



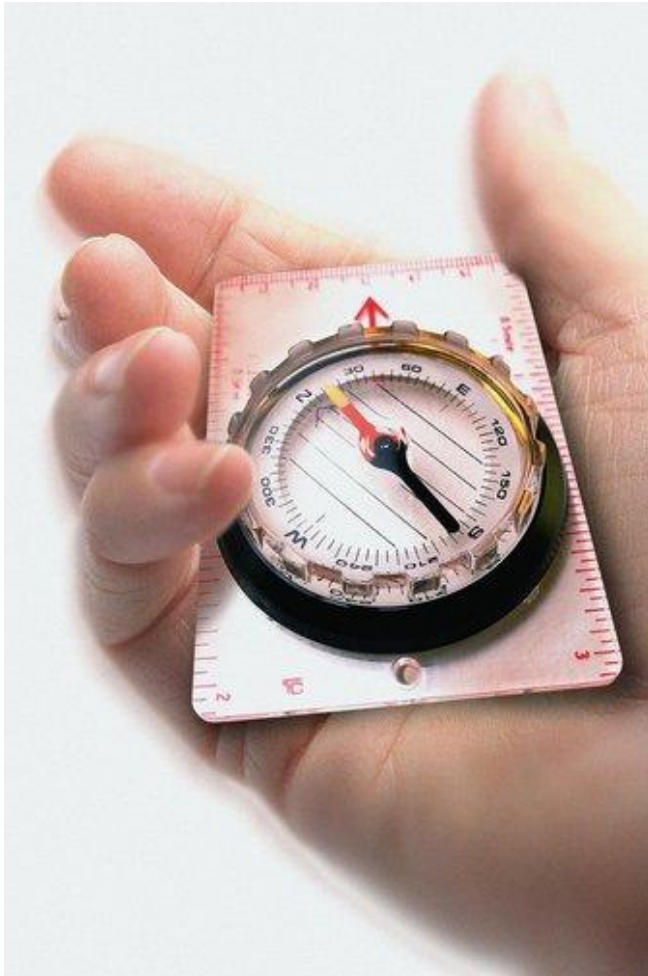
# Managing the Database





# 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 iSQL\*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

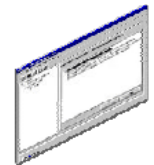
- The three components of the Oracle Database 10g management framework are:
  - Database instance
  - Listener
  - Management interface
    - Management agent (when using Grid Control)
    - Database Control



Listener



- 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 reserved.
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
```

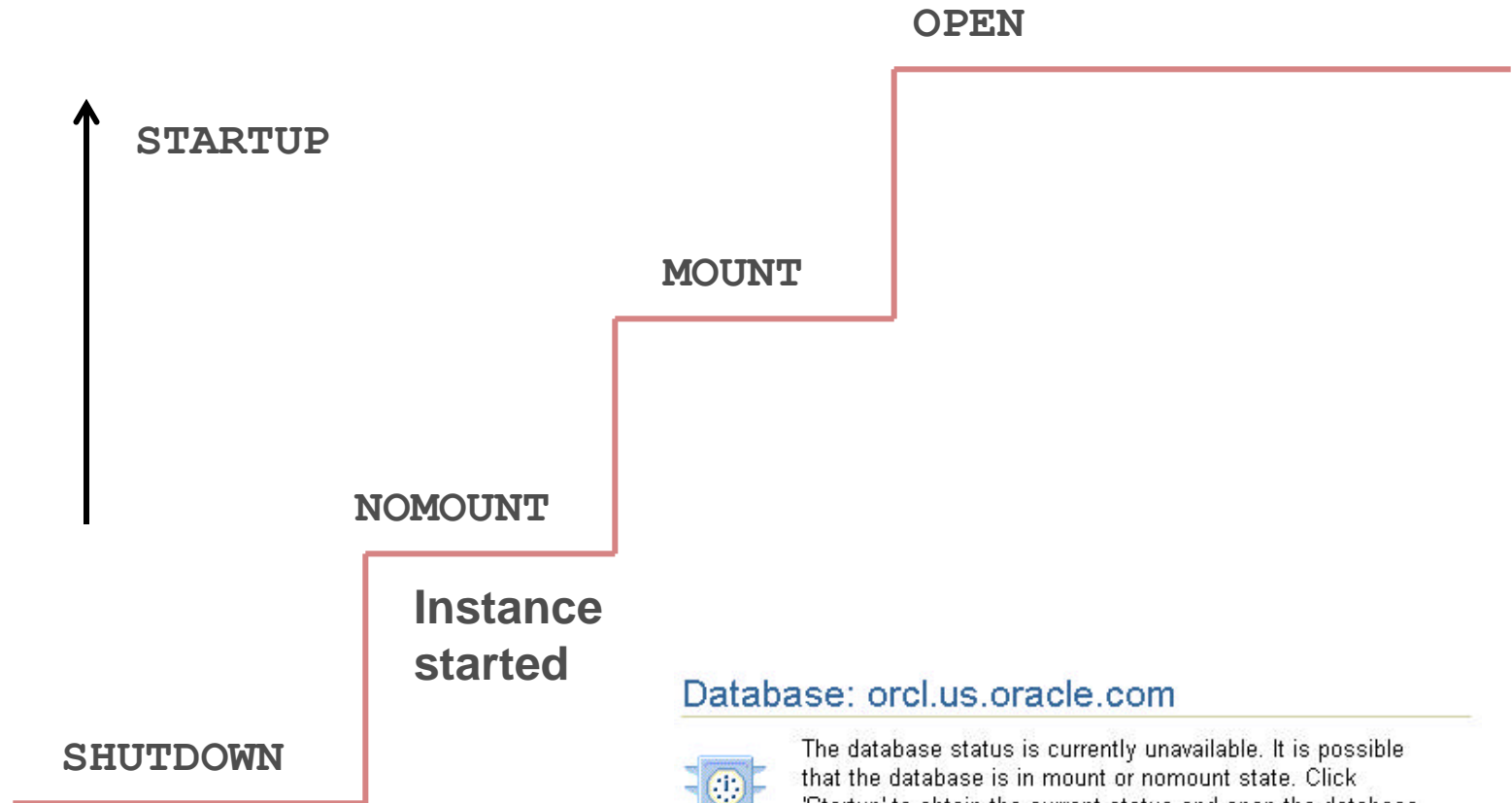
```
$ emctl stop dbconsole
TZ set to US/Pacific
Oracle Enterprise Manager 10g Database Control Release 10.1.0.2. 0
Copyright (c) 1996, 2004 Oracle Corporation. All rights reserved.
http://edrsr9p1.us.oracle.com:5500/em/console/aboutApplication
Stopping Oracle Enterprise Manager 10g Database Control ...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





# Startup Stages

## NOMOUNT



Database: [orcl.us.oracle.com](http://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

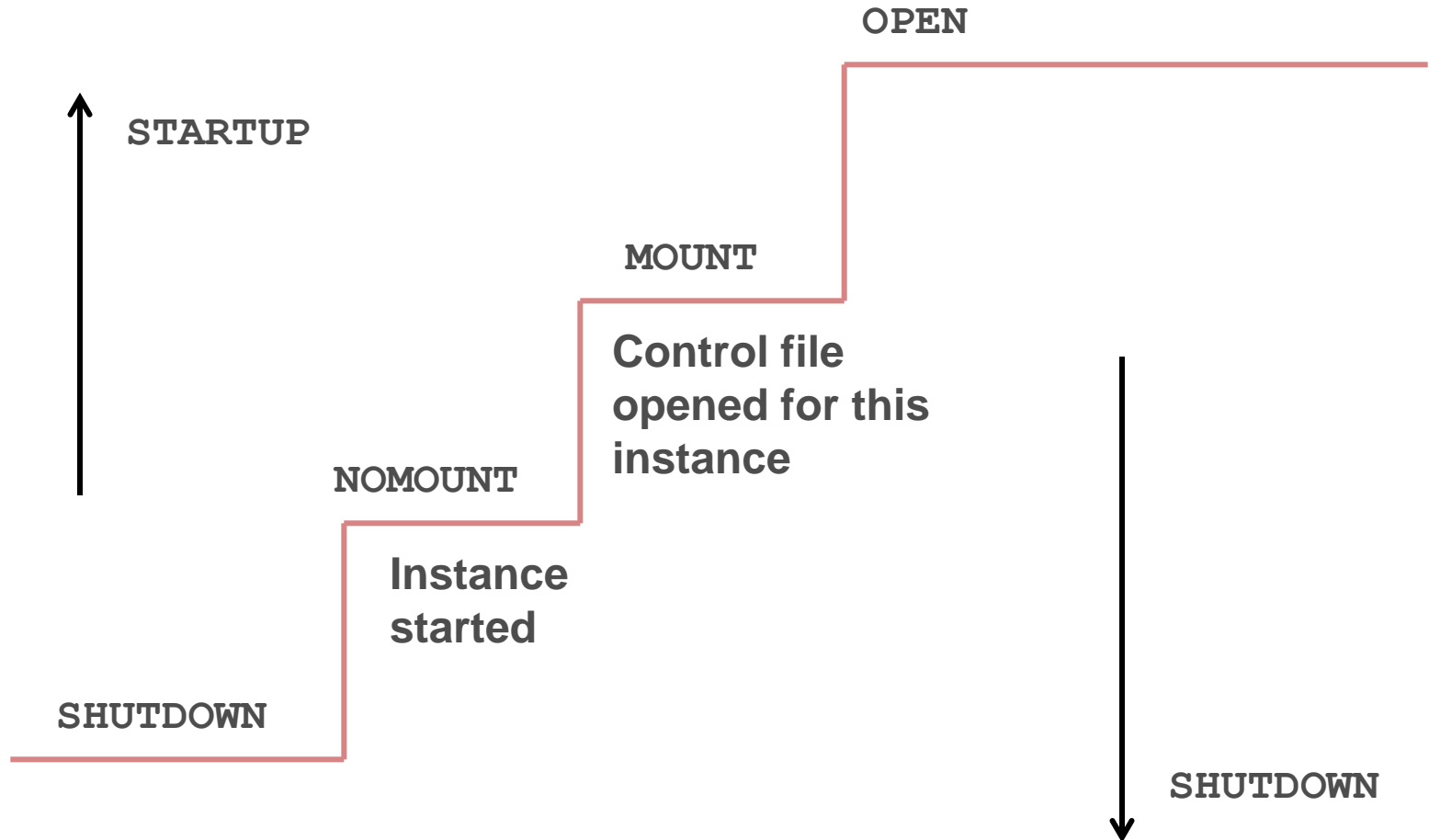
Perform Recovery





# Startup Stages

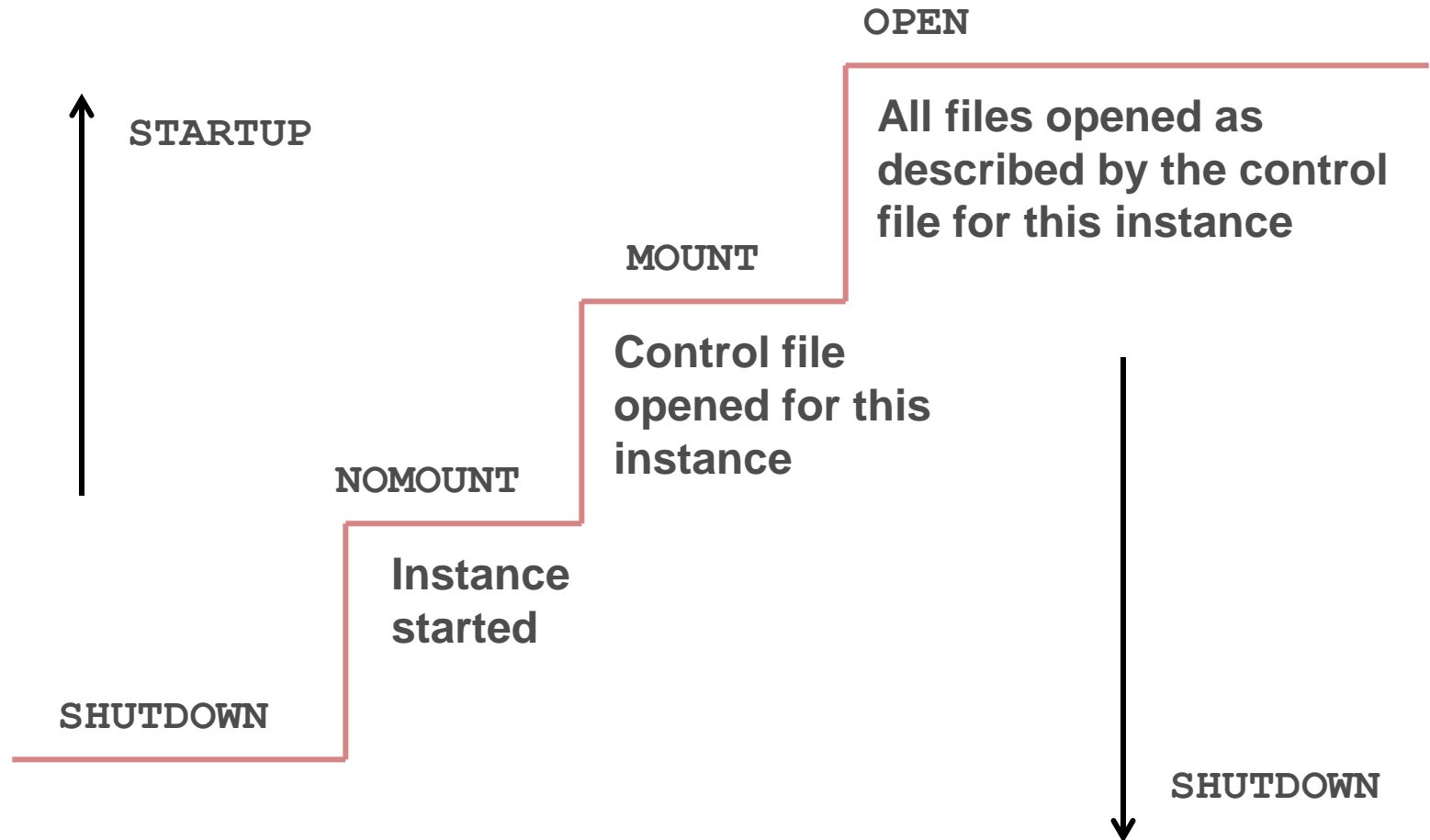
**MOUNT**





# Startup Stages

**OPEN**





# 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:

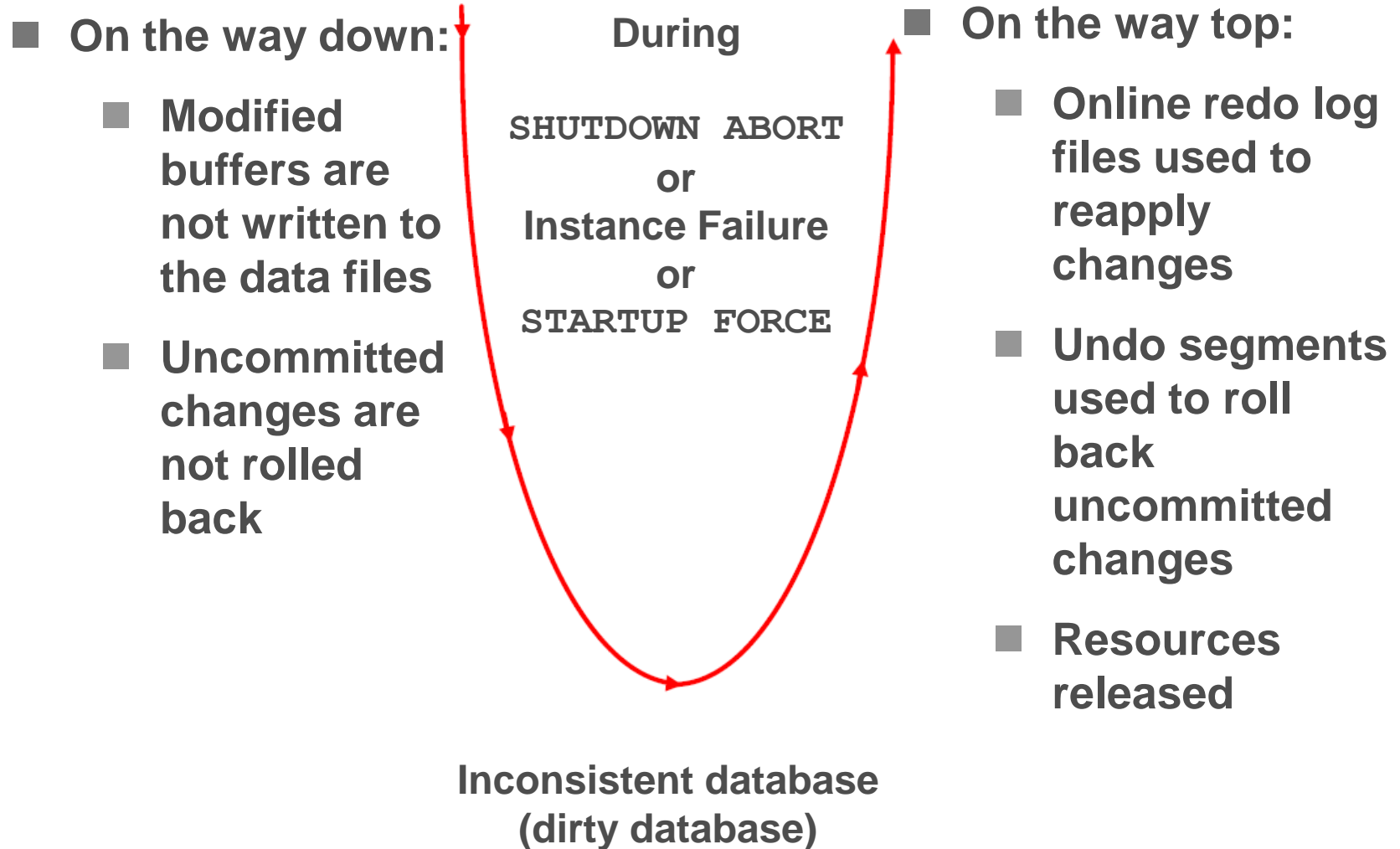
- No Instance recovery

Consistent database  
(clean database)





# Shutdown Mode

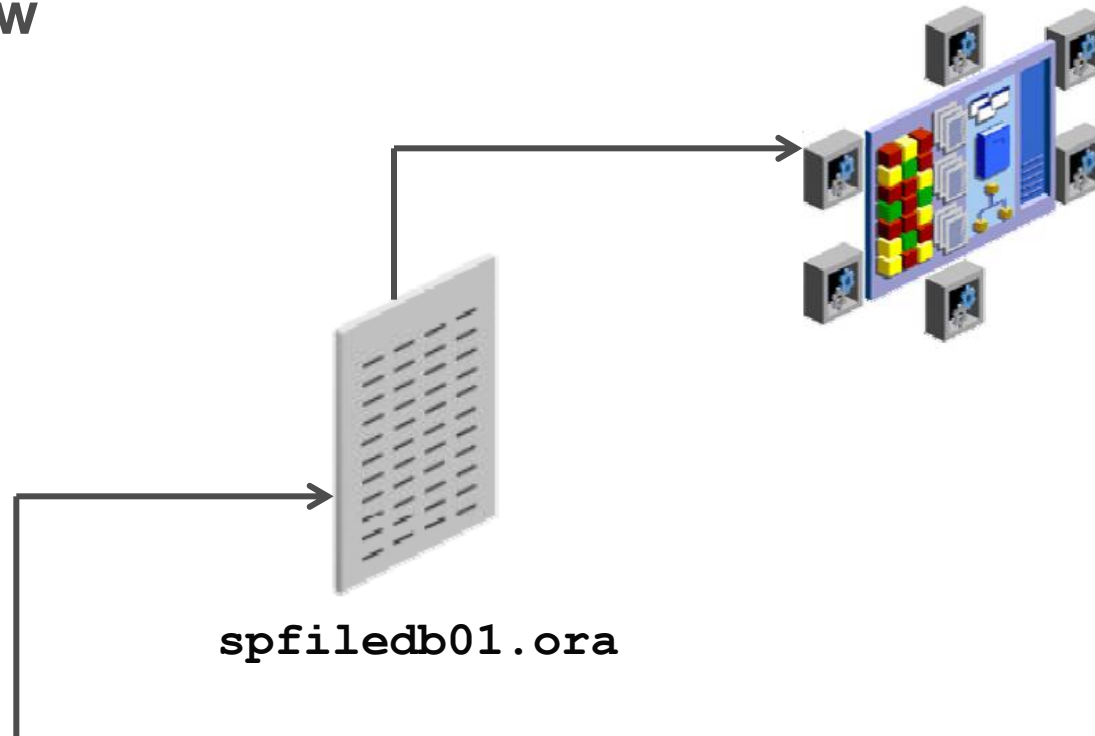






# Initialization Parameter Files

## Overview



Database: [orcl.us.oracle.com](http://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

The screenshot shows a web browser window with the address bar displaying `http://139.185.35.109:5500/em`. The page title is "ORACLE Enterprise Manager 10g Database Control". A blue "Login" button is at the top left. Below it, the text "Login to Database:orcl.oracle.com" is displayed. The login form contains three fields: "User Name" with the value "sys", "Password" with masked characters "\*\*\*\*\*", and "Connect As" with a dropdown menu showing "SYSDBA". A "Login" button is at the bottom right of the form. A mouse cursor is hovering over this button, and a small "Login" label is visible near the cursor. At the bottom of the page, the copyright notice "Copyright © 1996, 2004, Oracle. All rights reserved." is shown. The browser's status bar at the bottom displays the URL `http://139.185.35.109:5500/em/console/logon/logon.jsessionid=8` and the "Internet" icon.

File Edit View Favorites Tools Help Links

Back Forward Stop Home Search Favorites Media Print Mail

Address `http://139.185.35.109:5500/em` Go

**ORACLE** Enterprise Manager 10g Database Control Help

Login

Login to Database:orcl.oracle.com

\* User Name

\* Password

Connect As

Login

Copyright © 1996, 2004, Oracle. All rights reserved.

`http://139.185.35.109:5500/em/console/logon/logon.jsessionid=8` Internet



# Using Database Control

## Connecting to Enterprise Manager

Login to Database:orcl.oracle.com

\* User Name

\* Password

Connect As

Normal  
SYSOPER  
SYSDBA

Login

Copyright © 1996, 2004, Oracle. All rights reserved.





# Using Database Control

## Database Home Page

**ORACLE Enterprise Manager 10G**  
Database Control

Setup Preferences Help Logout

Database

Logged in As SYS

Database: orcl.us.oracle.com

Home Performance Administration Maintenance

Latest Data Collected From Target Dec 8, 2003 6:16:17 AM Refresh

View Data Manually

### General



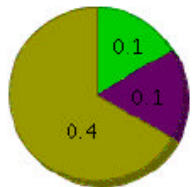
Status **Up** Shutdown  
Up Since **Dec 1, 2003 11:13:35 AM**  
Time Zone **PST**  
Availability (%) **99.82**  
(Last 24 hours)  
Instance Name **orcl**  
Version **10.1.0.2.0**  
Oracle Home **/u01/app/oracle/product/10.1.0**  
Listener **LISTENER\_EDCDR33P1**  
Host **EDCDR33P1**

### Host CPU



Run Queue **3.0**  
Paging (pages per second) **Unavailable**

### Active Sessions



Active Sessions **0.6**  
SQL Response Time (%) **318.22**  
(compared to baseline)

### High Availability

Instance Recovery Time (seconds) **0**  
Last Backup **n/a**  
Archiving **Disabled**  
Archive Area Used (%) **n/a**  
Flashback Logging **Disabled**

### Space Usage

Database Size (GB) **1**  
Problem Tablespace **0**  
Segment Findings **Not Configured**  
Policy Violations **0**  
Dump Area Used (%) **Unavailable**

### Diagnostic Summary

Performance Findings **0**  
All Policy Violations **65**  
Alert Log **26-NOV-03**

#### Alerts

Critical **0**  
Warnings **2**





# Using Database Control

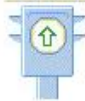
## Changing the Listener Status

Listener: LISTENER\_EDRSR9P1

Home Serviced Databases

Page Refreshed Feb 17, 2004 7:08:31 AM

### General

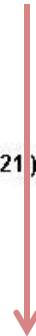


Status **Up**  
Availability (%) **99**  
(Last 24 Hours)  
Alias **LISTENER**  
Version **10.1.0.2.0**  
Oracle Home /u01/app/oracle/product/10.1.0/db\_1  
Net Address **(ADDRESS=(PROTOCOL=TCP)(HOST=EDRSR9P1)(PORT=1521))**  
LISTENER.ORA Location /u01/app/oracle/product/10.1.0/db\_1/network/admin  
Start Time **Feb 11, 2004 10:17:53 AM**  
Host edrsr9p1.us.oracle.com

Edit Stop

### State

TNS Ping (ms) **✓ 0**  
Established  
Connections per minute **Unavailable**  
Refused  
Connections per minute **Unavailable**



Listener: LISTENER\_EDRSR9P1 > Start/Stop: LISTENER

### Start/Stop: LISTENER

Current Status **Started**  
Operation **Stop**

Cancel OK

Cancel OK





# Using Database Control

## Viewing the Alert Log

---

**Related Links**

<a href="#">Advisor Central</a>	<a href="#">Alert History</a>	<a href="#">Alert Log Content</a>
<a href="#">All Metrics</a>	<a href="#">Blackouts</a>	<a href="#">iSQL*Plus</a>
<a href="#">Jobs</a>	<a href="#">Manage Metrics</a>	<a href="#">Metric Collection Errors</a>
<a href="#">Monitoring Configuration</a>	<a href="#">User-Defined Metrics</a>	

---

**Database** | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

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[About Oracle Enterprise Manager 10g Database Control](#)

---

[Database: orcl](#) > Most Recent Alert Log Entries

**Most Recent Alert Log Entries**

Page Refreshed Jan 5, 2004 12:36:34 PM

This shows the last 100,000 bytes of the alert log. The log is constantly growing, so select the browser's Refresh button to see the most recent log entries.

Number of Lines Displayed **249**

```
alter database rename global_name to "orcl"
Completed: alter database rename global_name to "orcl"
Mon Jan  5 12:16:53 2004
ALTER TABLESPACE TEMP ADD TEMPFILE 'u01/app/oracle/oradata/orcl/temp01.db' SIZE 20480K F
Mon Jan  5 12:16:53 2004
Setting default datafile format ID for platform 0
Mon Jan  5 12:16:53 2004
Completed: ALTER TABLESPACE TEMP ADD TEMPFILE 'u01/app/orac
Mon Jan  5 12:16:53 2004
ALTER DATABASE DEFAULT TABLESPACE "USERS"
```





# 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

Password

#### Database Credentials

Specify the credentials for the target database.

To use OS authentication, leave the user name and password fields blank.

User Name

Password

Role

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

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

Cancel OK

### Startup/Shutdown: Confirmation

Current Status **open**

Operation **shutdown immediate**

Are you sure you want to perform this operation?

Show SQL Advanced Options No Yes

### 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

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

Previous 1-25 of 256 Next 25

Name	Help	Revisions	Value	Type	Basic	Default	Dynamic	Category
cluster_database	<a href="#">?</a>		FALSE	Boolean	✓	✓		Cluster Database
compatible	<a href="#">?</a>		10.1.0.1.0	String	✓			Miscellaneous
control_files	<a href="#">?</a>		'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

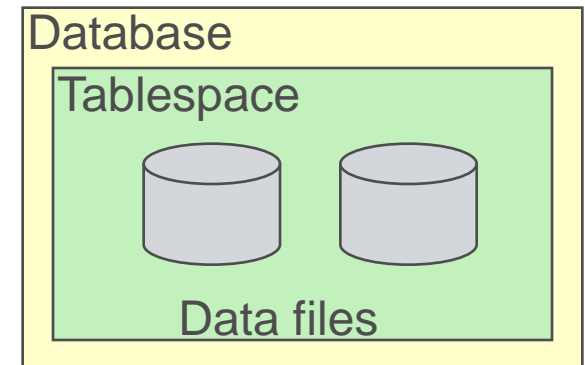
- What are Tablespaces and Data Files
- Managing tablespaces





# 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

#### Extent Management

- ☒ Locally Managed
- ☐ Dictionary Managed

#### Type

- ☒ Permanent
  - ☐ Set as default permanent tablespace
- ☐ Temporary
  - ☐ Set as default temporary tablespace
- ☐ Undo

#### Status

- ☒ Read Write
- ☐ Read Only
- ☐ Offline

#### Datafiles

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

[Add](#)

Select	Name	Directory	Size (MB)
<input checked="" type="radio"/>	<a href="#">inventory01.dbf</a>	/u01/app/oracle/oradata/orcl/	50.00

[Edit](#) [Remove](#)





# 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

#### 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

Create								
Edit View Delete Actions Add Datafile Go								
Select	Name ▲	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	66.875	44.58
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	230.000	222.688	96.82
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	440.000	434.375	98.72
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	26.000	25.000	96.15
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	25.000	11.750	47.00
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	2.750	55.00





## Managing Tablespaces

### Altering a Tablespace

Edit Tablespace: EXAMPLE

Show SQL

Revert

Apply

General Storage Thresholds

Name EXAMPLE

Bigfile tablespace No

#### Extent Management

- ☒ Locally Managed
- ☐ Dictionary Managed

#### Type

- ☒ Permanent
  - ☐ Set as default permanent tablespace
- ☐ Temporary
  - ☐ Set as default temporary tablespace
- ☐ Undo

#### Status

- ☒ Read Write
- ☐ Read Only
- ☐ Offline

Offline Mode Normal

Normal  
Temporary  
Immediate  
For Recover

#### Datafiles

Add

Edit

Remove

Select	Name	Directory	Size (MB)	Used (MB)
<input checked="" type="radio"/>	example01.dbf	/u01/app/oracle/product/10.1.0/oradata/orcl/	150.00	66.88





## Managing Tablespaces

### Actions with Tablespaces

Delete	Actions	Generate DDL	Create	Go
Used (MB)	Use	Add Datafile		
		Create Like		
66.875		Generate DDL		58
202.938		Make Locally Managed		64
427.125		Make Readonly		33
25.000		Make Writable		15
23.125		Place Online		50
2.750		Reorganize		00
		Show Dependencies		
		Run Segment Advisor		
		Take Offline		

Edit Tablespace: EXAMPLE

Logged in As SYS

### DDL

Return

```
CREATE SMALLFILE TABLESPACE "EXAMPLE" DATAFILE
'/u01/app/oracle/oradata/orcl/example01.dbf' SIZE 150M
REUSE AUTOEXTEND ON NEXT 640K MAXSIZE 32767M NOLOGGING
EXTENT MANAGEMENT LOCAL SEGMENT SPACE MANAGEMENT AUTO
BEGIN DBMS_SERVER_ALERT.SET_THRESHOLD
(9000,NULL,NULL,NULL,NULL,1,1,NULL,5,'EXAMPLE'); END;
```





## Managing Tablespaces

### Dropping a Tablespace

Database: [orcl.us.oracle.com](#) > [Tablespaces](#) > Delete Tablespace: EXAMPLE Logged in As SYS



#### Warning

No

Yes

Once a tablespace has been dropped, the objects and data in it will no longer be available. To recover them can be a time consuming process. Oracle recommends a backup before and after dropping a tablespace.

Are you sure you want to delete Tablespace EXAMPLE?

☒ Delete associated datafiles from the OS

No

Yes

Edit View Delete Actions Run Segment Advisor Go									
Select	Name ▲	Type	Extent Management	Segment Management	Status	Size (MB)	Used (MB)	Used (%)	
<input checked="" type="radio"/>	EXAMPLE	PERMANENT	LOCAL	AUTO	ONLINE	150.000	66.875	<div></div>	44.58
<input type="radio"/>	SYSAUX	PERMANENT	LOCAL	AUTO	ONLINE	220.000	211.313	<div></div>	96.05
<input type="radio"/>	SYSTEM	PERMANENT	LOCAL	MANUAL	ONLINE	430.000	427.313	<div></div>	99.38
<input type="radio"/>	TEMP	TEMPORARY	LOCAL	MANUAL	ONLINE	26.000	25.000	<div></div>	96.15
<input type="radio"/>	UNDOTBS1	UNDO	LOCAL	MANUAL	ONLINE	25.000	11.938	<div></div>	47.75
<input type="radio"/>	USERS	PERMANENT	LOCAL	AUTO	ONLINE	5.000	2.750	<div></div>	55.00



# 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)
<a href="#">example01.dbf</a>	/u01/app/oracle/oradata/orcl/	150.00	<div><div></div></div> 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
<input checked="" type="radio"/>	<a href="#">EXAMPLE</a>	PERMANENT	LOCAL	AUTO	ONLINE	150.000	80.250	<div><div></div></div>





# Part 2 Summary

A light blue notepad icon with a silver pushpin at the top center, containing the text "What are tablespaces and data files".

**What are  
tablespaces  
and data files**

A dark gray notepad icon with a silver pushpin at the top center, containing the text "Managing Tablespaces".

**Managing  
Tablespaces**





## Part 2 Stop-and-think

Do you have any questions ?



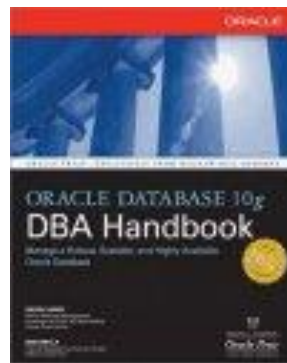
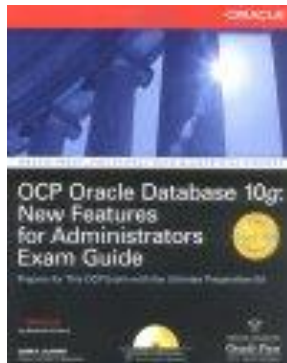




# For more

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

### Publications



<http://www.oracle.../bookstore/>

### Web sites

<http://www.labo-oracle.com>

<http://www.oracle.com>

<http://otn.oracle.com>

### Courses

Cursus: Merise & SQL

Cursus: PL/SQL

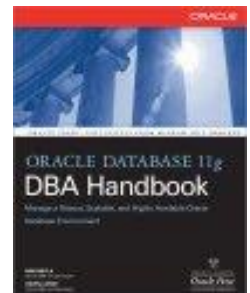
Cursus: DBA1 & DBA2

Cursus: DWH, OAS & BIS

### Certifications

1Z0-042

1Z0-043







THE INTERNATIONAL INSTITUTE OF

**SUPINFO**

INFORMATION TECHNOLOGY

# **Congratulations**

You have successfully completed  
the SUPINFO course module n°6

**Oracle Technologies**  
**Managing the Database**

# The end

