Performance Management

13
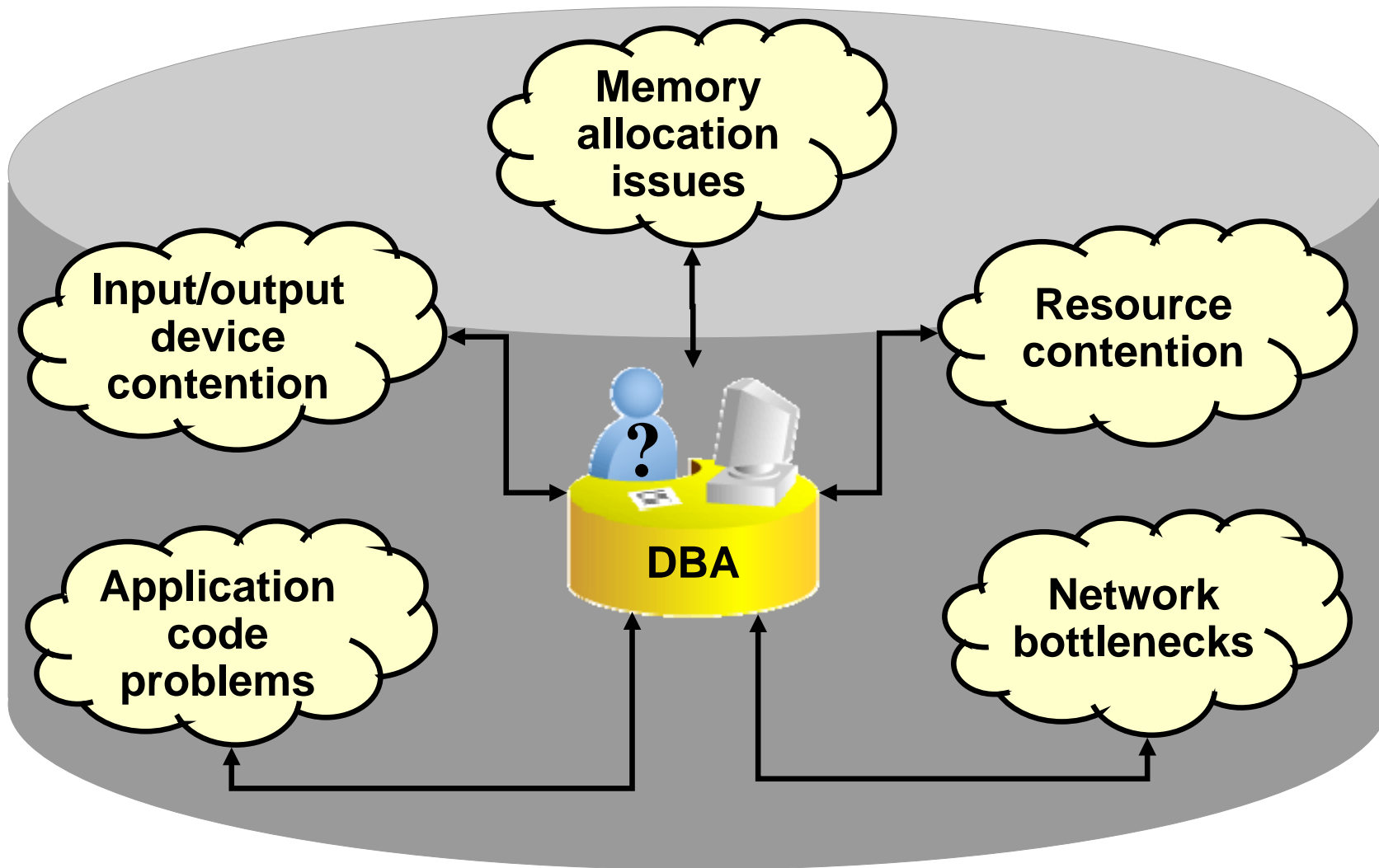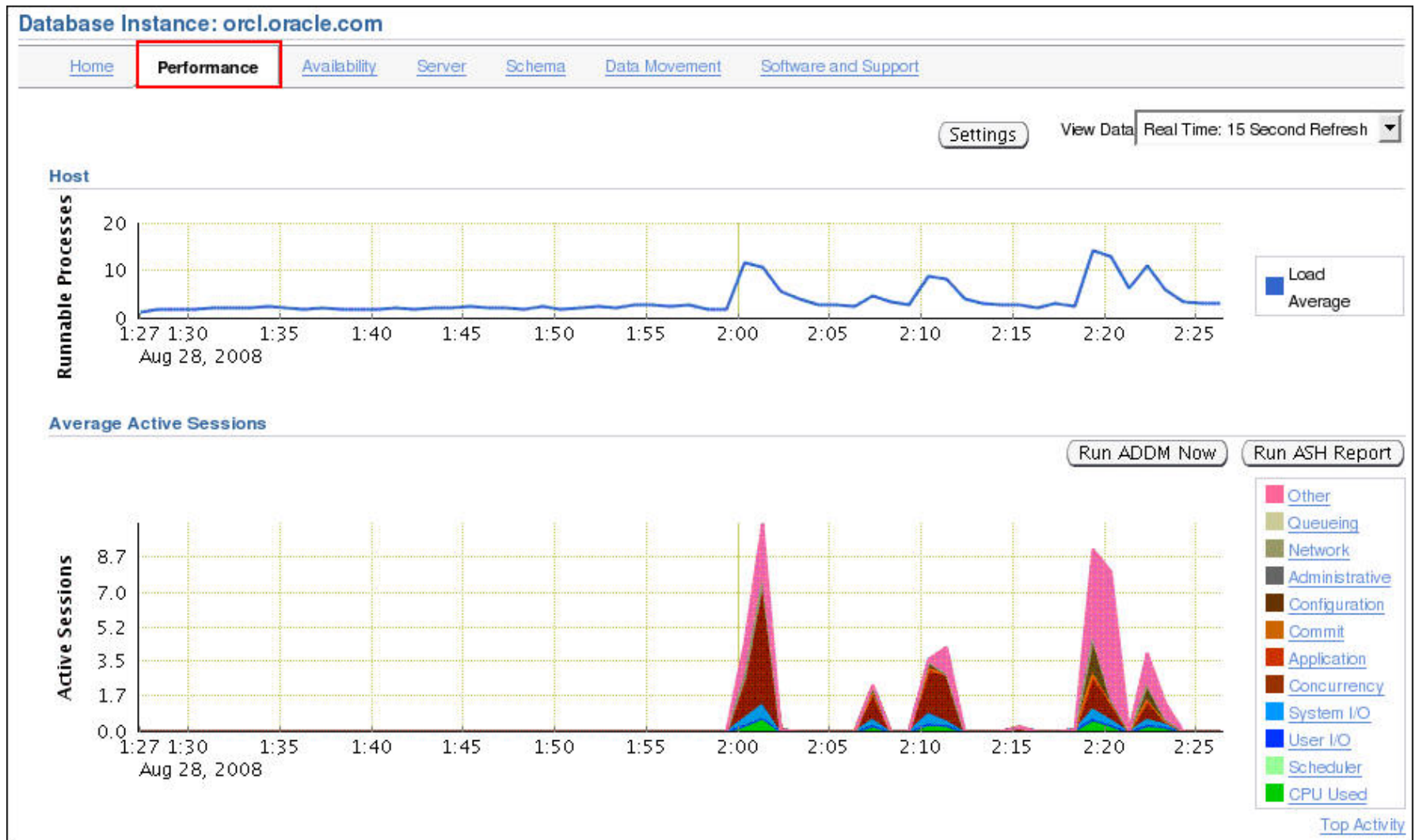
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Objectives

After completing this lesson, you should be able to:

- Use Enterprise Manager to monitor performance
- Use Automatic Memory Management (AMM)
- Use the Memory Advisor to size memory buffers
- View performance-related dynamic views
- Troubleshoot invalid and unusable objects

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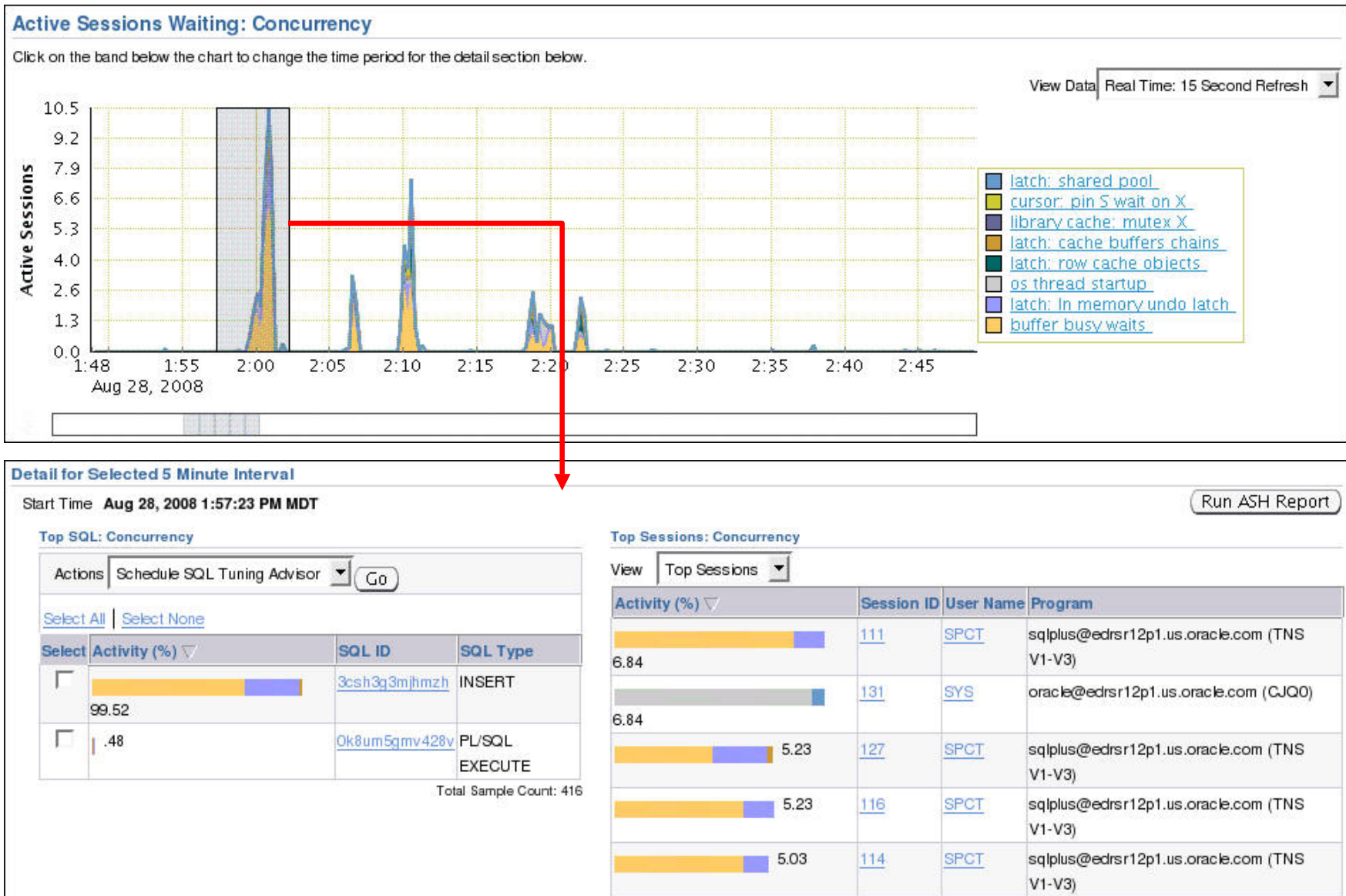

Memory allocation issues

Input/output device contention

Resource contention

Application code problems

DBA

Network bottlenecks

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Enterprise Manager Performance Page

Drilling Down to a Particular Wait Category

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Performance Page: Throughput

Database Instance: orcl.oracle.com

| Home | **Performance** | Availability | Server | Schema | Data Movement | Software and Support |

Scroll down on the Performance page.

| **Throughput** | I/O | Parallel Execution | Services |

Instance Throughput Rate ⊙ Per Second ○ Per Transaction

Per Second
2,000
6,000
0
1:55 2:04 2:09 2:14 2:19 2:24 2:29 2:34 2:39 2:44 2:49 2:54
Aug 28, 2008

■ Logons
■ Transactions

Per Second
6,000
3,000
0
1:55 2:04 2:09 2:14 2:19 2:24 2:29 2:34 2:39 2:44 2:49 2:54
Aug 28, 2008

■ Physical Reads (KB)
■ Redo Size (KB)

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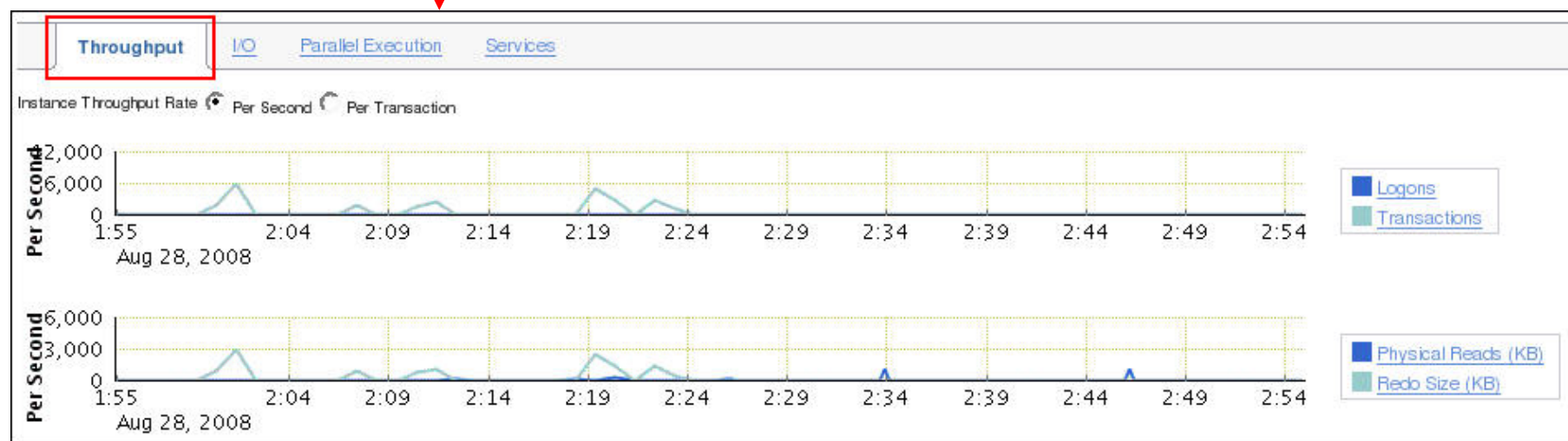
Performance Monitoring: Top Sessions

Top Consumers

Overview   Top Services   Top Modules   Top Actions   Top Clients   **Top Sessions**

(Show Active SQL)   (Customize)

(Kill Session) (View) (Disable SQL Trace) (Enable SQL Trace)

Select	SID	DB User	CPU (1/100 sec)	PGA Memory (bytes)	Physical Reads	Logical Reads	Hard Parses	Total Parses	Disk Sorts	Status	Program	Module	OS PID	Machine	OS User	SQL Trace
⦿	36	INVENTORY	1	1540712	20	228	0	0	0	ACTIVE	sqlplus@edrsr12p1.us.oracle.com (TNS V1-V3)	SQL*Plus	18269	edrsr12p1.us.oracle.com	oracle	DISABLED
○	59	DBSNMP	12	7168500	0	56	0	10	0	ACTIVE	emagent@edrsr12p1.us.oracle.com (TNS V1-V3)	emagent_SQL_oracle_database	9753	edrsr12p1.us.oracle.com	oracle	DISABLED
○	42	CJQ0	0	1794548	0	6	0	0	0	ACTIVE	oracle@edrsr12p1.us.oracle.com (CJQ0)		13001	edrsr12p1.us.oracle.com	oracle	DISABLED
○	41	DBSNMP	0	2384372	0	3	0	2	0	ACTIVE	emagent@edrsr12p1.us.oracle.com (TNS V1-V3)	emagent_AQMetrics	13286	edrsr12p1.us.oracle.com	oracle	DISABLED
○	29	SYSMAN	0	2843124	0	1	0	5	0	ACTIVE	OMS	OEM.DefaultPool	12965	edrsr12p1.us.oracle.com	oracle	DISABLED
○	49	DBSNMP	14	1532404	0	0	0	2	0	ACTIVE	OMS	Realtime Connection	18390	edrsr12p1.us.oracle.com	oracle	DISABLED
○	34	SYSMAN	0	2384372	0	0	0	0	0	ACTIVE	OMS	OEM.SystemPool	13061	edrsr12p1.us.oracle.com	oracle	DISABLED
○	30	SYSMAN	0	3105268	0	0	0	3	0	ACTIVE	OMS	OEM.DefaultPool	12967	edrsr12p1.us.oracle.com	oracle	DISABLED
○	18	MMNL	0	1270260	0	0	0	0	0	ACTIVE	oracle@edrsr12p1.us.oracle.com (MMNL)		12861	edrsr12p1.us.oracle.com	oracle	DISABLED
○	25	QMNC	0	745972	0	0	0	0	0	ACTIVE	oracle@edrsr12p1.us.oracle.com (QMNC)	STREAMS	12963	edrsr12p1.us.oracle.com	oracle	DISABLED
○	57	J001	0	418292	0	0	0	0	0	ACTIVE	oracle@edrsr12p1.us.oracle.com (J001)		18451	edrsr12p1.us.oracle.com	oracle	DISABLED
○	43	SMCO	0	418292	0	0	0	0	0	ACTIVE	oracle@edrsr12p1.us.oracle.com (SMCO)	KTSJ	13544	edrsr12p1.us.oracle.com	oracle	DISABLED

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Performance Monitoring: Top Services

View | Active Services

(Enable SQL Trace) (Disable SQL Trace) (View SQL Trace File)

Select All | Select None

Select	Service	Activity (% for the last 5 minutes) ▽	SQL Trace Enabled	Delta Elapsed Time (seconds)	Cumulative Elapsed Time (seconds)
☐	SYS$USERS	42.9	FALSE	0	227
☐	SYS$BACKGROUND	35.7	FALSE	0	0
☐	SH	14.3	FALSE	0	2
☐	SERV1	7.1	FALSE	0	2

Delta CPU Time (seconds)	Cumulative CPU Time (seconds)	Delta Physical I/O (blocks)	Cumulative Physical I/O (blocks)
0	0	0	16031
0	137	0	14414
0	1	15	637
0	2	0	12

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Managing Memory Components

- Automatic Memory Management (AMM)
  - Enables you to specify total memory allocated to instance (including both SGA and PGA)
- Automatic Shared Memory Management (ASMM):
  - Enables you to specify 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 large pool
- Manually setting shared memory management:
  - Sizes the components through multiple individual initialization parameters
  - Uses the appropriate Memory Advisor to make recommendations

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Enabling Automatic Memory Management (AMM)

Database Instance: orcl.oracle.com > Advisor Central >

Memory Advisors

Page Refreshed **August 28, 2008 3:08:57 PM MDT**   [Refresh]

[Show SQL] [Revert] [Apply]

Click Enable to enable Automatic Memory Management.

...ent is enabled, the database will automa...
distribution of memory will ch...e from time to time to accomodate changes...

Automatic Memory Management **Disabled** [Enable]

Memory Advisors

Page Refreshed **August 28,**

When Automatic Memory Management is enabled, the database will automatically set the optim...
distribution of memory will change from time to time to accomodate changes in the workload.
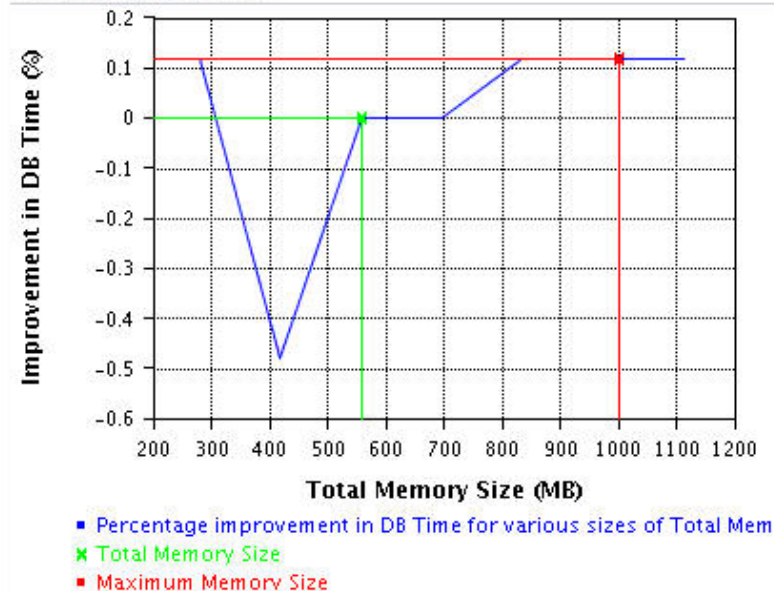
Automatic Memory Management **Enabled** [Disable]

Total Memory Size [556] [MB ▼] [Advice]

Maximum Memory Size [1000] [MB ▼]

The database must be resta... ...ny changes to this value tak...

Use the Memory Size Advisor.

Memory Size Advice

- Percentage improvement in DB Time for various sizes of Total Mem
- Total Memory Size
- Maximum Memory Size

Total Memory Size (MB) **556**

You can click on the curve in the graph to set a new value. Total Memory Size cannot be greater than the Maximum Memory Size. First modify the Maximum Memory size (from the parent page) and then select a value of Total Memory up to the Maximum Memory size.

[Cancel] [OK]

Enabling Automatic Shared Memory Management (ASMM)

SGA   PGA

The System Global Area (SGA) is a group of shared memory structures that contains data and control information for one Oracle database. The SGA is allocated in memory when an Oracle database instance is started.

Automatic Shared Memory Management **Disabled** [Enable]

> Click Enable to enable Automatic Shared Memory Management.

Shared Pool [248]   [MB ▼] (Advice)
Buffer Cache [136]   [MB ▼] (Advice)
Large Pool [4]   [MB ▼]
Java Pool [12]   [MB ▼]
Other (MB) **5**
Total SGA (MB) **405** (Calculate)

1% 3% 1%

34%   61%

- Shared Pool (61.1%)
- Buffer Cache (33.5%)
- Large Pool (1%)
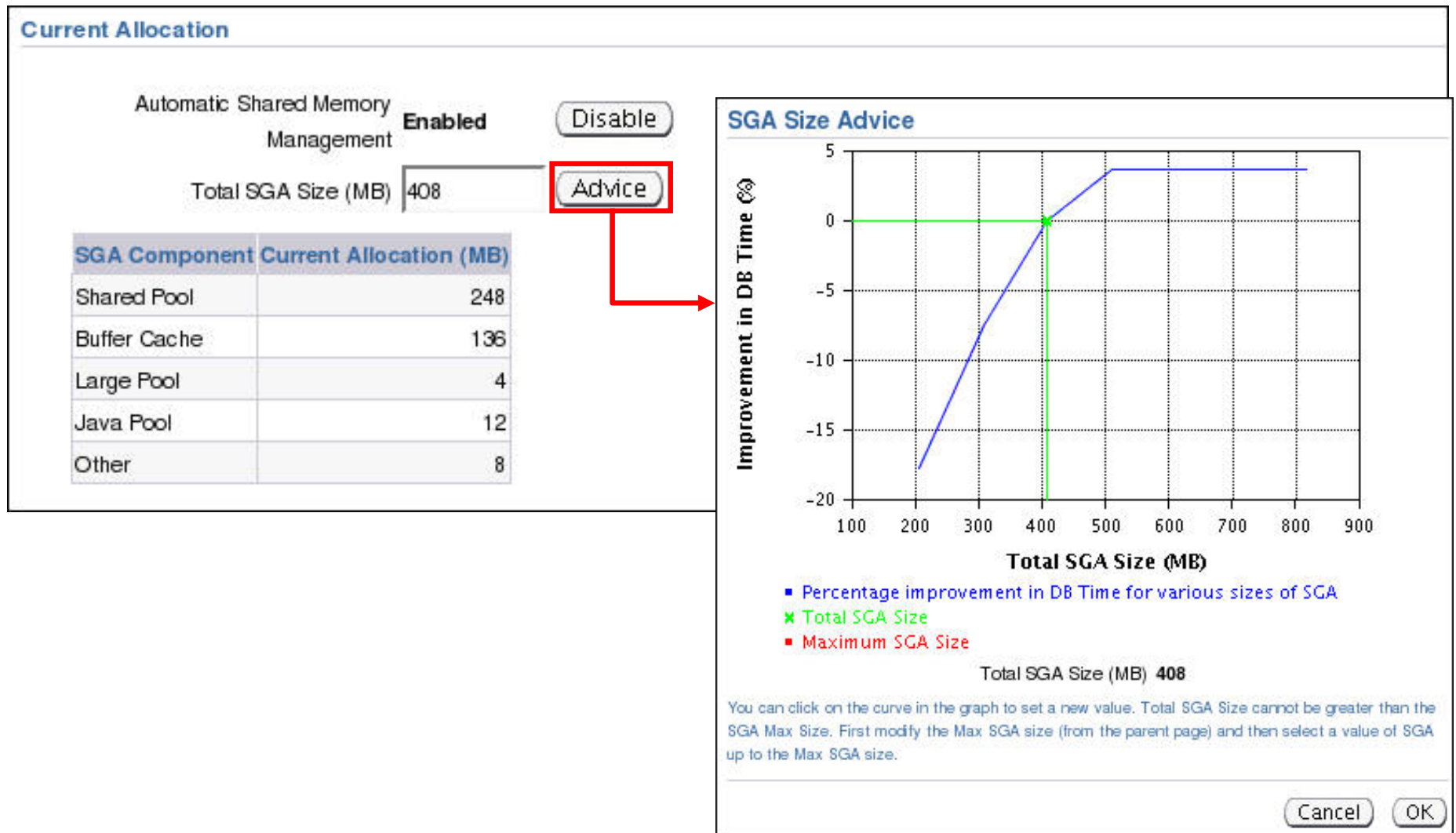- Java Pool (3%)
- Other (1.4%)

Maximum SGA Size

The Maximum SGA Size specifies the maximum memory that the database may allocate. If you specify the Maximum SGA Size, you can later dynamically change SGA component sizes (provided the total SGA size does not exceed the Maximum SGA Size).
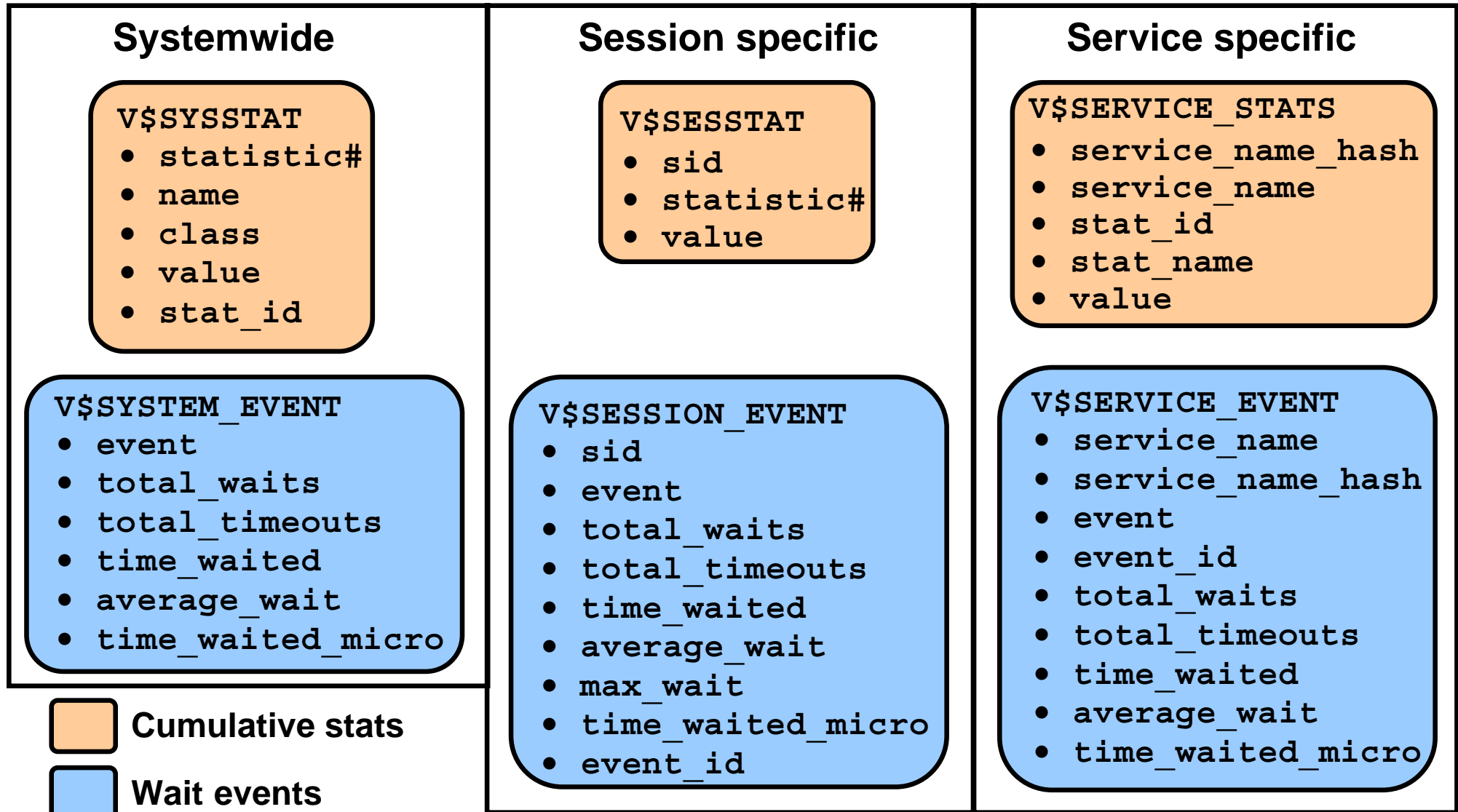
Maximum SGA Size (MB) [1000]

The database must be restarted before any changes to this value take effect.

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Automatic Shared Memory Advisor

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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

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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$BUFFER_POOL_STATISTICS
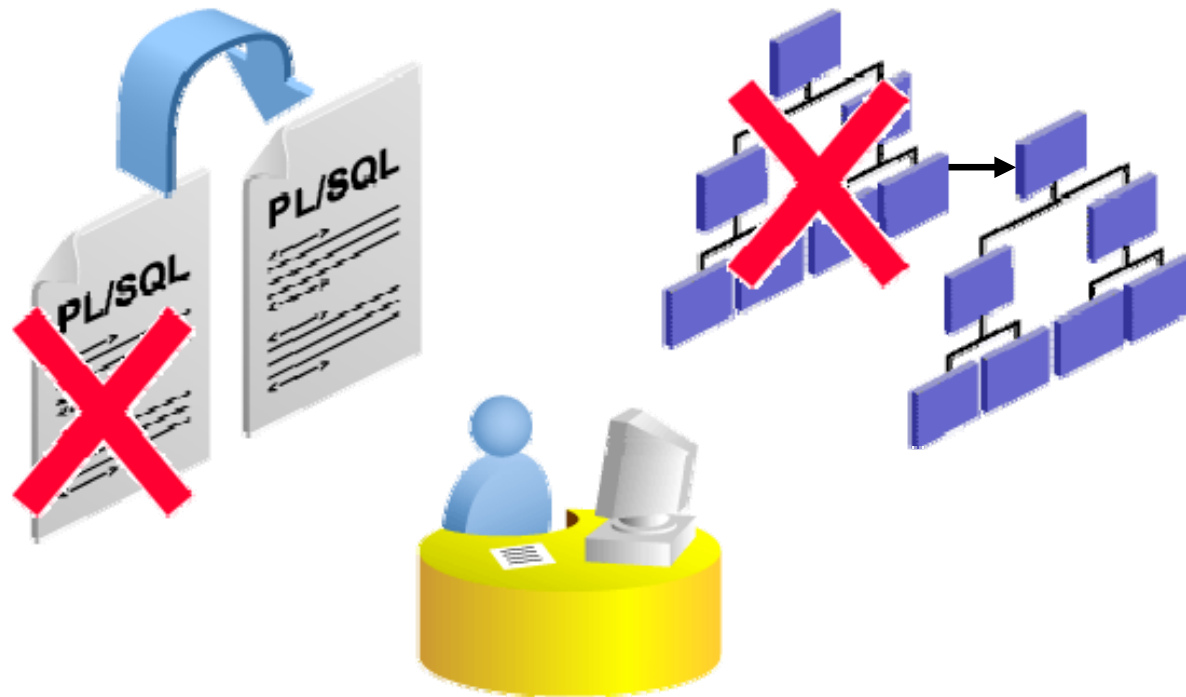V$LIBRARYCACHE
V$SGAINFO
V$PGASTAT

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

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Invalid and Unusable Objects

Effect on performance:

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

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Quiz

Automatic Memory Management allows the Oracle instance to reallocate memory from the _____ to the SGA .

1. Large Pool
2. Log Buffer
3. PGA
4. Streams Pool

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Quiz

`SGA_TARGET` may not be sized greater than _____ .

1. `LOG_BUFFER`
2. `SGA_MAX_SIZE`
3. `STREAMS_POOL_SIZE`
4. `PGA_AGGREGATE_TARGET`

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Summary

In this lesson, you should have learned how to:

- Use Enterprise Manager to monitor performance
- Use Automatic Memory Management (AMM)
- Use the Memory Advisor to size memory buffers
- View performance-related dynamic views
- Troubleshoot invalid and unusable objects

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Practice 13 Overview:
Monitoring and Improving Performance

This practice covers the following topics:

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

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