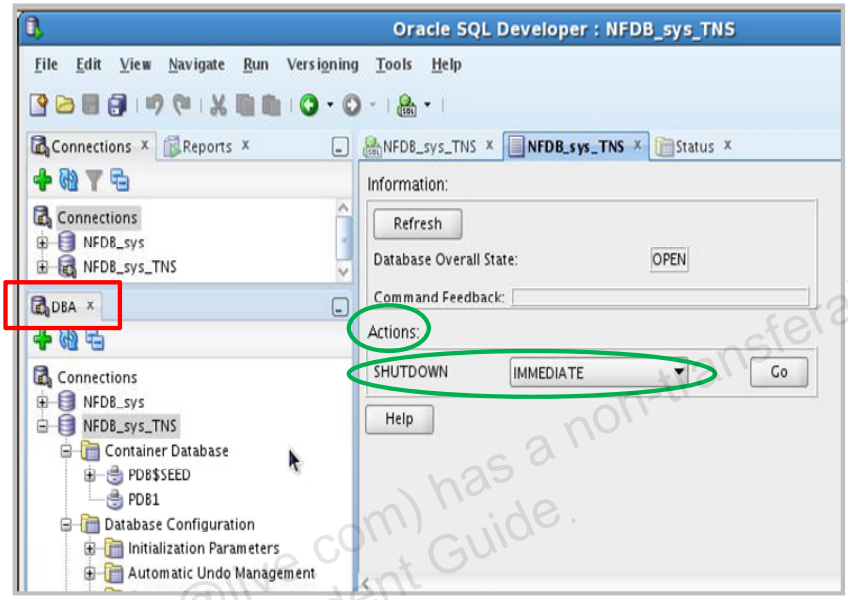
Oracle SQL Developer is a tool that allows stand-alone graphical browsing and development of database schema objects, as well as execution of database administrative tasks.
SQL Developer enables users with database administrator privileges to view and edit certain information relevant to DBAs and perform DBA operations. To perform DBA operations, use the DBA navigator, which is similar to the Connections navigator in that it has nodes for all defined database connections. If the DBA navigator is not visible, select View, then DBA. You should add only connections for which the associated database user has DBA privileges, or at least privileges for the desired DBA navigator operations on the specified database.

Oracle SQL Developer: DBA Actions

Using DBA features through DBA navigator



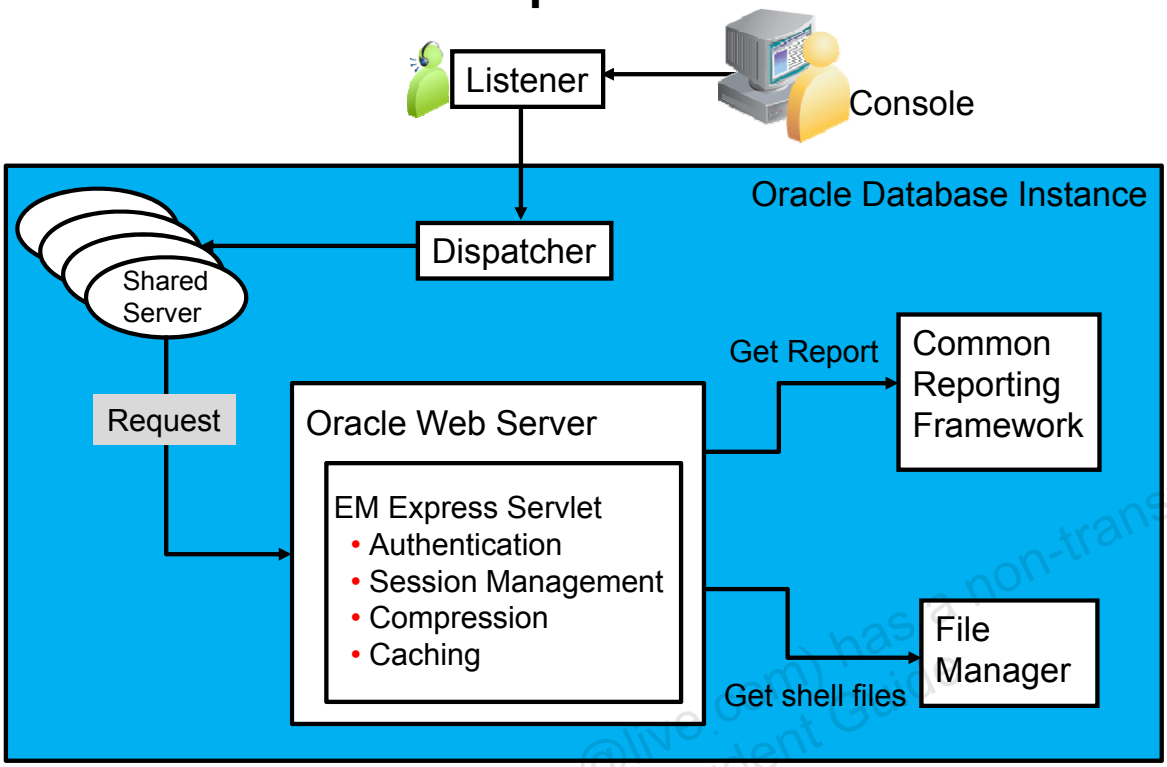
Performing DBA actions



The DBA operations that can be performed are the following:

- Database startup/shutdown
- Database configuration: Initialization Parameters, Automatic Undo Management, Current Database Properties, Restore Points, View Database Feature Usage
- Database status view
- Data Pump export and import jobs
- RMAN backup/recovery actions
- Resource Manager configuration
- Scheduler setting
- Security configuration like audit settings, profiles, roles, and users
- Storage configuration for archive logs, control files, data files, redo log groups, tablespaces, and temporary tablespace groups

Oracle Enterprise Manager Database Express Architecture



Oracle Enterprise Manager Database Express is a lightweight administration tool. It provides an out-of-box browser-based management solution for a single Oracle database (or database cluster), including performance monitoring, configuration management, administration, diagnostics and tuning.

Oracle Enterprise Manager Database Express uses a web-based console, communicating with the built-in web server available in XML DB.

As requests from the console are processed, the Enterprise Manager Database Express servlet handles the requests, including authentication, session management, compression, and caching. The servlet passes requests for reports to the Common Reporting Framework and actions requiring shell files to the File Manager.

Enterprise Manager Database Express is available only when the database is open. This means that Enterprise Manager Database Express cannot be used to start up the database. Other operations that require that the database change state, such as enable or disable ARCHIVELOG mode, are also not available in Enterprise Manager Database Express.

Configuring Enterprise Manager Database Express

- Configure an HTTP listener port for each database instance.
  - Verify `DISPATCHERS` parameter.

```
dispatchers=(PROTOCOL=TCP)(SERVICE=sampleXDB)
```

  - Use `DBMS_XDB.setHTTPPort` procedure.

```
exec DBMS_XDB.setHTTPPort(5500)
```

  - Launch Enterprise Manager Database Express:

```
http://hostname:5500/em
```

- Use a different port for each instance.
- Browser requires Flash plug-in.

Oracle Enterprise Manager Database Express is configurable with a single click in Database Configuration Assistant (DBCA).

Enterprise Manager Database Express requires that the XMLDB components are installed. All Oracle version 12.1.0 databases have XMLDB installed.

To activate Enterprise Manager Database Express in a database, verify that the `DISPATCHERS` initialization parameter has at least one dispatcher configured for the XMLDB service with the TCP protocol.

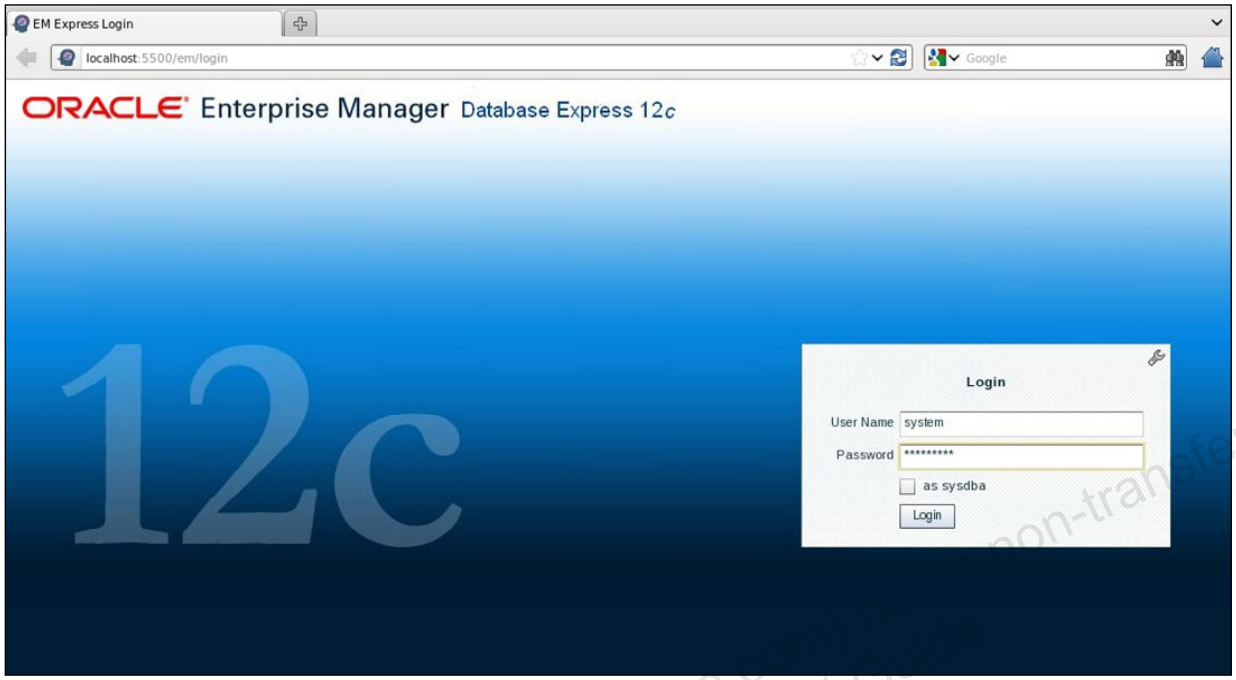
Use the `SETHTTPPORT` procedure in the `DBMS_XDB` package to configure a port on the server. Connect to the Enterprise Manager Database Express console with the URL shown in the slide. Substitute the host name of the server and the port number you set by using the `SETHTTPPORT` procedure.

If you have multiple database instances to monitor on the same machine, set a different port for each. To find the port used for each database instance, execute the following statement:

```
SQL> SELECT dbms_xdb.gethttpport FROM DUAL;
```

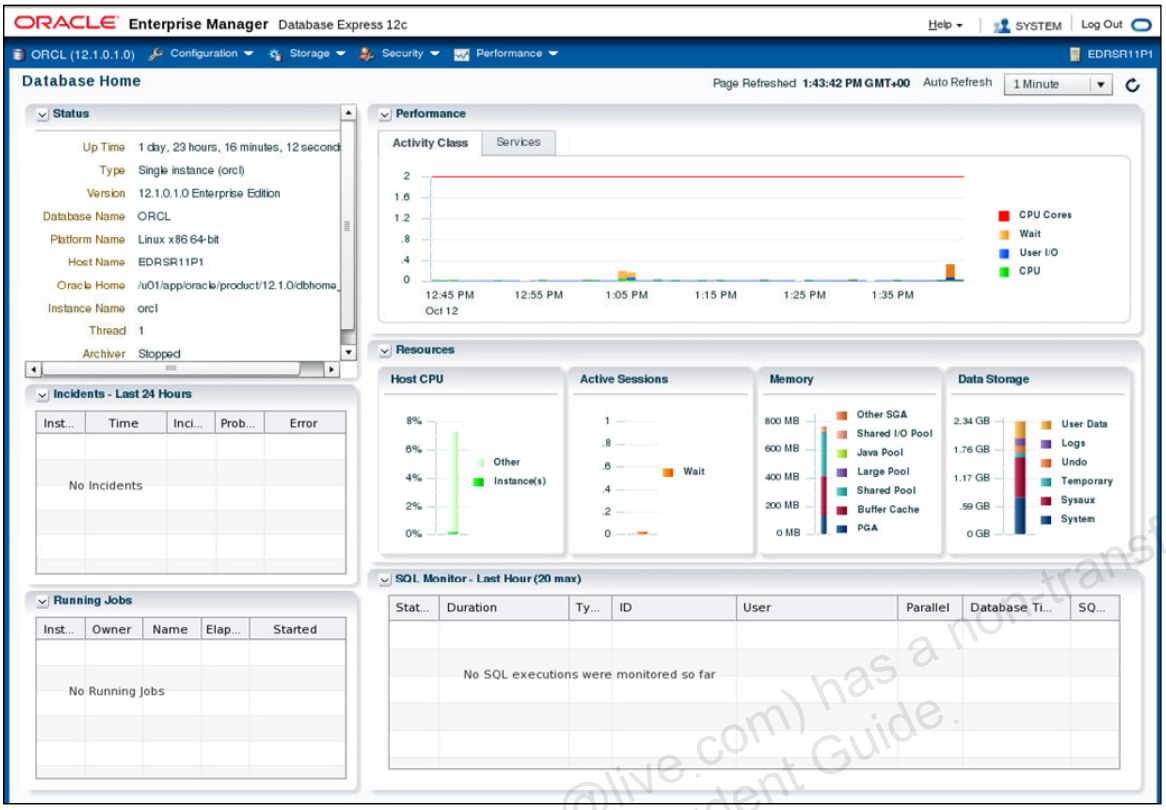
Enterprise Manager Database Express uses Shockwave Flash (SWF) files, so the web browser must have the Flash plug-in installed.

Logging In to Oracle Enterprise Manager Database Express



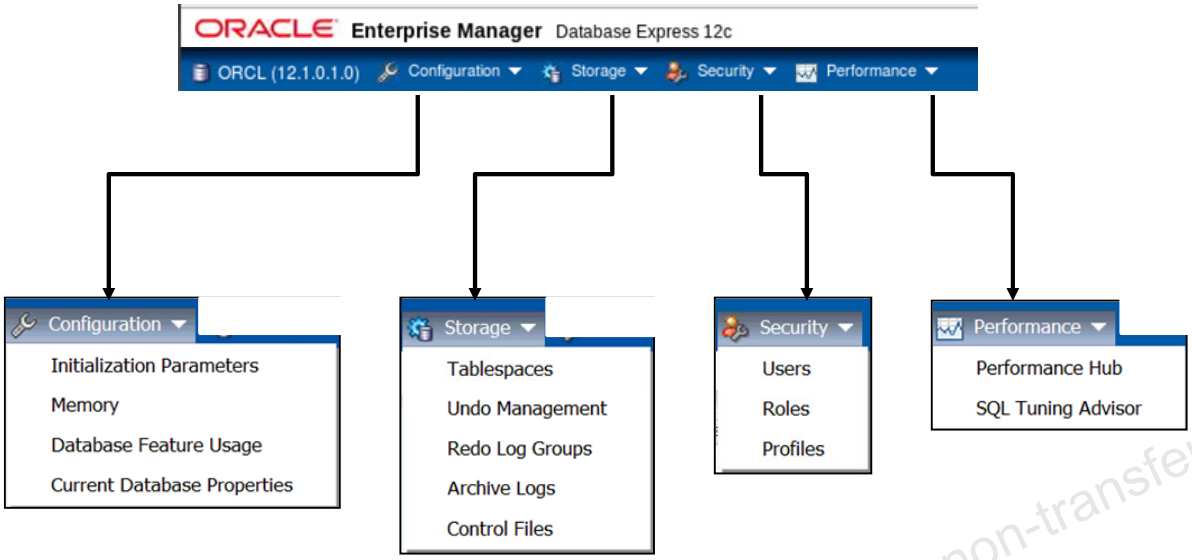
Launch Enterprise Manager Database Express by using the configured HTTP port. Log in as the database user appropriate to the tasks you want to accomplish.

Using the Database Home Page



The Enterprise Manager Database Express Home page presents an overall view of the database instance status and activity.

Using Enterprise Manager Database Express Menus

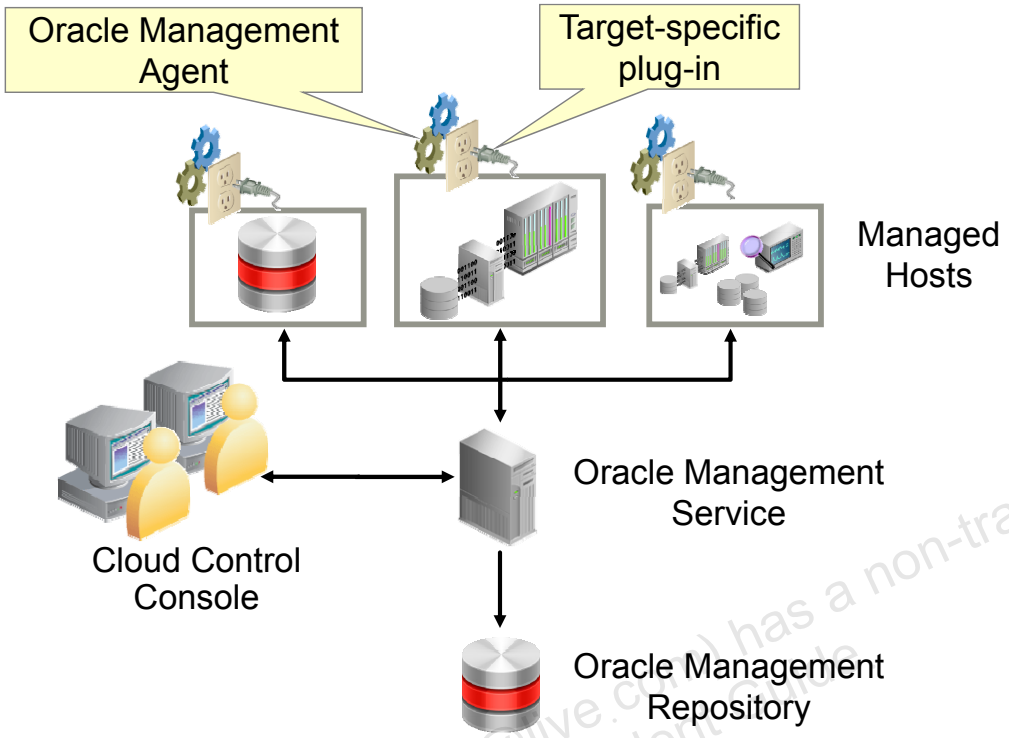


The menu layout for Enterprise Manager Database Express is shown in the slide. There are four main menu items: Configuration, Storage, Security, and Performance. The menu selections for each of the main items are shown.

The Configuration menu includes: Initialization Parameters, Memory, Database Feature Usage, and Current Database Properties. The Storage menu includes Tablespaces, Undo Management, Redo Log Groups, Archive Logs, and Control Files. The Security menu includes: Users, Roles, and Profiles. The Performance menu includes: Performance Hub and SQL Tuning Advisor.

In each of the menu areas, the menu selection directs you to a page that allows you to manage a particular area. For example, the Configuration => Initialization Parameters selection will display a page that allows you to search, view, and modify current and server parameter file (SPFILE) initialization parameters. In many of the pages, when you select an action, a pop-up dialog box enables you to specify parameters. A SQL command is then created to perform the action. You may view the SQL command before you submit it, or you can copy and paste the SQL command.

Oracle Enterprise Manager Cloud Control Components

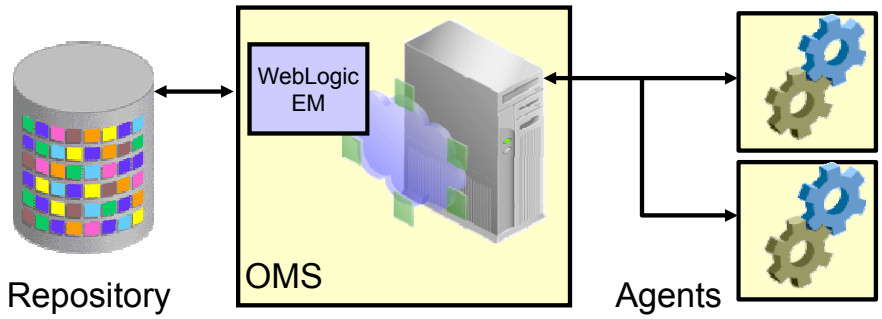


Oracle Enterprise Manager Cloud Control is composed of four main components as illustrated in the slide:

- Oracle Management Repository (OMR)
- Oracle Management Service (OMS)
- Oracle Management Agent (OMA or agent) with target-specific plug-ins
- Cloud Control Console

The Oracle Management Agent runs on hosts, gathering metric data about those host environments as well as using plug-ins to monitor availability, configuration, and performance and to manage targets running on the host. The agents communicate with the Oracle Management Service to upload metric data collected by them and their plug-ins. In turn, the OMS stores the data it collects in the Oracle Management Repository where it can be accessed by the OMS for automated and manual reporting and monitoring. The OMS also communicates with the agents to orchestrate the management of their monitored targets. As well as coordinating the agents, the OMS runs the Cloud Control Console web pages that are used by administrators and users to report on, monitor, and manage the computing environment that is visible to Cloud Control via the agents and their plug-ins.

Controlling the Enterprise Manager Cloud Control Framework



Component Control Utilities		
Repository	OMS	Agent
SQL*Plus or Server Control	Enterprise Manager Control	Enterprise Manager Control
Listener Control		

Each component of the Enterprise Manager Cloud Control framework has its own utility or utilities that can be used to monitor, start, and stop the component. In many cases, these utilities also provide some capability to configure the component beyond the simple start-and-stop functionality.

RAC databases require the use of Server Control commands; for single instances, there is a choice between SQL*Plus and Server Control. Server Control can be used when Oracle Restart is installed and the database is registered with the OLR.

To start and stop the listener, either use the Server Control utility or the `lsnrctl` command.

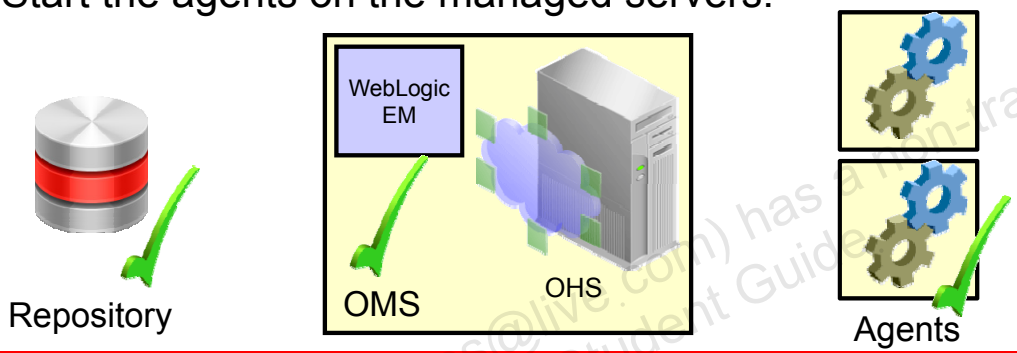
Examples:

```
srvctl stop database -d orcl -o immediate
srvctl start database -d orcl -o open
```

Starting the Enterprise Manager Cloud Control Framework

To start the Cloud Control framework, perform the following steps:

1. Start the repository database listener.
2. Start the repository database instance.
3. Start OMS.
4. Start the agent on the OMS/repository server.
5. Start the agents on the managed servers.



To start the whole Enterprise Manager Cloud Control framework, perform the following steps:

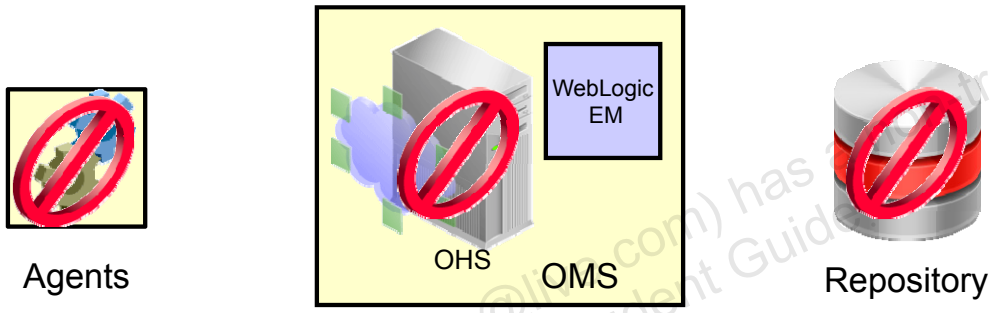
1. Start the repository listener:
   ```
   $ORACLE_HOME/bin/lsnrctl start
   ```
2. Start the repository database instance:
   ```
   $ORACLE_HOME/bin/sqlplus / as sysdba
   SQL> startup
   ```
3. Start OMS (including OHS and WebLogic Managed Server):
   ```
   $OMS_HOME/bin/emctl start oms
   ```
4. Start the agent (on OMS/repository host):
   ```
   $AGENT_HOME/bin/emctl start agent
   ```
5. Start the agent on the managed servers:
   ```
   $AGENT_HOME/bin/emctl start agent
   ```

Note: Use the SRVCTL command if you have a RAC instance for the repository or the repository is controlled by Oracle Restart.

Stopping the Enterprise Manager Cloud Control Framework

To stop the Enterprise Manager Cloud Control framework, perform the following steps:

1. Stop the agents on managed servers.
2. Stop the agent on the OMS/repository server.
3. Stop OMS.
4. Stop the repository database instance.



To stop the whole Enterprise Manager Cloud Control framework, perform the following steps:

1. Stop the agent on the managed servers:
   ```
   $AGENT_HOME/bin/emctl stop agent
   ```
2. Stop the agent (on OMS/repository host):
   ```
   $AGENT_HOME/bin/emctl stop agent
   ```
3. Stop OMS (including OHS and WebLogic Managed Server):
   ```
   $OMS_HOME/bin/emctl stop oms
   ```
4. Stop the repository database instance:
   ```
   $ORACLE_HOME/bin/sqlplus / as sysdba
   SQL> shutdown immediate
   ```

Note: Use the `SRVCTL` command if you have a RAC instance for the repository.

Types of Enterprise Manager Cloud Control Targets

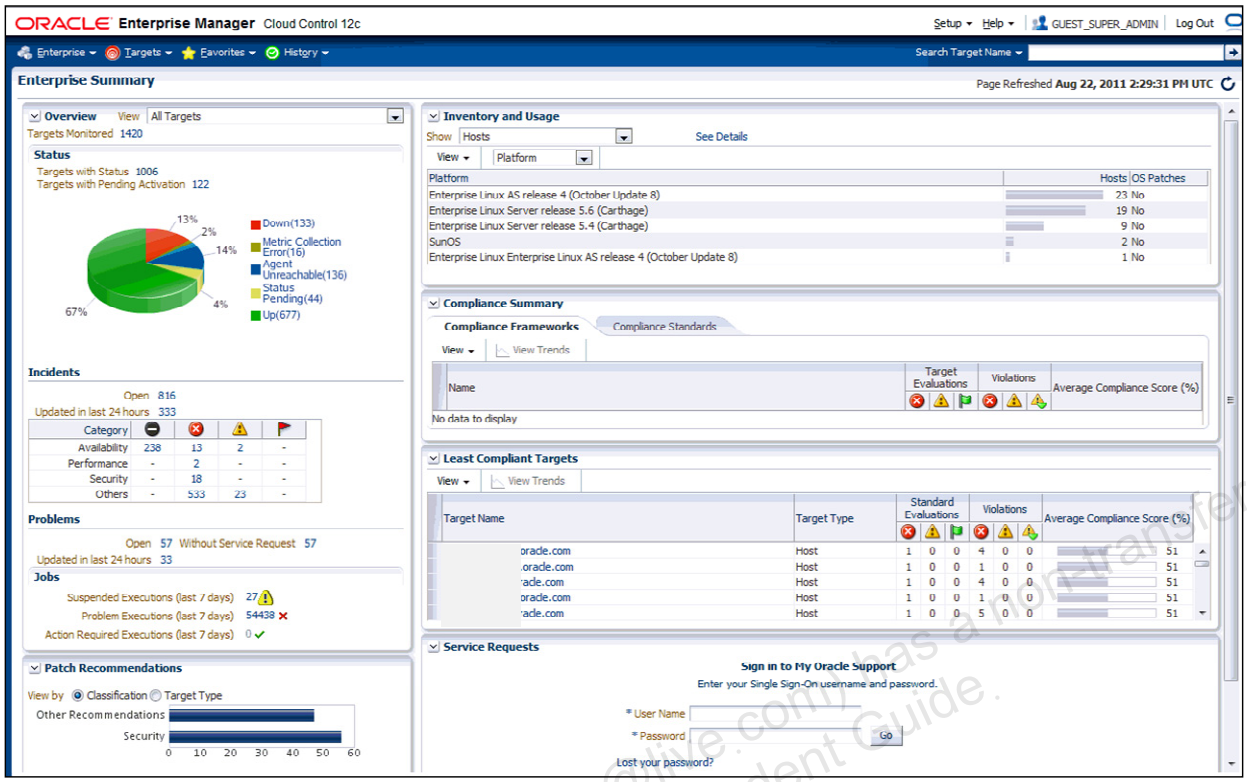
Enterprise Manager Cloud Control can monitor, administer, maintain, and manage different types of targets including:

- Oracle databases
- Oracle Database Listener
- Oracle Fusion Middleware products
- Oracle Application Server
- Oracle WebLogic Server
- Oracle applications, including E-Business Suite, SOA, Siebel, and PeopleSoft
- Exadata and Exalogic
- Cloud Control Components: OMR and OMS
- Third-party products

Targets are the entities that Enterprise Manager Cloud Control manages. To do so, it uses target-type-specific plug-ins and host-specific agents.

Enterprise Manager Cloud Control can monitor, administer, maintain, and manage different types of targets as listed in the slide. As your environment changes, you can add and remove targets from Enterprise Manager Cloud Control as needed. The commonly used Oracle targets (including Enterprise Manager Cloud Control components, such as the OMR and OMS) are predefined as part of the base Enterprise Manager Cloud Control product, but Enterprise Manager Cloud Control has an open API that enables you to create custom targets.

Enterprise Manager Cloud Control

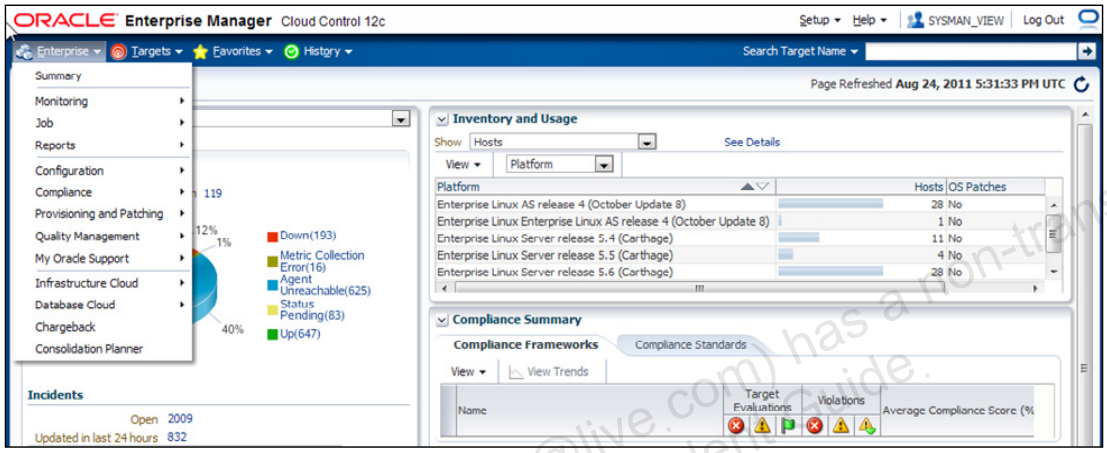


The slide shows the Enterprise Summary page of Oracle Enterprise Manager Cloud Control. The user interface (UI) functionality includes:

- Information displayed in graphs and tables
- Summary information with drilldown capability to relevant details
- User-selected home page from a predefined set, or based on any page in the console
- Menu-driven navigation
- Global target search
- History and favorites
- Customizable target home pages (per-user basis)

Using Enterprise Manager Cloud Control

- Predefined home page based on roles
- Any page can be set as home page
- Menu-based navigation
- Make any page “favorite” for quick access



Use drop-down menus to navigate from one place to another in the product.

- Choose your own home page: When you first log in to Enterprise Manager, you are provided with a selection of pre-defined home pages based on roles. If you are managing databases, you can choose the database home page.
  If those are not suitable, you can select any page to be your home page instead.
- Mark any page as a “favorite” for quick access. For example, if there are certain targets that you manage quite often, you can mark the page you manage them from as a favorite in much the same way you mark a favorite in a browser. However, because the favorites you mark in Enterprise Manager are stored in the repository, you can move from client machine to client machine and your favorites are still available to you.

Quiz

Enterprise Manager Database Express can be used to manage many databases concurrently.

a. True
b. False

Answer: b

Summary

In this lesson, you should have learned how to:

- Use SQL*Plus to access the Oracle database
- Use Oracle Enterprise Manager Database Express to perform administrative tasks
- Use Oracle Enterprise Manager Cloud Control to manage the database instance

Practice 6

- 6-1: Registering the `orcl` Database in Oracle Enterprise Manager Cloud Control
- 6-2: Creating an Administrative User
- 6-3: Logging In to Oracle Enterprise Manager Database Express