

4

Managing the Database Instance

Objectives

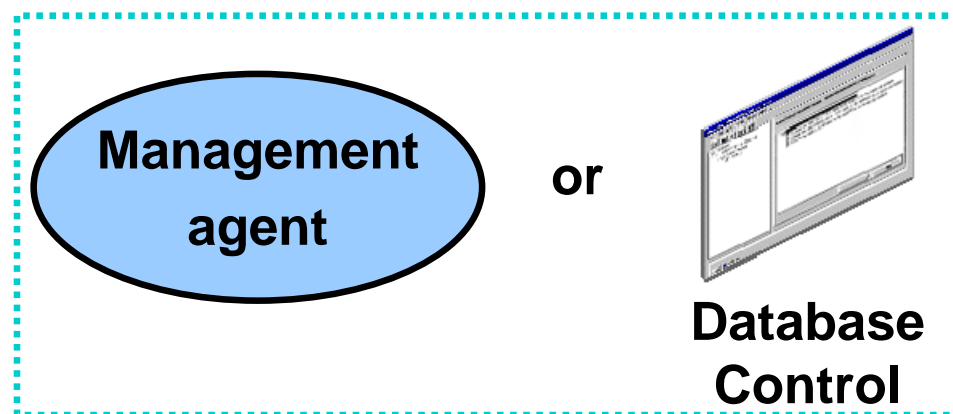
After completing this lesson, you should be able to:

- Start and stop the Oracle database and components
- Use Oracle Enterprise Manager
- Access a database with SQL*Plus
- Modify database initialization parameters
- Describe the stages of database startup
- Describe database shutdown options
- View the alert log
- Access dynamic performance views

Management Framework

Oracle Database 11g Release 2 management framework components:

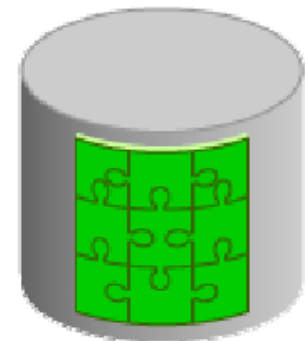
- Database instance
- Listener
- Management interface:
 - Database Control
 - Management agent (when using Grid Control)



Management interface



Listener



Starting and Stopping Database Control

```
$ . oraenv
ORACLE_SID = [orcl] ? orcl
The Oracle base for ORACLE_HOME=/u01/app/oracle/product/11.2.0/db_home1
is /u01/app/oracle
$ emctl start dbconsole
Oracle Enterprise Manager 11g Database Control Release 11.2.0.1.0
Copyright (c) 1996, 2009 Oracle Corporation. All rights reserved.
http://host01.example.com:1158/em/console/aboutApplication
Starting Oracle Enterprise Manager 11g Database Control .....started.
-----
Logs are generated in directory
/u01/app/oracle/product/11.2.0/db_home1/host01.example.com_orcl/sysman/
log
```

```
$ emctl stop dbconsole
Oracle Enterprise Manager 11g Database Control Release 11.2.0.1.0
Copyright (c) 1996, 2009 Oracle Corporation. All rights reserved.
https://host01.example.com:1158/em/console/aboutApplication
Stopping Oracle Enterprise Manager 11g Database Control ...
... Stopped.
```

Oracle Enterprise Manager

The screenshot shows a web browser window titled "Oracle Enterprise Manager - Mozilla Firefox". The address bar displays "http://host01.example.com:1158/em". The page header includes the Oracle logo, "Enterprise Manager 11g", and "Database Control". A "Login" button is visible in the top right corner. The main content area contains a login form with the following fields:

- User Name:** A text box containing the value "sys".
- Password:** A text box containing seven dots, indicating a masked password.
- Connect As:** A dropdown menu with "SYSDBA" selected.

A "Login" button is located below the password field. At the bottom of the page, there is a copyright notice: "Copyright © 1996, 2009, Oracle. All rights reserved. Oracle, JD Edwards, PeopleSoft, and Retek are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners. Unauthorized access is strictly prohibited."

Database Home Page

ORACLE Enterprise Manager 11g Database Control

Setup Preferences Help Logout

Database

Logged in As SYS

Database Instance: orcl.example.com

Home Performance Availability Server Schema Data Movement Software and Support

Page Refreshed Jun 18, 2009 11:46:00 PM GMT+07:00 Refresh View Data Automatically (60 sec)

General

Shutdown Black Out

Status Up

Up Since Jun 18, 2009 5:31:03 AM GMT+07:00

Instance Name orcl

Version 11.2.0.1.0

Host edrsr25p1.us.oracle.com

Listener LISTENER_edrsr25p1.us.orac...

ASM +ASM_edrsr25p1.us.oracle.com

[View All Properties](#)

Host CPU

Load 0.31 Paging 0.05

Active Sessions

Core Count 1

SQL Response Time

SQL Response Time (%) 102.90

[Edit Reference Collection](#)

Diagnostic Summary

ADDM Findings	<u>2</u>
Period Start Time	<u>Jun 18, 2009 10:00:40 PM GMT+07:00</u>
Alert Log Active Incidents	<u>No ORA- errors</u>

Space Summary

Database Size (GB)	<u>1.448</u>
Problem Tablespace	<u>0</u>
Segment Advisor Recommendations	<u>0</u>
Policy Violations	<u>0</u>
Dump Area Used (%)	<u>85</u>

High Availability

Console Oracle Restart	<u>Enabled</u>
Instance Recovery Time (sec)	<u>14</u>
Last Backup	<u>n/a</u>
Usable Flash Recovery Area (%)	<u>95.96</u>
Flashback Database Logging	<u>Disabled</u>

Other Oracle Tools

Components
> **SQL*Plus**
Init Params
DB Startup
DB Shutdown
Alert Log
Perf Views

- SQL*Plus provides an additional interface to your database so that you can:
 - Perform database management operations
 - Execute SQL commands to query, insert, update, and delete data in your database
- SQL Developer:
 - Is a graphical user interface for accessing your instance of Oracle Database
 - Supports development in both SQL and PL/SQL
 - Is available in the default installation of Oracle Database

Using SQL*Plus

SQL*Plus is:

- A command-line tool
- Used interactively or in batch mode

```
$ sqlplus hr
```

```
SQL*Plus: Release 11.2.0.1.0 - Production on Thu Jun 18 05:04:49 2009
```

```
Copyright (c) 1982, 2009, Oracle. All rights reserved.
```

```
Enter Password: *****
```

```
Connected to:
```

```
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production  
With the Partitioning, Automatic Storage Management, OLAP, Data Mining  
and Real Application Testing options
```

```
SQL> select last_name from employees;
```

```
LAST_NAME
```

```
-----
```

```
Abel
```

```
Ande
```

```
...
```


Calling SQL*Plus from a Shell Script

```
$ ./batch_sqlplus.sh
```

```
SQL*Plus: Release 11.2.0.1.0 - Production on Thu Jun 18 05:10:19 2009  
Copyright (c) 1982, 2009, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production  
With the Partitioning, Automatic Storage Management, OLAP, Data Mining  
and Real Application Testing options
```

```
SQL>
```

```
COUNT(*)
```

```
-----
```

```
107
```

```
SQL>
```

```
107 rows updated.
```

```
SQL>
```

```
Commit complete.
```

```
SQL> Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.1.0 - Production
```

```
With the Partitioning, Automatic Storage Management, OLAP, Data Mining  
and Real Application Testing options
```

```
$
```

```
# Name of this file: batch_sqlplus.sh  
# Count employees and give raise.  
sqlplus hr/hr <<EOF  
select count(*) from employees;  
update employees set salary = salary*1.10;  
commit;  
quit  
EOF
```

Output

Calling a SQL Script from SQL*Plus

script.sql

```
select * from departments where location_id = 1400;  
quit
```

↓ Output

```
$ sqlplus hr/hr @script.sql
```

```
SQL*Plus: Release 11.2.0.1.0 - Production on Thu Jun 18 05:13:42 2009  
Copyright (c) 1982, 2009, Oracle. All rights reserved.
```

```
Connected to:
```

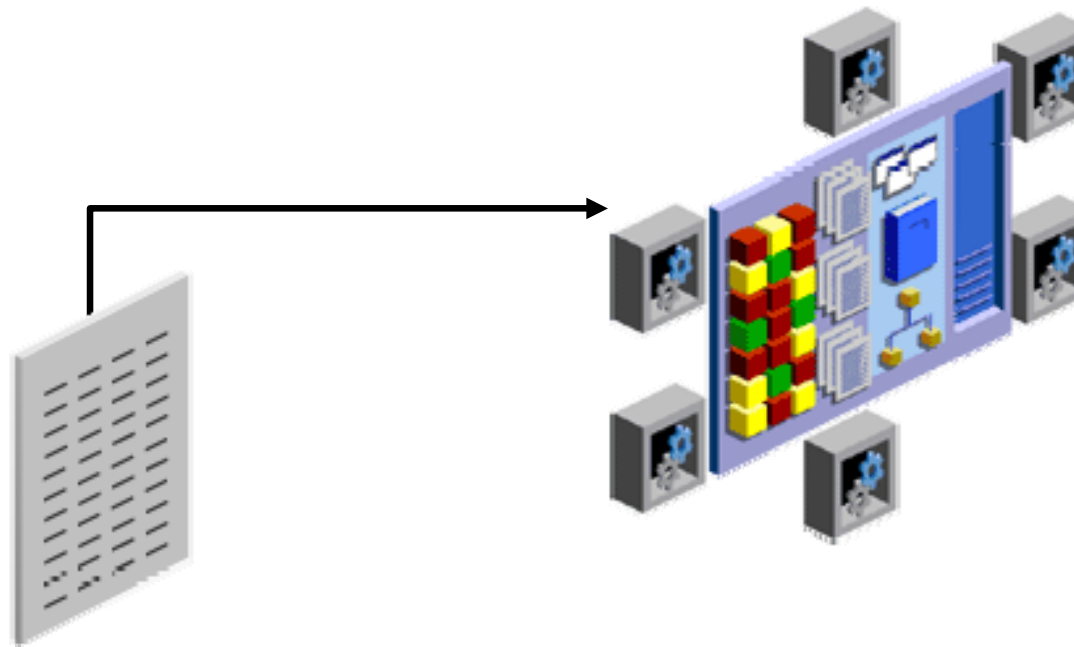
```
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - Production  
With the Partitioning, Automatic Storage Management, OLAP, Data Mining  
and Real Application Testing options
```

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
60	IT	103	1400

```
Disconnected from Oracle Database 11g Enterprise Edition Release  
11.2.0.1.0 - Production  
With the Partitioning, Automatic Storage Management, OLAP, Data Mining  
and Real Application Testing options
```

Initialization Parameter Files

Components
SQL*Plus
> **Init Params**
DB Startup
DB Shutdown
Alert Log
Perf Views



`spfileorcl.ora`

or

`initorcl.ora`

Simplified Initialization Parameters

Basic



CONTROL_FILES
DB_BLOCK_SIZE
PROCESSES
UNDO_TABLESPACE
...

Advanced

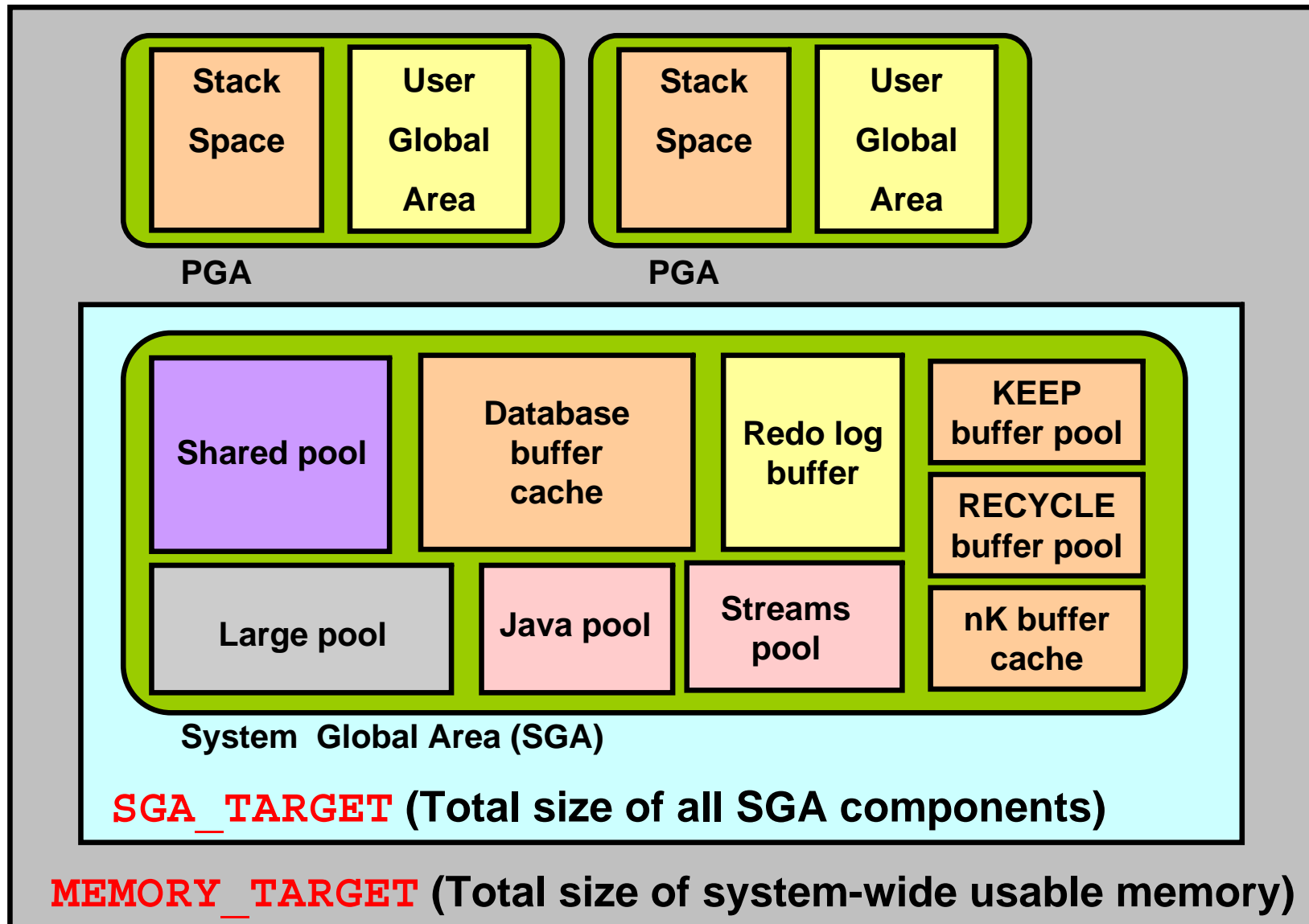


DB_CACHE_SIZE
DB_FILE_MULTIBLOCK
_READ_COUNT
SHARED_POOL_SIZE
...

Initialization Parameters: Examples

Parameter	Specifies
CONTROL_FILES	One or more control file names
DB_FILES	Maximum number of database files
PROCESSES	Maximum number of OS user processes that can simultaneously connect
DB_BLOCK_SIZE	Standard database block size used by all tablespaces
DB_CACHE_SIZE	Size of the standard block buffer cache

Initialization Parameters: Examples



Initialization Parameters: Examples

Parameter	Specifies
PGA_AGGREGATE_TARGET	Amount of PGA memory allocated to all server processes
SHARED_POOL_SIZE	Size of shared pool (in bytes)
UNDO_MANAGEMENT	Undo space management mode to be used

Using SQL*Plus to View Parameters

```
SQL> SELECT name , value FROM V$PARAMETER;
```

NAME	VALUE
lock_name_space	2
processes	150
sessions	247
timed_statistics	TRUE
timed_os_statistics	0
...	

```
SQL>SHOW PARAMETER SHARED_POOL_SIZE
```

NAME	TYPE	VALUE
shared_pool_size	big integer	0

```
SQL> show parameter para
```

NAME	TYPE	VALUE
fast_start_parallel_rollback	string	LOW
parallel_adaptive_multi_user	boolean	TRUE
parallel_automatic_tuning	boolean	FALSE
parallel_execution_message_size	integer	16384
parallel_instance_group	string	
...		

Changing Initialization Parameter Values

- Static parameters:
 - Can be changed only in the parameter file
 - Require restarting the instance before taking effect
 - Account for about 110 parameters
- Dynamic parameters:
 - Can be changed while database is online
 - Can be altered at:
 - Session level
 - System level
 - Are valid for duration of session or based on SCOPE setting
 - Are changed by using ALTER SESSION and ALTER SYSTEM commands
 - Account for about 234 parameters

Changing Parameter Values: Examples

```
SQL> ALTER SESSION  
      SET NLS_DATE_FORMAT = 'mon dd yyyy';
```

Session altered.

```
SQL> SELECT SYSDATE FROM dual;
```

```
SYSDATE  
-----  
jun 18 2009
```

```
SQL> ALTER SYSTEM SET  
SEC_MAX_FAILED_LOGIN_ATTEMPTS=2 COMMENT='Reduce  
from 10 for tighter security.' SCOPE=SPFILE;
```

System altered.

Quiz

Enterprise Manager Database Control can be used to manage many databases concurrently.

1. True
2. False

Quiz

The majority of the database parameters are dynamic and can be changed without having to shut down the database instance.

1. True
2. False

Database Startup and Shutdown: Credentials

Components
SQL*Plus
Init Params
> **DB Startup**
DB Shutdown
Alert Log
Perf Views

ORACLE® Enterprise Manager 11g Setup Preferences Help Logout
Database Control Database

Database Instance: orcl.example.com > Logged in As SYS
Cancel OK

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.

* Username
* Password

Database Credentials


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

* Username
* Password
Database
* Connect As ▼
☐ Save as Preferred Credential

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


Cancel OK

General Shutdown



or **1**

Database Instance Startup



2

ORACLE®

Starting Up an Oracle Database Instance

Database Instance: orcl.example.com
Enterprise Manager is not able to connect to the database instance. The state of the components are listed below.
Page Refreshed Jun 19, 2009 1:39:14 AM GMT+07:00

Database Instance (1)

Status **Down**
Host **edrsr25p1.us.oracle.com**
Port **1521**
SID **orcl**
Oracle Home **/u01/app/oracle/product/11.2.0/db_home1**

Details **There has been a user-initiated shutdown.**

Host Credentials
Specify the OS user name and password
Username **oracle**
Password **.....** (2)

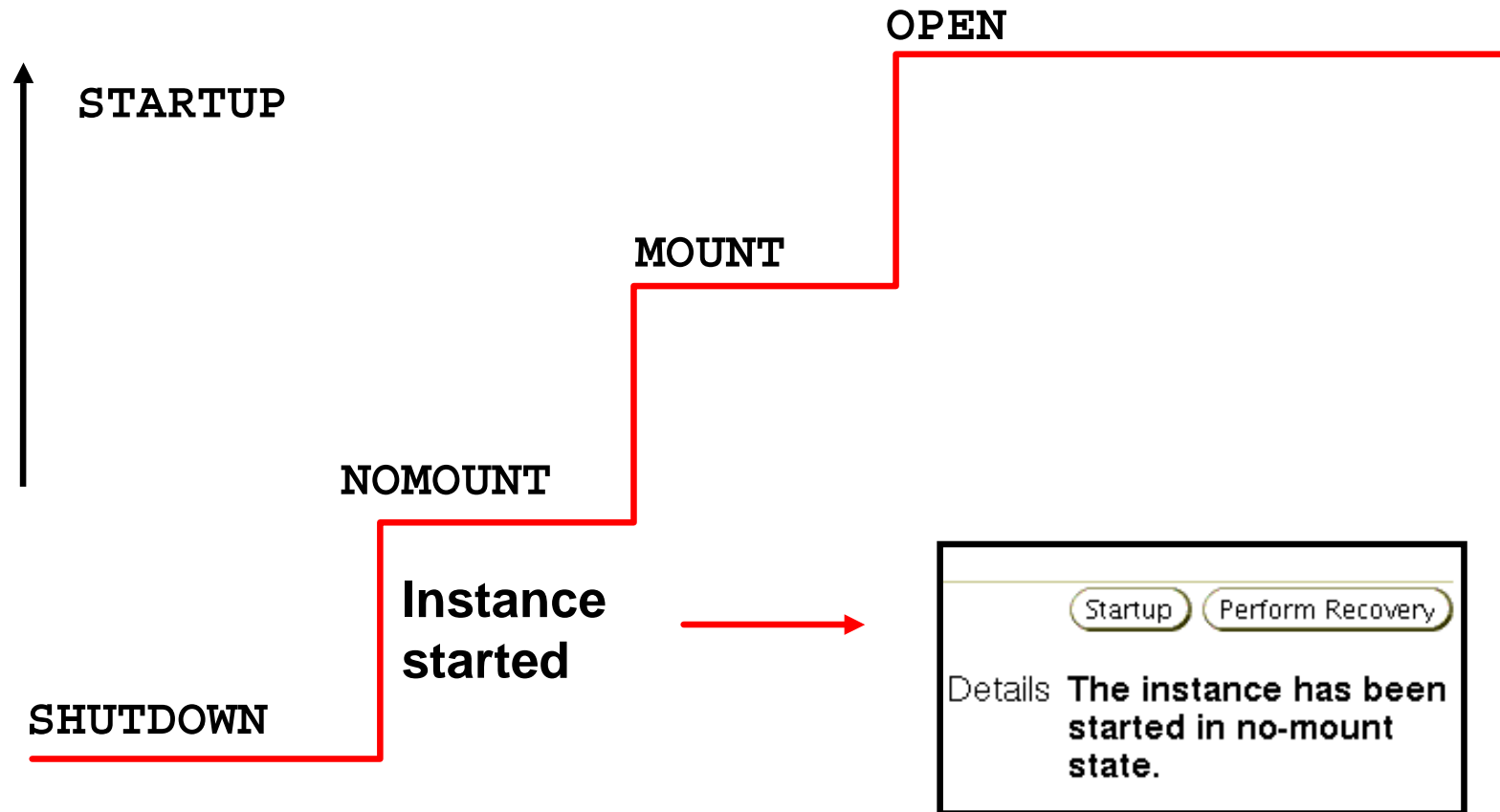
Database Credentials
Specify the credentials for the target

Select Startup Type (3)
This database is registered with Oracle Restart. This enables you to use srvctl utility that comes with Oracle Restart to start this database. Using srvctl will attempt to start the database resource and all other resources on which this database depends (eg: listener, ASM instance etc). Alternatively you may attempt to start the database alone using sqlplus utility. Choose the way in which you want to start the database.
Select Startup Type ☒ Start database along with dependent resources ☐ Start database only

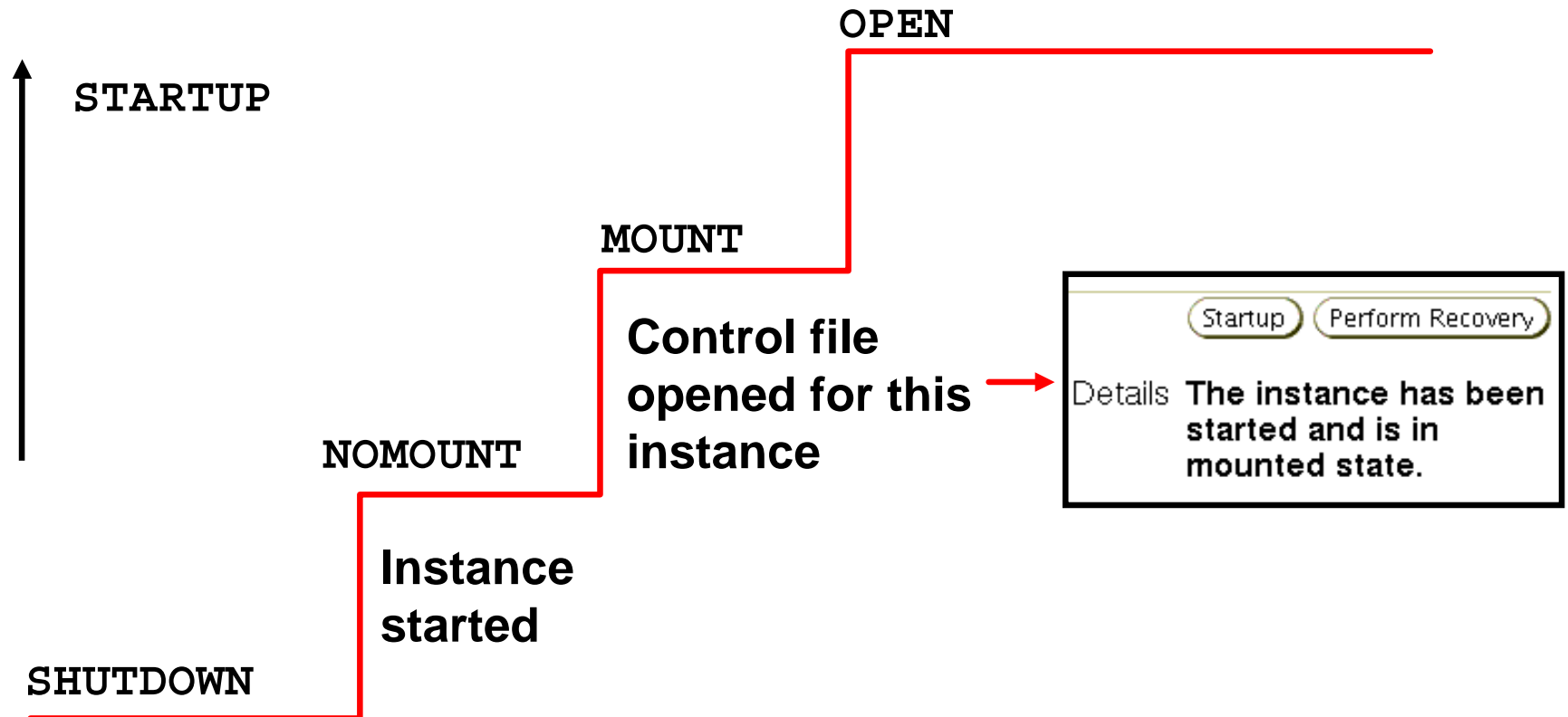
Startup: Advanced Options (5)
Startup mode
☐ Start the database
☐ Mount the database
☒ Open the database
Other Startup Options
☐ Restrict access to database
☐ Force the instance(s) to start

Startup/Shutdown: Confirmation (4)
Instances **orcl**
Operation **startup instance(s) in open mode**
Are you sure you want to perform this operation?

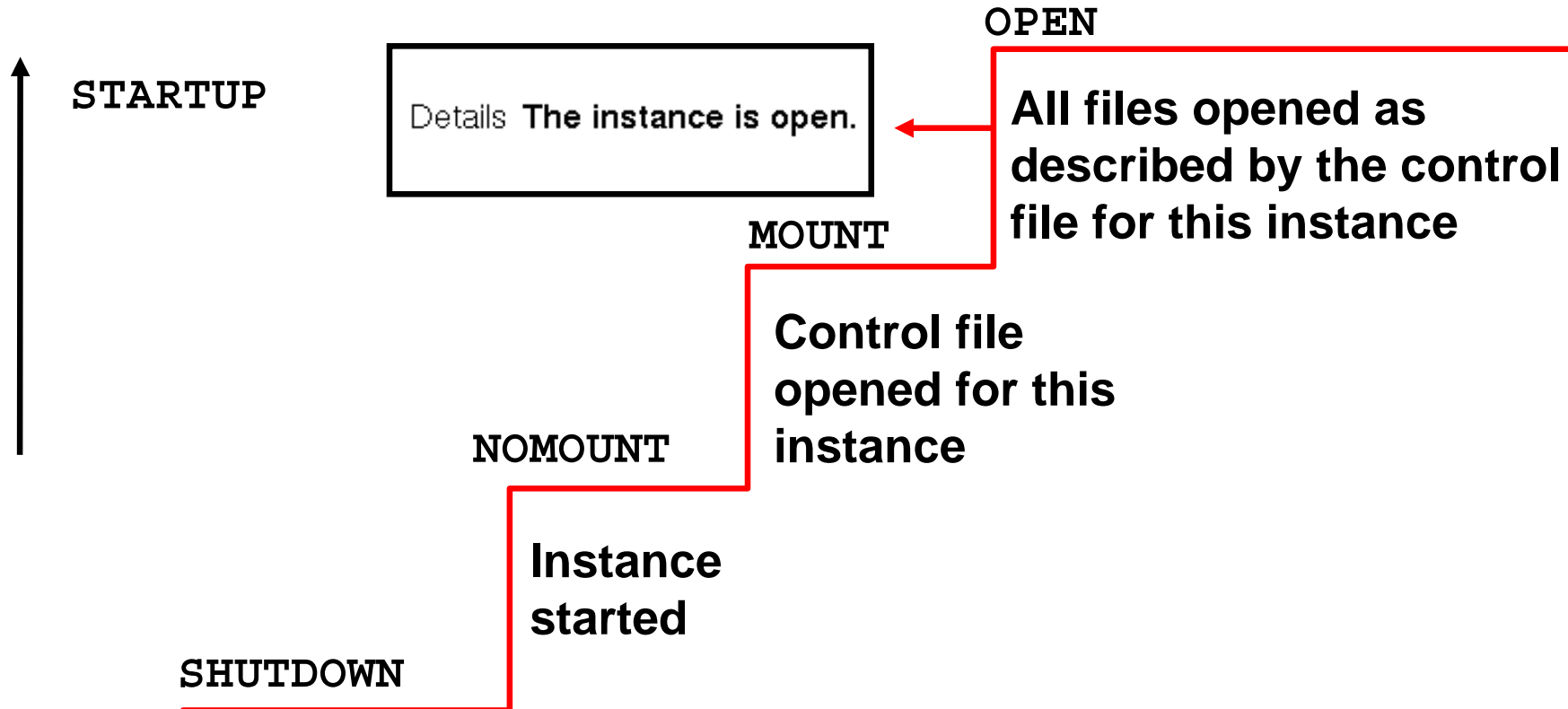
Starting Up an Oracle Database Instance: NOMOUNT



Starting Up an Oracle Database Instance: MOUNT



Starting Up an Oracle Database Instance: OPEN



Startup Options: Examples

- Using the `sqlplus` utility:

```
SQL> startup
```

1

```
SQL> startup nomount
```

2

```
SQL> alter database mount;
```

3

```
SQL> alter database open;
```

4

- Using the `srvctl` utility with Oracle Restart

```
$ srvctl start database -d orcl -o mount
```

Shutting Down an Oracle Database Instance

General

↑ **1** Shutdown Black Out

Status Up
Up Since **Jun 19, 2009 2:02:00 AM GMT+07:00**
Instance Name **orcl**
Version **11.2.0.1.0**
Host [edrsr25p1.us.oracle.com](#)
Listener [LISTENER_edrsr25p1.us.orac...](#)
ASM [+ASM_edrsr25p1.us.oracle.com](#)

[View All Properties](#)

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.

* Username
* Password

Database Credentials

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

* Username **2**
* Password
Database **orcl.example.com**
* Connect As

Startup/Shutdown: Advanced Shutdown Option

Specify the shutdown mode

☐ Normal [Browse Sessions](#)
⚠ Wait for all currently connected users to disconnect from the database

☐ Transactional
Disconnect all connected users after transactions have completed

☒ **Immediate**
Rollback active transactions and disconnect all connected users

☐ Abort **4**
Instantaneous shutdown by aborting the database instance

Cancel OK

Startup/Shutdown: Confirmation **3**

Current Status **open**
Operation **shutdown immediate**

Are you sure you want to perform this operation?

Show SQL Advanced Options No Yes

Shutdown Modes

Shutdown Modes	A	I	T	N
Allows new connections	No	No	No	No
Waits until current sessions end	No	No	No	Yes
Waits until current transactions end	No	No	Yes	Yes
Forces a checkpoint and closes files	No	Yes	Yes	Yes

Shutdown modes:

- A = ABORT
- I = IMMEDIATE
- T = TRANSACTIONAL
- N = NORMAL

Shutdown Options

On the way down:

- Uncommitted changes rolled back, for IMMEDIATE
- Database buffer cache written to data files
- Resources released

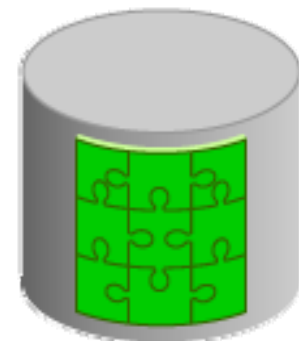
During:

SHUTDOWN
NORMAL
or
SHUTDOWN
TRANSACTIONAL
or
SHUTDOWN
IMMEDIATE

On the way up:

- No instance recovery

Consistent database



ORACLE

Shutdown Options

On the way down:

- Modified buffers not written to data files
- Uncommitted changes not rolled back



During:

SHUTDOWN ABORT
or
Instance failure
or
STARTUP FORCE

On the way up:

- Online redo log files used to reapply changes
- Undo segments used to roll back uncommitted changes
- Resources released

Inconsistent database

Shutdown Options: Examples

- Using SQL*Plus:

```
SQL> shutdown
```

1

```
SQL> shutdown transactional
```

2

```
SQL> shutdown immediate
```

3

```
SQL> shutdown abort
```

4

- Using the SRVCTL utility with Oracle Restart

```
$ srvctl stop database -d orcl -o abort
```

Viewing the Alert Log

Database Home page > Related Links region > Alert Log Content

Components
SQL*Plus
Init Params
DB Startup
DB Shutdown
> **Alert Log**
Perf Views

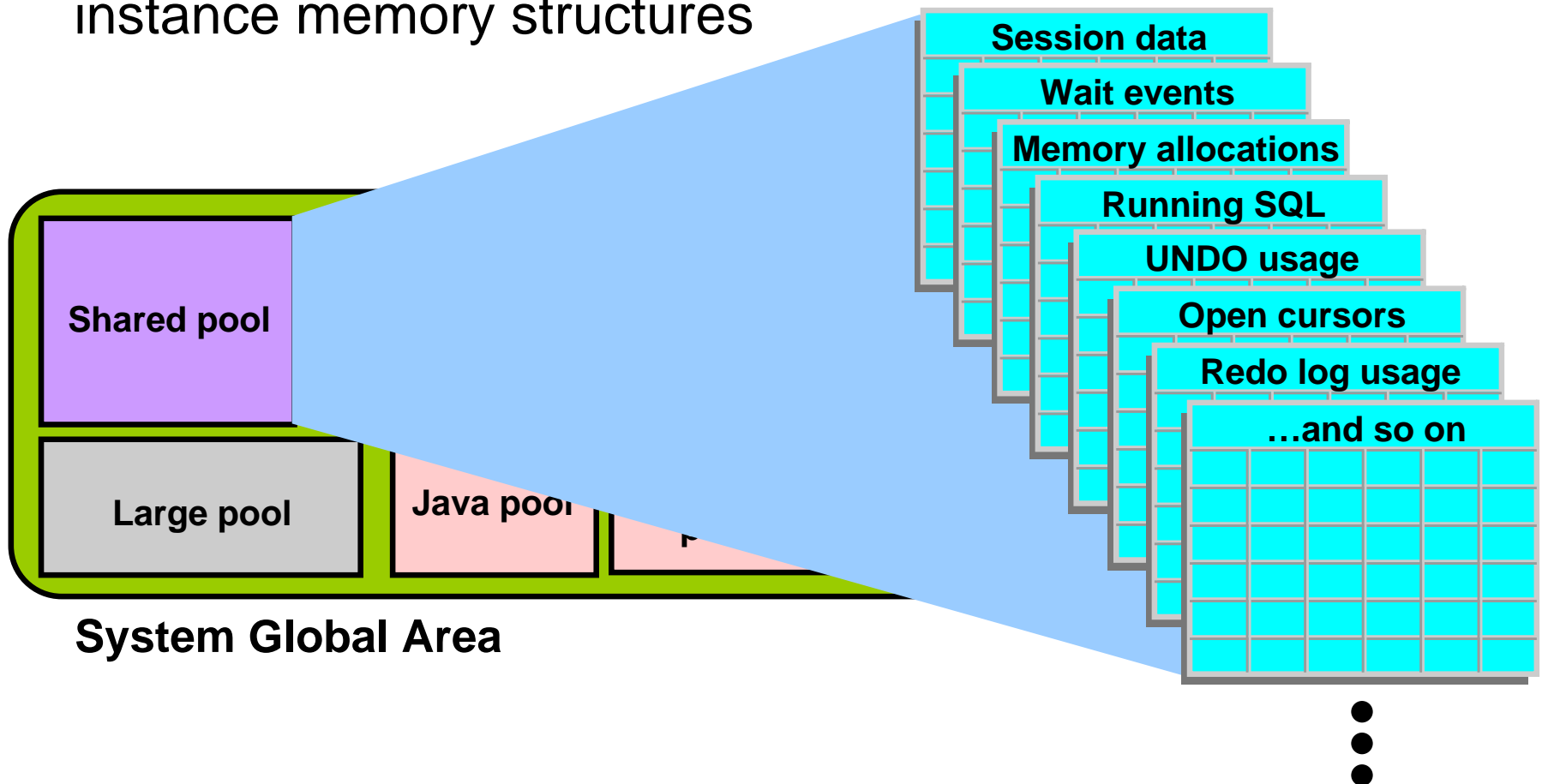
View Entries <input type="button" value="Last 50"/> <input type="button" value="Go"/> <input type="button" value="Search"/>						
Previous 1-25 of 50 Next 25						
Timestamp	Type	Level	Incident ID	Group	Message ID	Message Text
Jun 19, 2009 10:00:16 PM GMT+07:00	NOTIFICATION	16		sqltune	kesaiTuneSqlDrv:5067:3456118459	End automatic SQL Tuning Advisor run for special tuning task "SYS_AUTO_SQL_TUNING_TASK"
Jun 19, 2009 10:00:03 PM GMT+07:00	NOTIFICATION	16		sqltune	kesaiTuneSqlDrv:4555:2579917519	Begin automatic SQL Tuning Advisor run for special tuning task "SYS_AUTO_SQL_TUNING_TASK"
Jun 19, 2009 10:00:00 PM GMT+07:00	NOTIFICATION	16		process start	ksbrdp:3833:3697353022	VKRM started with pid=24, OS id=7929
Jun 19, 2009 10:00:00 PM GMT+07:00	NOTIFICATION	16		process start	ksbs1p_real:2253:2371767696	Starting background process VKRM
Jun 19, 2009 2:07:22 AM GMT+07:00	NOTIFICATION	16		process start	ksbrdp:3833:3697353022	SMCO started with pid=23, OS id=30582
Jun 19, 2009 2:07:22 AM GMT+07:00	NOTIFICATION	16		process start	ksbs1p_real:2253:2371767696	Starting background process SMCO
Jun 19, 2009 2:02:26 AM GMT+07:00	NOTIFICATION	16		process start	ksbrdp:3833:3697353022	CJQ0 started with pid=33, OS id=29846

Using Trace Files

- Each server and background process can write to an associated trace file.
- Error information is written to the corresponding trace file.
- Automatic diagnostic repository (ADR)
 - Is a systemwide central tracing and logging repository
 - Stores database diagnostic data such as:
 - Traces
 - Alert log
 - Health monitor reports

Dynamic Performance Views

Provide access to information about changing states of the instance memory structures



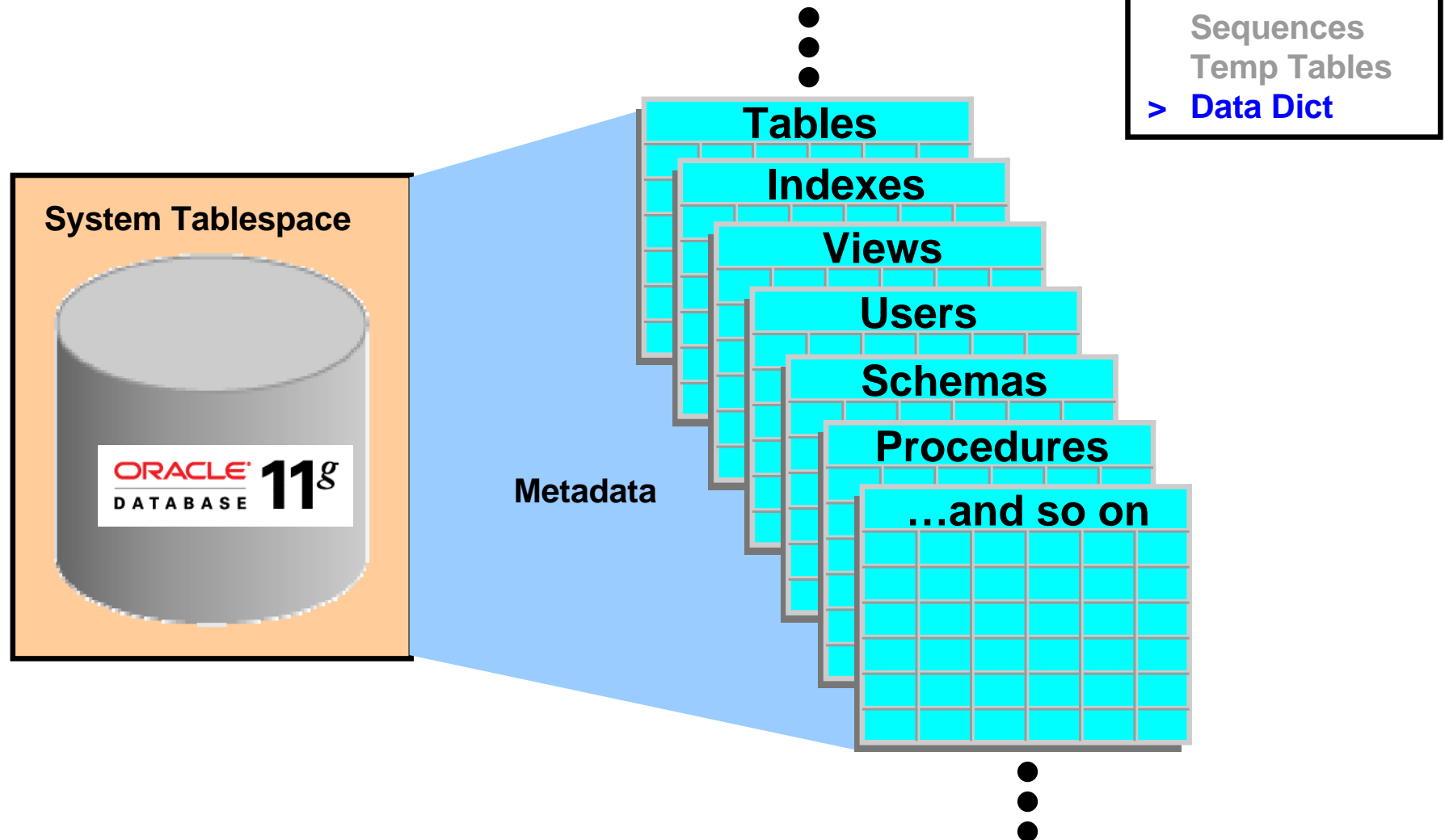
Dynamic Performance Views: Usage Examples

- 1 SQL> SELECT sql_text, executions FROM v\$sql
WHERE cpu_time > 200000;
- 2 SQL> SELECT * FROM v\$session WHERE machine =
'EDRSR9P1' and logon_time > SYSDATE - 1;
- 3 SQL> SELECT sid, ctime FROM v\$lock
WHERE block > 0;

Dynamic Performance Views: Considerations

- These views are owned by the `SYS` user.
- Different views are available at different times:
 - The instance has been started.
 - The database is mounted.
 - The database is open.
- You can query `V$FIXED_TABLE` to see all the view names.
- These views are often referred to as “v-dollar views.”
- Read consistency is not guaranteed on these views because the data is dynamic.

Data Dictionary: Overview



```
SELECT * FROM dictionary;
```

Data Dictionary Views

	Who Can Query	Contents	Subset of	Notes
DBA_	DBA	Everything	N/A	May have additional columns meant for DBA use only
ALL_	Everyone	Everything that the user has privileges to see	DBA_ views	Includes user's own objects and other objects the user has been granted privileges to see
USER_	Everyone	Everything that the user owns	ALL_ views	Is usually the same as ALL_ except for the missing OWNER column (Some views have abbreviated names as PUBLIC synonyms.)

Data Dictionary: Usage Examples

1

```
SELECT table_name, tablespace_name  
FROM user_tables;
```

2

```
SELECT sequence_name, min_value, max_value,  
increment_by  
FROM all_sequences  
WHERE sequence_owner IN ('MDSYS','XDB');
```

3

```
SELECT USERNAME, ACCOUNT_STATUS  
FROM dba_users  
WHERE ACCOUNT_STATUS = 'OPEN';
```

4

```
DESCRIBE dba_indexes
```

Quiz

When using Oracle Restart, the server control utility (`srvctl`) must be used instead of SQL*Plus to start and stop a database instance.

1. True
2. False

Quiz

Which data dictionary view can be used to find the names of all tables in the database?

1. USER_TABLES
2. ALL_TABLES
3. DBA_TABLES
4. ANY_TABLES

Summary

In this lesson, you should have learned how to:

- Start and stop the Oracle database and components
- Use Oracle Enterprise Manager
- Access a database with SQL*Plus
- Modify database initialization parameters
- Describe the stages of database startup
- Describe database shutdown options
- View the alert log
- Access dynamic performance views

Practice 4 Overview: Managing the Oracle Instance

This practice covers the following topics:

- Navigating in Enterprise Manager
- Viewing and modifying initialization parameters
- Stopping and starting the database instance
- Viewing the alert log
- Connecting to the database by using SQL*Plus