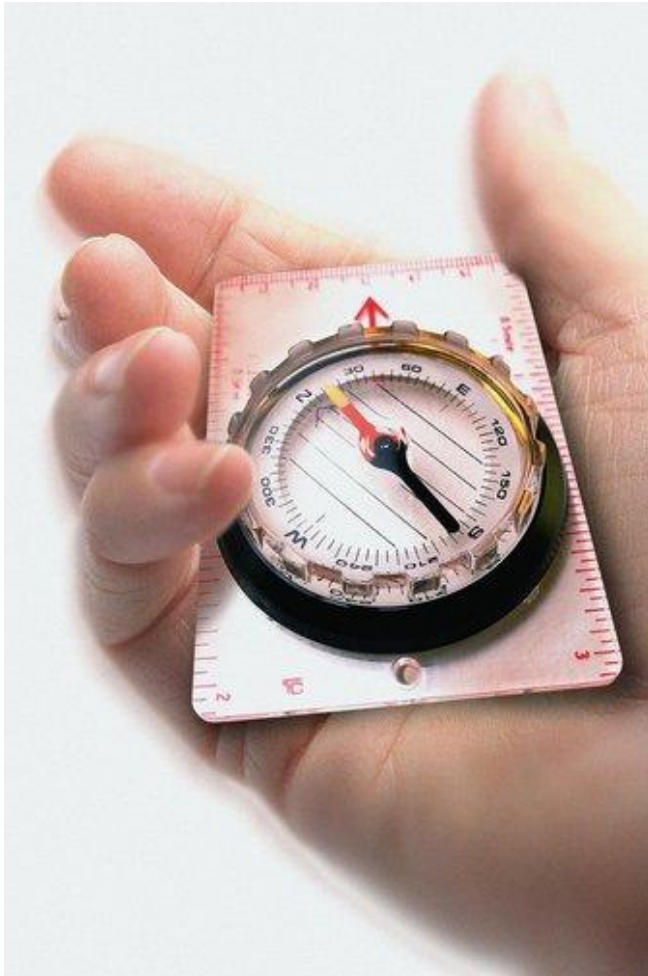# Managing the Database

Course objectives

By completing this course, you will:

- **Startup and shutdown the database and the utilities**

- **Understand logical Oracle Storage Structures**

- **Manage and create tablespaces**

Course topics

Course's plan:

- **Controlling the Database**
- **Oracle Storage Structures**

Controlling the Database

Preview

- Managing Tools

- Startup Stages

- Shutdown Modes

- Initialization Parameter Files

- Using Database Control

Managing Tools

Starting and Stopping *i*SQL*Plus

```
$ isqlplusctl start
iSQL*Plus 10.1.0.2.0
Copyright (c) 2004 Oracle. All rights reserved.
Starting iSQL*Plus ...
iSQL*Plus started.
```

```
$ isqlplusctl stop
iSQL*Plus 10.1.0.2.0
Copyright (c) 2004 Oracle. All rights reserved.
Stopping iSQL*Plus ...
iSQL*Plus stopped.
```

Managing Tools
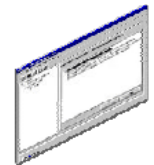
Management Framework

- The three components of the Oracle Database 10g management framework are:

  - Database instance

  - Listener

  - Management interface

    - Management agent (when using Grid Control)

    - Database Control

Listener

Management agent   - OR -   Database Control

Management interface

Managing Tools

Starting the listener

```
$ lsnrctl start
LSNRCTL for Linux: Version 10.1.0.3.0 - Production on 05-MAY-2011 18:49:11
Copyright (c) 1991, 2004, Oracle.  All rights reserved.
Starting /u01/app/oracle/product/10.1.0/db_1/bin/tnslsnr: please wait...
TNSLSNR for Linux: Version 10.1.0.3.0 - Production
System parameter file is
/u01/app/oracle/product/10.1.0/db_1/network/admin/listener.ora
…
Listener Parameter File
/u01/app/oracle/product/10.1.0/db_1/network/admin/listener.ora
Listener Log File
/u01/app/oracle/product/10.1.0/db_1/network/log/listener.log
Listening Endpoints Summary...
   (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=vmware.labo-oracle.com)(PORT=1521)))
   (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc)(KEY=EXTPROC)))
Services Summary...
Service "PLSExtProc" has 1 instance(s).
   Instance "PLSExtProc", status UNKNOWN, has 1 handler(s) for this service...
The command completed successfully
```

Managing Tools

Stopping the listener

```
$ lsnrctl stop

LSNRCTL for Linux: Version 10.1.0.3.0 - Production on 05-MAY-2011 18:53:21

Copyright (c) 1991, 2004, Oracle.  All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=vmware.labo-
oracle.com)(PORT=1521)))
The command completed successfully
```

Managing Tools

## Starting and Stopping Enterprise Manager

```
$ emctl start dbconsole
TZ set to US/Pacific
Oracle Enterprise Manager 10g Database Control Release 10.1.0.2. 0
Copyright (c) 1996, 2004 Oracle Corporation. All rights reserve d.
http://edrsr9p1.us.oracle.com:5500/em/console/aboutApplication
Starting Oracle Enterprise Manager 10g Database Control
..................... started.
------------------------------------------------------------- --
Logs are generated in directory
/u01/app/oracle/product/10.1.0/db_1/edrsr9p1.us.oracle.com_orcl/ sy
sman/log
```

```
$ emctl stop dbconsole
TZ set to US/Pacific
Oracle Enterprise Manager 10g Database Control Release 10.1.0.2. 0
Copyright (c) 1996, 2004 Oracle Corporation. All rights reserve d.
http://edrsr9p1.us.oracle.com:5500/em/console/aboutApplication
Stopping Oracle Enterprise Manager 10g Database Control ...
... Stopped.
```

Startup Stages

NOMOUNT
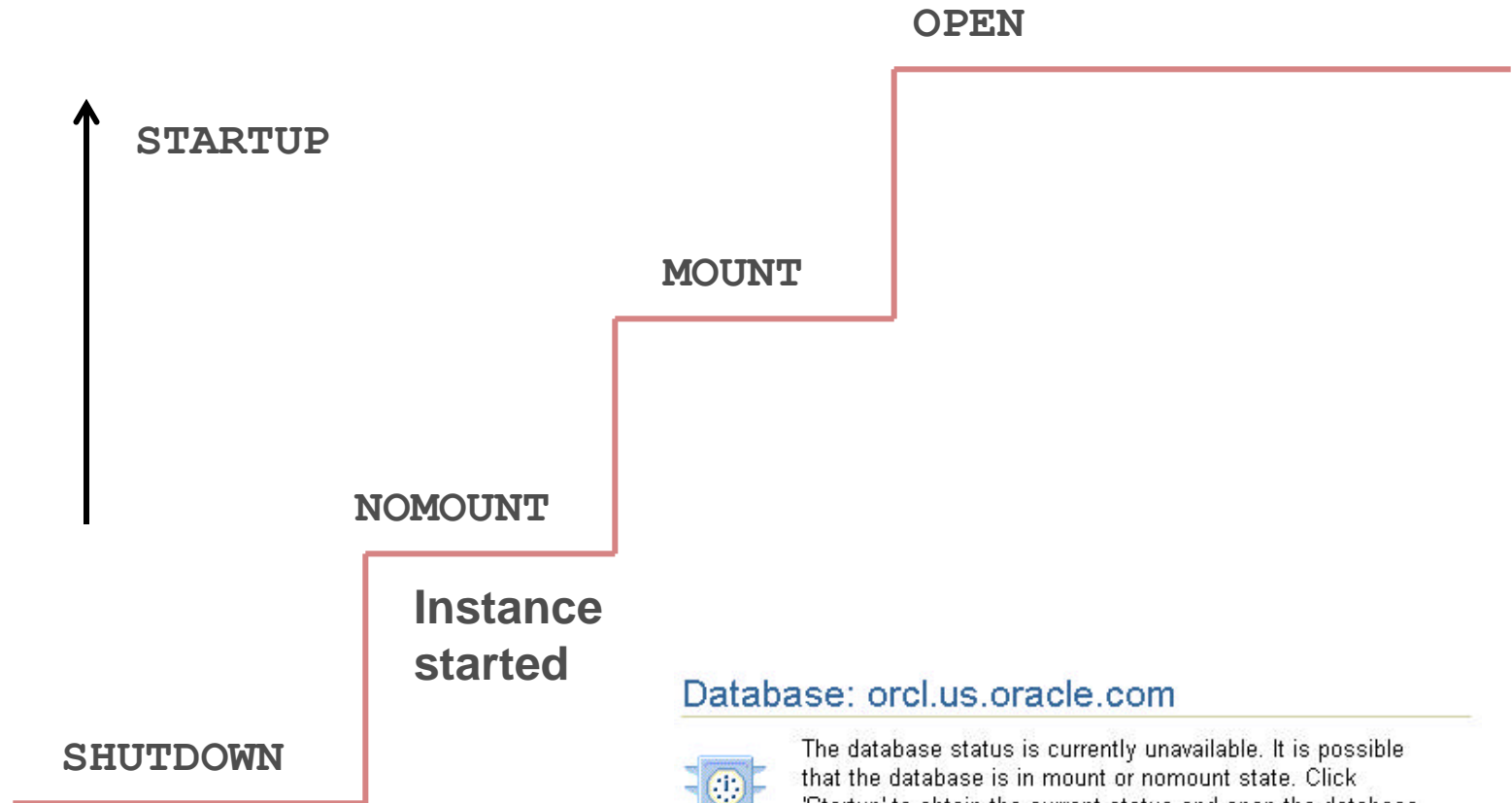
OPEN

STARTUP

MOUNT

NOMOUNT

Instance started

SHUTDOWN

Database: orcl.us.oracle.com

The database status is currently unavailable. It is possible that the database is in mount or nomount state. Click 'Startup' to obtain the current status and open the database. If the database cannot be opened, click 'Perform Recovery' to perform an appropriate recovery operation.
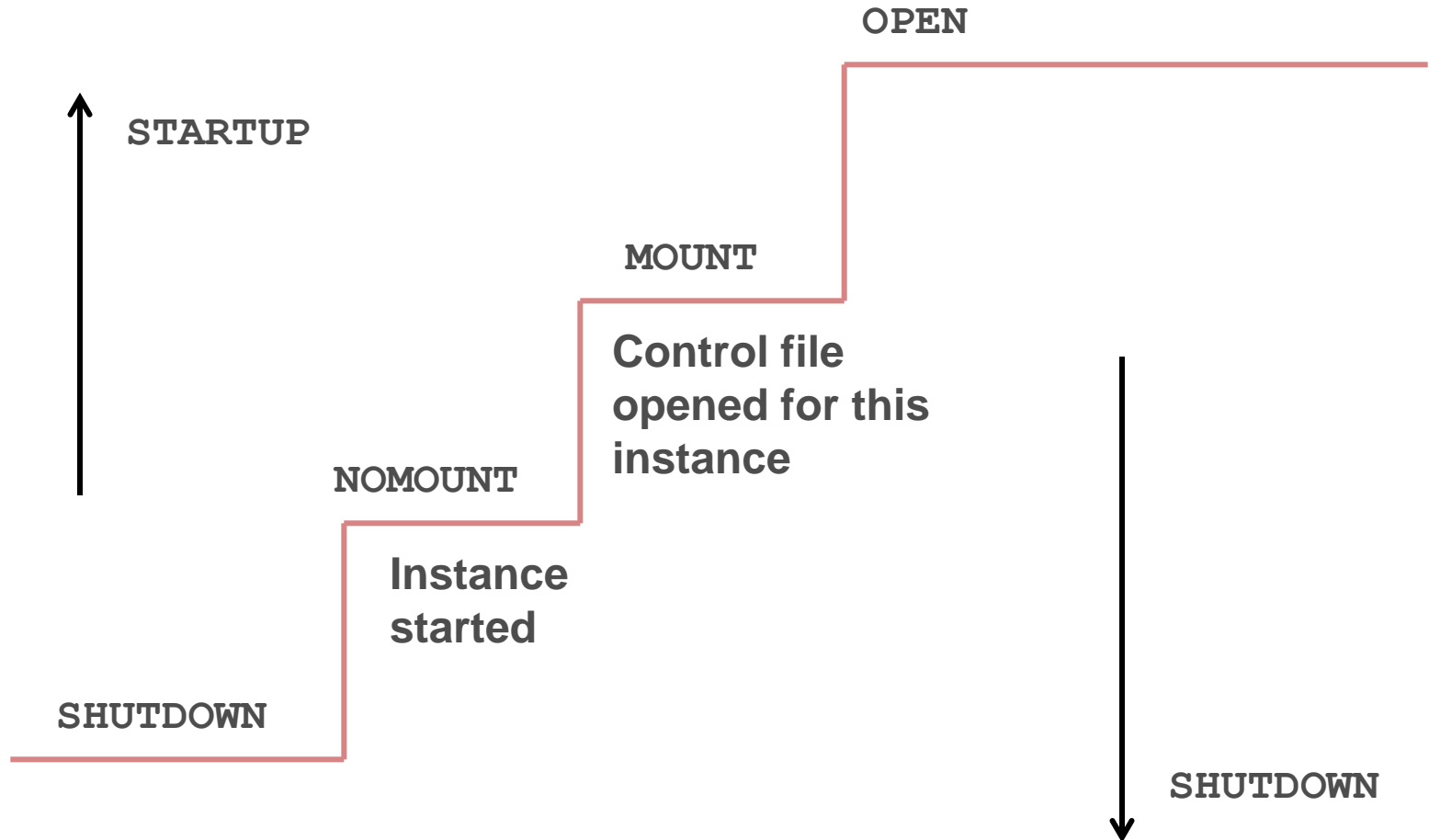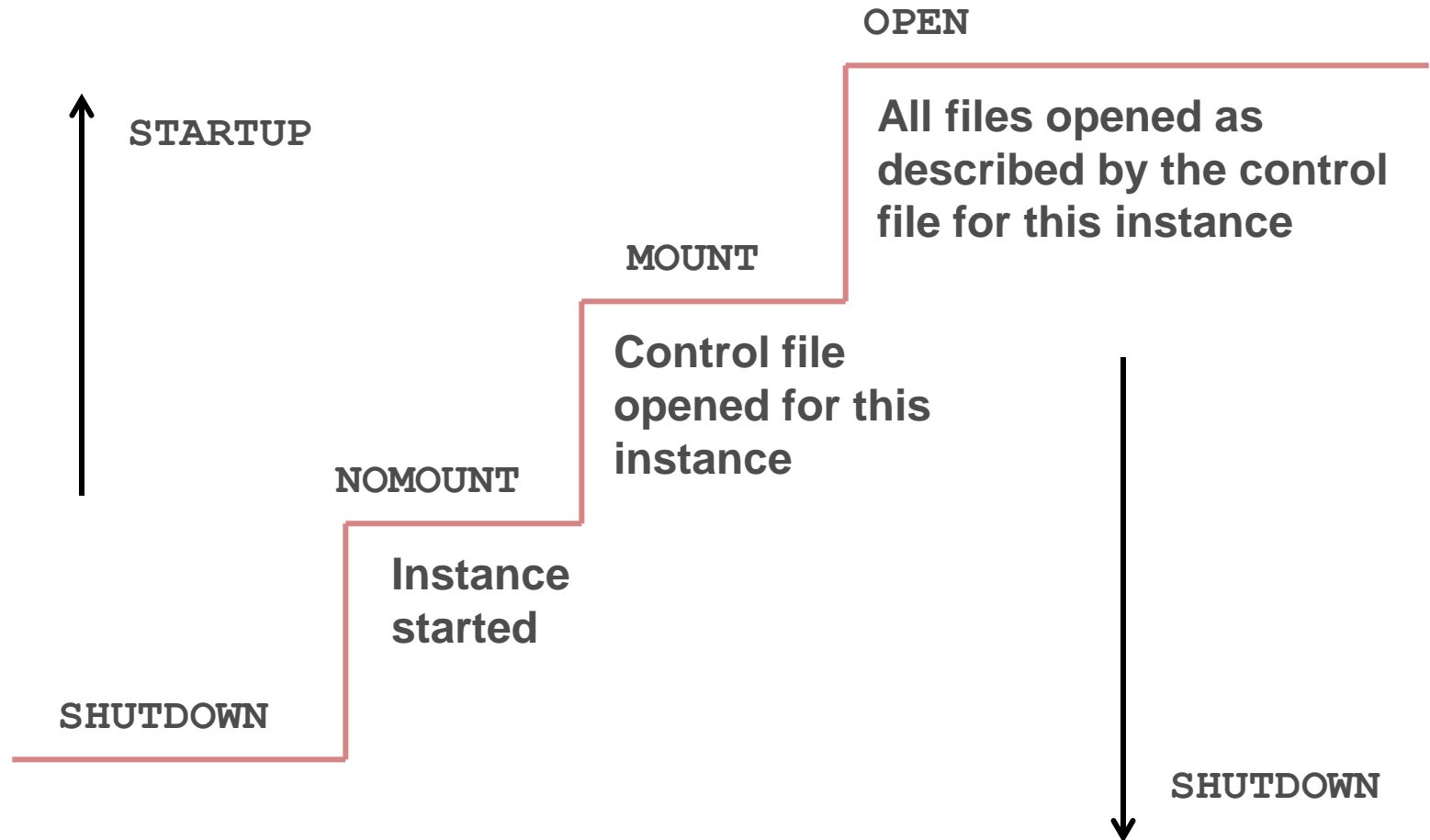
(Startup) (Perform Recovery)

Startup Stages

MOUNT

OPEN

STARTUP

MOUNT

Control file opened for this instance

NOMOUNT

Instance started

SHUTDOWN

SHUTDOWN

Startup Stages

OPEN

OPEN

STARTUP

All files opened as described by the control file for this instance

MOUNT

Control file opened for this instance

NOMOUNT

Instance started

SHUTDOWN

SHUTDOWN

Shutdown Mode

Shutdown Mode	A	I	T	N
Allow new connections				
Wait until current sessions end				✓
Wait until current transactions end			✓	✓
Force a checkpoint and close files		✓	✓	✓

- **Shutdown mode:**
    - **A = ABORT**
    - **I = IMMEDIATE**
    - **T = TRANSACTIONAL**
    - **N = NORMAL**

General

Shutdown

Status **Up**
Up Since **Dec 1, 2003 11:13:35 AM**
Time Zone **PST**
Availability (%) 99.82
(Last 24 hours)
Instance Name **orcl**
Version **10.1.0.2.0**
Oracle Home /u01/app/oracle/product/10.1.0
Listener LISTENER_EDCDR33P1
Host EDCDR33P1

Shutdown Mode

- **On the way down:**
  - **Database buffer cache written to the data files**
  - **Uncommitted changes rolled back**
  - **Resources released**

During

`SHUTDOWN NORMAL`
or
`SHUTDOWN TRANSACTIONAL`
or
`SHUTDOWN IMMEDIATE`

- **On the way top:**
  - **No Instance recovery**

**Consistent database
(clean database)**

Shutdown Mode

- **On the way down:**
  - **Modified buffers are not written to the data files**
  - **Uncommitted changes are not rolled back**

During

```
SHUTDOWN ABORT
```
or
Instance Failure
or
```
STARTUP FORCE
```

- **On the way top:**
  - **Online redo log files used to reapply changes**
  - **Undo segments used to roll back uncommitted changes**
  - **Resources released**

Inconsistent database (dirty database)
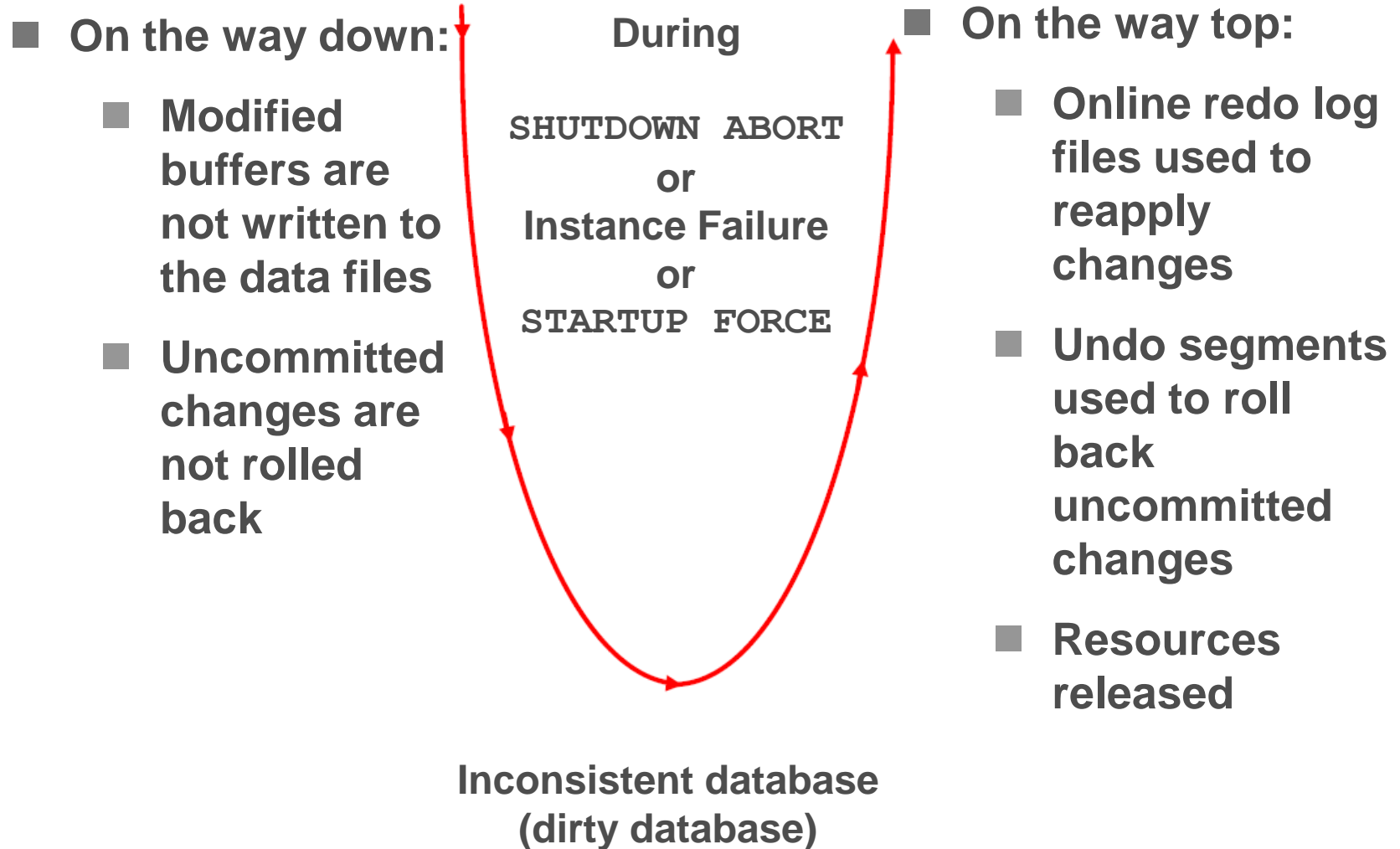
Initialization Parameter Files

Overview
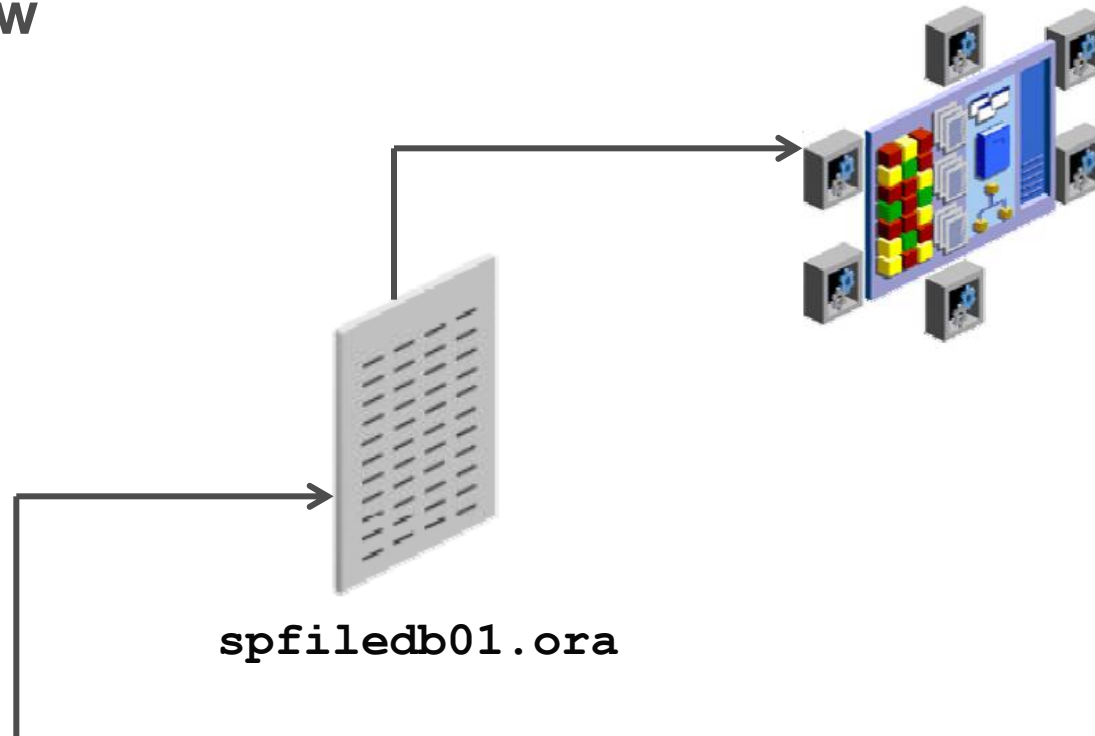
spfiledb01.ora

Database: orcl.us.oracle.com

The database status is currently unavailable. It is possible that the database is in mount or nomount state. Click 'Startup' to obtain the current status and open the database. If the database cannot be opened, click 'Perform Recovery' to perform an appropriate recovery operation.

(Startup) (Perform Recovery)

Using Database Control

Logging into Database Control

Using Database Control

Connecting to Enterprise Manager

Using Database Control

Database Home Page

Using Database Control

Changing the Listener Status

Using Database Control

Viewing the Alert Log

Using Database Control

Startup/Shutdown

Database: orcl > Startup/Shutdown:Specify Host and Target Database Credentials

Startup/Shutdown:Specify Host and Target Database Credentials

Specify the following credentials in order to change the status of the database.

Host Credentials

Specify the OS user name and password to login to target database machine.

User Name oracle

Password ******

Database Credentials

Specify the credentials for the target database.
To use OS authentication, leave the user name and password fields blank.

User Name sys

Password ******

Role SYSDBA

ⓘ Note that you need to login to the database as SYSDBA or SYSOPER in order to change the status of the database.

Cancel OK

Database | Setup | Preferences | Help | Logout

Startup/Shutdown:Confirmation

Current Status **shutdown**

Operation **startup database in open mode**

Initialization Parameter **default**

Are you sure you want to perform this operation?

Show SQL   Advanced Options   No   Yes

Startup/Shutdown:Confirmation

Current Status **open**

Operation **shutdown immediate**

Are you sure you want to perform this operation?

Show SQL   Advanced Options   No   Yes

Click Advanced Options to select startup options and shutdown mode

Using Database Control

Initialization Parameter Files

Database: orcl.us.oracle.com

| Home | Performance | **Administration** | Maintenance |

Instance

Memory Parameters
Undo Management
All Initialization Parameters

Storage

Controlfiles
Tablespaces
Datafiles
Rollback Segments
Redo Log Groups
Archive Logs
Temporary Tablespace Groups

Database: orcl.us.oracle.com > Initialization Parameters   Logged in As SYS

Initialization Parameters

(Show SQL) (Revert) (Apply)

Current | SPFile

The parameter values listed here are currently used by the running instance(s). You can change static parameters in SPFile mode.

Filter [   ] (Go)   (Save to File) (Show All)
      Filter on a name or partial name

⊝ Previous [1-25 of 256 ▼] Next 25 ⊛

Name	Help	Revisions	Value	Type	Basic △	Default	Dynamic	Category
cluster_database	ⓘ		FALSE	Boolean	✓	✓		Cluster Database
compatible	ⓘ		10.1.0.1.0	String	✓			Miscellaneous
control_files	ⓘ		'/u01/app/oracle/oradata/orcl/control01.ctl', '/u01/app/oracle/oradata/orcl/control02.ctl', '/u01/app/oracle/oradata/orcl/control03.ctl'	String	✓			File Configuration

Part 1 Summary

Initialization Parameter Files

Managing Tools

Using Database Control

Startup Stages

Shutdown Modes

Part 1 Stop-and-think

Do you have any questions ?

# Oracle Storage Structures

Preview

- What are Tablespaces and Data Files

- Managing tablespaces

What are Tablespaces and Data Files

- Oracle stores data logically in tablespaces and physically in data files.

- Tablespaces:

  - Can belong to only one database at a time

  - Consist of one or more data files

  - Are further divided into logical units of storage

- Data files:

  - Can belong to only one tablespace and one database

  - Are a repository for schema object data
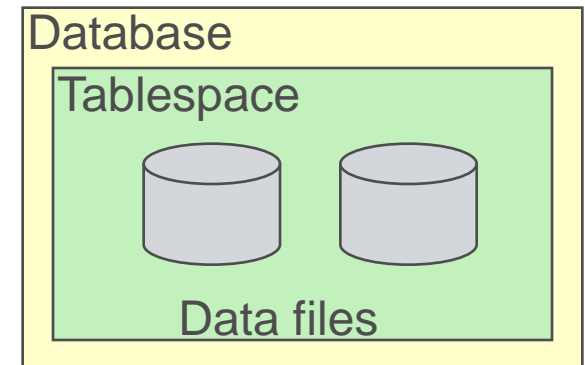
What are Tablespaces and Data Files

- Locally managed tablespace:

    - Free extents are managed in the tablespace.

    - Bitmap is used to record free extents.

    - Each bit corresponds to a block or group of blocks.

    - Bit value indicates free or used.

- Dictionary-managed tablespace:

    - Free extents are managed by the data dictionary.

    - Appropriate tables are updated when extents are allocated or deallocated.

Extent Management

⦿ Locally Managed

○ Dictionary Managed

Managing Tablespaces

Creating a New Tablespace

Database: orcl.oracle.com > Tablespaces > Create Tablespace   Logged in As SYS

Create Tablespace

(Show SQL) (Cancel) (OK)

General | Storage   Thresholds

* Name [INVENTRORY]

Extent Management	**Type**	**Status**
⦿ Locally Managed	⦿ Permanent	⦿ Read Write
○ Dictionary Managed	☐ Set as default permanent tablespace	○ Read Only
	○ Temporary	○ Offline
	☐ Set as default temporary tablespace	
	○ Undo	

Datafiles

☐ Use bigfile tablespace
Tablespace can have only one datafile with no practical size limit.

(Add)

(Edit) (Remove)

Select	Name	Directory	Size (MB)
⦿	inventory01.dbf	/u01/app/oracle/oradata/orcl/	50.00

Managing Tablespaces

Storage for Locally Managed Tablespaces

Database: orcl.us.oracle.com > Tablespaces > Create Tablespace   Logged in As SYS

Create Tablespace

(Show SQL)   (Cancel) (OK)

General   **Storage**   Thresholds

Extent Allocation

⦿ Automatic

○ Uniform

Size [   ] [KB ▾]

Segment Space Management

⦿ Automatic

 Objects in the tablespace automatically manage their free space. It offers high performance for free space management.

○ Manual

 Objects in the tablespace will manage their free space using free lists. It is provided for backward compatibility.

Managing Tablespaces

Default Tablespaces

- SYSTEM
- SYSAUX
- TEMP

- UNDOTBS1
- USERS
- EXAMPLE

Select	Name △	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)	
●	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	66.875		44.58
○	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	230.000	222.688		96.82
○	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	440.000	434.375		98.72
○	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	26.000	25.000		96.15
○	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	25.000	11.750		47.00
○	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	2.750		55.00

Edit View Delete Actions Add Datafile Go Create

Managing Tablespaces

Altering a Tablespace

Edit Tablespace: EXAMPLE

(Show SQL) (Revert) (Apply)

General | Storage Thresholds

Name EXAMPLE

Bigfile tablespace **No**

Extent Management	Type	Status
⊙ Locally Managed	⊙ Permanent	⊙ Read Write
○ Dictionary Managed	☐ Set as default permanent tablespace	○ Read Only
	○ Temporary	○ Offline
	☐ Set as default temporary tablespace	Offline Mode [Normal ▾]
	○ Undo	Normal / Temporary / Immediate / For Recover

Datafiles

(Add)

(Edit) (Remove)

Select	Name	Directory	Size (MB)	Used (MB)
⊙	example01.dbf	/u01/app/oracle/product/10.1.0/oradata/orcl/	150.00	66.88

Managing Tablespaces

Actions with Tablespaces

Managing Tablespaces

Dropping a Tablespace

Managing Tablespaces

Viewing Tablespaces Information

Database: orcl.oracle.com > Tablespaces >
View Tablespace: EXAMPLE

Logged in As SYS

View Tablespace: EXAMPLE

(Edit) (Return)

Name **EXAMPLE**
Bigfile tablespace **No**
Status **ReadWrite**
Type **Permanent**
Extent Management **local**

Storage

Allocation Type **Automatic**
Segment Space Management **Automatic**
Enable logging **No**
Block Size (B) **8192**

Datafiles

Name	Directory	Size (MB)	Used (MB)
example01.dbf	/u01/app/oracle/oradata/orcl/	150.00	80.25

Thresholds

Use Default Thresholds
Warning (% used) **85**
Critical (% used) **97**

(Edit) (View) (Delete) Actions Ge

Select	Name △	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Use
⊙	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	80.250	

Part 2 Summary

What are tablespaces and data files

Managing Tablespaces

Part 2 Stop-and-think

Do you have any questions ?

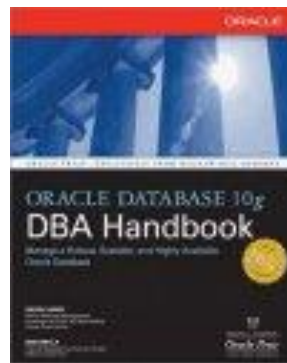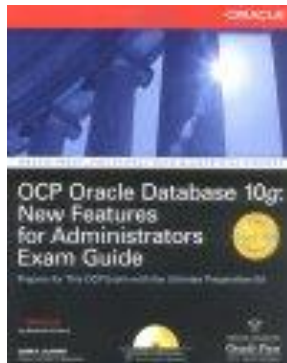# For more

If you want to go into these subjects more deeply, …

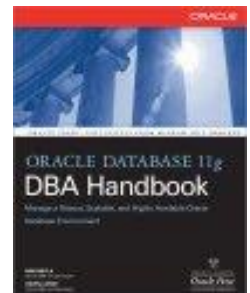| Publications	Courses

Cursus: Merise & SQL

Cursus: PL/SQL

Cursus: DBA1 & DBA2

Cursus: DWH, OAS & BIS

http://www.oracle.../bookstore/

Web sites	Certifications

http://www.labo-oracle.com

http://www.oracle.com

http://otn.oracle.com

1Z0-042

1Z0-043

Congratulations

You have successfully completed
the SUPINFO course module n°6

**Oracle Technologies
Managing the Database**

The end