

# **Creating Oracle Databases**

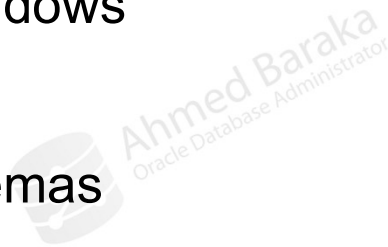
**By Ahmed Baraka**

# Objectives

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In this lecture, you will learn how to perform the following:

- Plan for database creation
- Response to the dbca windows
- Run dbca in silent mode
- Describe the sample schemas
- Drop Oracle databases
- Understand the guideline of creating Oracle databases



# Basic Planning for Database Creation

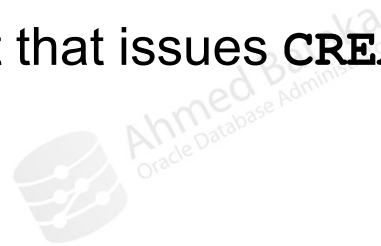
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- Capacity:
  - Number of users
  - Storage
- Database size: total size of all the segments
- Database name: **DB\_NAME**
  - Acceptable characters: alphanumeric, \_ , # , \$
- Domain name: **DB\_DOMAIN**
- Characterset
- Block Size: default 8K, 4K for OLTP, 16K for warehouses
- Multitenancy?

# Database Creation Tools

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- Database Configuration Assistant **dbca**
  - Interactive mode
  - Silent mode
- Manually: running a script that issues **CREATE DATABASE** statement



# Configuring a Listener

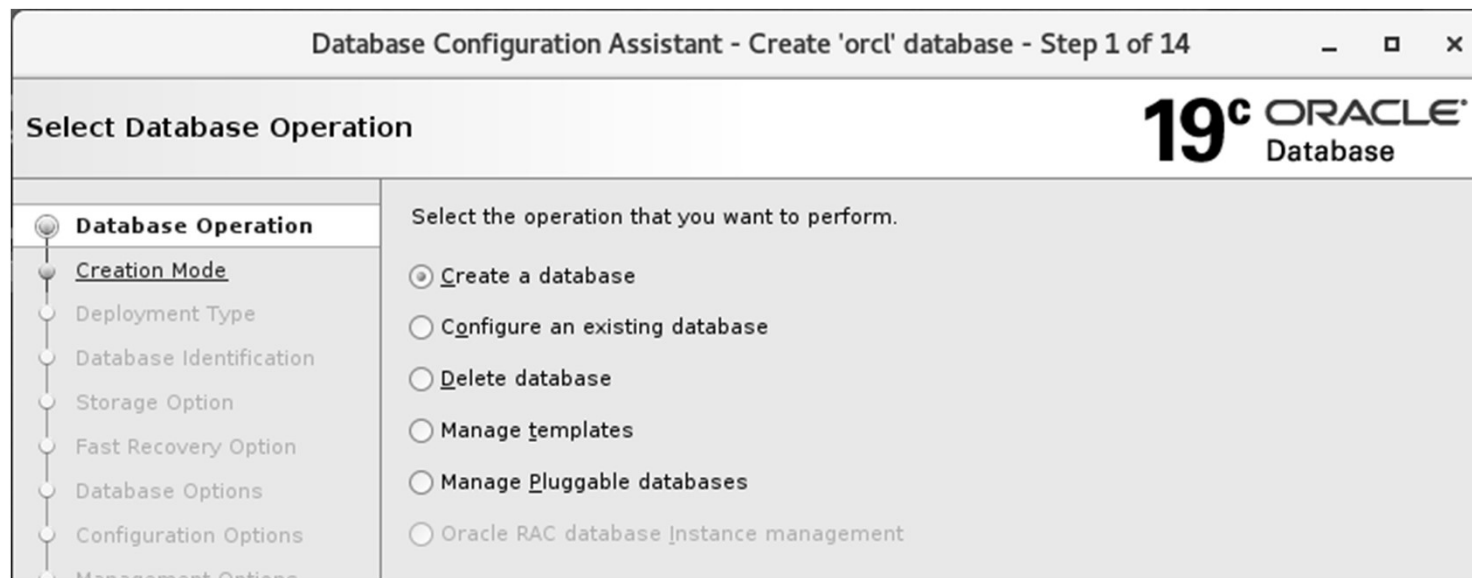
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- If there is no listener already configured, configure a new listener using the Network Configuration Assistant (**netca**)
- If a GUI interface is not available in the machine, run **netca** in silent mode

```
netca -silent -responsefile  
/u01/app/oracle/product/19.0.0/db_1/assistants/netca/netca.rsp
```

# Database Operation

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# Creation Mode

Database Configuration Assistant - Create a database - Step 2 of 14

Select Database Creation Mode

**19c ORACLE Database**

Database Operation

**Creation Mode**

Deployment Type

Database Identification

Storage Option

Fast Recovery Option

Database Options

Configuration Options

Management Options

User Credentials

Creation Option

Summary

Progress Page

Finish

☐ Typical configuration

Global database name:

Storage type:

Database files location:

Fast Recovery Area (FRA):

Database character set:

Administrative password:

Confirm password:

☒ Create as Container database

Pluggable database name:

☒ Advanced configuration

# Deployment Type

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Database Operation

Creation Mode

**Deployment Type**

Select the type of database you want to create.

Database type: Oracle Single Instance database

Configuration type: Admin Managed

	Template name	Include datafiles
<input type="radio"/>	Data Warehouse	Yes
<input checked="" type="radio"/>	Custom Database	No
<input type="radio"/>	General Purpose or Transaction Processing	Yes

	Template name	Include datafiles	Details
<input type="radio"/>	Data Warehouse	Yes	<a href="#">View details</a>
<input checked="" type="radio"/>	Custom Database	No	<a href="#">View details</a>
<input type="radio"/>	General Purpose or Transaction Processing	Yes	<a href="#">View details</a>

User Credentials

Creation Option

Summary

Progress Page



# Database Identification Details

Database Configuration Assistant - Create a database - Step 4 of 14

**Specify Database Identification Details** **19c ORACLE Database**

Provide a unique database identifier information. An Oracle database is uniquely identified by a Global database name, typically of the form "name.domain".

Global database name:

SID:

Service name:

☒ **Create as Container database**

A Container database can be used for consolidating multiple databases into a single database, and it enables database virtualization. A Container database (CDB) can have zero or more pluggable databases (PDB).

☒ Use Local Undo tablespace for PDBs

☐ Create an empty Container database

☒ Create a Container database with one or more PDBs

Number of PDBs:

PDB name:

**Mark this checkbox to create a Multitenant environment (CDB). Unmark this checkbox to create a non-CDB database.**

Help < Back Next > Finish Cancel

# Storage Option

Database Configuration Assistant - Create 'oradb' database - Step 5 of 14

**19c ORACLE Database**

### Select Database Storage Option

- Database Operation
- Creation Mode
- Deployment Type
- Database Identification
- Storage Option**
- Fast Recovery Option
- Database Options
- Configuration Options
- Management Options
- User Credentials
- Creation Option
- Summary
- Progress Page
- Finish

☐ Use template file for database storage attributes  
Storage type and location for database files will be picked up from the template file (General Purpose or Transaction Processing).

☒ Use following for the database storage attributes  
All the database files will be put at the specified location below. You can customize the name and location of each datafile in the subsequent screen.

Database files storage type: File System

Database files location: {ORACLE\_BASE}/oradata/{DB\_UNIQUE\_NAME} Browse...

Oracle Managed files option will enable Oracle to automatically generate the names of the datafiles for simplified database management.

☐ Use Oracle-Managed Files (OMF) Multiplex redo logs and control files...

File location variables...

**ASM or File System**

**Directory where the datafiles will be created**

**Default location of datafiles**

# Setting Fast Recovery Option

Database Configuration Assistant - Create 'oradb' database - Step 6 of 14

**19c ORACLE Database**

## Select Fast Recovery Option

Choose the recovery options for the database.

☒ **Specify Fast Recovery Area**

Recovery files storage type: File System **ASM or File System**

Fast Recovery Area: {ORACLE\_BASE}/fast\_recovery\_area/{DB\_UNIQUE\_} **Browse...**

Fast Recovery Area size: 17271 **MB** **Set it to maximum size allowed by storage**

☐ **Enable archiving** **Usually enabled after the db creation** **Edit archive mode parameters...**

- Database Operation
- Creation Mode
- Deployment Type
- Database Identification
- Storage Option**
- Fast Recovery Option**
- Database Options
- Configuration Options
- Management Options
- User Credentials
- Creation Option
- Summary

# Network Configuration

Database Configuration Assistant - Create 'orcl' database - Step 7 of 14

**Specify Network Configuration Details** **19c ORACLE Database**

- Database Operation
- Creation Mode
- Deployment Type
- Database Identification
- Storage Option
- Fast Recovery Option
- Network Configuration**
- Configuration Options
- Management Options
- User Credentials
- Creation Option
- Summary
- Progress Page
- Finish

Listener selection

Listeners data is loaded from TNS\_ADMIN env:  
/u01/app/oracle/product/19.0.0/db\_1/network/admin

	Name	Port	Oracle home	Status
<input checked="" type="checkbox"/>	LISTENER	1521	/u01/app/oracle/product/19.0.0/db_1	Up

☐ Create a new listener

Listener name:

Listener port:

Oracle home: /u01/app/oracle/product/19.0.0/db\_1

**Use existing Listner**

**Create a new Listener**

# Selecting Database Options

Database Configuration Assistant - Create 'oradb' database - Step 8 of 15

**19c ORACLE Database**

## Select Database Options

Select the standard database components you want to configure for use. Oracle recommends that you always install these components in your database. These components may cause you to no longer be able to choose some options on subsequent pages.

Select Component	Tablespace	Include in PDBs
<input checked="" type="checkbox"/> Oracle JVM	SYSTEM	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Oracle Text	SYSAUX	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Oracle Multimedia	SYSAUX	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Oracle OLAP	SYSAUX	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Oracle Spatial	SYSAUX	<input checked="" type="checkbox"/>
<input type="checkbox"/> Oracle Label Security	SYSTEM	<input type="checkbox"/>
<input type="checkbox"/> Oracle Application Express	SYSAUX	<input type="checkbox"/>
<input type="checkbox"/> Oracle Database Vault	SYSAUX	<input type="checkbox"/>

Select only the options required by the system.  
Some options require licenses.

# Setting the Memory

Database Configuration Assistant - Create 'oradb' database - Step 9 of 15

Specify Configuration Options

19c ORACLE Database

Database Operation  
Creation Mode  
Deployment Type  
Database Identification  
Storage Option  
Fast Recovery Option  
Network Configuration  
**Database Options**  
**Configuration Options**  
Management Options  
User Credentials  
Creation Option  
Summary  
Progress Page  
Finish

Memory Sizing Character sets Connection mode Sample schemas

☒ Use Automatic Shared Memory Management

SGA size: 2901 MB

PGA Size: 967 MB

390 3868 5692

☐ Use Manual Shared Memory Management

Shared pool size: 0 MB

Buffer cache size: 0 MB

Java pool size: 0 MB

Large pool size: 0 MB

PGA size: 0 MB

Total memory for database 0 MB

☐ Use Automatic Memory Management

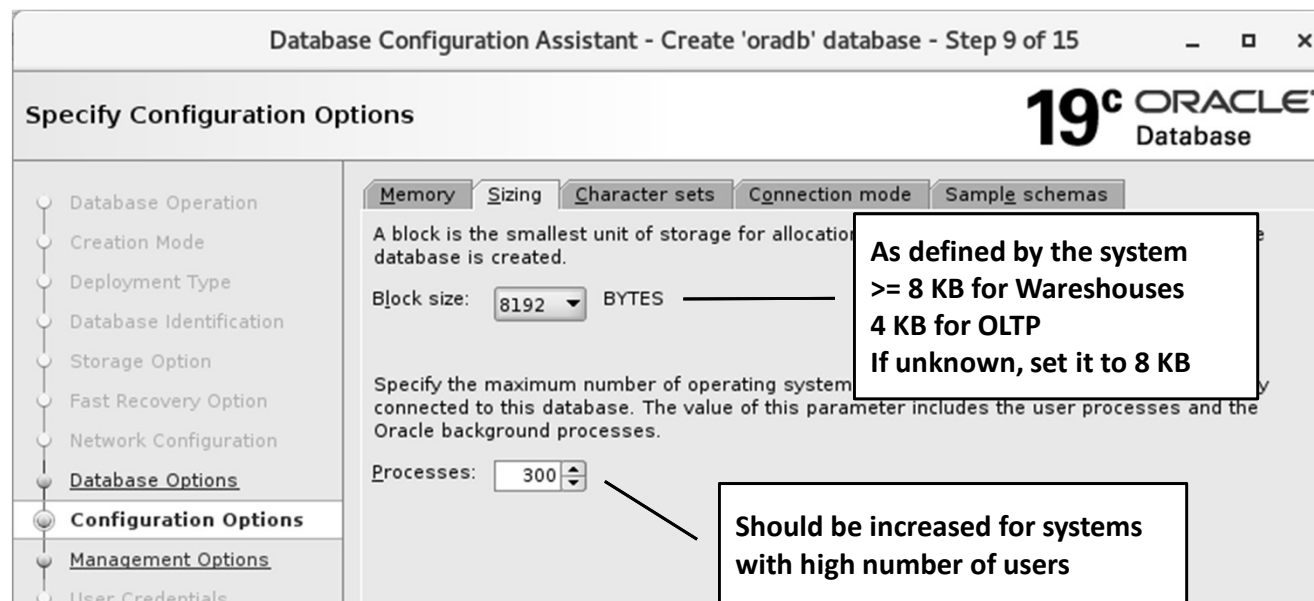
Memory target: 2276 MB

390 2276 5692 39%

Slide the pointer to set the total size. Part of it is allocated for SGA and the rest is allocated to PGA

Set the total size of SGA and PGA. The memory size allocated to each one is defined dynamically while the database is in operation.

# Setting Block Size and Processes



# Setting Charactersets

Database Configuration Assistant - Create 'oradb' database - Step 9 of 15

Specify Configuration Options

19c ORACLE Database

Memory Sizing Character sets Connection mode Sample schemas

The database character set determines how character data is stored in the database.

☒ Use Unicode (AL32UTF8)  
Setting character set to Unicode (AL32UTF8) ends the configuration.

☐ Use OS character set (WE8MSWIN1252)  
Character set is based on the language setting of this operating system.

☐ Choose from the list of character sets  
Database character set: AL32UTF8 - Unicode UTF-8 Universal character set

☒ Show recommended character sets only

National character set: AL16UTF16 - Unicode UTF-16 Universal character set

Default language: American

Default territory: United States

Database Operation  
Creation Mode  
Deployment Type  
Database Identification  
Storage Option  
Fast Recovery Option  
Network Configuration  
Database Options  
Configuration Options  
Management Options  
User Credentials  
Creation Option  
Summary  
Progress Page  
Finish

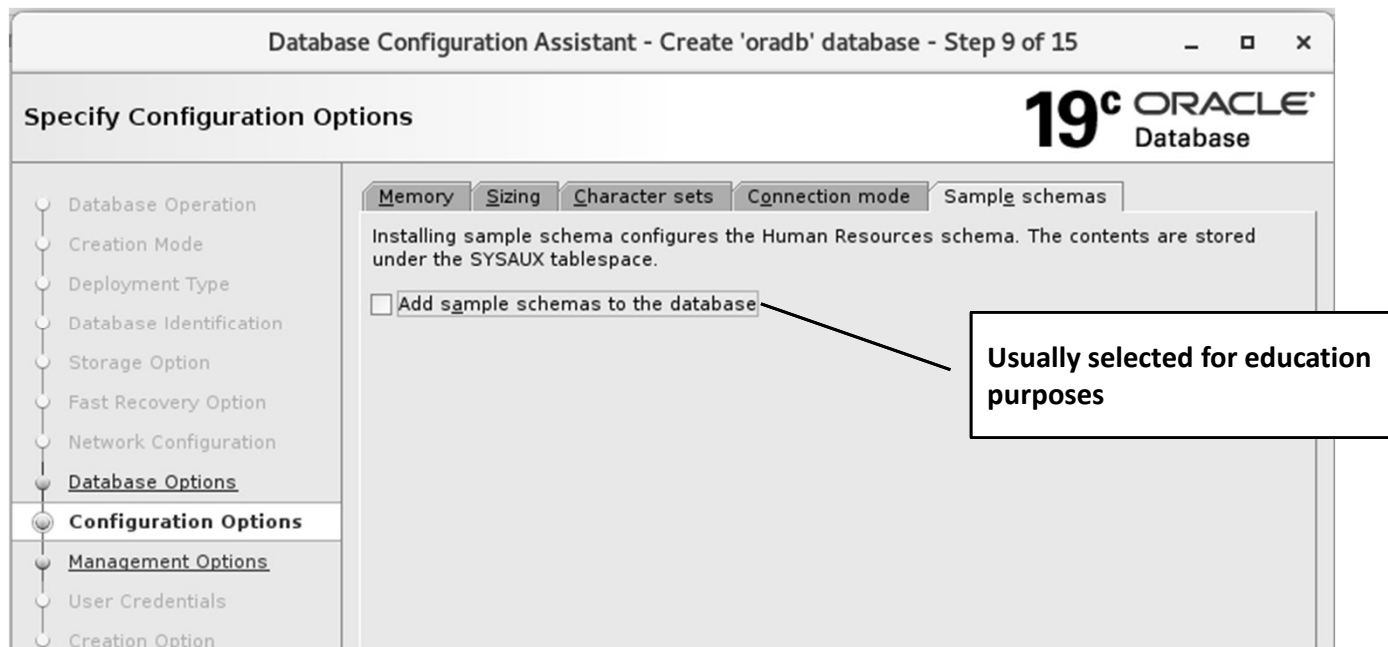
Used by column of data type CHR and VARCHAR2

Used by column of data types NCHAR and NVARCHAR2



# Installing Sample Schemas

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# Configuring EM Express and Registering in OEM

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Database Configuration Assistant - Create 'oradb' database - Step 10 of 15

**19c ORACLE Database**

### Specify Management Options

Specify the management options for the database.

- ☒ **Configure Enterprise Manager (EM) database express** Configure EM Express
  - EM database express port:
  - ☐ Configure EM database express port as global port
- ☐ **Register with Enterprise Manager (EM) cloud control** Register the database in OEM
  - OMS host:
  - OMS port:
  - EM admin username:
  - EM admin password:

Navigation pane on the left:

- Database Operation
- Creation Mode
- Deployment Type
- Database Identification
- Storage Option
- Fast Recovery Option
- Network Configuration
- Database Options
- Configuration Options**
- Management Options**
- User Credentials

# Creation Option

Database Configuration Assistant - Create 'oradb' database - Step 12 of 15

**19c ORACLE Database**

### Select Database Creation Option

Select the database creation options.

☒ **Create database**

Specify the SQL scripts you want to run after the database is created. The scripts are run in the order listed below.

Post DB creation scripts:  **Create a template with the same specifications**

☐ **Save as a database template**

Template name:

Template location:  **Use it to create scripts**

Description:

☐ **Generate database creation scripts**

Destination directory:   **Used to control the locations and specifications of database files**

Following advanced configuration options customize database storage locations.

**Set values to the parameters different from the default ones**

**Creation Option**

- Database Operation
- Creation Mode
- Deployment Type
- Database Identification
- Storage Option
- Fast Recovery Option
- Network Configuration
- Database Options
- Configuration Options
- Management Options
- User Credentials
- Creation Option**
- Summary
- Progress Page
- Finish

# Setting the Initialization Parameters

Database Configuration Assistant - Create 'orcl' database - Step 12 of 15

All initialization parameters

⚠ Update the initialization parameters only when it is required. Refer to the Oracle documentation to learn more about each initialization parameter and its valid set of values.

(Storage related parameter(s) value is shown in MB) ☐ Show advanced parameters

Name	Value	Include in spfile	Category
undo_tablespace	UNDOTBS1	<input checked="" type="checkbox"/>	Cluster Database
sga_target	1707	<input checked="" type="checkbox"/>	SGA Memory
db_block_size (bytes)	8192	<input checked="" type="checkbox"/>	Cache and I/O
nls_language	AMERICAN	<input checked="" type="checkbox"/>	NLS
control_files	{*{ORACLE_BASE}/orad...	<input checked="" type="checkbox"/>	File Configuration
remote_login_password...	EXCLUSIVE	<input checked="" type="checkbox"/>	Security and Auditing
processes	300	<input checked="" type="checkbox"/>	Processes and Session
pga_aggregate_target	569	<input checked="" type="checkbox"/>	Sort, Hash Joins, Bi...
nls_territory	AMERICA	<input checked="" type="checkbox"/>	NLS
db_recovery_file_dest_s...	17271	<input checked="" type="checkbox"/>	File Configuration
open_cursors	300	<input checked="" type="checkbox"/>	Cursors and Library Cache
compatible	19.0.0	<input checked="" type="checkbox"/>	Miscellaneous
db_name	orcl	<input checked="" type="checkbox"/>	Database Identification
db_recovery_file_dest	{ORACLE_BASE}/fast_re...	<input checked="" type="checkbox"/>	File Configuration
cluster_database	FALSE	<input type="checkbox"/>	Cluster Database
log_archive_dest_1		<input type="checkbox"/>	Archive
log_archive_dest_2		<input type="checkbox"/>	Archive

Description:

undo\_tablespace: Undo tablespaces are used solely for storing undo information. UNDO\_TABLESPACE is only allowed in System Managed Undo (SMU) mode. The specified undo tablespace, . will be used by the instance. If the tablespace does not exist, or is not an undo tablespace, or is being used by another instance, the instance STARTUP will fail. Default: Each database contains zero or more undo tablespaces. In the SMU mode, each ORACLE instance is assigned one (and only one) undo tablespace.

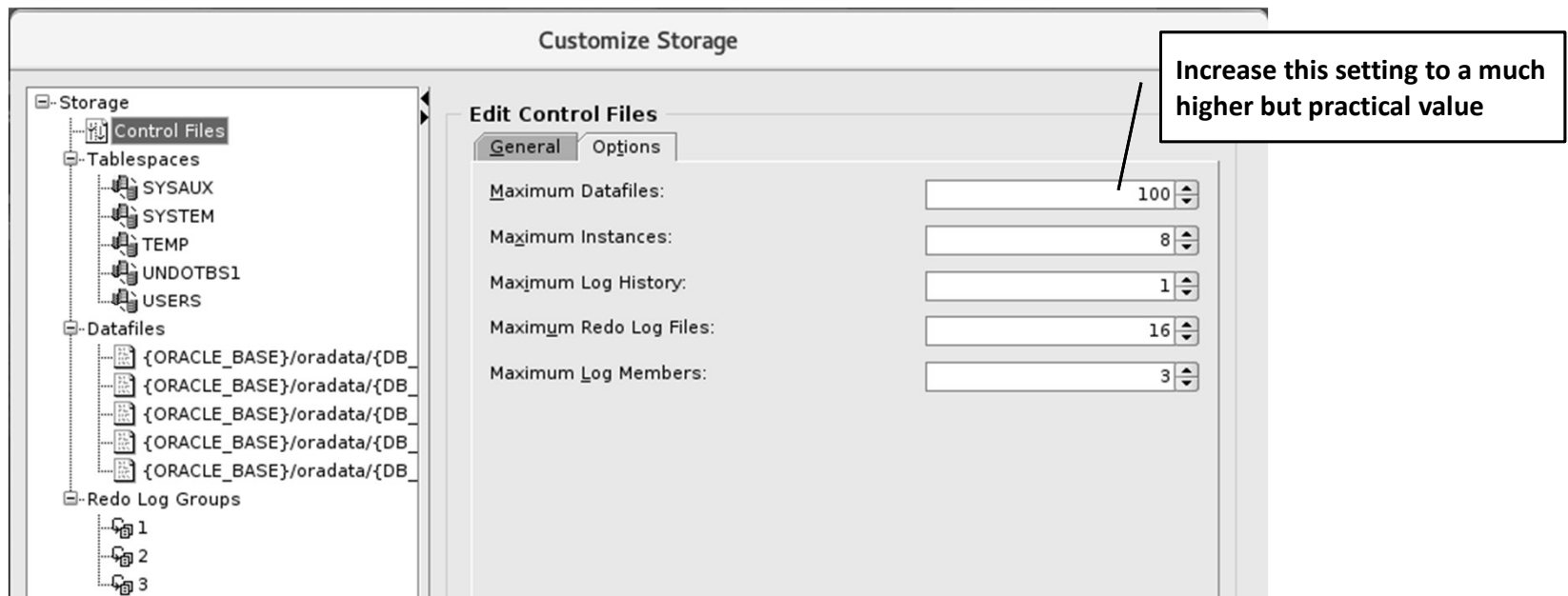
Help Close

Mark this checkbox to display the advance parameters

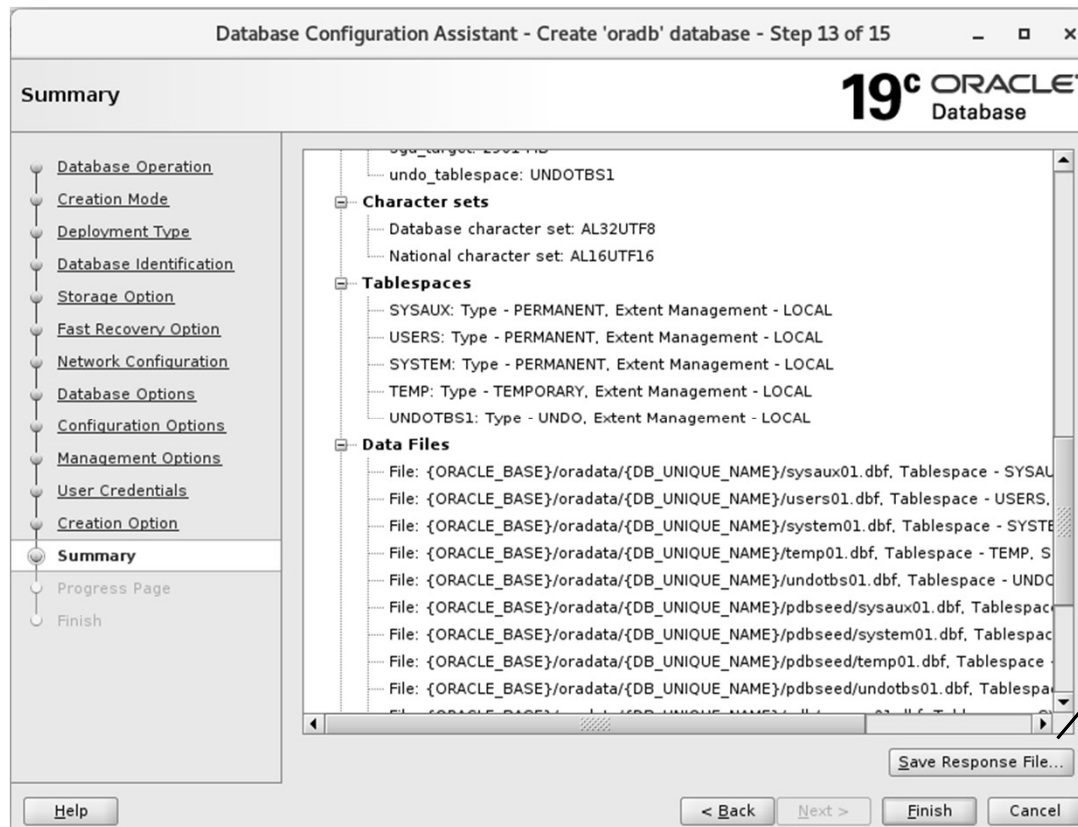
Click on the Value field to change the parameter value

# Customize the Storage

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# Creating Response File



Create Response File to be used in silent mode

# Running dbca in Silent Mode

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- dbca can be invoked in silent mode to create a database
- Answers to the dbca questions can be provided in response file:

```
dbca -createDatabase -silent -responseFile ./dbca.rsp
```

- Answers can be provided in the command line itself:

```
dbca -silent -createDatabase \  
-templateName General_Purpose.dbc \  
-gdbname cdb3 -sid cdb3 -responseFile NO_VALUE \  
-characterSet AL32UTF8 \  
-createAsContainerDatabase true \  
-numberOfPDBs 1 \  
-pdbName pdb3 \  
-pdbAdminPassword OraPasswd1 \  
...
```

# Providing Database Options to the Command Line

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- Database options (components) cannot be provided in the response file.
- They can be provided in the command line as follows:

```
dbca -createDatabase -silent -responseFile ./dbca.rsp  
-dbOptions  
JSERVER:true,DV:false,APEX:false,OMS:false,SPATIAL:false,IMEDIA:false  
,ORACLE_TEXT:false,CWMLITE:false
```

- If they are not provided, the **dbca** creates the database with all the options
- If you want to drop specific component, use the **chopt** tool:  
<https://docs.oracle.com/en/database/oracle/oracle-database/19/ssdbi/chopt-tool.html>



# dbca Capabilities in Silent Mode

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Command-line Parameter	Description
<b>createDatabase</b>	Creates a database
<b>createDuplicateDB</b>	Creates a duplicate of an Oracle database (19c)
<b>configureDatabase</b>	Configures a database
<b>createTemplateFromDB</b>	Creates a database template from an existing database
<b>createTemplateFromTemplate</b>	Creates a database template from an existing database template
<b>createCloneTemplate</b>	Creates a clone (seed) database template from an existing database
<b>deleteTemplate</b>	Deletes a database template
<b>generateScripts</b>	Generates scripts, which can be used to create a database
<b>deleteDatabase</b>	Deletes a database
<b>createPluggableDatabase</b>	Creates a pluggable database (PDB) in a multitenant container database (CDB)

# dbca Capabilities in Silent Mode

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Command-line Parameter	Description
<b>unplugDatabase</b>	Unplugs a pluggable database (PDB) from a multitenant container database (CDB)
<b>deletePluggableDatabase</b>	Deletes a PDB
<b>relocatePDB</b>	Relocates a PDB from a remote CDB to a local CDB (19c)
<b>configurePluggableDatabase</b>	Configures a pluggable database (PDB)
<b>addInstance</b>	Adds a database instance to an administrator-managed Oracle RAC database
<b>deleteInstance</b>	Deletes a database instance from an administrator-managed Oracle RAC database
<b>executePrereqs</b>	Executes the prerequisites checks and reports the results. This command can be used to check the environment before running dbca to create a database.

# Troubleshooting dbca in Silent Mode

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- Refer to the following MOS document:
  - Issues Running DBCA in Silent Mode (Doc ID 164672.1)



# About Sample Schemas

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- Based on a fictitious sample company

Schema	Description
<b>HR</b>	Division Human Resources tracks information about the company employees and facilities.
<b>OE</b>	Division Order Entry tracks product inventories and sales of company products through various channels.
<b>PM</b>	Division Product Media maintains descriptions and detailed information about each product sold by the company.
<b>IX</b>	Division Information Exchange manages shipping through B2B applications.
<b>SH</b>	Division Sales tracks business statistics to facilitate business decisions.
<b>CO</b>	Division Customer Orders models a simple retail application consisting of customer, product, store and order data

# About Sample Schemas

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- Before 12c R2, they can be installed when creating the database
- Starting from 12c R2, when creating sample schemas is selected, only HR schema is created
- HR schema can be manually created by running the following script:

```
$ORACLE_HOME/demo/schema/human_resources/hr_main.sql
```

- The other schemas can be manually created from GitHub:
  - Obtain the required version from the following link:  
<https://github.com/oracle/db-sample-schemas/releases/latest>
  - Download the ZIP bundle from GitHub and extract the files
  - Follow the instructions in the README file

# Sample Schemas Documentation

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- A separate documentation titled “**Database Sample Schemas**”
  - <https://docs.oracle.com/en/database/oracle/oracle-database/19/comsc/index.html>

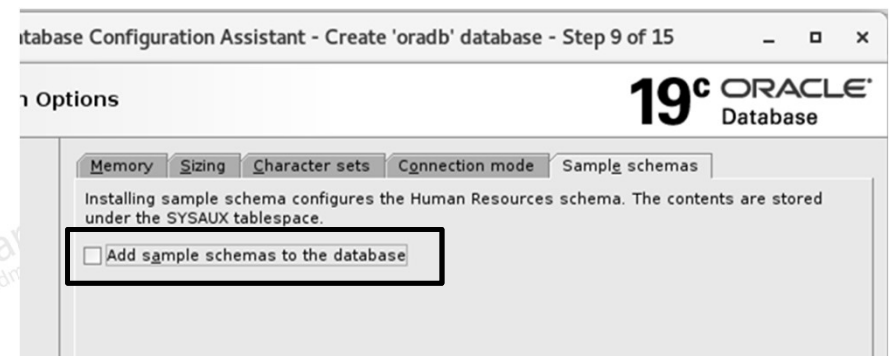


# An Issue with HR Sample Schema

- In the dbca interactive mode, it is created by selecting the option below
- In silent mode, it is set using the parameter **sampleSchema=true**
- Does not work in silent mode

```
SELECT USERNAME FROM DBA_USERS  
WHERE ORACLE_MAINTAINED='N'  
ORDER BY 1;
```

- If you need to install the HR Sample Schema, use dbca in GUI mode or deploy the sample schema later after creating the database.



# Dropping an Oracle Database

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- We can use **dbca** in interactive or silent modes:

```
dbca -silent -deleteDatabase -sourceDB ${ORACLE_SID} -sysDBAUserName  
sys -sysDBAPassword <password>
```

- Using SQL:

```
DROP DATABASE;
```





# Database Creation Guideline

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- For single db creation in a GUI system, use **dbca** in interactive mode
- For multiple db creations or command line systems, use **dbca** in silent mode
- If you are creating a database for a specific application, consult the vendor or developers for the required database specifications
- By the end of the course, you will be able to perform further customization based on the requirements
- Do not ignore the documentation
- Stick with the policies

# Summary

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In this lecture, you should have learnt how to perform the following:

- Plan for database creation
- Response to the dbca windows
- Run dbca in silent mode
- Describe the sample schemas
- Drop Oracle databases
- Understand the guideline of creating Oracle databases

