13

Performance Management

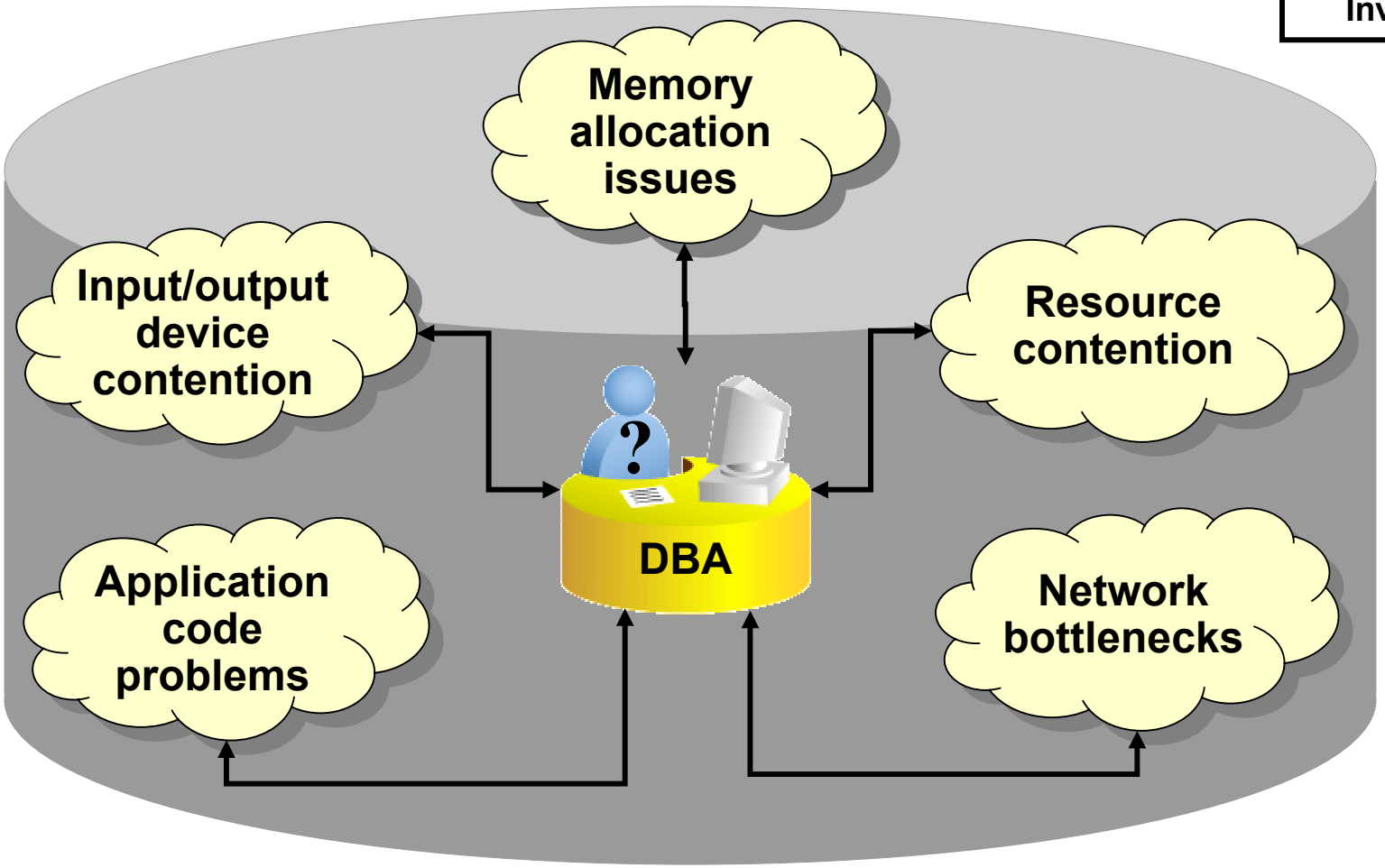
Objectives

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

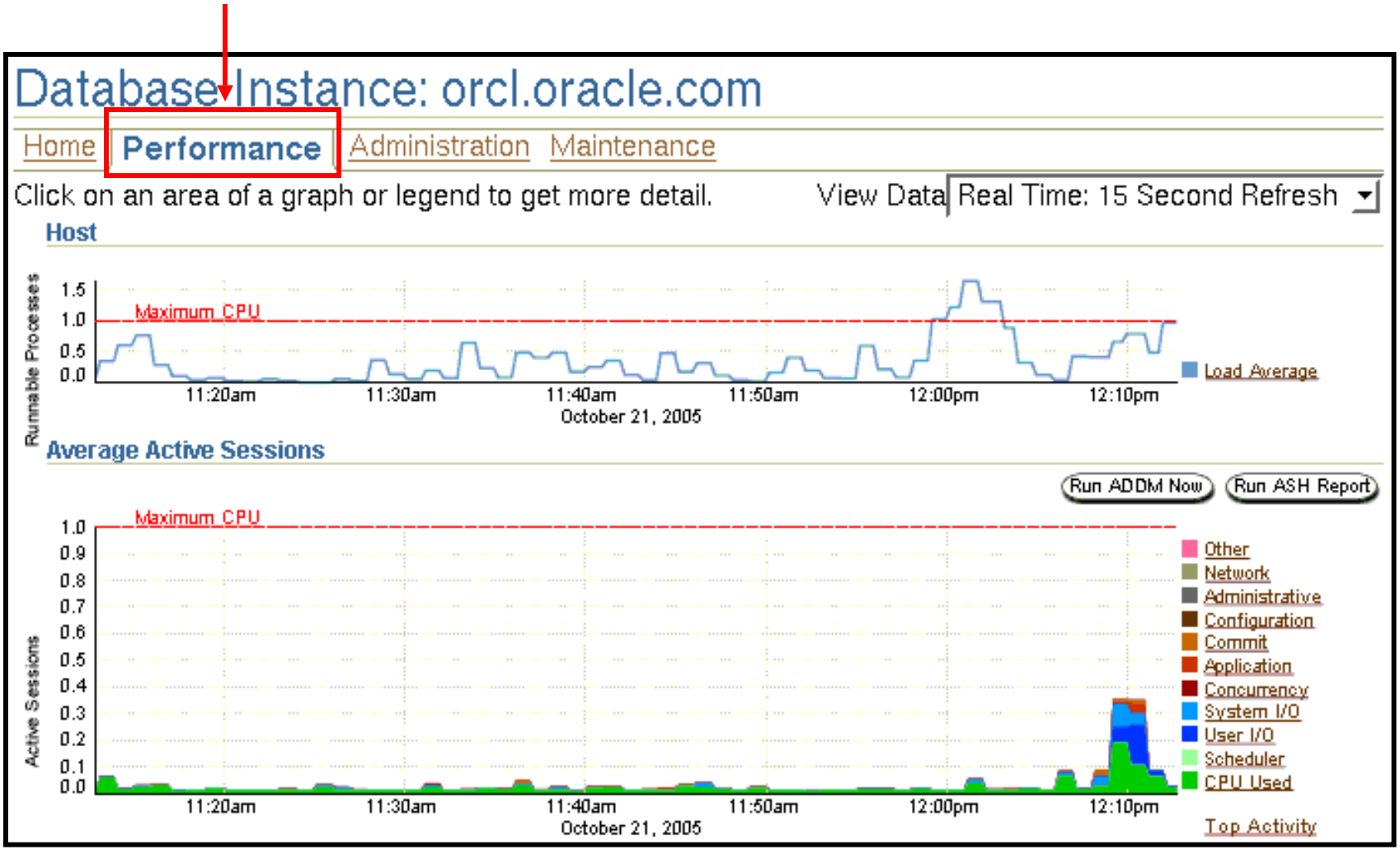
- Use Enterprise Manager to monitor performance
- Tune SQL by using the SQL Tuning Advisor
- Tune SQL by using the SQL Access Advisor
- Use Automatic Shared Memory Management (ASSM)
- Use the Memory Advisor to size memory buffers
- View performance-related dynamic views
- Troubleshoot invalid and unusable objects

Performance Monitoring

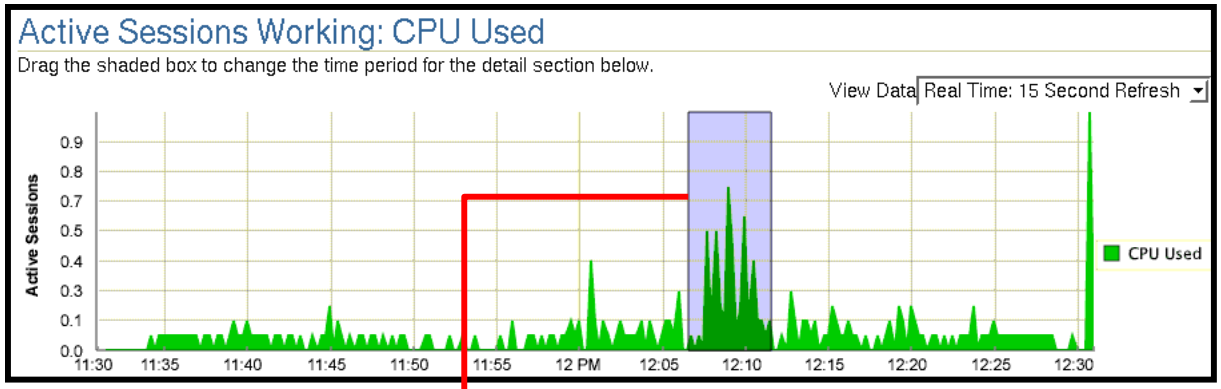
> Perf Mon
Tuning Adv
Access Adv
Memory
Stats
Invalid Obj



Performance Monitoring



Performance Monitoring



Detail for Selected 5 Minute Interval

Start Time **Oct 21, 2005 12:06:35 PM PDT**

Top Working SQL

Schedule SQL Tuning Advisor | Create SQL Tuning Set

Select All | Select None

Select	Activity (%)	SQL ID	SQL Type
☐	30.19	a0q0ya8fxx52s	INSERT
☐	9.43	257rmrxgvaj4z	SELECT
☐	7.55	8f4zf0m1b7b6u	INSERT
☐	7.55	9c3326865m2h9	SELECT
☐	7.55	cakg0hdjjw2wf	SELECT
☐	3.77	fsz8wz5pmvamh	SELECT
☐	3.77	6uvk7uc8m4mf0	SELECT
☐	3.77	4c1xvq9ufwcjc	SELECT
☐	1.89	f787fyhjmkp61	INSERT

Total Sample Count: 53

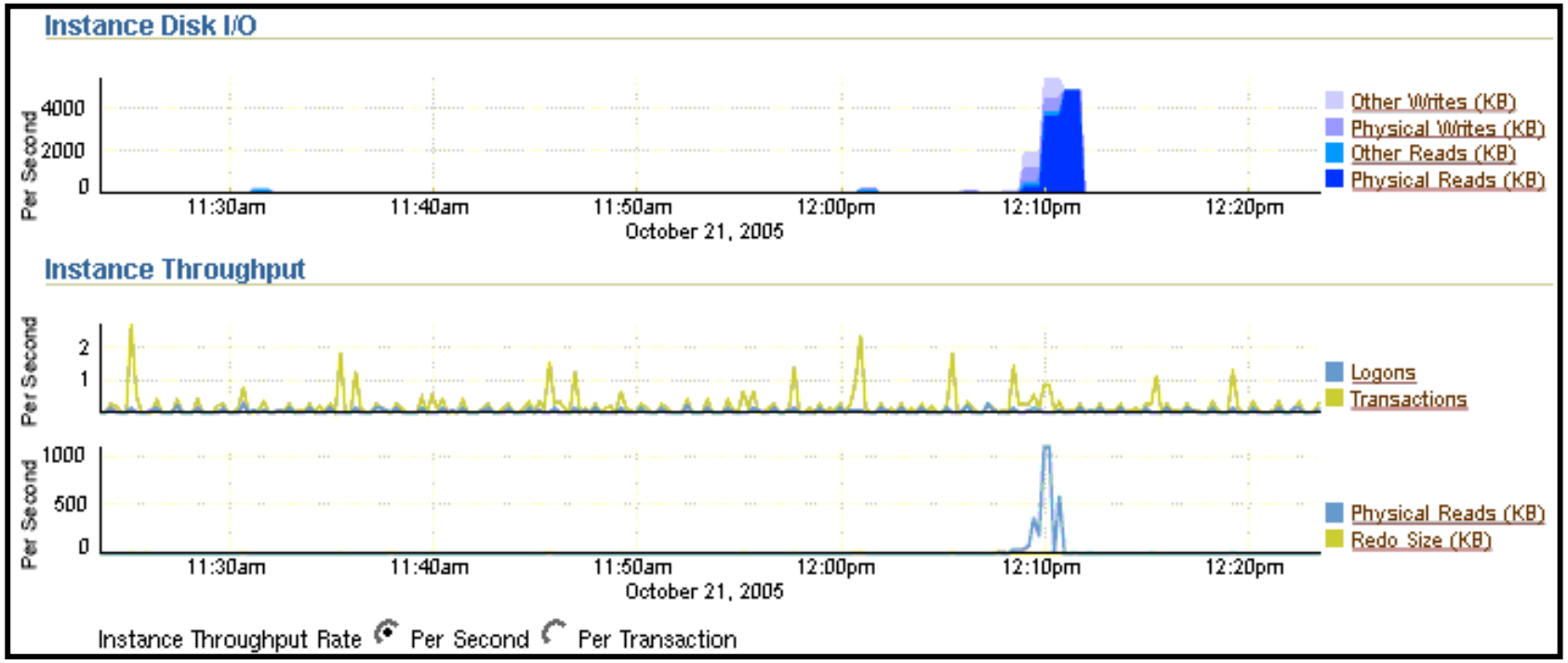
Top Working Sessions

View Top Sessions

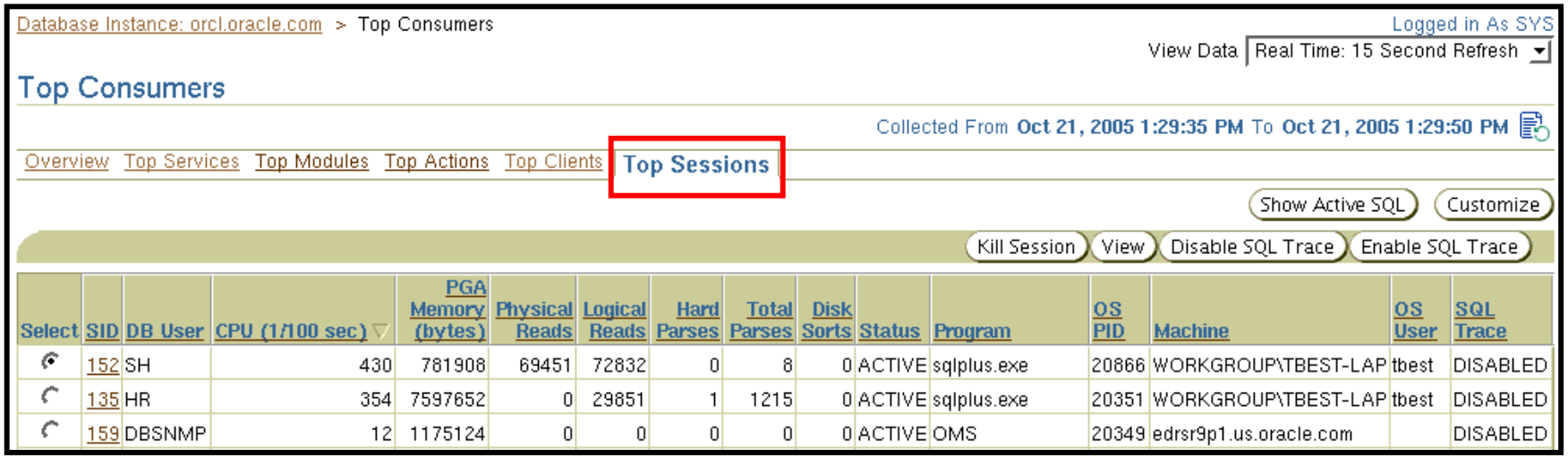
Activity (%)	Session ID	User Name	Program
41.43	132	HR	sqlplus.exe
22.86	159	DBSNMP	OMS
11.43	167	SYS	oracle@edrsr9p1 (DBW0)
10.00	145	SYS	oracle@edrsr9p1 (m000)
4.29	128	SYSMAN	OMS
2.86	141	SYSMAN	OMS
2.86	137	SYSMAN	OMS
1.43	146	SYS	oracle@edrsr9p1 (q000)

Total Sample Count: 70

Performance Monitoring



Performance Monitoring: Top Sessions



Select	SID	DB User	CPU (1/100 sec)	PGA Memory (bytes)	Physical Reads	Logical Reads	Hard Parses	Total Parses	Disk Sorts	Status	Program	OS PID	Machine	OS User	SQL Trace
◉	152	SH	430	781908	69451	72832	0	8	0	ACTIVE	sqlplus.exe	20866	WORKGROUP\TBEST-LAP	tbest	DISABLED
○	135	HR	354	7597652	0	29851	1	1215	0	ACTIVE	sqlplus.exe	20351	WORKGROUP\TBEST-LAP	tbest	DISABLED
○	159	DBSNMP	12	1175124	0	0	0	0	0	ACTIVE	OMS	20349	edrsr9p1.us.oracle.com		DISABLED

Performance Monitoring: Top Services

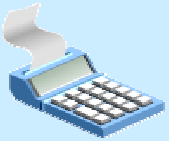
Select	Service	Activity (% for the last 5 minutes)	SQL Trace Enabled	Delta Elapsed Time (seconds)
☐	SYS$USERS	37.8	FALSE	1
☐	SYS$BACKGROUND	27.0	FALSE	0
☐	inventory.oracle.com	24.3	FALSE	0
☐	orcl.oracle.com	8.1	FALSE	0
☐	hr.oracle.com	2.7	FALSE	1

Cumulative Elapsed Time (seconds)	Delta CPU Time (seconds)	Cumulative CPU Time (seconds)	Delta Physical I/O (blocks)	Cumulative Physical I/O (blocks)
4874	1	1774	9518	362289
0	0	0	1	328437
262	0	58	0	10250
2486	0	1186	0	4977
1124	0	73	5874	55841

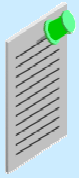
SQL Tuning Advisor: Overview

Perf Mon
> Tuning Adv
Access Adv
Memory
Stats
Invalid Obj

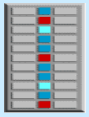
Automatic Tuning Optimizer



Statistics check optimization mode

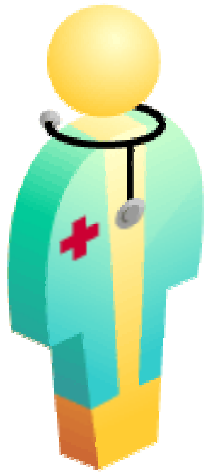


Plan tuning optimization mode



Access analysis optimization mode

SQL analysis optimization mode



SQL Tuning Advisor

Comprehensive SQL tuning

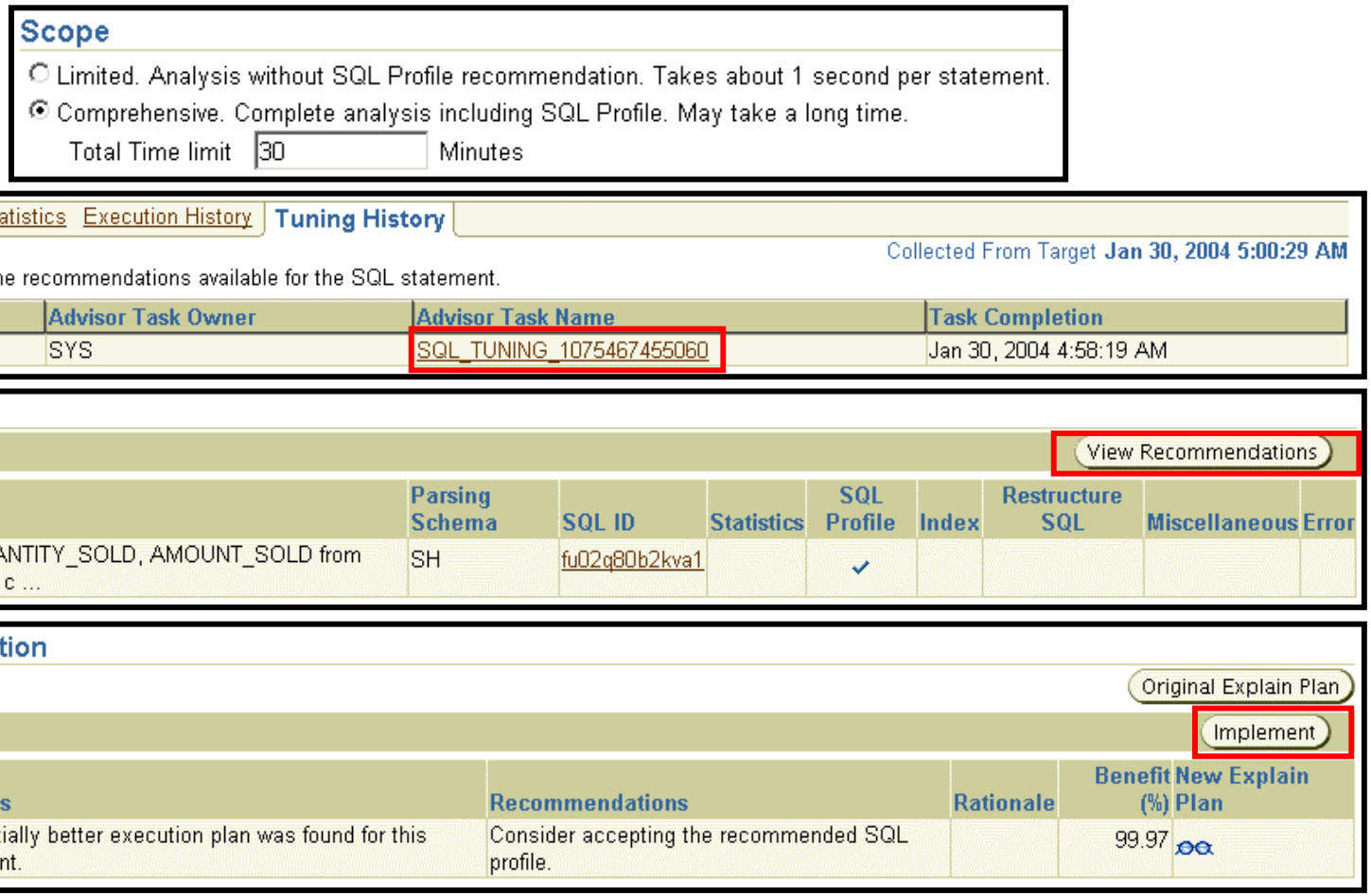
Detect stale or missing statistics

Tune SQL plan (SQL profile)

Add missing index
Run access advisor

Restructure SQL

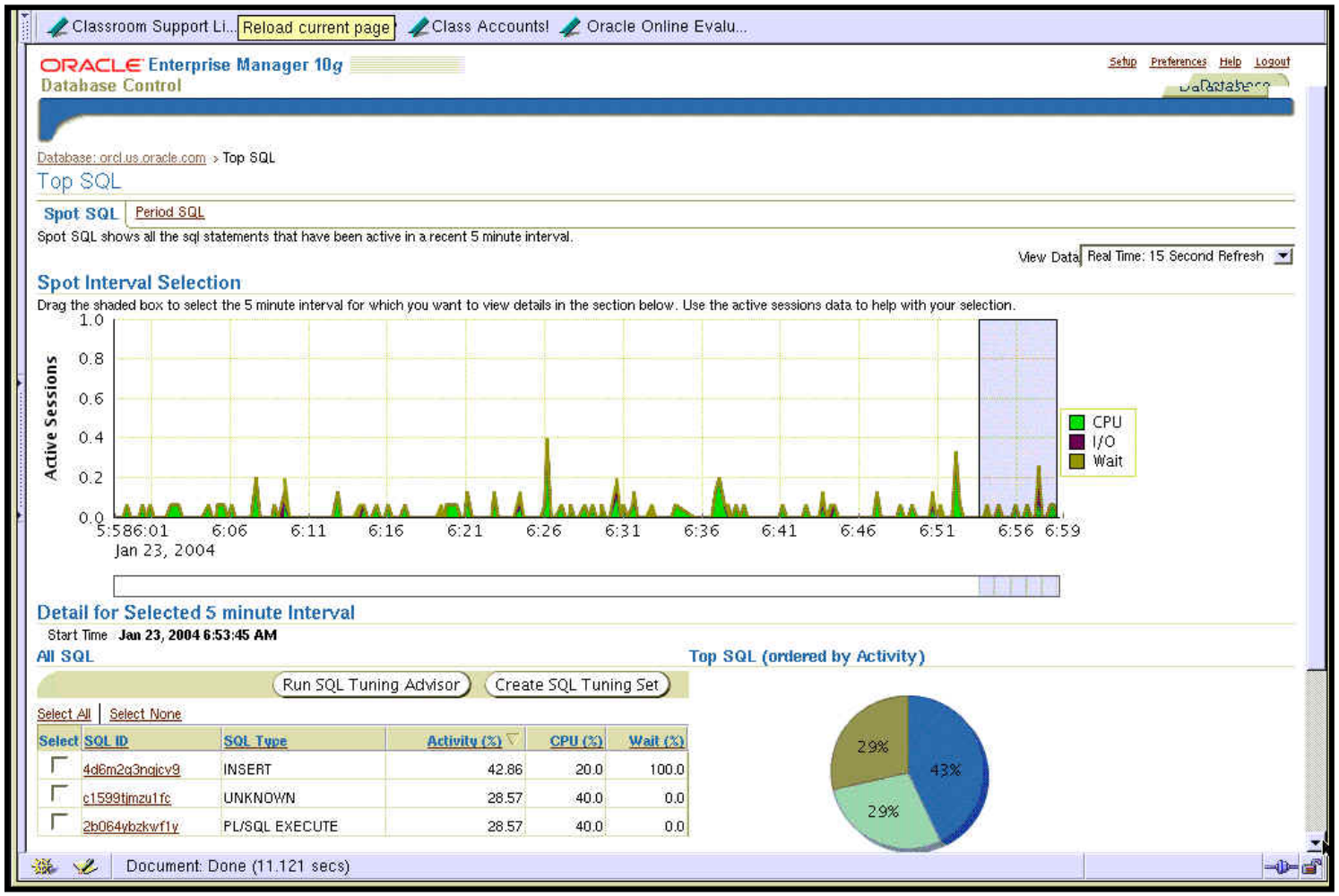
SQL Tuning Advisor Options and Recommendations



Using the SQL Tuning Advisor

- Use the SQL Tuning Advisor to analyze SQL statements and obtain performance recommendations.
- Sources for SQL Tuning Advisor to analyze
  - Top SQL: Analyzes the top SQL statements currently active
  - SQL Tuning Sets: Analyzes a set of SQL statements you provide
  - Snapshots: Analyzes a snapshot
  - Baselines: Analyzes a baseline

Using the SQL Tuning Advisor: Example

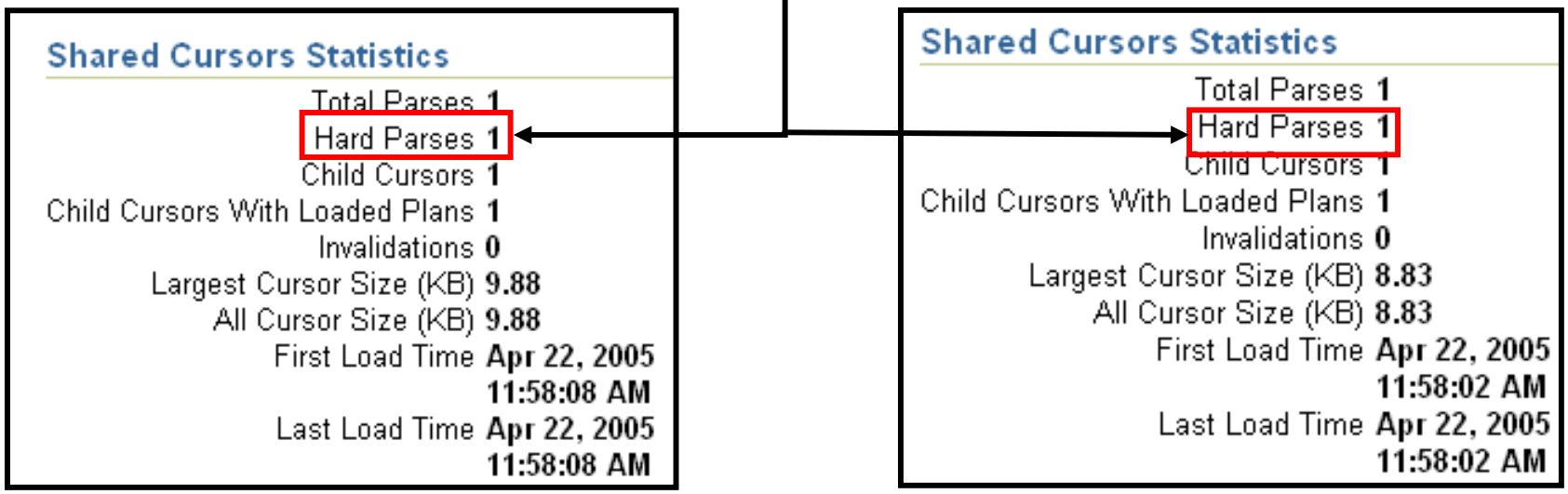


SQL Tuning Advisor: SQL Statistics

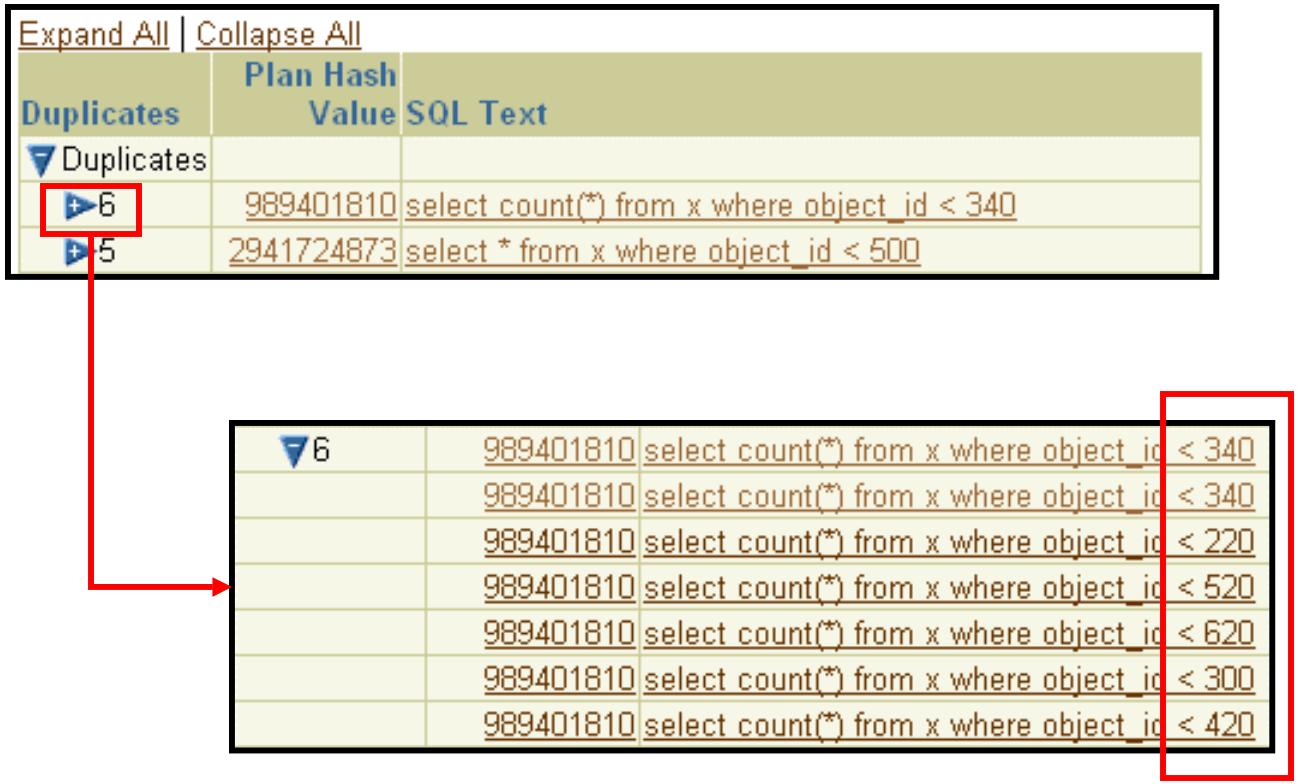
```
select count(*) from x
where object_id < 340
```

```
select count(*) from x
where object_id < 220
```

Each statement causes a hard parse.



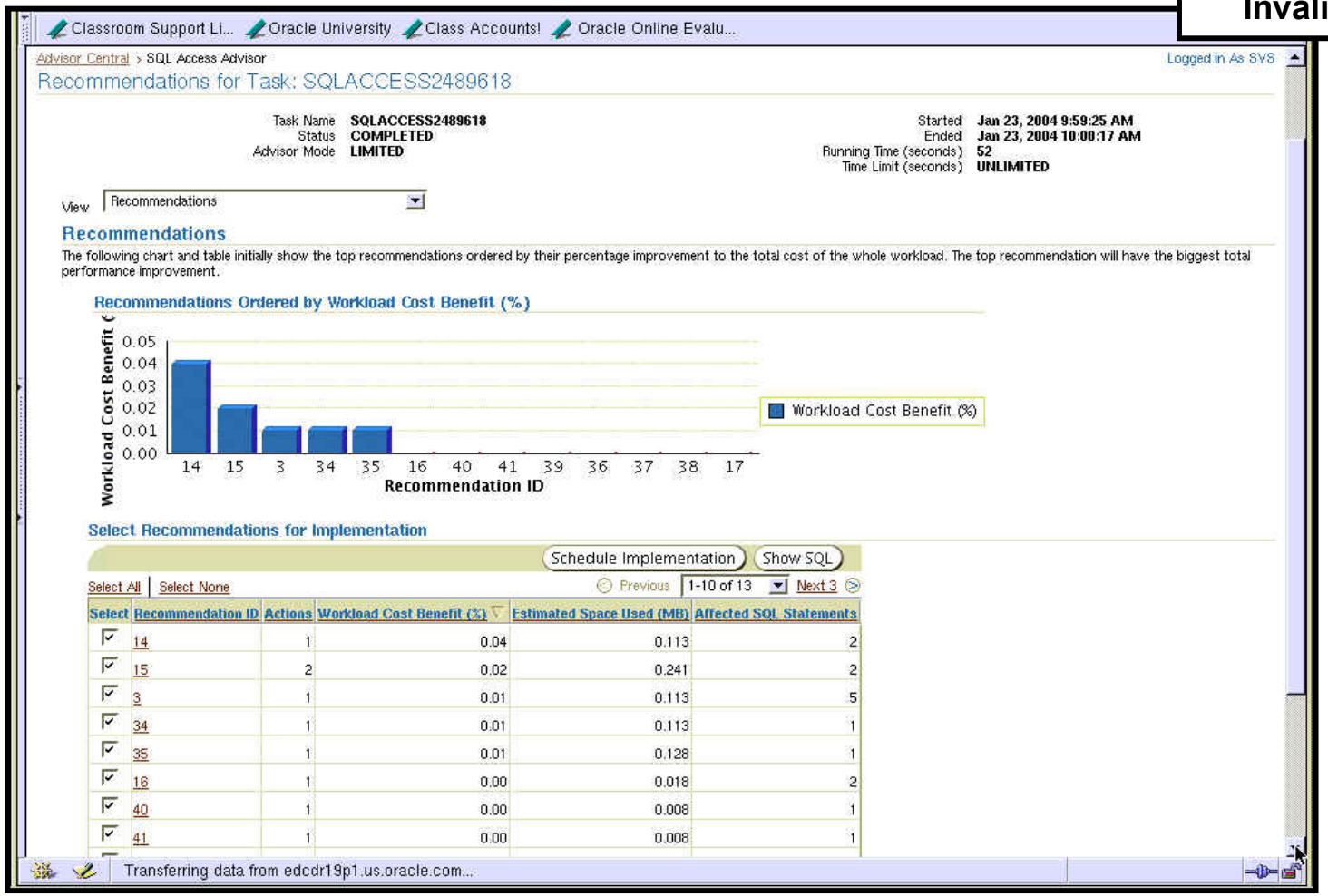
SQL Tuning Advisor: Identifying Duplicate SQL



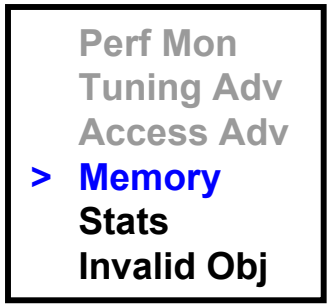
Bind variable candidates

Using the SQL Access Advisor

- Perf Mon
- Tuning Adv
- > Access Adv
- Memory
- Stats
- Invalid Obj

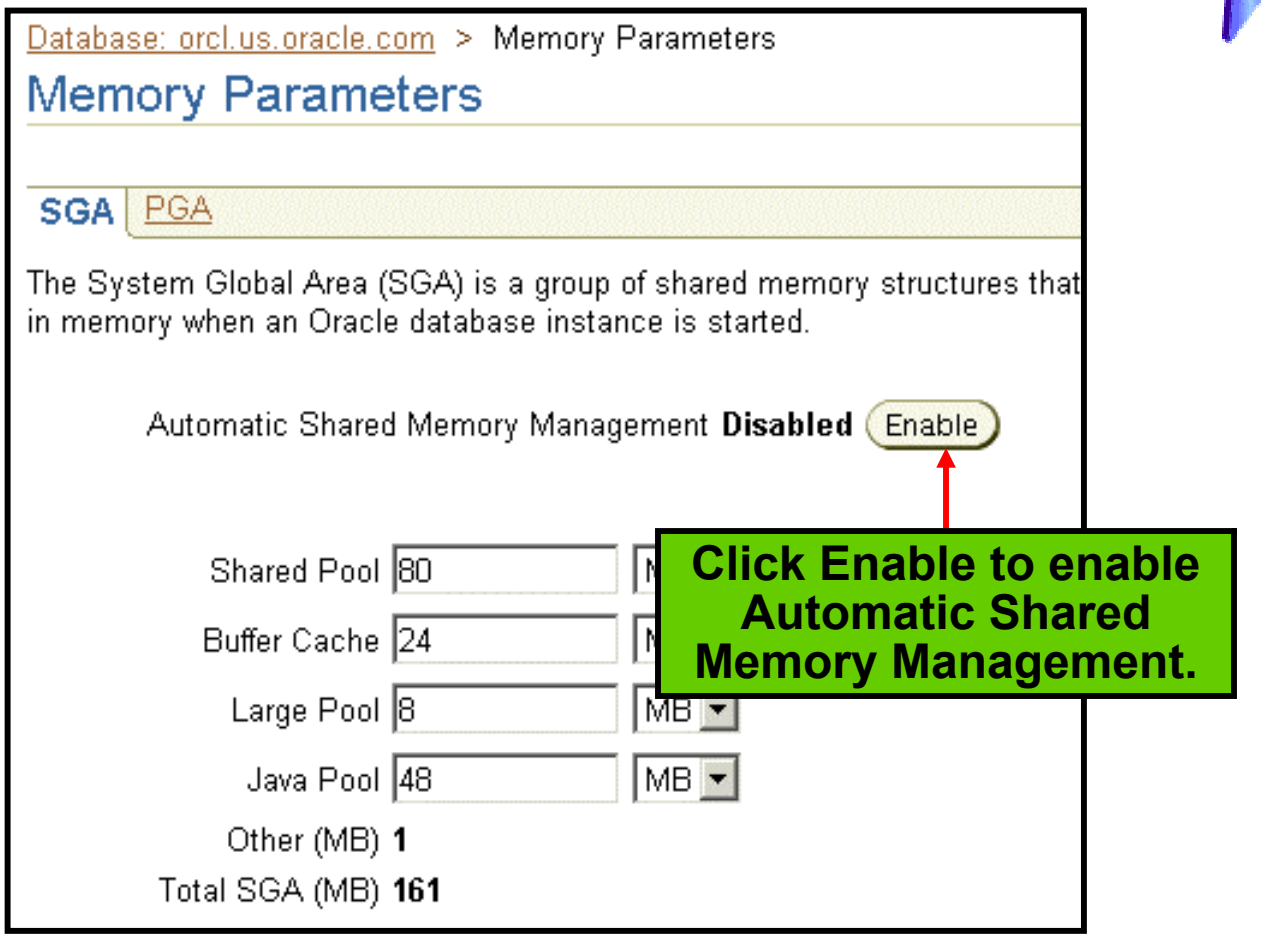


Managing Memory Components

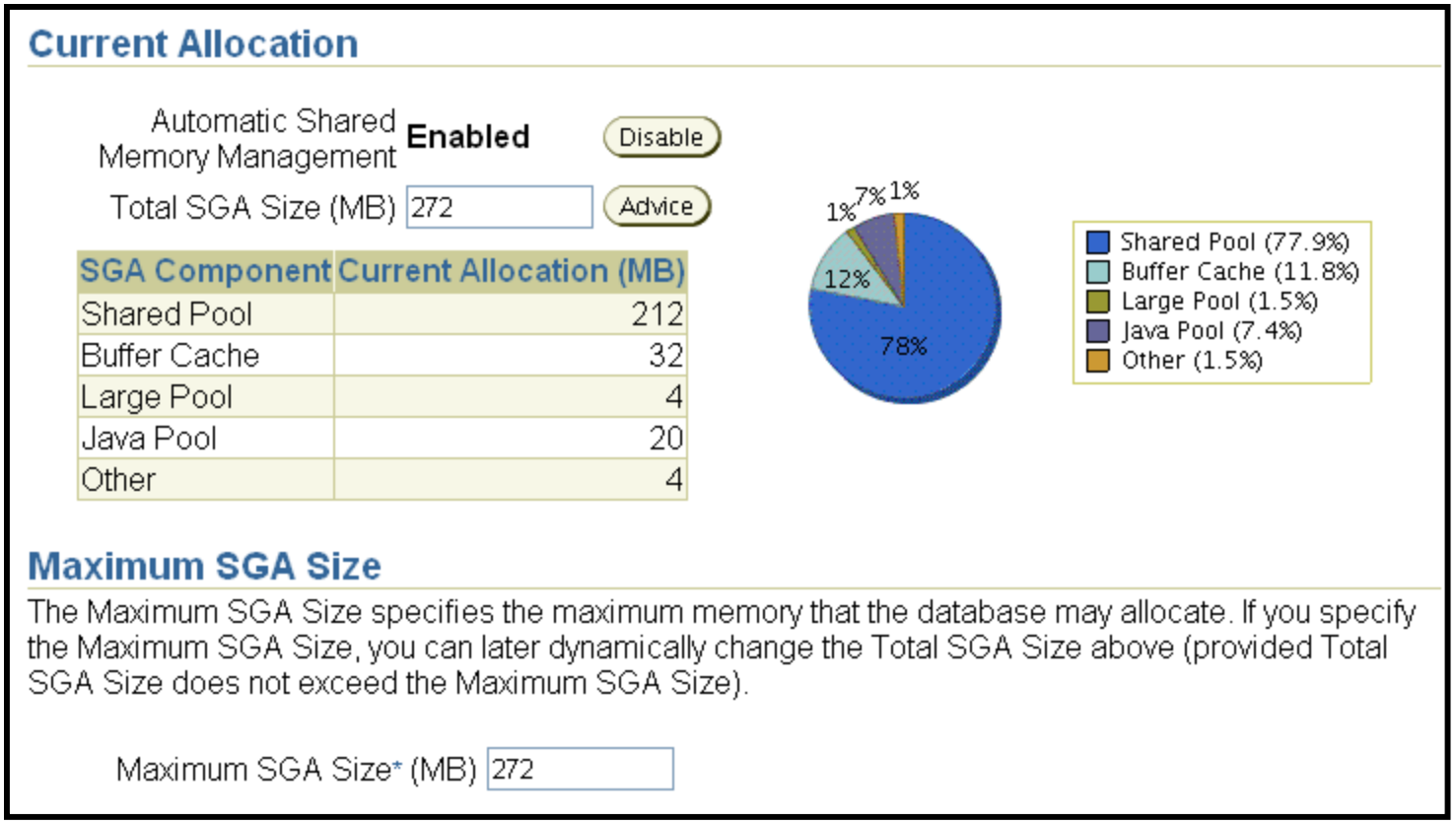


- **Automatic Shared Memory Management:**
  - **Is recommended to simplify management**
  - **Enables you to specify the total SGA memory through one initialization parameter**
  - **Enables the Oracle server to manage the amount of memory allocated to the shared pool, Java pool, buffer cache, streams pool, and the large pool**
- **Manually setting shared memory management:**
  - **Sizes the components through multiple individual initialization parameters**
  - **Uses the Memory Advisor to make recommendations**

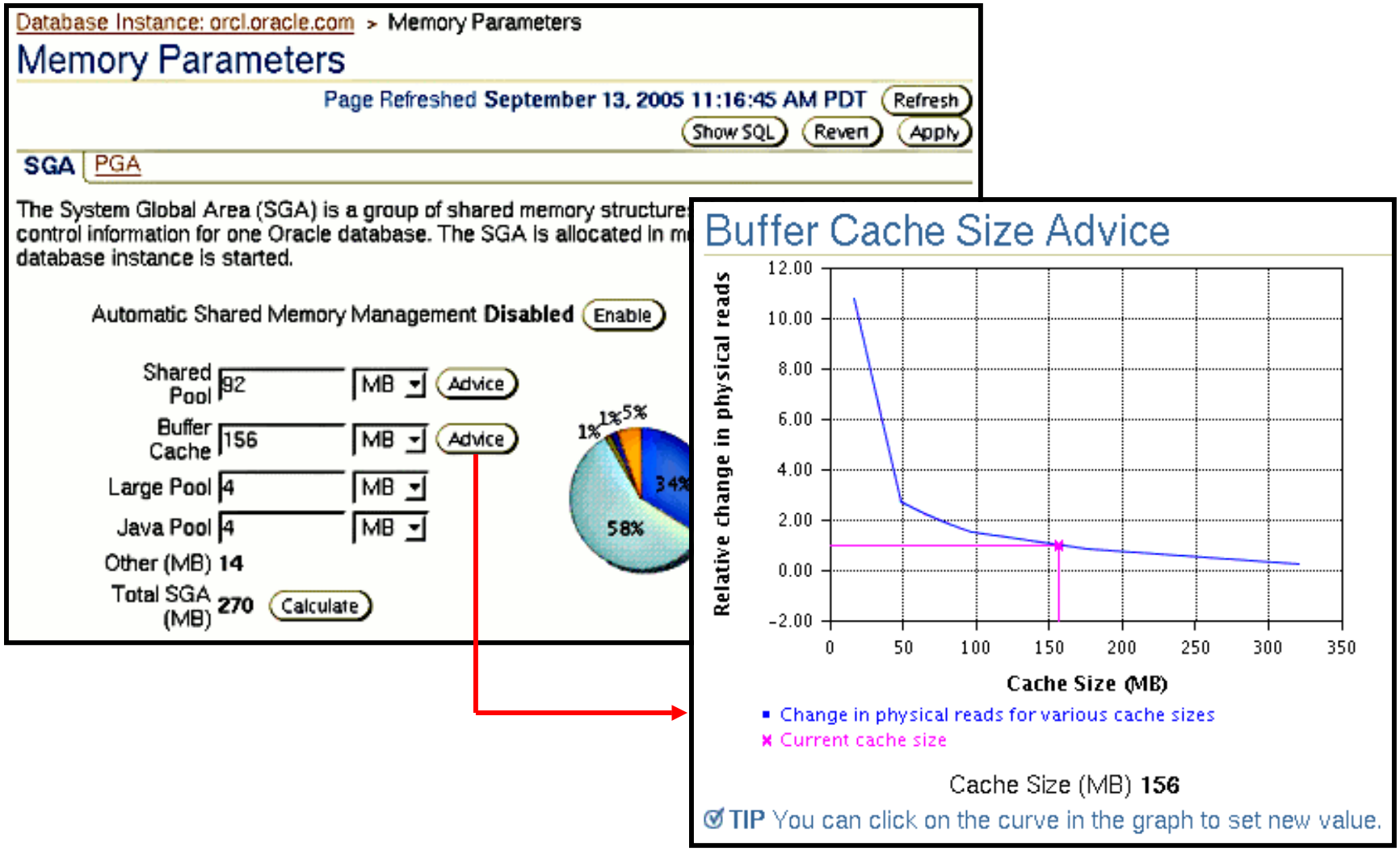
Enabling Automatic Shared Memory Management (ASMM)



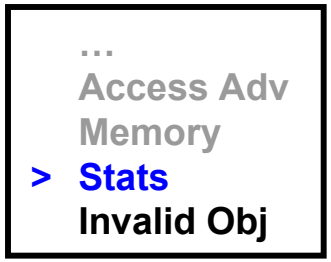
Manually Setting Shared Memory Management



Using the Memory Advisor



Dynamic Performance Statistics



Systemwide

V$SYSSTAT
- statistic#
- name
- class
- value
- stat_id

V$SYSTEM_EVENT
- event
- total_waits
- total_timeouts
- time_waited
- average_wait
- time_waited_micro

Session specific

V$SESSTAT
- sid
- statistic#
- value

V$SESSION_EVENT
- sid
- event
- total_waits
- total_timeouts
- time_waited
- average_wait
- max_wait
- time_waited_micro
- event_id

Service specific

V$SERVICE_STATS
- service_name_hash
- service_name
- stat_id
- stat_name
- value

V$SERVICE_EVENT
- service_name
- service_name_hash
- event
- event_id
- total_waits
- total_timeouts
- time_waited
- average_wait
- time_waited_micro

Cumulative stats

Wait events

Troubleshooting and Tuning Views

Instance/Database

V$DATABASE
V$INSTANCE
V$PARAMETER
V$SPPARAMETER
V$SYSTEM_PARAMETER
V$PROCESS
V$BGPROCESS
V$PX_PROCESS_SYSSTAT
V$SYSTEM_EVENT

Disk

V$DATAFILE
V$FILESTAT
V$LOG
V$LOG_HISTORY
V$DBFILE
V$TEMPFILE
V$TEMPSEG_USAGE
V$SEGMENT_STATISTICS

Memory

V$BUFFER_POOL_STATISTICS
V$LIBRARYCACHE
V$SGAINFO
V$PGASTAT

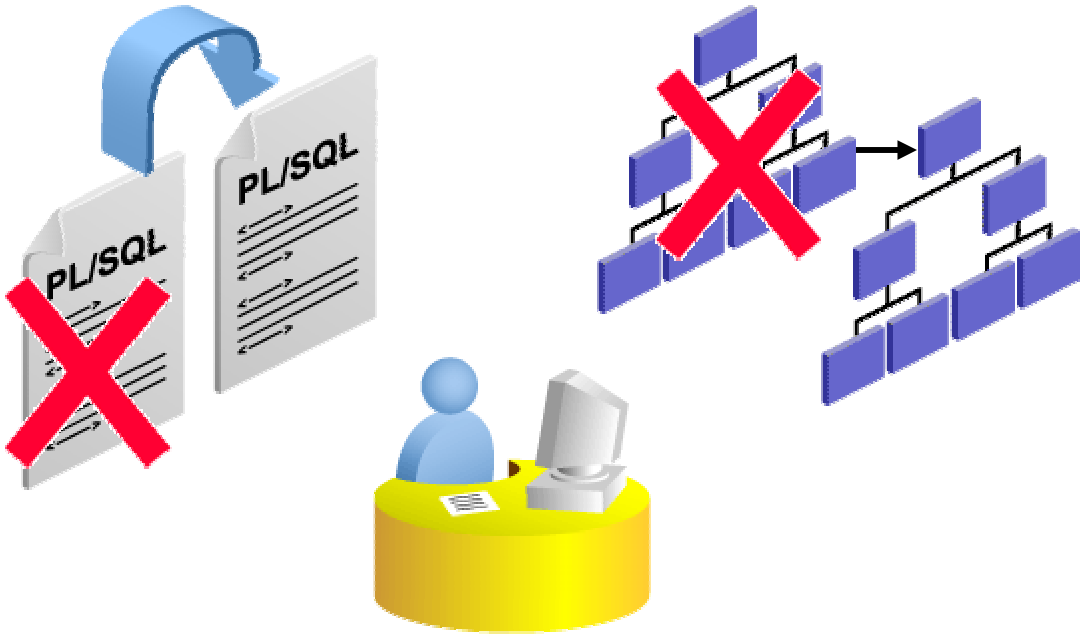
Contention

V$LOCK
V$UNDOSTAT
V$WAITSTAT
V$LATCH

Invalid and Unusable Objects

Effect on Performance:

- **PL/SQL code objects are recompiled.**
- **Indexes are rebuilt.**



Summary

In this lesson, you should have learned how to:

- Use Enterprise Manager to monitor performance
- Tune SQL using the SQL Tuning Advisor
- Tune SQL using the SQL Access Advisor
- Use Automatic Shared Memory Management
- Use the Memory Advisor to size memory buffers
- View performance-related dynamic views
- Troubleshoot invalid and unusable objects

Practice Overview: Monitoring and Improving Performance

This practice covers the following topics:

- Detecting and repairing unusable indexes
- Using the SQL Tuning Advisor
- Using the Performance page in Enterprise Manager