Oracle 11g DBA Fundamentals Overview

Lesson 02: Creating an Oracle Database

Lesson Objectives

- Deciding How to Create an Oracle Database
- Manually Creating an Oracle Database
- Understanding the CREATE DATABASE Statement
- Initialization Parameters and Database Creation
- Dropping a Database
- Managing Initialization Parameters Using a Server Parameter File
- Viewing Information About the Database
  - Using Data Dictionaries
  - Using EM
- Using DBCA

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Deciding How to Create an Oracle Database

- Use the Database Configuration Assistant (DBCA)
- Use the CREATE DATABASE statement
- Upgrade an existing database

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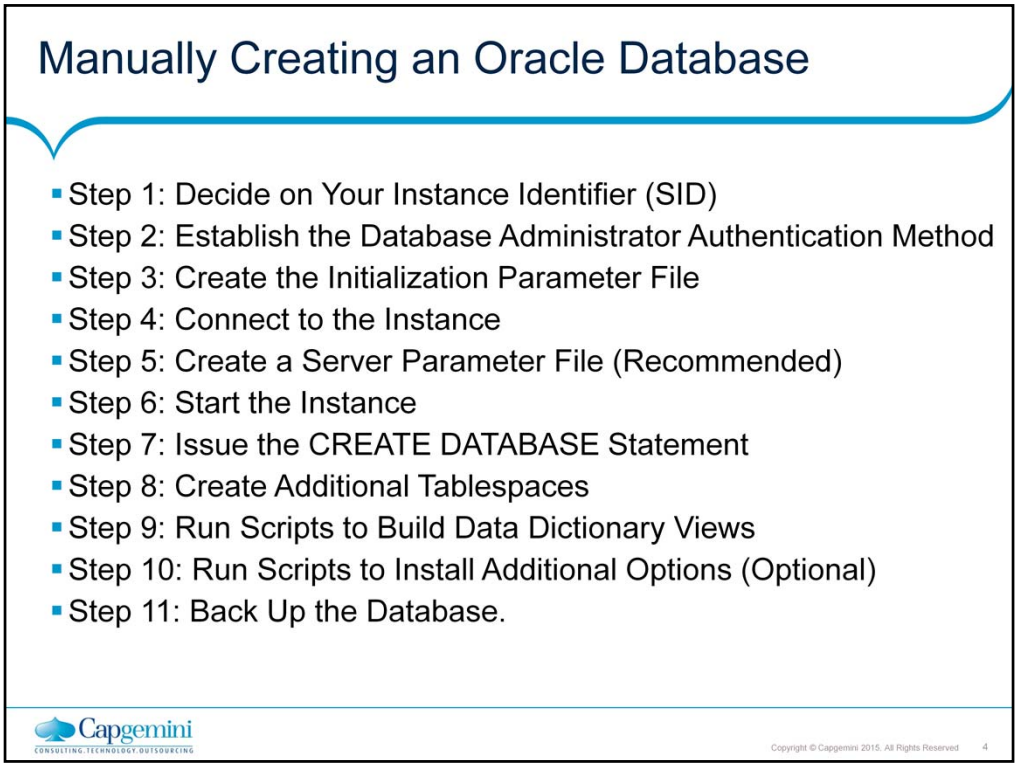

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Understanding the CREATE DATABASE Statement

- Creates the datafiles for the database
- Creates the control files for the database
- Creates the redo log files for the database and establishes the ARCHIVELOG mode.
- Creates the SYSTEM tablespace and the SYSTEM rollback segment
- Creates the SYSAUX tablespace
- Creates the data dictionary
- Sets the character set that stores data in the database
- Sets the database time zone
- Mounts and opens the database for use

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```
CREATE DATABASE rajita
MAXLOGFILES 5
  MAXLOGMEMBERS 5
  MAXLOGHISTORY 1
  MAXDATAFILES 100
  MAXINSTANCES 1
  CHARACTER SET US7ASCII
  NATIONAL CHARACTER SET AL16UTF16
  DATAFILE 'F:\rajita\data/system01.dbf' SIZE 325M REUSE
  EXTENT MANAGEMENT LOCAL
  SYSAUX DATAFILE 'F:\rajita\data\sysaux01.dbf' SIZE 325M REUSE
  DEFAULT TABLESPACE tbs_1
  DEFAULT TEMPORARY TABLESPACE tempts1
    TEMPFILE 'F:\rajita\data\temp01.dbf'
    SIZE 20M REUSE
  UNDO TABLESPACE ts_undo
    DATAFILE 'F:\rajita\data\undotbs01.dbf'
    SIZE 200M REUSE AUTOEXTEND ON MAXSIZE UNLIMITED
  LOGFILE GROUP 1 ('F:\rajita\data\redo01.log') SIZE 100M,
        GROUP 2 ('F:\rajita\data\redo02.log') SIZE 100M,
        GROUP 3 ('F:\rajita\data\redo03.log') SIZE 100M
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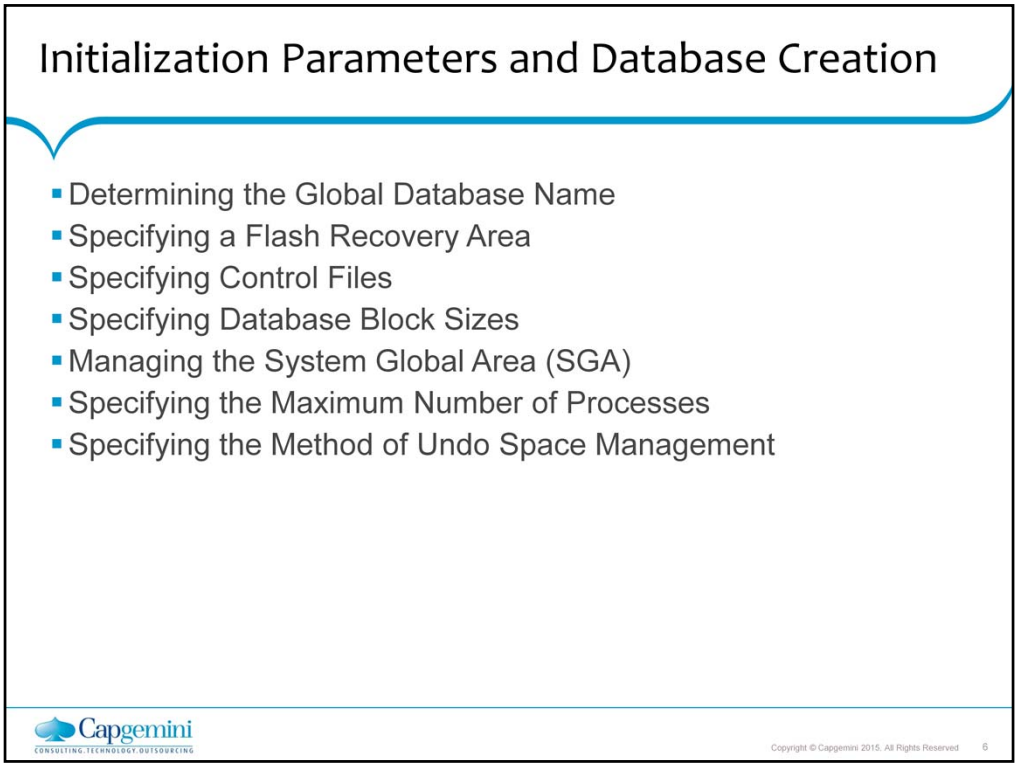

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Dropping a Database

- To use the DROP DATABASE statement successfully, all of the following conditions must apply:
  - **The database must be mounted and closed**
  - **The database must be mounted exclusively--not in shared mode**
  - **The database must be mounted as RESTRICTED**
- An example of this statement is:
  - **DROP DATABASE;**

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Managing Initialization Parameters Using a Server Parameter File

- What Is a Server Parameter File?
- Migrating to a Server Parameter File
- Creating a Server Parameter File
- The SPFILE Initialization Parameter
- Managing Initialization Parameters Using a Server Parameter File
- Using ALTER SYSTEM to Change Initialization Parameter Values
- Exporting the Server Parameter File
- Backing Up the Server Parameter File
- Errors and Recovery for the Server Parameter File
- Viewing Parameter Settings

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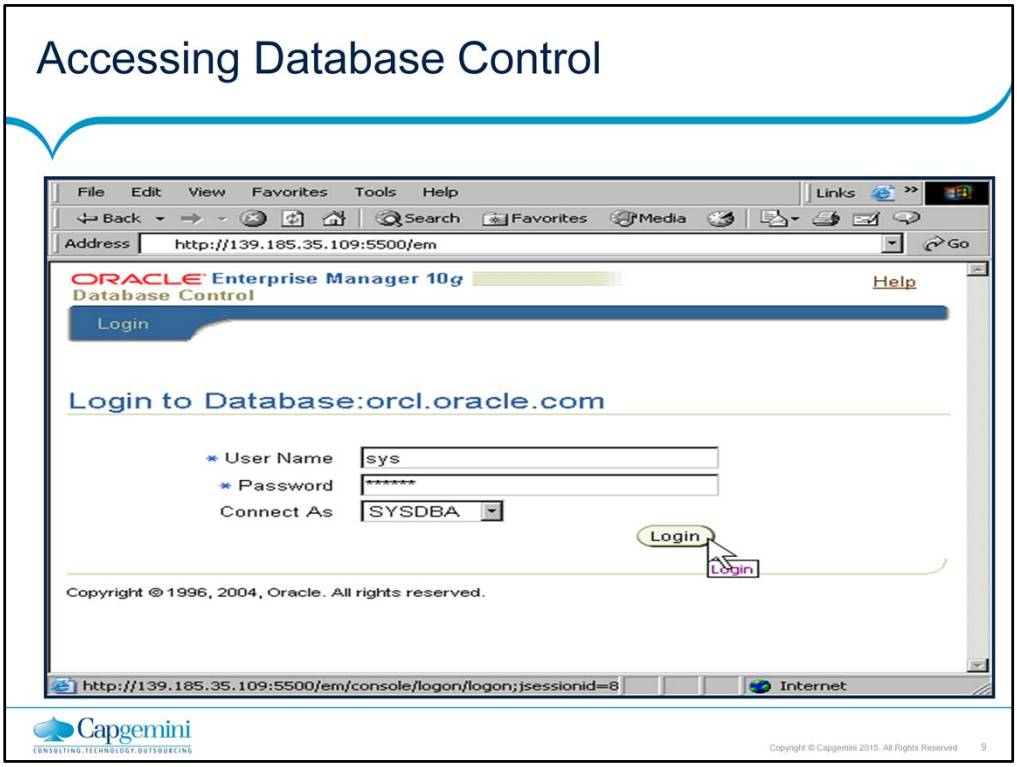


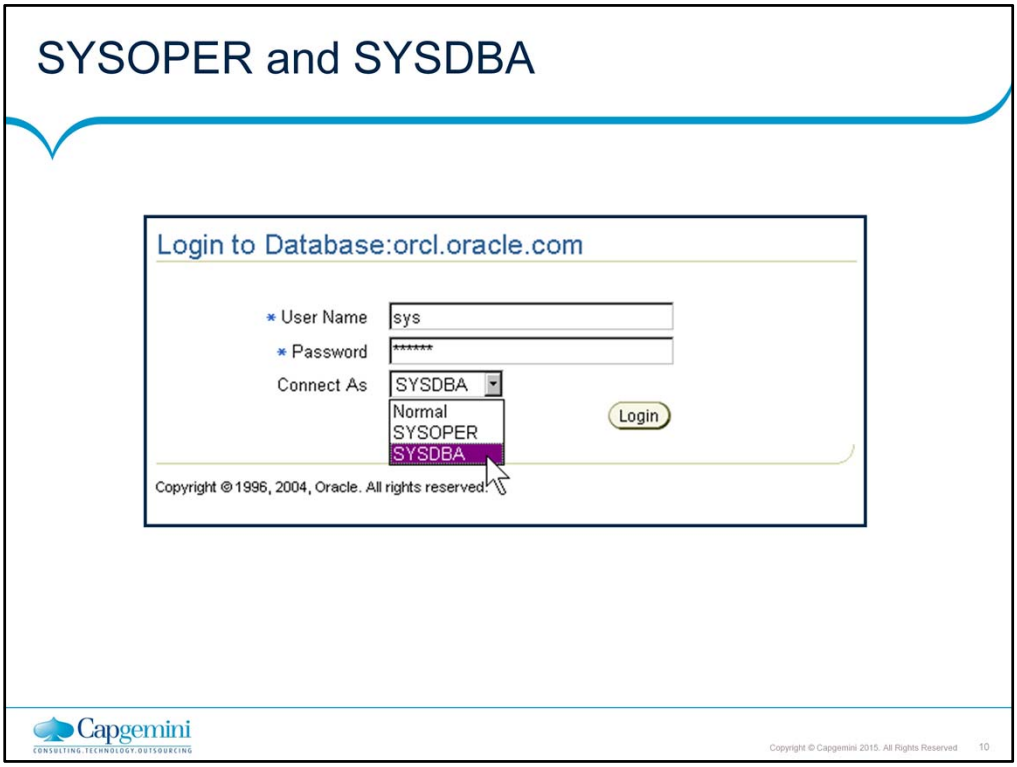
Accessing Database Control

Open your Web browser and enter the following URL (the default port is 5500):

http://hostname:portnumber/em

If the database is up, Enterprise Manager displays the Database Control Login page. Log in to the database using a username that is authorized to access Database Control. This initially will be SYS, SYSMAN or SYSTEM. Use the password you specified for the account during the database installation.

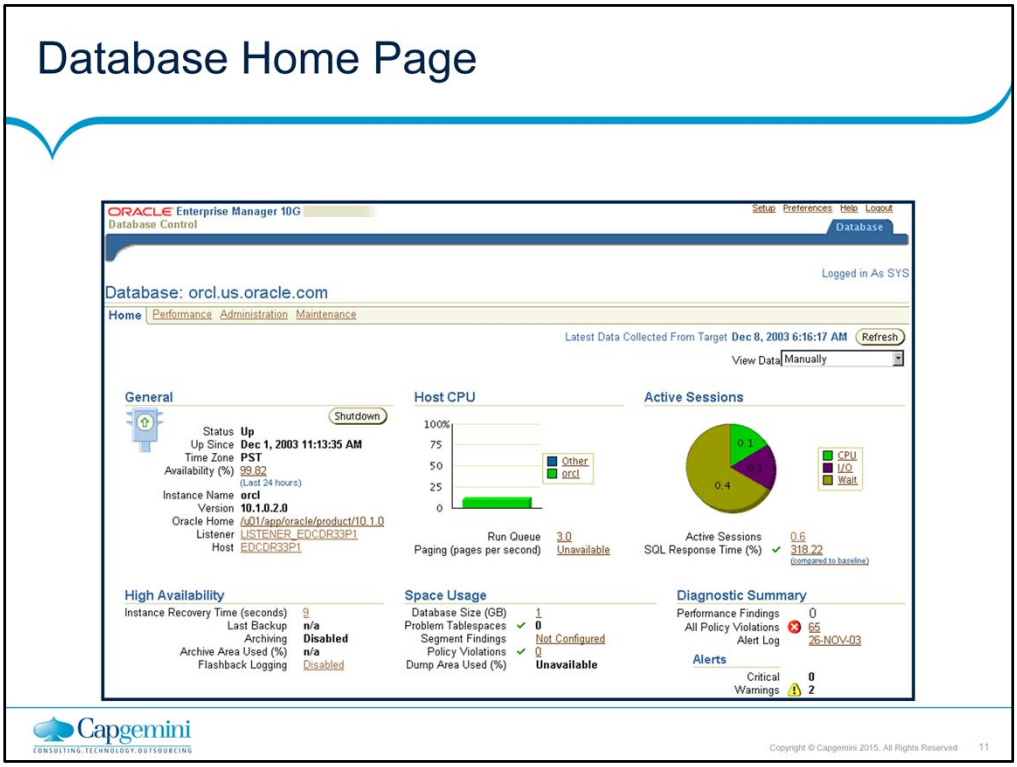
If the database is down and needs to be started, Enterprise Manager displays the Startup/Shutdown and Perform Recovery page. If this is the case, click the Startup/Shutdown button. You are then prompted for the host and target database login usernames and passwords, which you must enter. For the database user and password, use SYS and the password you specified during installation. Click OK to start the database. In the Confirmation page, click YES to start the database in open mode.



SYSOPER and SYSDBA

SYSOPER: Is a special database administration role that permits a database administrator to perform STARTUP, SHUTDOWN, ALTER DATABASE OPEN/MOUNT, ALTER DATABASE BACKUP, ARCHIVE LOG, and RECOVER, and includes RESTRICTED SESSION privileges. When you connect with SYSDBA privileges, you are in the schema owned by SYS.

SYSDBA: Is a special database administration role that contains every system privilege with ADMIN OPTION and SYSOPER system privileges. SYSDBA also permits CREATE DATABASE actions and incomplete recovery. When you connect as SYSOPER, you are in the public schema. More details on user management will be covered in the lesson titled “Administering Users.”

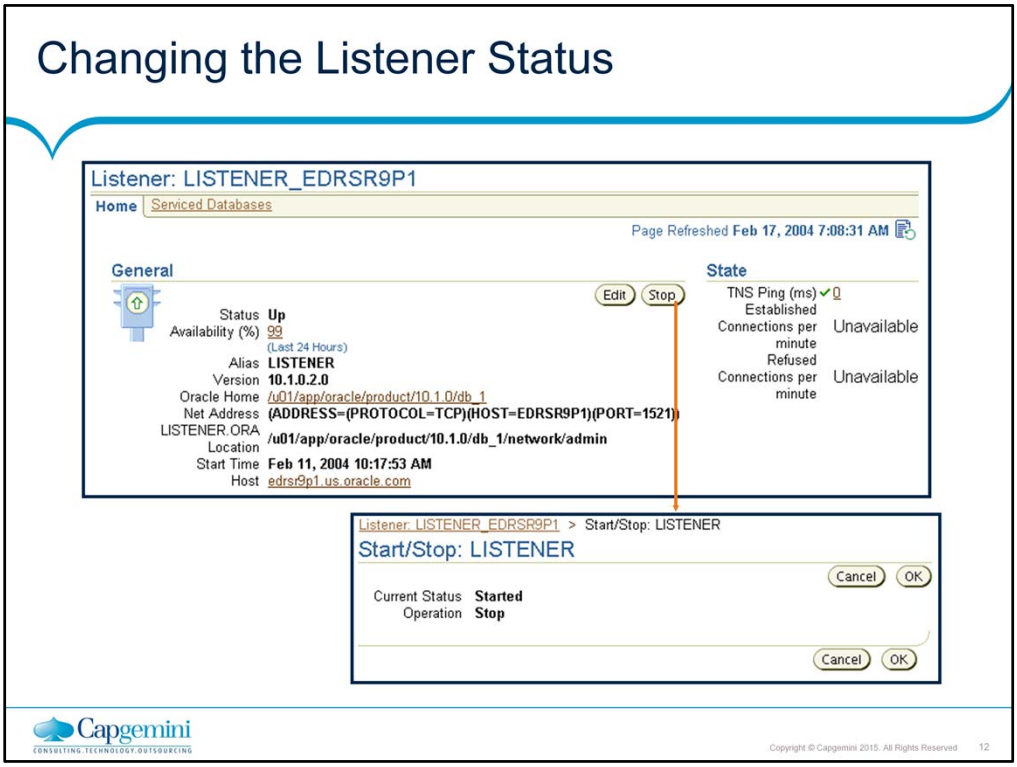


Database Home Page

The property pages across the top of the Database home page enable you to access performance, administration, and maintenance pages for managing your database. The various sections of the Database home page, and related links, provide a wealth of information about the database's environment and health.

To grant management access to other database users, use the following procedure:

1. Start your Web browser and log in to Database Control as the SYS or SYSTEM database user.
2. Click Setup at the top of the Database home page.
3. Click Administrators in the left navigation bar.
4. Click Create to create a new Enterprise Manager user by assigning the management privileges to an existing database user.
5. Click the flashlight icon next to the Name field and select an existing database user from the pop-up window.
6. Enter the password for the selected user and click Finish.



Changing the Listener Status

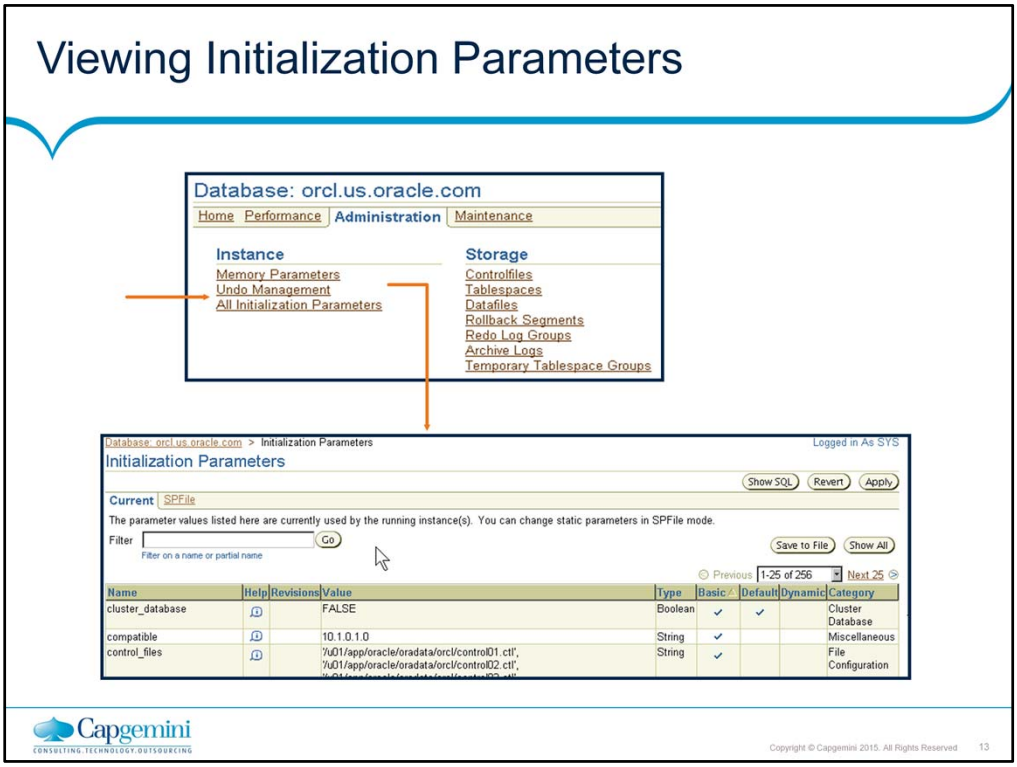
From the Database home page click the listener name to open the Listener home page. Click Stop to stop the listener if it is running or Start to start the listener if it is not running. You must log on to the host as an OS user if you have not done so already. This will be the OS user that starts or stops the listener.

The command line method for starting, stopping, and seeing the status of the listener is:

lsnrctl START [listener_name]
lsnrctl STOP [listener_name]
lsnrctl STATUS [listener_name]

Where listener_name is the name of the listener defined in the listener.ora file. It is not necessary to identify the listener if you are using the default listener, named LISTENER.

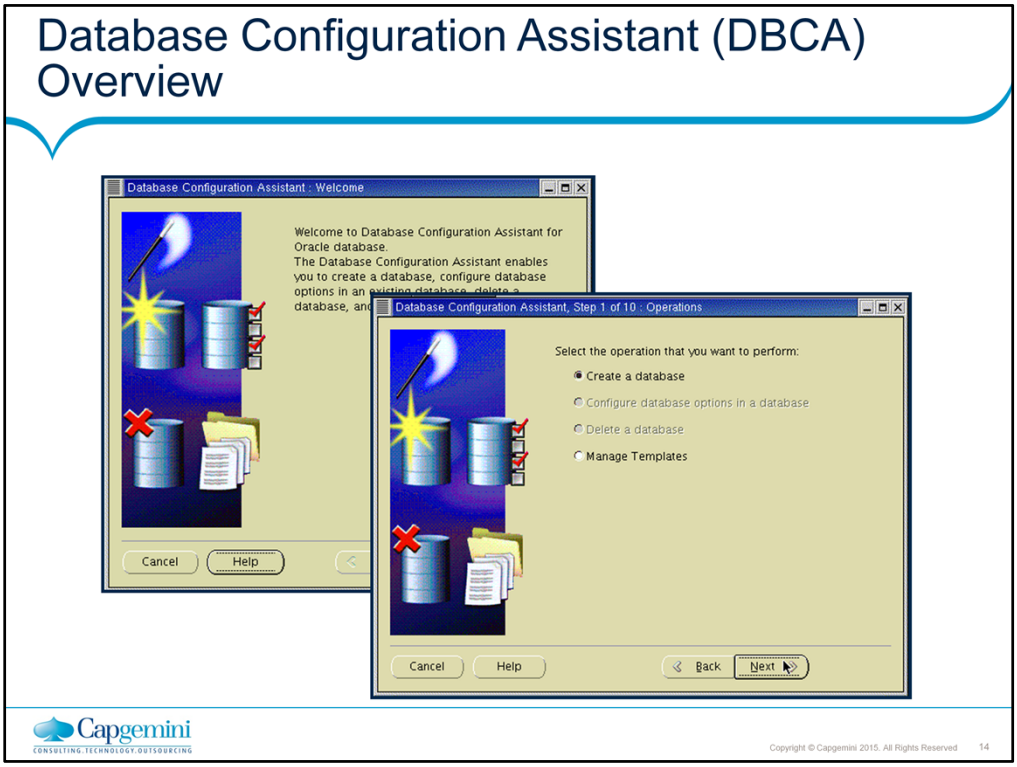
The STATUS command provides basic status information about a listener, including a summary of listener configuration settings, the listening protocol addresses, and a summary of services registered with the listener.



Viewing Initialization Parameters

The Oracle Database provides a number of initialization parameters to optimize its operation in diverse environments. Only a few of these parameters must be explicitly set because the default values are adequate in the majority of cases. There are 28 basic parameters.

The advanced parameters are preserved to allow expert DBAs to adapt the behavior of the Oracle Database to meet unique requirements without overwhelming those who have no such requirements.



Database Configuration Assistant Overview (DBCA)

Database Configuration Assistant (DBCA) enables you to create, change the configuration of, or delete a database. You can also create a database from a list of predefined templates or use an existing database as a sample to create a new database or template. A template is a predefined database that you use as a starting point for a new database.

Create a database: If you select this option, you can create a new database or template.

Configure options in a database: If you select the “Change database configuration” option, you can configure installed options that have not previously been configured for use with your database. You can also enable or disable shared server support.

Note: The “Change database configuration” option is not available for Oracle Real Application Clusters.

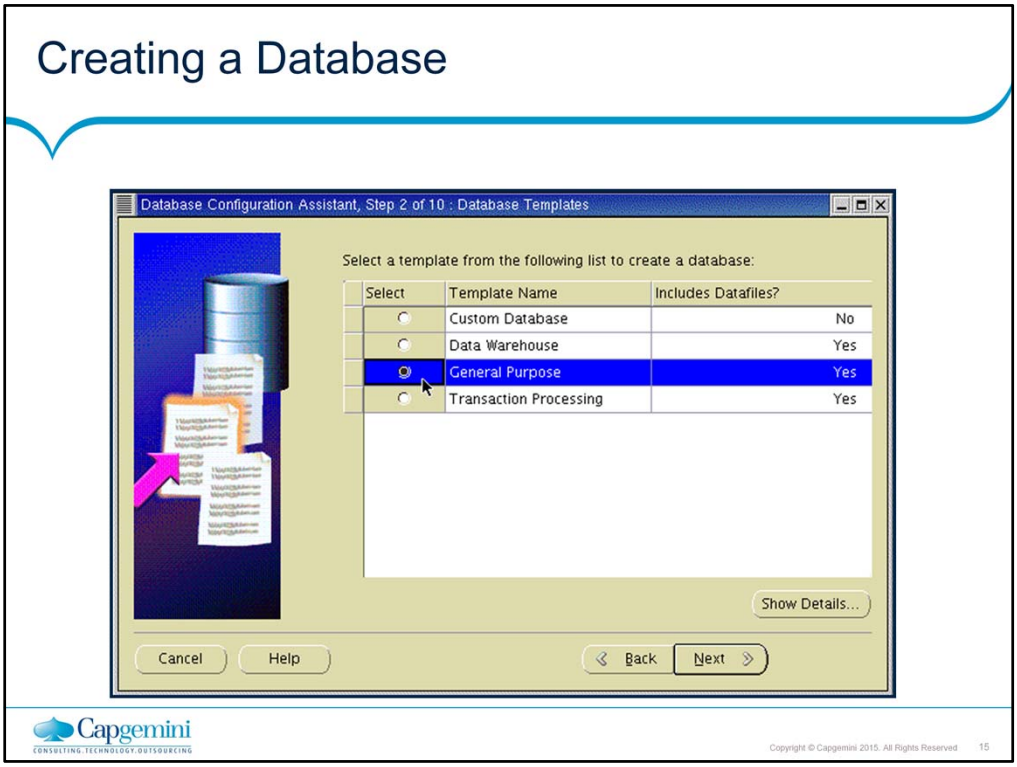
Delete a database: If you select this option, you can delete all the database files.

Manage Templates: If you select this option, you have three ways to create a template:

From an existing template

From an existing database (structure only)

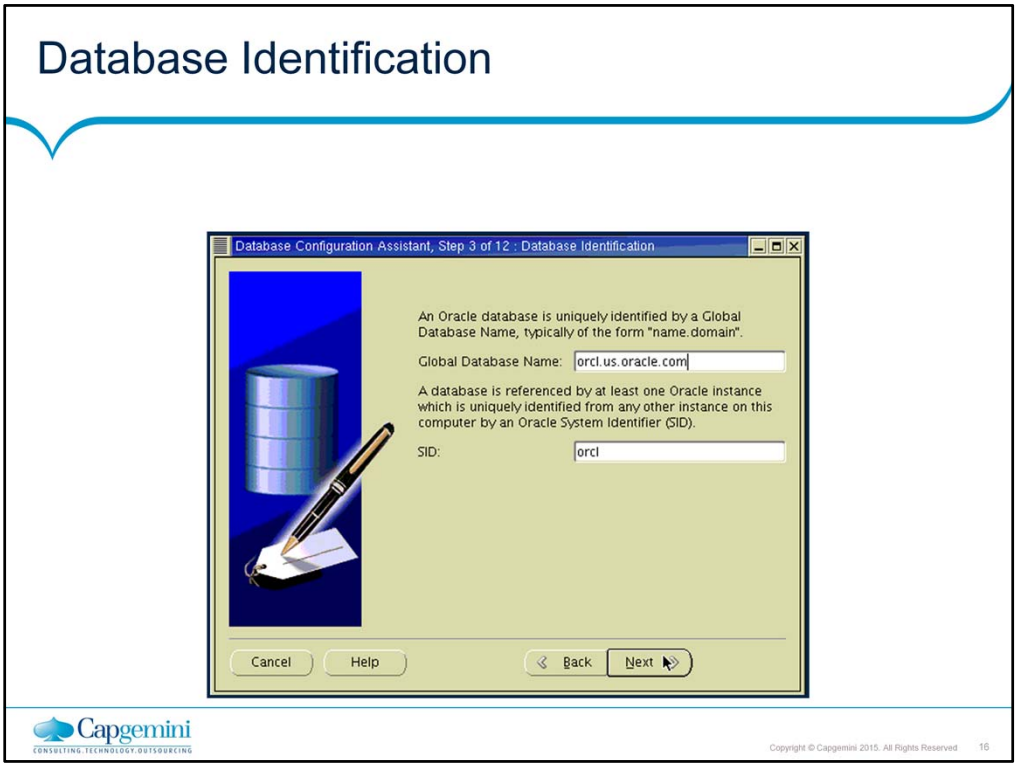
From an existing database (structure as well as data)



Creating a Database

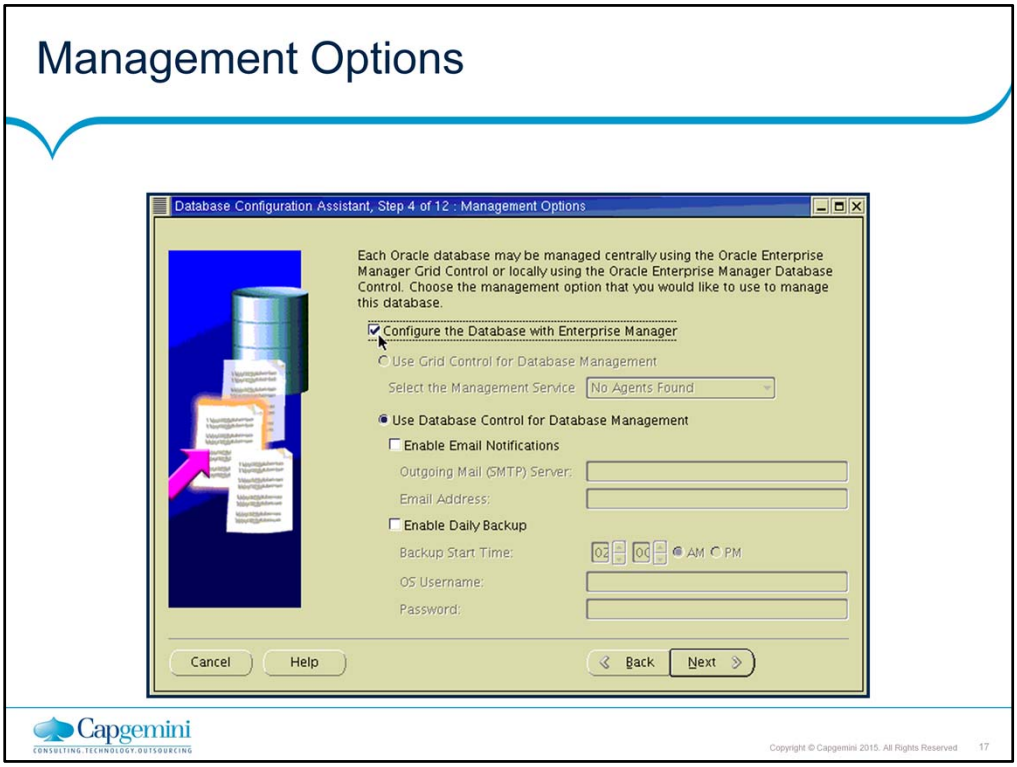
When creating a database with DBCA, you can select one of three predefined databases, or create a custom database. Oracle Corporation ships predefined templates. There are templates for data warehouse, general purpose, and transaction processing databases. The templates contain settings optimized for workload. Click Show Details to see the configuration for each type of database. Choose the template suited to the type of workload your database will support. If you are not sure, select the default General Purpose template.

For more complex environments, you may want to select the Custom Database option. This results in a more extensive interview and takes longer to create your database, because a database creation script must be run.



Database Identification

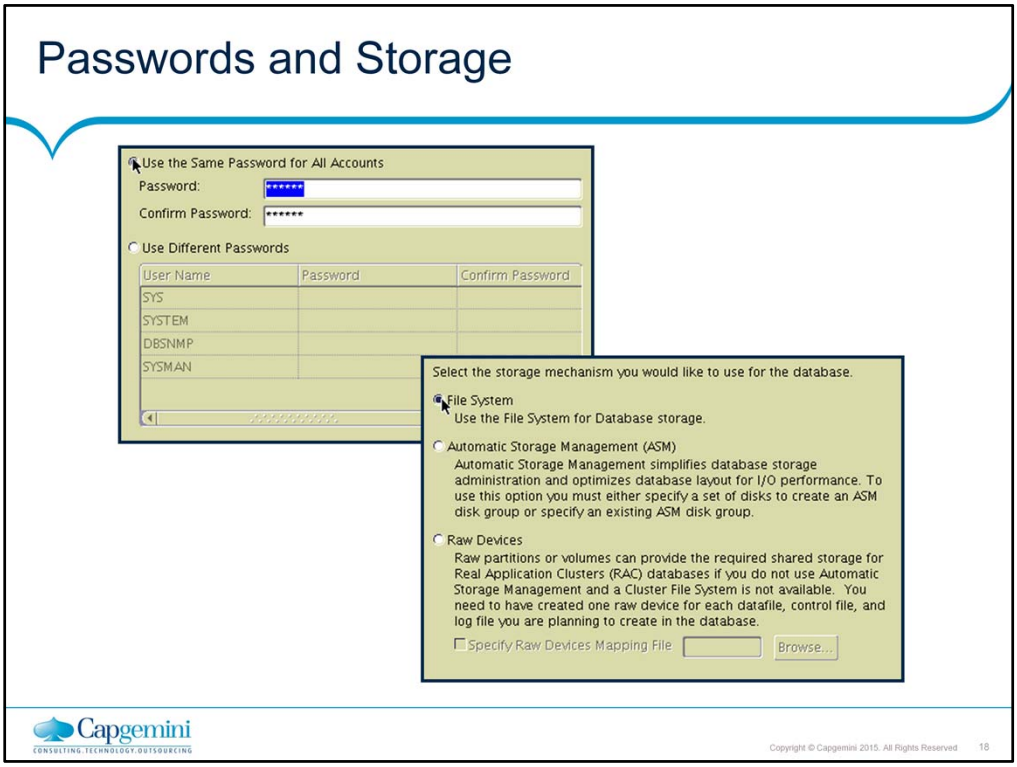
Enter the Global Database Name, in the form database_name.domain_name and SID (Oracle system identifier). The SID defaults to the database name and uniquely identifies the instance that runs the database. It is important to understand that the SID is the name of the instance that will connect to a database and not necessarily the name of the database. An instance and the database the instance connects to need not have the same name, although it is convenient. With Real Application Clusters, multiple instances open the same database and the SIDs for each instance will be different.



Management Options

Use this page to set up your database so it can be managed with Oracle Enterprise Manager, which provides web-based management tools for individual databases, as well as central management tools for managing your entire Oracle environment. To use Enterprise Manager, select Configure the Database with Enterprise Manager.

If the Oracle Management Agent has been installed on your host computer, then you are given the option of selecting central management by selecting Use Grid Control for Database Management. If you select this type of management, you must also indicate which management service to use in the drop-down menu. Otherwise, select Use Database Control for Database Management to manage your database individually. If you choose this option, you can additionally enable Email Notifications and Enable Daily Backup. Click Help for more information about these options.



Passwords and Storage

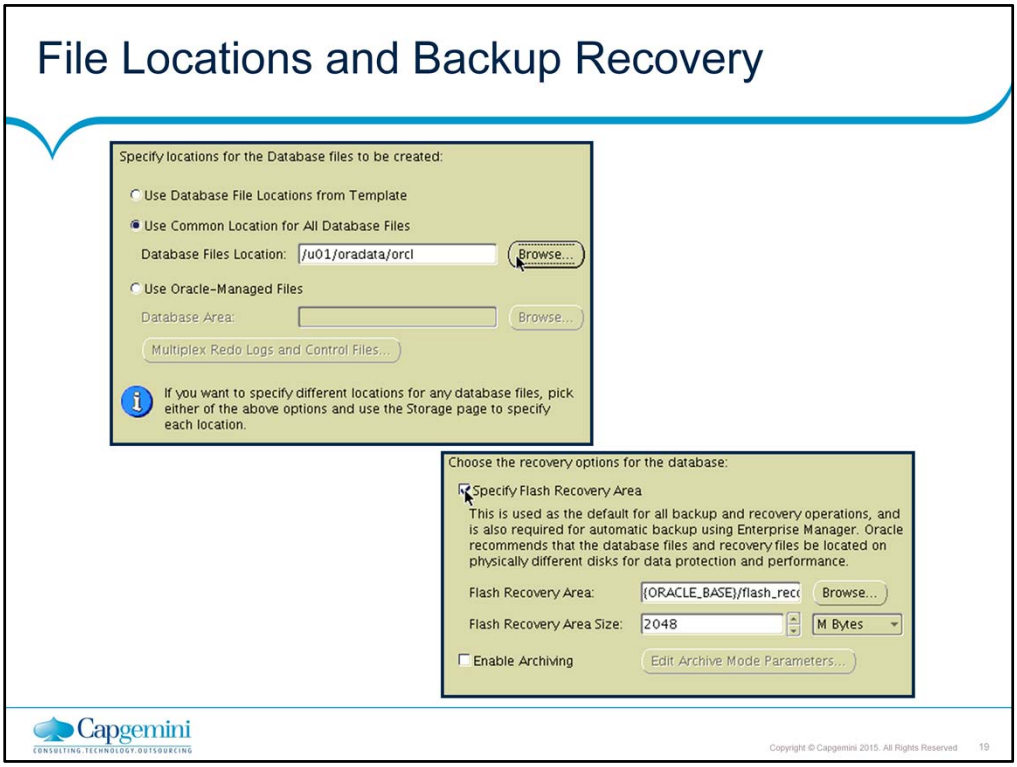
Database schema passwords: Provide passwords for the administrative users, SYS, SYSTEM, SYSMAN and DBSNMP. You can provide a password for each one separately or provide one password for all.

File Storage Options

File System: This stores files in your OS-configured file system.

Automatic Storage Management (ASM): Automatic Storage Management files are created and managed automatically, and you get the additional benefits of features such as mirroring and striping. For details on how to set up ASM, see the Oracle Database Administrator's Guide.

Raw Devices (partitions): These are disk partitions without a file system on them. Generally you should use these only if you are very familiar with the use of raw partitions already. Check your OS documentation for details on setting up and maintaining raw partitions.



File Locations and Backup Recovery

File Locations

Use Database File Locations from Template: Selecting this option instructs the DBCA to use the directory information as specified in the template. You will have an opportunity later to make modifications to database file names and locations.

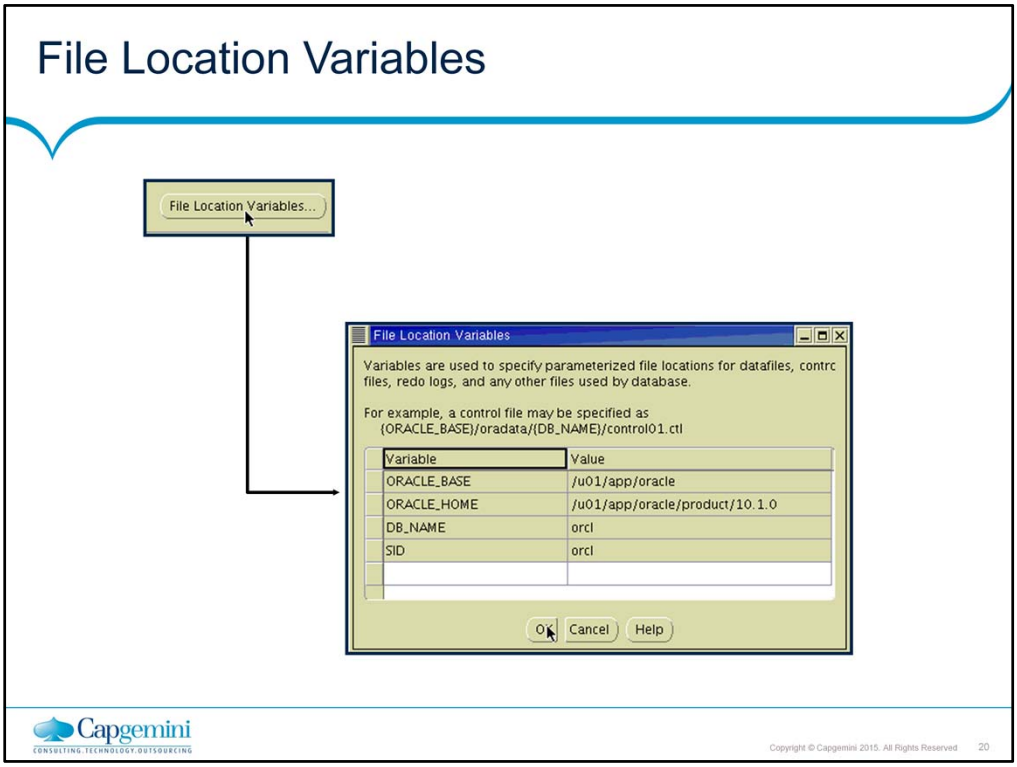
Use Common Location for All Database Files: This option requires you to specify a new common area for all your database files. You will have an opportunity later to make modifications to database file names and locations on the Storage page.

Use Oracle-Managed Files: Select this option to eliminate the need for you, the DBA, to directly manage operating system files that an Oracle database comprises. You must provide the path to the database area. For more details on Oracle Managed Files see the Database Administrator's Guide.

Backup and Recovery Options

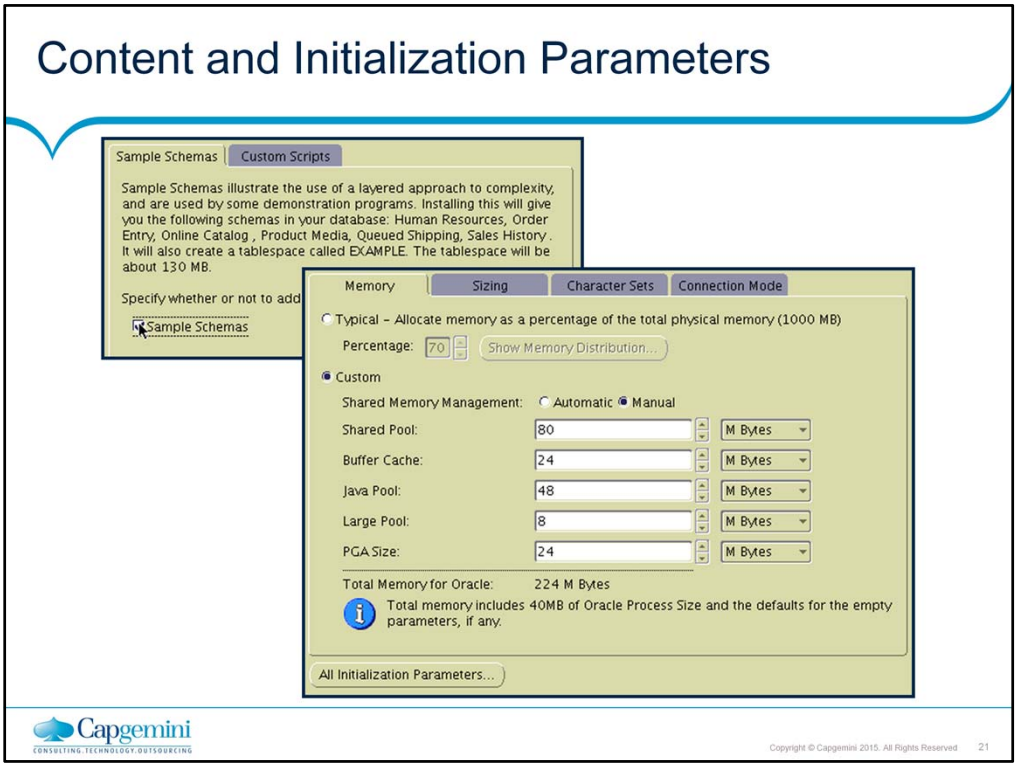
A flash recovery area is a location in which Oracle can store and manage files related to backup and recovery. For details on setting up and sizing the flash recovery area, see the Oracle Database Backup and Recovery Basics guide.

Enabling archiving puts the database in archive log mode at creation time. Archiving will be covered more detail in the lesson titled "Backup and Recovery Concepts."



File Location Variables

On several pages you can click File Location Variables to open a page that shows you the definition of defined variables. These variables are used in the path definition for files of the database. You cannot change the values while in DBCA. If you need these values modified, you must exit DBCA, change them in the OS environment, and then restart DBCA.



Content and Initialization Parameters

Sample schemas: The sample schemas are a set of schemas used for demonstrations and training.

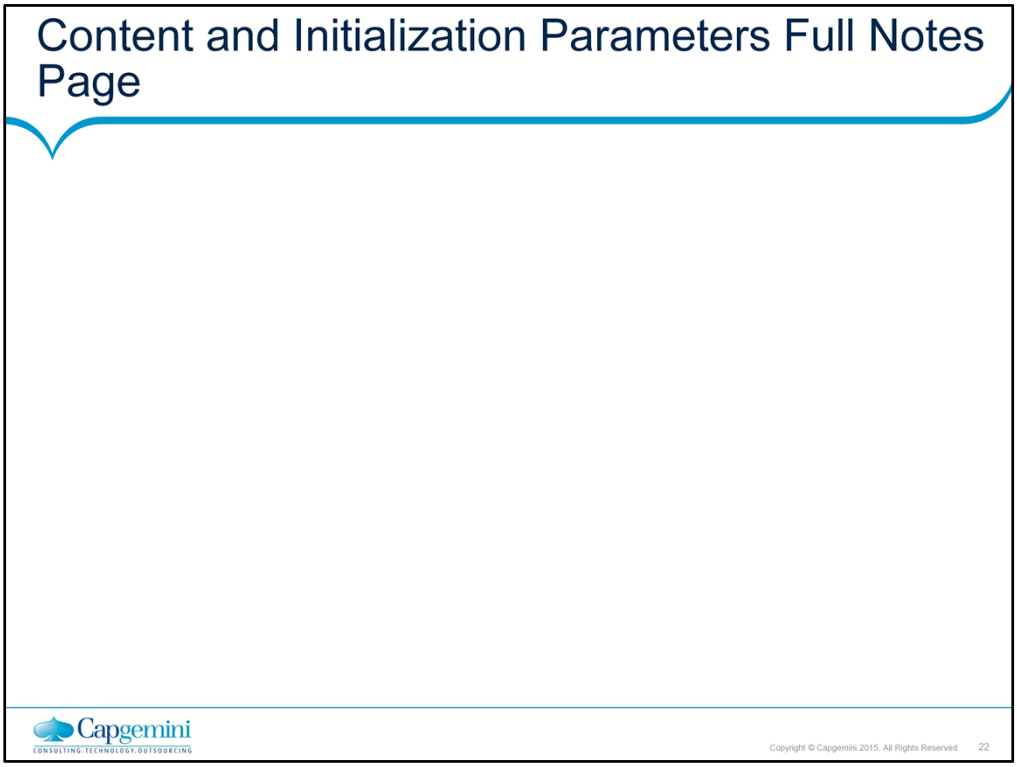
Custom scripts: Here you can specify any scripts you want run at creation time.

Initialization parameters: The four tabs can be used to set the most common parameters, and by clicking All Initialization Parameters you can view and set all the parameters.

Memory: This allocates the memory used by the SGA and each PGA of the user processes.

Sizing: Here you can set the block size, but if using a template the block size cannot be changed. You can also set the maximum number of OS processes that are allowed to connect to the instance.

Character sets: Here you set the default character set for the database and the national character set. The default character set is used for most data types in the database. The NCHAR, NVARCHAR2, and NCLOB data types support Unicode data only, which is the national character set option. You can use either the AL32UTF8 or the AL16UTF16 character set. For more information on choosing a character set refer to Globalization Support Guide.

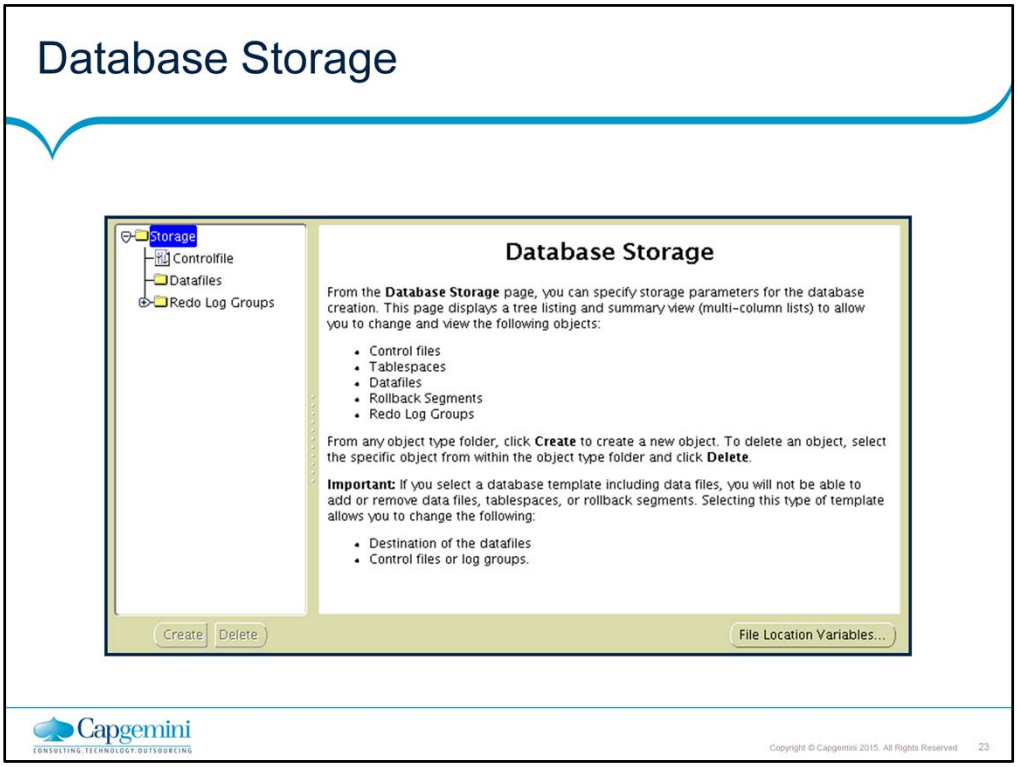


Content and Initialization Parameters (continued)

Connection mode: Oracle Database creates server processes to handle the requests of user processes connected to an instance. A server process can be either of the following:

- A dedicated server process, where one server process services only one user process
- A shared server process, where a server process can service multiple user processes

Your database is always enabled to allow dedicated server processes, but you must specifically configure and enable shared server by setting one or more initialization parameters. Using Oracle Shared Servers will be discussed in a later lesson. You can also refer to the Database Administrator's Guide.

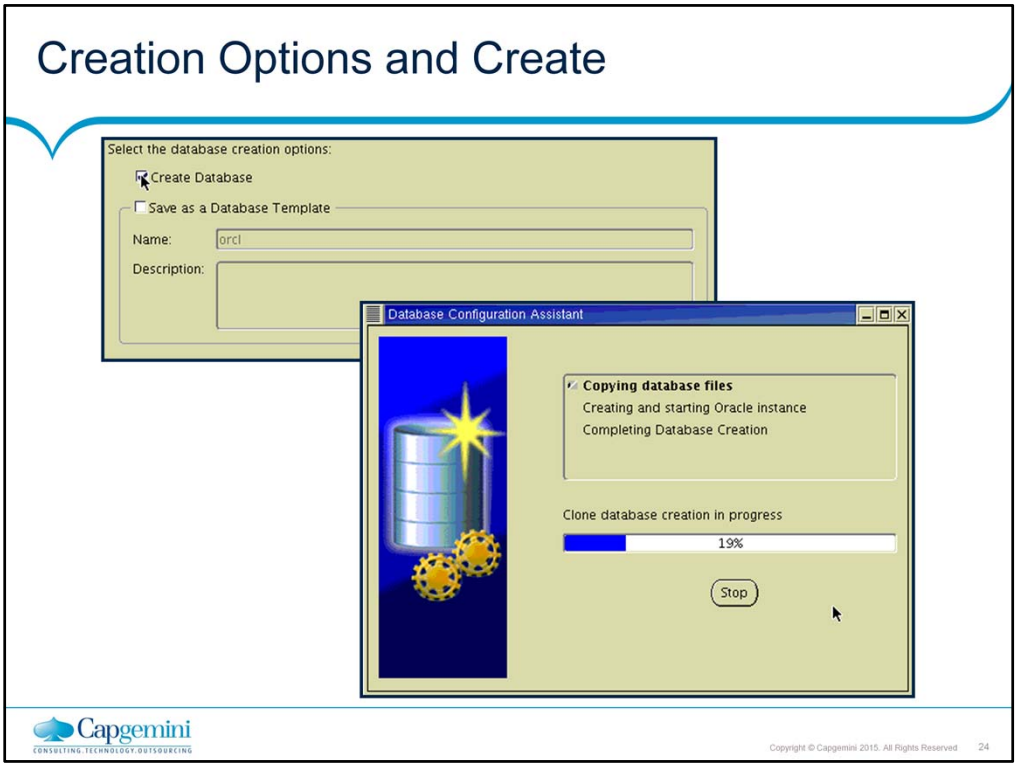


Database Storage

On this page you can see the storage settings for the control files, data files, and online redo log files. When using a template you cannot add any data files to the database, but you can add more control files and online redo log files.

Multiple control files are all maintained such that each is an exact copy of the others. DBCA automatically multiplexes the control file across three files. You can add more if you want.

Redo logs work in groups and should also be multiplexed. DBCA doesn't automatically multiplex the online redo log files. Each file in a log group is an exact copy of the other members in the group. You can add in more members per group now or add them at anytime after creation of the database.

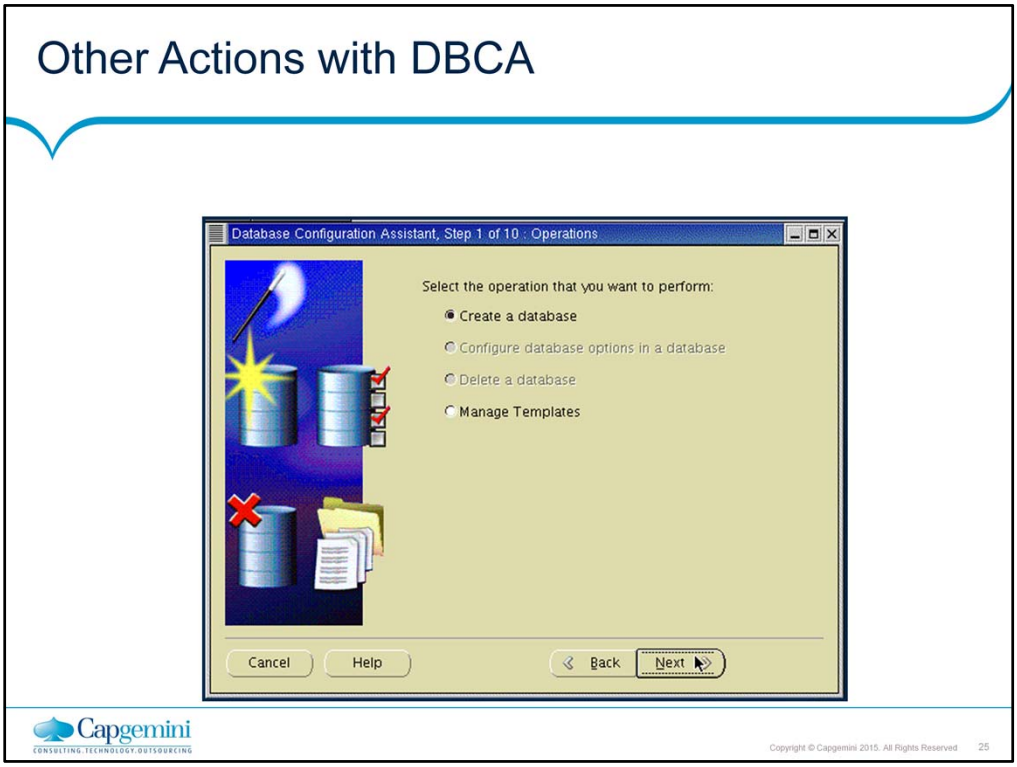


Creation Options and Create

You have the option of saving the database that you have defined as a template. This template can be used later to create databases with all the options you have defined.

After you click Next on the Creation Options page, a Confirmation page appears where you can review all the options taken. This is the last chance to make a change before the creation process starts. You can also save the Confirmation page as an HTML file to review later. After you click OK on the Confirmation page, the database creation starts.

At the end of the installation you will see a page presenting you the opportunity to unlock accounts created and change passwords if you desire. Click Password Management to unlock accounts and change password. Click Ok when don't managing the accounts, then click Exit to DBCA.



Other Actions with DBCA

Configure database options in a database: This allows you to add in options to an existing database.

Delete a database: This permanently removes a database from your system.

Manage Templates: This allows you to perform the following with templates.

Create a Template:

From an existing Template: Uses and existing template as a starting point to build a new template. Many of the pages are the same as those in the create database process.

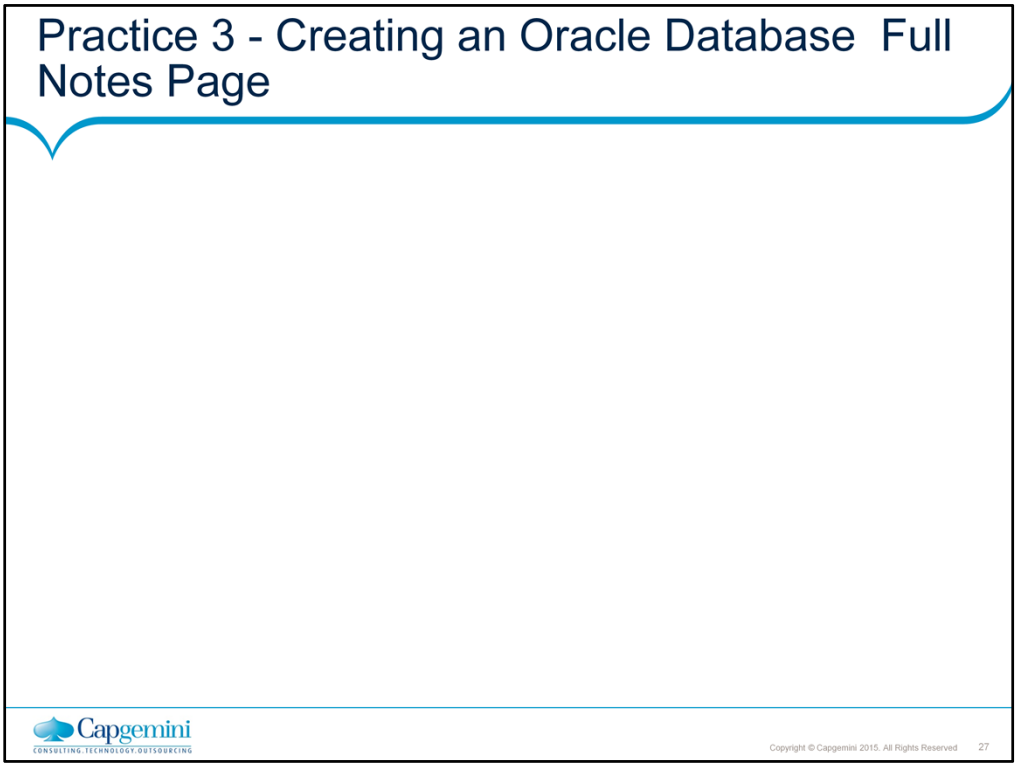
From an existing database (structure only): This requires logging in to an existing database and uses its structure as a starting point.

From an existing database (structure as well as data):This requires logging into an existing database and uses it's structure as a base line; however it captures the data files as well.

Delete a database template: This permanently removes a database template from your system

Practice 3: Creating an Oracle Database

- This practice covers creating an Oracle database by using DBCA.



Practice 3: Create an Oracle Database

Your IT manager returns from a meeting with a few of the users that will be using the new system you are going to support. They want a second database for storage of historical data.

Using DBCA you will create a database using the General Purpose template with the following information:

- Set the global database name hist.oracle.com and the SID to hist.
- Set the passwords to oracle.
- For the storage options use File System.
- Use Flash Recovery area, accept the default size and location, disable the backups.

After you create the database the users decided that they don't need to track the historical data. Drop the hist database

Lab: Creating an Oracle Database

- This practice covers creating an Oracle database manually.

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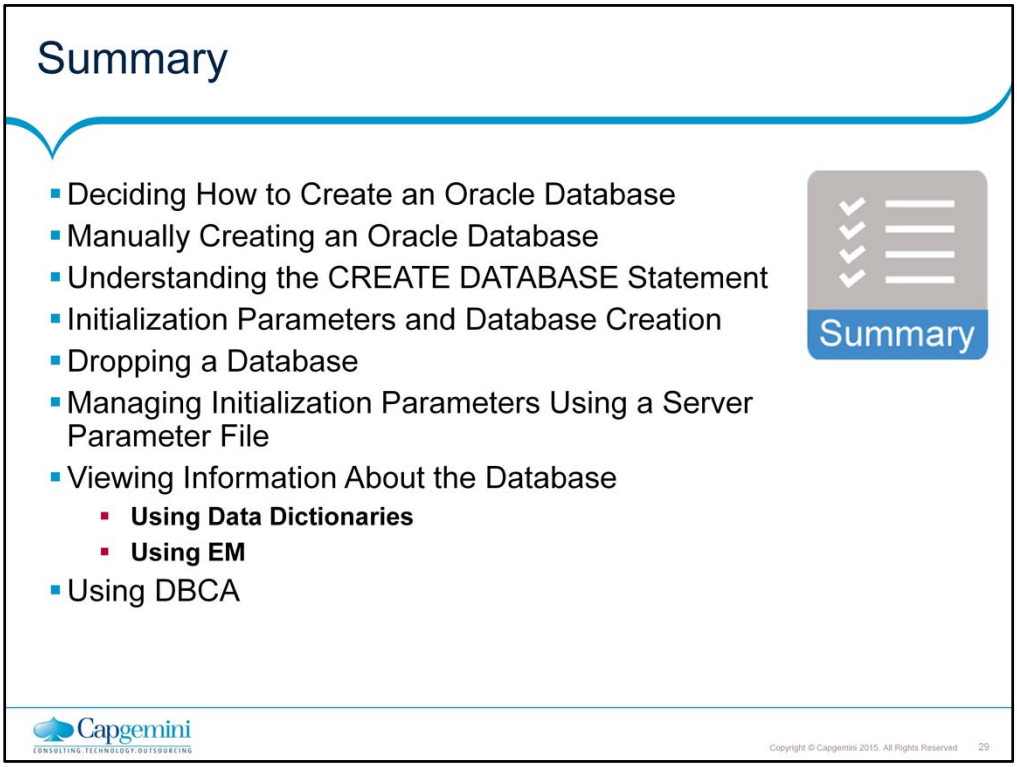

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