Creating a Database

4

Objectives

After completing this lesson, you should be able to do the following:

- Understand the **prerequisites necessary for database creation**
- Create a database using **Oracle Database Configuration Assistant**
- Create a database **manually**
- Create a database using Oracle **Managed Files**

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Managing and Organizing a Database

- **Planning** for your **database** is the **first step** in managing a database system
  - Define the purpose of the database
  - Define the type of the database
  - Outline a database architectural design
  - Choose the database name
- Create your database
- Oracle **Data Migration Assistant** is used to migrate from an earlier version of the database

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Optimal Flexible Architecture (OFA)

- Oracle's recommended standard database architecture layout

- OFA involves **three major rules**:

  - **Establish a directory structure** where any database file can be stored on any disk resource.

  - **Separate objects with different behavior into different tablespaces**.

  - **Maximize** database **reliability and performance** by **separating database components** across different disk resources.

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Oracle Software and File Locations

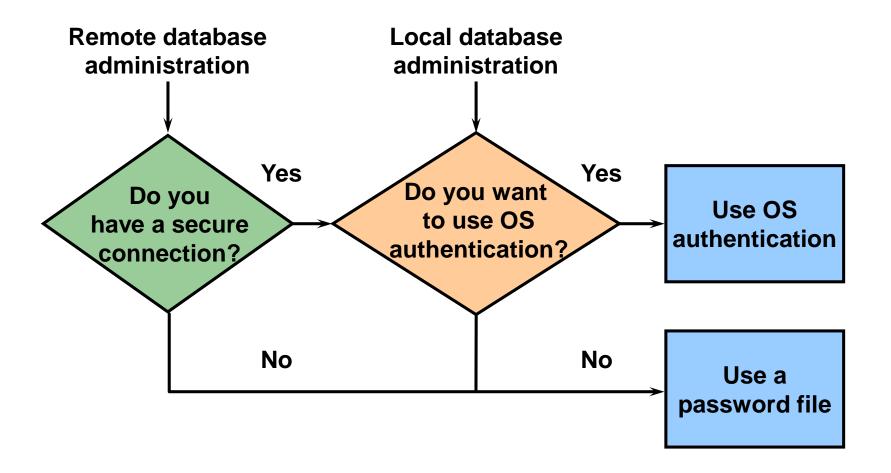| Software	Files

`oracle_base`
 	
   `/product`
 	
      `/release_number`
 	
         `/bin`
 	
         `/dbs`
 	
         `/rdbms`
 	
         `/sqlplus`
 	
`/admin`
 	
     `/inst_name`
 	
     `/pfile`
	`oradata/`
	
	   `db01/`
	
	     `system01.dbf`
	
	     `control01.ctl`
	
	     `redo0101.log`
	
	     `...`
	
	   `db02/`
	
	     `system01.dbf`
	
	     `control01.ctl`
	
	     `redo0101.log`
	
	     `...`

Creation Prerequisites

To create a new database, you must have the following:

- A privileged account authenticated by one of the following:
  - Operating system
  - Password file
- Sufficient memory to start the instance
- Sufficient disk space for the planned database

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Authentication Methods
for Database Administrators

Remote database administration

Local database administration

Do you have a secure connection?

Yes

No

Do you want to use OS authentication?

Yes

No

Use OS authentication

Use a password file

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Using Password File Authentication

- Create the password file using the password utility

```
$ orapwd file=$ORACLE_HOME/dbs/orapwU15
  password=admin entries=5
```

- Set `REMOTE_LOGIN_PASSWORDFILE=EXCLUSIVE` in initialization parameter file

- Add users to the password file

- Assign appropriate privileges to each

```
GRANT SYSDBA TO HR;
```

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Creating a Database

An Oracle database can be created by:

1. **Oracle Universal Installer**

2. **Oracle Database Configuration Assistant DBCA**
   - **Graphical user interface**
   - **Java-based**
   - **Launched by the Oracle Universal Installer**
   - **Can be used as a standalone**

3. **The `CREATE DATABASE` command**

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Operating System Environment

Set the following environment variables:

- `ORACLE_BASE`

- `ORACLE_HOME`

- `ORACLE_SID`

- `ORA_NLS33`

- `PATH`

- `LD_LIBRARY_PATH`

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Database Configuration Assistant

The Database Configuration Assistant allows you to:

- **Create a database**

- **Configure database options**

- **Delete a database**

- **Manage templates**

  - **Create new template using pre-defined template settings**

  - **Create new template from an existing database**

  - **Delete database template**

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Create a Database Using Database Configuration Assistant

- Select type of database to be created from predefined templates

- Specify global database name and SID

- Select features to use in your database

- Identify any scripts to be run after database creation

- Select mode you want the database to operate in

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Create a Database Using Database Configuration Assistant

- Specify options for memory, archiving, database sizing, and file locations

- Define database storage parameters

- Change file location variables as needed

- Select a database creation option to complete database creation

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Creating a Database Manually

- Choose a unique instance and database name.
- Choose a database character set.
- Set operating system variables.
- Create the initialization parameter file.
- Start the instance in `NOMOUNT` stage.
- Create and execute the `CREATE DATABASE` command.
- Open the database.
- Run scripts to generate the data dictionary and accomplish post creation steps.
- Create additional tablespaces as needed.

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Creating the Database

```
CREATE DATABASE user01
 LOGFILE
  GROUP 1 ('/$HOME/ORADATA/u01/redo01.log') SIZE 100M,
  GROUP 2 ('/$HOME/ORADATA/u02/redo02.log') SIZE 100M,
  GROUP 3 ('/$HOME/ORADATA/u03/redo03.log') SIZE 100M
 MAXLOGFILES 5
 MAXLOGMEMBERS 5
 MAXLOGHISTORY 1
 MAXDATAFILES 100
 MAXINSTANCES 1
 DATAFILE '/$HOME/ORADATA/u01/system01.dbf' SIZE 325M
 UNDO TABLESPACE undotbs
 DATAFILE '/$HOME/ORADATA/u02/undotbs01.dbf' SIZE 200M
       AUTOEXTEND ON NEXT 5120K MAXSIZE UNLIMITED
 DEFAULT TEMPORARY TABLESPACE temp
 CHARACTER SET US7ASCII
 NATIONAL CHARACTER SET AL16UTF16
 SET TIME_ZONE= 'America/New_York'
```

Creating a Database Using Oracle Managed Files (OMF)

- Using OMF simplifies file administration on the operating system

- OMF are created and deleted by the Oracle server as directed by SQL commands

- OMF are established by setting two parameters:

  - `DB_CREATE_FILE_DEST`: Set to give the default location for datafiles

  - `DB_CREATE_ONLINE_LOG_DEST_N`: Set to give the default locations for online redo logs and control files

    - Maximum of five locations

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Creating a Database Using
Oracle Managed Files (OMF)

- **Define the OMF parameters in the initialization parameter file. Example:**
  - `DB_CREATE_FILE_DEST=/$HOME/ORADATA/u05`
  - `DB_CREATE_ONLINE_DEST_1=/$HOME/ORADATA/u01`
  - `DB_CREATE_ONLINE_DEST_2=/$HOME/ORADATA/u02`
- **`CREATE DATABASE` command is simplified:**

```
@cddba01.sql
> CREATE DATABASE dba01;
```

Troubleshooting

Creation of the database fails if:

- **There are syntax errors in the SQL script**
- **Files that should be created already exist**
- **Operating system errors such as file or directory permission or insufficient space errors occur**

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After Database Creation

The database contains:

- **Datafiles, control files, and redo log files**
- **User `SYS` with the password `change_on_install`**
- **User `SYSTEM` with the password `manager`**
- **Internal tables (but no data dictionary views)**

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Summary

In this lesson, you should have learned to:

- Identify the prerequisites for creating a database
- Create a database using the Oracle Database Configuration Assistant
- Create a database manually
- Create a database using Oracle Managed Files

Practice 4 Overview

- **This lesson provides two specific ways to creating a database:**

  - **Use the Database Configuration Assistant to create a database using graphical steps. Launched by:**

    `Start > Programs > Oracle-OraHome90 > Configuration and Migration Tools.`

  - **Appendix A provides a step by step guide for creating a database manually on a UNIX system.**

- **Review the steps, and optionally create a database manually or by using the Database Configuration Assistant.**

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