Monitoring Oracle DB Performance and Troubleshooting(RAC)

Performance tuning for an Oracle Real Application Clusters (Oracle RAC) database is very similar to performance tuning for a single-instance database. Many of the tuning tasks that you perform on single-instance Oracle databases can also improve performance of your Oracle RAC database. This chapter focuses on the performance tuning and monitoring tasks that are unique to Oracle RAC.

This chapter includes the following sections:

See Also:

- *Oracle Database 2 Day DBA* for more information about basic database tuning
- *Oracle Database 2 Day + Performance Tuning Guide* for more information about general performance tuning
- *Oracle Real Application Clusters Administration and Deployment Guide* for more information about diagnosing problems for Oracle Real Application Clusters components
- *Oracle Clusterware Administration and Deployment Guide* for more information about diagnosing problems for Oracle Clusterware components

Monitoring Oracle RAC Database and Cluster Performance

Both Oracle Enterprise Manager Database Control and Oracle Enterprise Manager Grid Control are cluster-aware and provide a central console to manage your cluster database.

From the Cluster Database Home page, you can do all of the following:

- View the overall system status, such as the number of nodes in the cluster and their current status. This high-level view capability means that you do not have to access each individual database instance for details if you just want to see inclusive, aggregated information.

- View alert messages aggregated across all the instances with lists for the source of each alert message. An **alert message** is an indicator that signifies that a particular metric condition has been encountered. A **metric** is a unit of measurement used to report the system's conditions.
- Review issues that are affecting the entire cluster and those that are affecting individual instances.
- Monitor cluster cache coherency statistics to help you identify processing trends and optimize performance for your Oracle RAC environment. Cache coherency statistics measure how well the data in caches on multiple instances is synchronized. If the data caches are completely synchronized with each other, then reading a memory location from the cache on any instance returns the most recent data written to that location from any cache on any instance.
- Determine if any of the services for the cluster database are having availability problems. A service is considered to be a problem service if it is not running on all preferred instances, if its response time thresholds are not met, and so on. Clicking on the link on the Cluster Database Home page opens the Cluster Managed Database services page where the service can be managed.
- Review any outstanding Clusterware interconnect alerts.

Also note the following points about monitoring Oracle RAC environments:

- Performance monitoring features, such as Automatic Workload Repository (AWR) and Statspack, are Oracle RAC-aware.

  Note:

  Instead of using Statspack, Oracle recommends that you use the more sophisticated management and monitoring features of the Oracle Database *11g* Diagnostic and Tuning packs, which include AWR

- You can use global dynamic performance views, or GV$ views, to view statistics across instances. These views are based on the single-instance V$ views.

This section contains the following topics:

About Automatic Database Diagnostic Monitor and Oracle RAC Performance

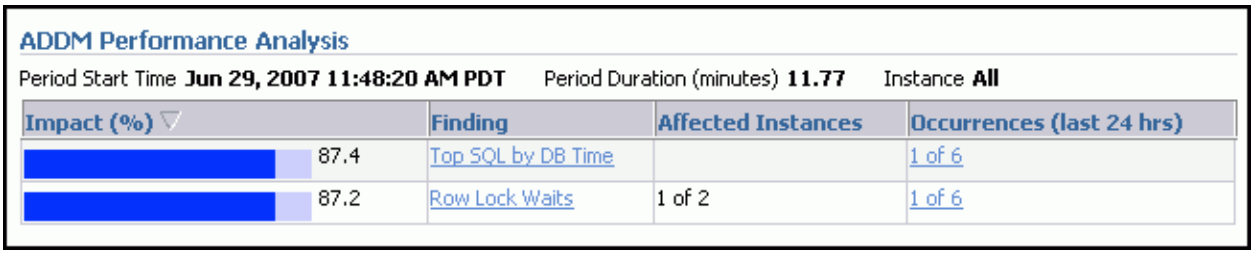
The Automatic Database Diagnostic Monitor (ADDM) is a self-diagnostic engine built into the Oracle Database. ADDM examines and analyzes data captured in the Automatic

Workload Repository (AWR) to determine possible performance problems in Oracle Database. ADDM then locates the root causes of the performance problems, provides recommendations for correcting them, and quantifies the expected benefits. ADDM analyzes the AWR data for performance problems at both the database and the instance level.

An ADDM analysis is performed as each AWR snapshot is generated, which is every hour by default. The results are saved in the database and can be viewed by using Enterprise Manager. Any time you have a performance problem, you should first review the results of the ADDM analysis. An ADDM analysis is performed from the top down, first identifying symptoms, then refining the analysis to reach the root causes, and finally providing remedies for the problems.

For the clusterwide analysis, Enterprise Manager reports two types of findings:

- Database findings: An issue that concerns a resource that is shared by all instances in the cluster database, or an issue that affects multiple instances. An example of a database finding is I/O contention on the disk system used for shared storage.
- Instance findings: An issue that concerns the hardware or software that is available for only one instance, or an issue that typically affects just a single instance. Examples of instance findings are high CPU load or sub-optimal memory allocation.



Description of the illustration addm_cluster_findings.gif

ADDM reports only the findings that are significant, or findings that take up a significant amount of instance or database time. Instance time is the amount of time spent using a resource due to a performance issue for a single instance and database time is the sum of time spent using a resource due to a performance issue for all instances of the database, excluding any Oracle Automatic Storage Management (Oracle ASM) instances.

An instance finding can be reported as a database finding if it relates to a significant amount of database time. For example, if one instance spends 900 minutes using the CPU, and the sum of all time spent using the CPU for the cluster database is 1040 minutes, then this finding would be reported as a database finding because it takes up a significant amount of database time.

A problem finding can be associated with a list of recommendations for reducing the impact of the performance problem. Each recommendation has a benefit that is an estimate of the portion of database time that can be saved if the recommendation is implemented. A list of recommendations can contain various alternatives for solving the same problem; you do not have to apply the recommendations.

Recommendations are composed of actions and rationales. You must apply all the actions of a recommendation to gain the estimated benefit of that recommendation. The rationales explain why the actions were recommended, and provide additional information to implement the suggested recommendation.

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- "About Workload Management"
- *Oracle Database 2 Day + Performance Tuning Guide* for more information about configuring and using AWR and ADDM
- *Oracle Database Performance Tuning Guide* for more information about Automatic Database Diagnostic Monitor

Viewing ADDM for Oracle RAC Findings

By default, ADDM runs every hour to analyze snapshots taken by the AWR during that period. If the database finds performance problems, then it displays the results of the analysis under Diagnostic Summary on the Cluster Database Home page. The ADDM Findings link shows how many ADDM findings were found in the most recent ADDM analysis.

ADDM for Oracle RAC can be accessed in Enterprise Manager by the following methods:

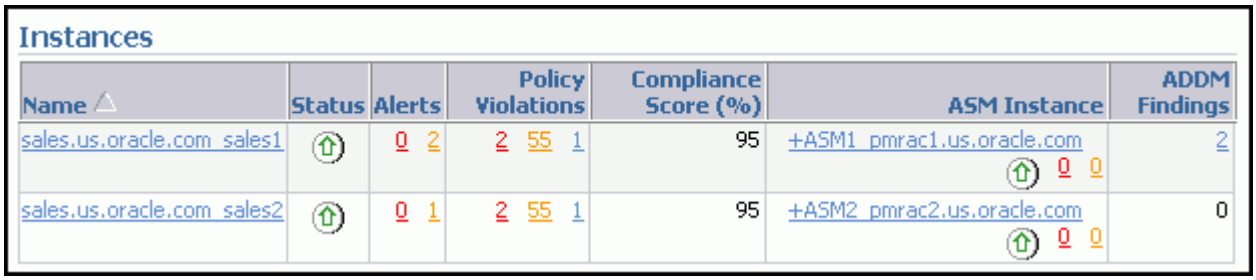
- On the Cluster Database Home Page, under Diagnostic Summary, click the **ADDM Findings Link**.
- On the Cluster Database Performance, click the camera icons at the bottom of the Active Sessions Graph.
- In the Related Links section on the Cluster Database Home page or the Performance, click **Advisor Central**. On the Advisor Central page, select **ADDM**. Choose the option **Run ADDM to analyze past performance** and specify an appropriate time period, then click **OK**.

To view ADDM findings from the Cluster Database Home page:

1. On the Cluster Database Home page, under Diagnostic Summary, if a nonzero number is displayed next to ADDM Findings, then click this link.

Description of the illustration addm_diag_home.gif

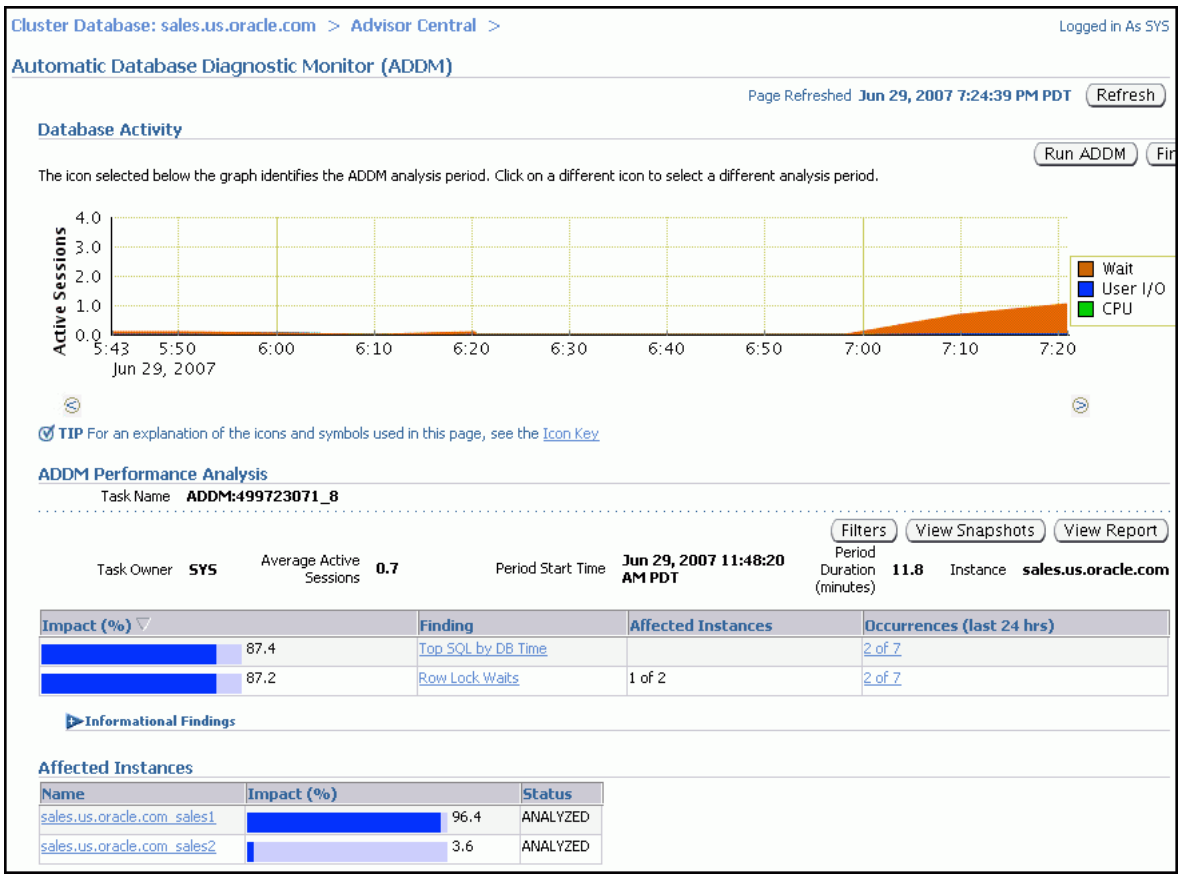
You can also view the ADDM findings per instance by viewing the Instances table on the Cluster Database Home page.



Description of the illustration addm_findings_by_inst.gif

When you select the number of ADDM Findings, the Automatic Database Diagnostic Monitor (ADDM) page for the cluster database appears.

2. Review the results of the ADDM run.



Description of the illustration addm_report_pg1.gif

On the Automatic Database Diagnostic Monitor (ADDM) page, the Database Activity chart shows the database activity during the ADDM analysis period. Database activity types are defined in the legend based on its corresponding color in the chart. Each icon below the chart represents a different ADDM task, which in turn corresponds to a pair of individual Oracle Database snapshots saved in the Workload Repository.

In the ADDM Performance Analysis section, the ADDM findings are listed in descending order, from highest impact to least impact. The Informational Findings section lists the areas that do not have a performance impact and are for informational purpose only.

The Affected Instances chart shows how much each instance is impacted by these findings.

3. (Optional) Click the Zoom icons to shorten or lengthen the analysis period displayed on the chart.
4. (Optional) To view the ADDM findings in a report, click **View Report**.

   The View Report page appears.

You can click **Save to File** to save the report for later access.

5. On the ADDM page, in the Affected Instances table, click the link for the instance associated with the ADDM finding that has the largest value for Impact.

   The Automatic Database Diagnostic Monitor (ADDM) page for that instance appears.

6. In the ADDM Performance Analysis section, select the name of a finding.

   The Performance Findings Detail page appears.

7. View the available Recommendations for resolving the performance problem. Run the SQL Tuning Advisor to tune the SQL statements that are causing the performance findings.

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- *Oracle Database 2 Day + Performance Tuning Guide*
- *Oracle Database 2 Day DBA* for more information about tuning a database and instance

Using the Cluster Database Performance Page

The Cluster Database Performance page provides a quick glimpse of the performance statistics for a database. Enterprise Manager accumulates data from each instance over specified periods of time, called collection-based data. Enterprise Manager also provides current data from each instance, known as real-time data.

Statistics are rolled up across all the instances in the cluster database. Using the links next to the charts, you can get more specific information and perform any of the following tasks:

- Identify the causes of performance issues.
- Decide whether resources need to be added or redistributed.
- Tune your SQL plan and schema for better optimization.
- Resolve performance issues.

The following screenshot shows a partial view of the Cluster Database Performance page. You access this page by clicking the **Performance** tab from the Cluster Database Home page.

Description of the illustration cldbperf001_11g.gif

The charts on the Performance page are described in the following sections:

- About Global Cache Block Access Latency Chart
- Viewing the Chart for Global Cache Block Access Latency
- Viewing the Chart for Cluster Host Load Average
- Viewing the Chart for Average Active Sessions
- Viewing the Database Throughput Chart

About Global Cache Block Access Latency Chart

Each cluster database instance has its own buffer cache in its System Global Area (SGA). Using Cache Fusion, Oracle RAC environments logically combine each instance's buffer cache to enable the database instances to process data as if the data resided on a logically combined, single cache.

When a process attempts to access a data block, it first tries to locate a copy of the data block in the local buffer cache. If a copy of the data block is not found in the local buffer cache, then a global cache operation is initiated. Before reading a data block

from disk, the process attempts to find the data block in the buffer cache of another instance. If the data block is in the buffer cache of another instance, then Cache Fusion transfers a version of the data block to the local buffer cache, rather than having one database instance write the data block to disk and requiring the other instance to reread the data block from disk. For example, after the `orcl1` instance loads a data block into its buffer cache, the `orcl2` instance can more quickly acquire the data block from the `orcl1` instance by using Cache Fusion rather than by reading the data block from disk.

The Global Cache Block Access Latency chart shows data for two different types of data block requests: current and consistent-read (CR) blocks. When you update data in the database, Oracle Database must locate the most recent version of the data block that contains the data, which is called the **current block**. If you perform a query, then only data committed before the query began is visible to the query. Data blocks that were changed after the start of the query are reconstructed from data in the undo segments. The reconstructed data is made available to the query in the form of a **consistent-read block**.

The Global Cache Block Access Latency chart on the Cluster Database Performance page shows the **latency** for each type of data block request, that is the elapsed time it takes to locate and transfer consistent-read and current blocks between the buffer caches.

If the Global Cache Block Access Latency chart shows high latencies (high elapsed times), then this can be caused by any of the following:

- A high number of requests caused by SQL statements that are not tuned.
- A large number of processes in the queue waiting for the CPU, or scheduling delays.
- Slow, busy, or faulty interconnects. In these cases, check your network connection for dropped packets, retransmittals, or cyclic redundancy check (CRC) errors.

Concurrent read and write activity on shared data in a cluster is a frequently occurring activity. Depending on the service requirements, this activity does not usually cause performance problems. However, when global cache requests cause a performance problem, optimizing SQL plans and the schema to improve the rate at which data blocks are located in the local buffer cache, and minimizing I/O is a successful strategy for performance tuning. If the latency for consistent-read and current block requests reaches 10 milliseconds, then your first step in resolving the problem should be to go to the Cluster Cache Coherency page for more detailed information.

Viewing the Chart for Global Cache Block Access Latency

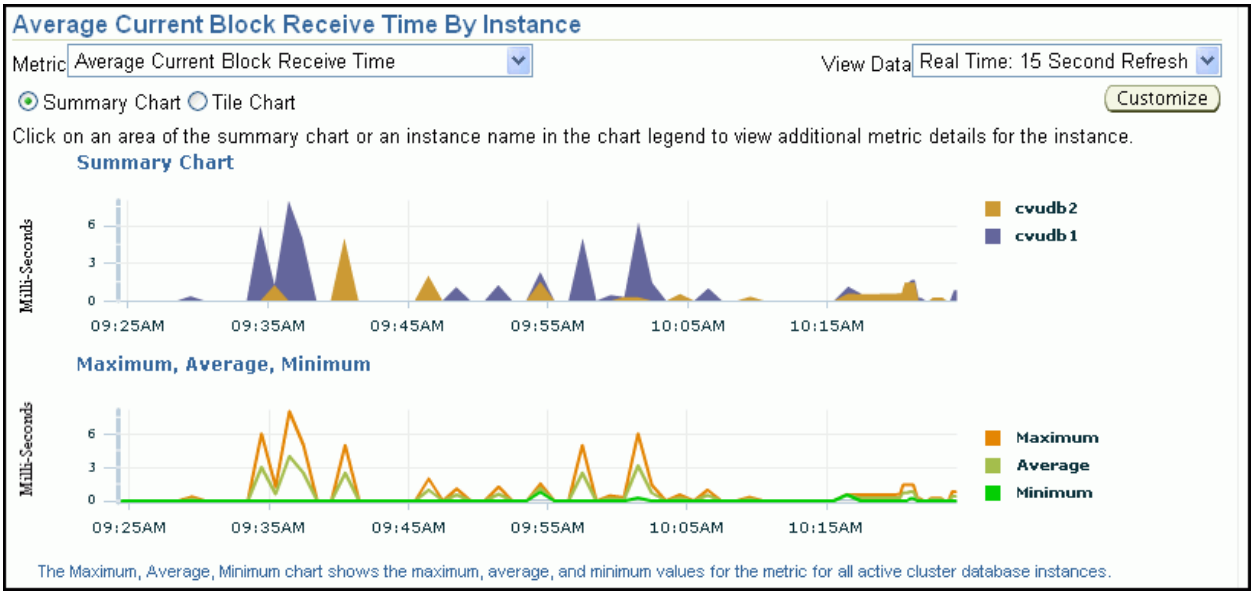
You can click either metric for the Global Cache Block Access Latency chart to view more detailed information about that type of cached block. For example, if you click the metric **Average Current Block Receive Time**, then the Average Current Block Receive Time by Instance page appears, displaying a summary chart that depicts the average current block receive time for up to four nodes in the cluster. You can select whether the data is displayed in a summary chart or using tile charts. If you choose Summary chart, then, by default, the instances with the four highest receive times are displayed. If you choose Tile charts, then the data for each node is displayed in its own chart. You can customize which nodes are displayed in either the Summary or Tile chart display.

Also, on the Average Current Block Receive Time By Instance page or the Cluster Cache Coherency page, you can use the slider bar on the Active Session History chart to focus on a five minute window (time period) within the past one hour. Using the slider bar enables you to identify the top sessions, services, modules, actions, or SQL statements that were running during a period of high cache coherency activity.

At the top of the page, you can use the Metric list to change the metric displayed. The choices are:

- Average CR Block Receive Time
- Average Current Block Receive Time
- GC Current Blocks Received
- GC CR Blocks Received
- Physical Reads
- Global Cache Block Transfers

Each metric displays a monitoring page for that metric. On each metric monitoring page you can view the data for that metric in either a summary chart or using tile charts. You can also view the Maximum, Average, Minimum chart on the metric monitoring page to view the maximum, average, and minimum values for the metric for all active cluster database instances.



Description of the illustration cldbperf004_r2.gif

Viewing the Chart for Cluster Host Load Average

The Cluster Host Load Average chart in the Cluster Database Performance page shows potential problems that are outside the database. The chart shows maximum, average, and minimum load values for available nodes in the cluster for the previous hour.

If the load average is higher than the average of the total number of CPUs across all the hosts in the cluster, then too many processes are waiting for CPU resources. SQL statements that are not tuned often cause high CPU usage. Compare the load average values with the values displayed for CPU Used in the Average Active Sessions chart. If the sessions value is low and the load average value is high, then this indicates that something else on the host, other than your database, is consuming the CPU.

You can click any of the load value labels for the Cluster Host Load Average chart to view more detailed information about that load value. For example, if you click the label **Average**, then the Hosts: Average Load page appears, displaying charts that depict the average host load for up to four nodes in the cluster.

You can select whether the data is displayed in a summary chart, combining the data for each node in one display, or using tile charts, where the data for each node is displayed in its own chart. You can click **Customize** to change the number of tile charts displayed in each row or the method of ordering the tile charts.

For more information about changing the data displayed on the Hosts: Average Load page, refer to the Enterprise Manager online Help.

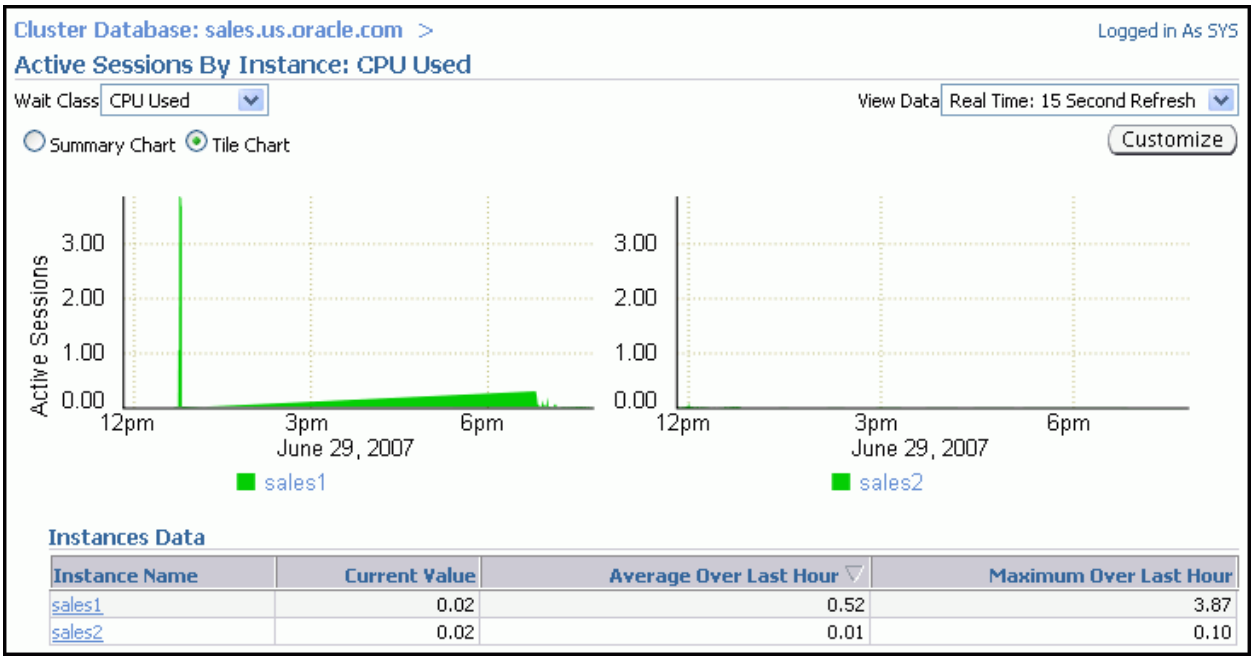
Viewing the Chart for Average Active Sessions

The Average Active Sessions chart in the Cluster Database Performance page shows potential problems inside the database. Categories, called wait classes, show how much of the database is using a resource, such as CPU or disk I/O. Comparing CPU time to wait time helps to determine how much of the response time is consumed with useful work rather than waiting for resources that are potentially held by other processes.

The chart displays the workload on the database or instance and identifies performance issues. At the cluster database level, this chart shows the aggregate wait class statistics across all the instances. For a more detailed analysis, you can click the clipboard icon at the bottom of the chart to view the ADDM analysis for the database for that time period.

Compare the peaks on the Average Active Sessions chart with those on the Database Throughput charts. If the Average Active Sessions chart displays a large number of sessions waiting, indicating internal contention, but throughput is high, then the situation may be acceptable. The database is probably also performing efficiently if internal contention is low but throughput is high. However, if internal contention is high and throughput is low, then consider tuning the database.

If you click the wait class legends beside the Average Active Sessions chart, then you can view instance-level information stored in Active Sessions by Instance pages. You can use the Wait Class action list on the Active Sessions by Instance page to view the different wait classes. The Active Sessions by Instance pages show the service times for up to four instances. Using the Customize button you can select the instances that are displayed. You can view the data for the instances separately using tile charts, or you can combine the data into a single summary chart.



Description of the illustration cpu_used_by_inst.gif

If you must diagnose and fix problems that are causing the higher number of wait events in a specific category, then you can select an instance of interest and view the wait events, also the SQL, sessions, services, modules, and actions that are consuming the most database resources.

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- "About Oracle Grid Infrastructure for a Cluster and Oracle RAC"
- *Oracle Database 2 Day + Performance Tuning Guide*
- *Oracle Database 2 Day DBA* for more information about tuning a database and instance

Viewing the Database Throughput Chart

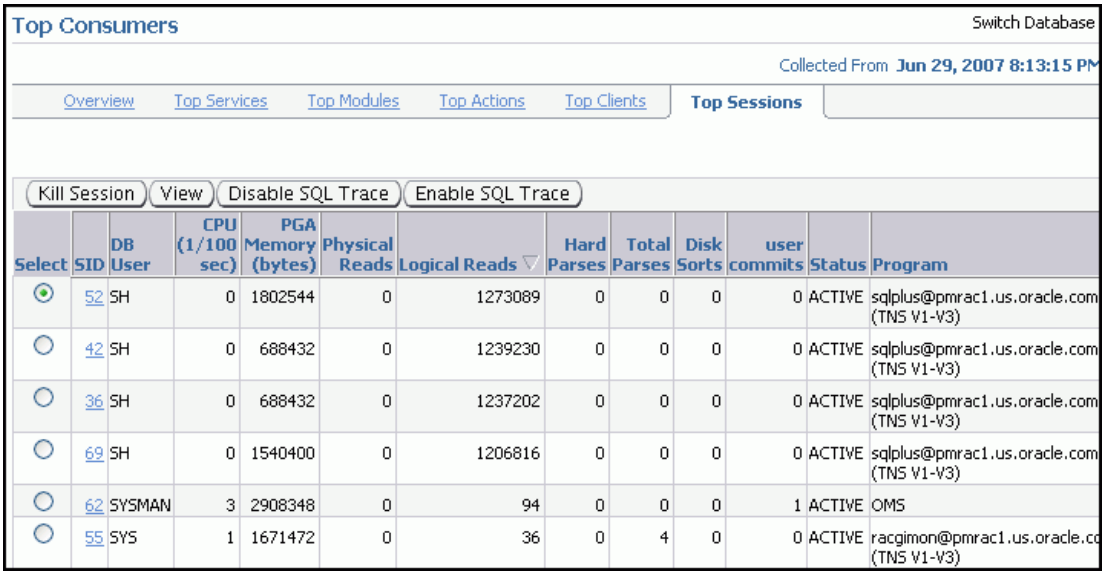
The last chart on the Performance page monitors the usage of various database resources. By clicking the Throughput tab at the top of this chart you can view the Database Throughput chart.

The Database Throughput charts summarize any resource contention that appears in the Average Active Sessions chart, and also show how much work the database is performing on behalf of the users or applications. The Per Second view shows the number of transactions compared to the number of logons, and the amount of physical reads compared to the redo size per second. The Per Transaction view shows the

amount of physical reads compared to the redo size per transaction. Logons is the number of users that are logged on to the database.

You can also obtain information at the instance level by clicking a legend to the right of the charts to access the Database Throughput by Instance page. This page shows the breakdown of the aggregated Database Throughput chart for up to four instances. Using the Customize button you can select the instances that are displayed. You can view the data for the instances separately using tile charts, or you can combine the data into a single summary chart. You can use this page to view the throughput for a particular instance, which may help you diagnose throughput problems.

You can drill down further on the Database Throughput by Instance page to see the sessions of an instance consuming the greatest resources. Click an instance name legend just under the chart to go to the Top Sessions subpage of the Top Consumers page for that instance.



Select	SID	DB User	CPU (1/100 sec)	PGA Memory (bytes)	Physical Reads	Logical Reads	Hard Parses	Total Parses	Disk Sorts	user commits	Status	Program
◉	52	SH	0	1802544	0	1273089	0	0	0	0	ACTIVE	sqlplus@pmrac1.us.oracle.com (TNS V1-V3)
○	42	SH	0	688432	0	1239230	0	0	0	0	ACTIVE	sqlplus@pmrac1.us.oracle.com (TNS V1-V3)
○	36	SH	0	688432	0	1237202	0	0	0	0	ACTIVE	sqlplus@pmrac1.us.oracle.com (TNS V1-V3)
○	69	SH	0	1540400	0	1206816	0	0	0	0	ACTIVE	sqlplus@pmrac1.us.oracle.com (TNS V1-V3)
○	62	SYSMAN	3	2908348	0	94	0	0	0	1	ACTIVE	OMS
○	55	SYS	1	1671472	0	36	0	4	0	0	ACTIVE	racgimon@pmrac1.us.oracle.co (TNS V1-V3)

Description of the illustration top_sessions_inst.gif

For more information about the information on this page, refer to the Enterprise Manager Help system.

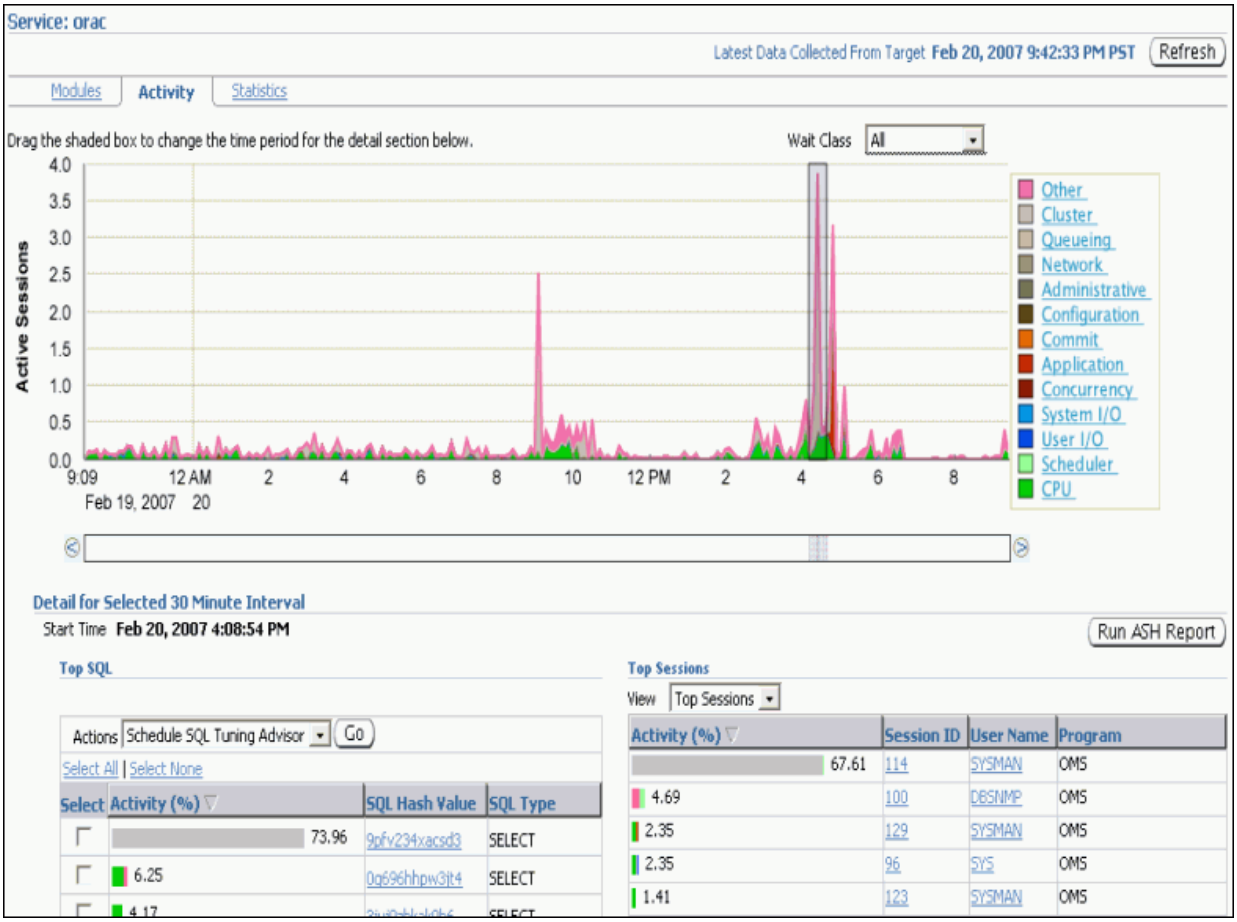
See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- "About Oracle Grid Infrastructure for a Cluster and Oracle RAC"
- *Oracle Database 2 Day + Performance Tuning Guide*
- *Oracle Database 2 Day DBA* for more information about tuning a database and instance

Viewing the Services Chart

The last chart on the Performance page monitors the usage of various database resources. By clicking the Services tab at the top of this chart you can view the Services chart.

The Services charts shows the top services being used by the active sessions. Only active services are shown. You can select a service legend to the right of the chart to go to the Service subpage of the Top Consumers page. The Activity subtab is selected by default. On this page you can view real-time data showing the session loads by wait classes for the service.



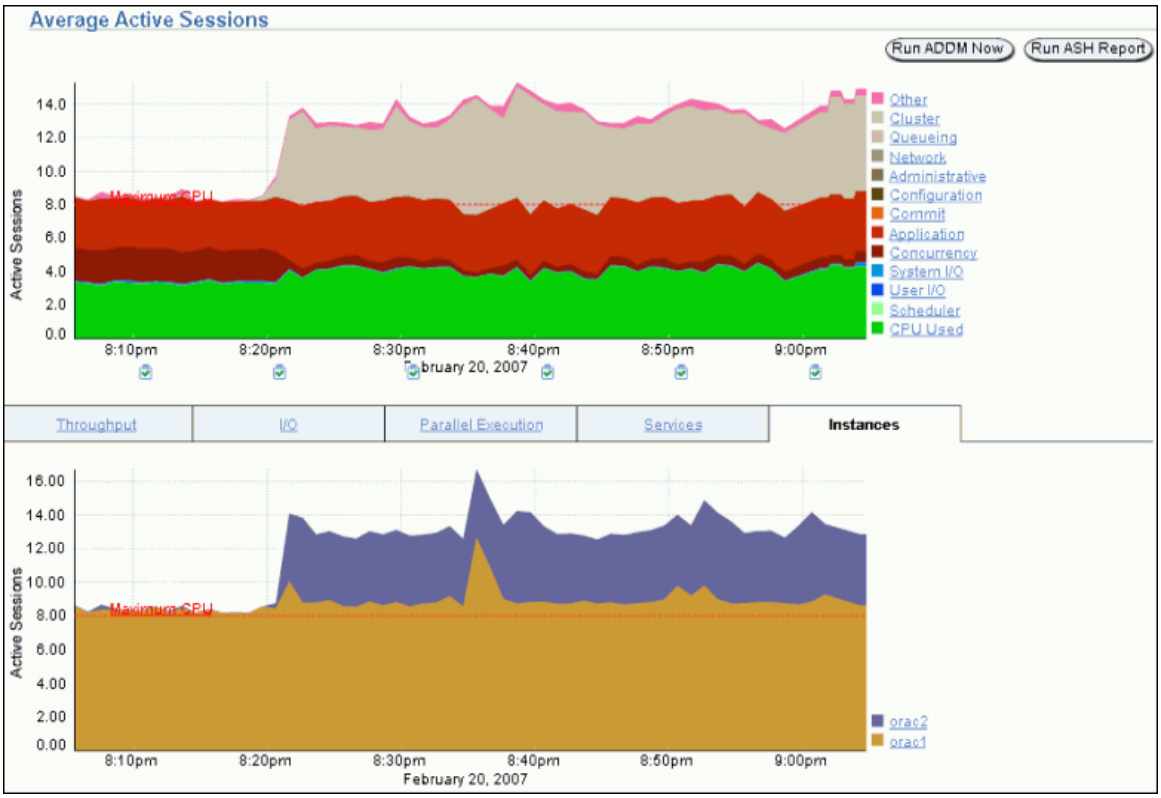
Description of the illustration addm_rac_top_service.gif

For more information about the information on this page, refer to the Enterprise Manager Help system.

Viewing the Active Sessions by Instance Chart

The last chart on the Performance page monitors the usage of various database resources. By clicking the Instances tab at the top of this chart you can view the Active Sessions by Instance chart.

The Active Sessions by Instance chart summarize any resource contention that appears in the Average Active Sessions chart. Using this chart you can quickly determine how much of the database work is being performed on each instance.



Description of the illustration addm_rac6.gif

You can also obtain information at the instance level by clicking a legend to the right of the chart to access the Top Sessions page. On the Top Session page you can view real-time data showing the sessions that consume the greatest system resources.

For more information about the information on this page, refer to the Enterprise Manager Help system.

Viewing Other Performance Related Charts

In the Additional Monitoring Links and Additional Instance Monitoring Links section of the Cluster Database Performance page, there are links to other charts that are useful in evaluating the performance of your cluster database.

This section contains the following topics:

- Accessing the Cluster Cache Coherency Page
- Accessing the Top Consumers Page
- Accessing the Top Sessions Page

- Accessing the Top Activity Page
- Accessing the Instance Activity Page
- Accessing the Top Segments Page
- Accessing the Database Locks Page

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- *Oracle Database 2 Day + Performance Tuning Guide*
- *Oracle Database 2 Day DBA* for more information about tuning a database and instance

Accessing the Cluster Cache Coherency Page

The Cluster Cache Coherency page contains summary charts for cache coherency metrics for the cluster.

Table 8-1 describes the Cluster Cache Coherency charts and the actions to perform to access more comprehensive information for problem resolution.

Table 8-1 Cluster Cache Coherency Charts

Name	Description
Global Cache Block Access Latency	Shows the total elapsed time, or latency, for a block request. Click a legend to the right of the chart to view the average time it takes to receive data blocks for each block type (current or CR) by instance. On the Average Block Receive Time by Instance page, you can click an instance legend under the chart to go to the Block Transfer for Local Instance page, where you can identify which block classes, such as undo blocks, data blocks, and so on, are subject to intense global cache activity. This page displays the block classes that are being transferred, and which instances are transferring most of the blocks.Cache transfer indicates how many current and CR blocks for each block class were received from remote instances, including how many transfers incurred a delay (busy) or an unexpected longer delay (congested).
Global Cache Block Transfer Rate	Shows the total aggregated number of blocks received by all instances in the cluster by way of an interconnect. Click a legend to the right of the chart to go to the Global Cache Blocks Received by Instance page for that type of block. From there, you can click an instance legend under the chart to go to the Segment Statistics by Instance page, where you can see which segments are causing cache contention.

Name	Description
Global Cache Block Transfers and Physical Reads	Shows the percentage of logical read operations that retrieved data from the buffer cache of other instances by way of Direct Memory Access and from disk. It is essentially a profile of how much work is performed in the local buffer cache, rather than the portion of remote references and physical reads, which both have higher latencies. Click a legend to the right of the chart to go to the Global Cache Block Transfers vs. Logical Reads by Instance and Physical Reads vs. Logical Reads by Instance pages. From there, you can click an instance legend under the chart to go to the Segment Statistics by Instance page, where you can see which segments are causing cache contention.

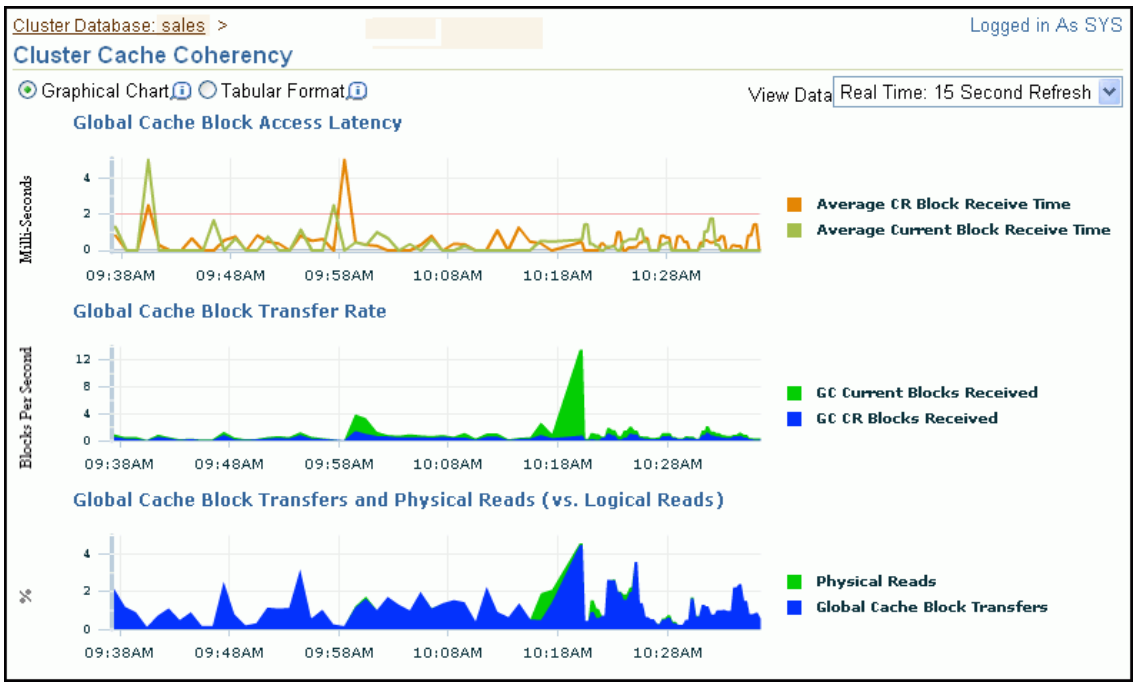
To access the Cluster Cache Coherency page:

1. On the Cluster Database Home page, select Performance.

   The Performance subpage appears.

2. Click **Cluster Cache Coherency** in the Additional Monitoring Links section at the bottom of the page.
3. Alternatively, click either of the legends to the right of the Global Cache Block Access Latency chart.

   The Cluster Cache Coherency page appears.



Description of the illustration cldbperf002_r2.gif

Accessing the Top Consumers Page

The Top Consumers page provides access to several tabs that enable you to view real-time or collection-based data for the services, modules, actions, clients, and sessions that are consuming the most system resources.

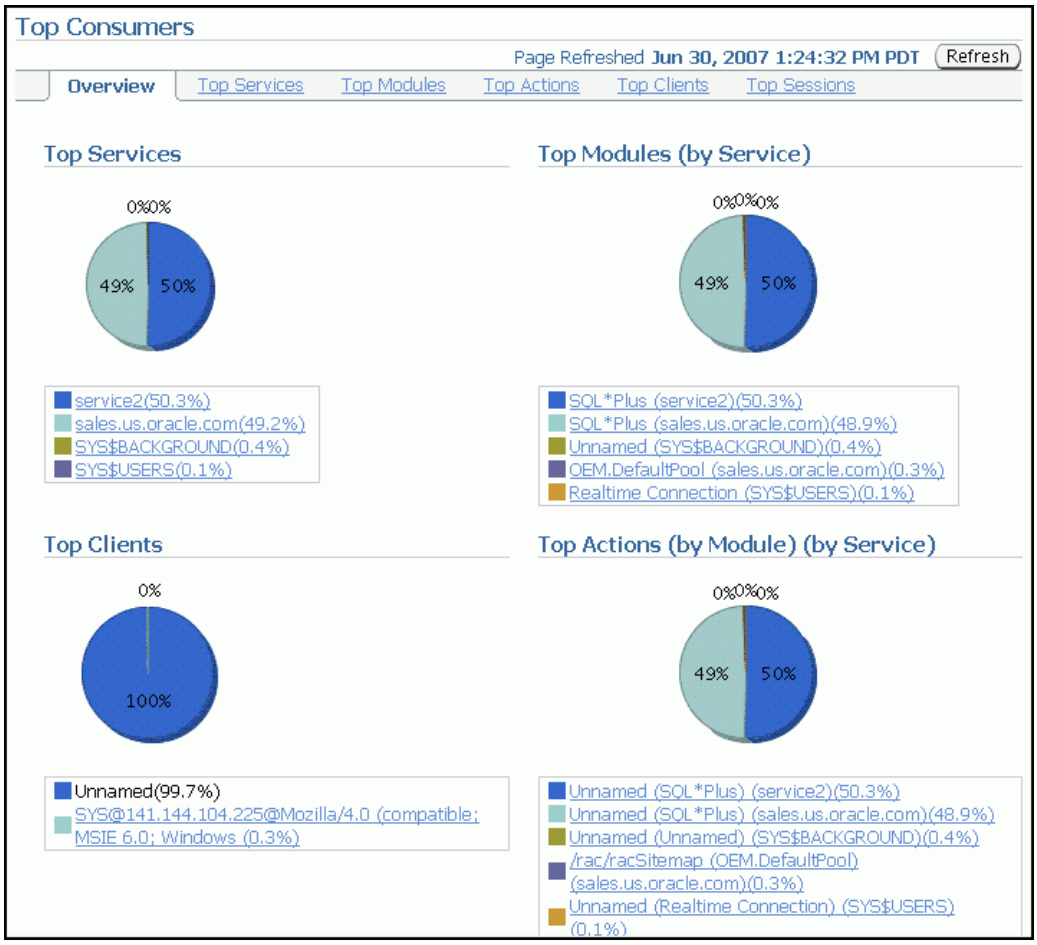
To access the Top Consumers page:

1. On the Cluster Database Home page, select Performance.

   The Performance subpage appears.

2. Click **Top Consumers** in the Additional Monitoring Links section at the bottom of the page.

   When accessed this way, the Top Consumers page initially displays the Overview tab by default, which shows aggregated summary data for the highest resource consumers.



Description of the illustration top_consumers.gif

3. (Optional) Click the portion of a chart representing the consumer or click the link under the chart for that consumer to view instance-level information about that consumer.

   The page that appears shows the running instances that are serving the consumer.

4. (Optional) Expand the names in the Action or Module column to show data for individual instances.

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- *Oracle Database 2 Day + Performance Tuning Guide*

Accessing the Top Sessions Page

The Top Sessions page shows a real-time summary list of sessions based on aggregated data. You can see which sessions have consumed the greatest amount of

system resources, referred to as the top sessions, and then decide whether you want to stop the sessions.

To access the Top Sessions page:

1. On the Cluster Database Home page, select Performance.

   The Performance subpage appears.

2. Click **Top Consumers** in the Additional Monitoring Links section at the bottom of the page.
3. On the Top Consumers page, click the **Top Sessions** subtab.

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- *Oracle Database 2 Day + Performance Tuning Guide*

Accessing the Top Activity Page

The Top Activity page enables you to view the cluster database activity by waits, services and instances. Also, you can see the details for the Top SQL and Top Sessions for a specific five minute interval by moving the slider bar on the Top Activity chart.

In the Top SQL detail section, you can select problematic SQL statements and either schedule the SQL Tuning Advisor for those statements or create a SQL Tuning Set.

By default, the Top Sessions for the selected time period are shown. Using the View action list in this section you can change the display to one of the following:

- Top Sessions
- Top Services
- Top Modules
- Top Actions
- Top Clients
- Top Files
- Top Objects
- Top PL/SQL
- Top Instances

To access the Top Activity page:

1. On the Cluster Database Home page, select **Performance**.

   The Performance subpage appears.

2. Click **Top Activity** in the Additional Monitoring Links section at the bottom of the page.

   The Top Activity page appears.

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- *Oracle Database 2 Day + Performance Tuning Guide*
- *Oracle Database 2 Day DBA* for more information about tuning a database and instance

Accessing the Instance Activity Page

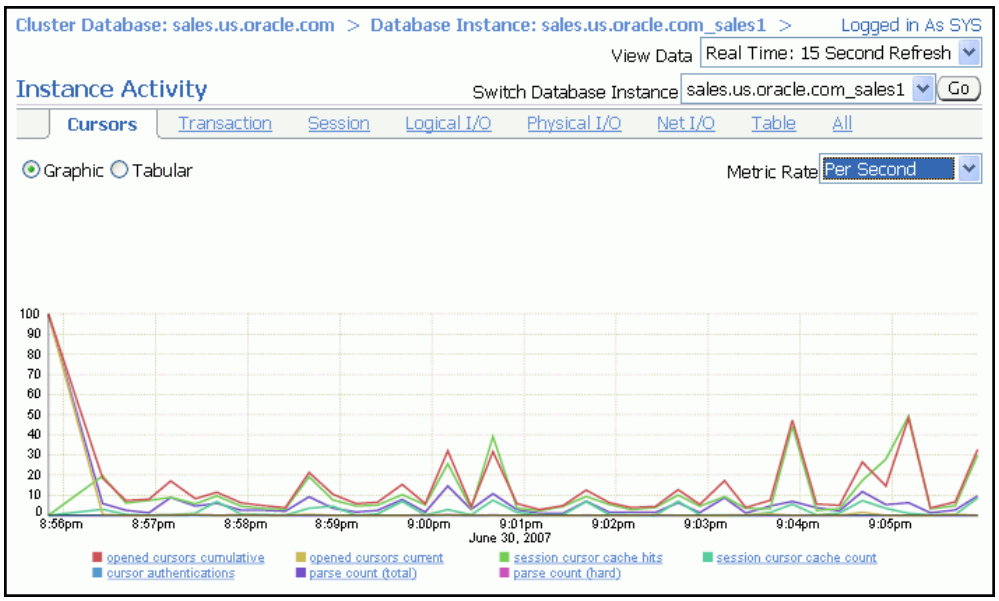
The Instance Activity page enables you to view instance activity for several metrics within general metric categories, such as cursors, transactions, sessions, logical I/O, physical I/O, and net I/O. You can view data for each second or transaction.

To access the Instance Activity page:

1. On the Cluster Database Home page, select **Performance**.

   The Performance subpage appears.

2. Click **Instance Activity** in the Additional Monitoring Links section at the bottom of the page.
3. (Optional) Click a metric legend under the chart if in Graphic mode, or click a name in the summary table if in Tabular mode to access top sessions statistics for a particular metric.



Description of the illustration instance_activity.gif

4. (Optional) Use the **Switch Database Instance** list to change the instance for which the data is displayed in the chart.

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- *Oracle Database 2 Day + Performance Tuning Guide*

Accessing the Top Segments Page

Collecting and viewing statistics at the segment level is an effective method for identifying frequently accessed tables or indexes in a database. The Top Segments page enables you to gather segment-level statistics to identify performance problems associated with individual segments. This page is particularly useful for Oracle RAC, because it also tracks the number of consistent-read and current blocks received by an object. A high number of current blocks received plus a high number of buffer waits may indicate potential resource contention.

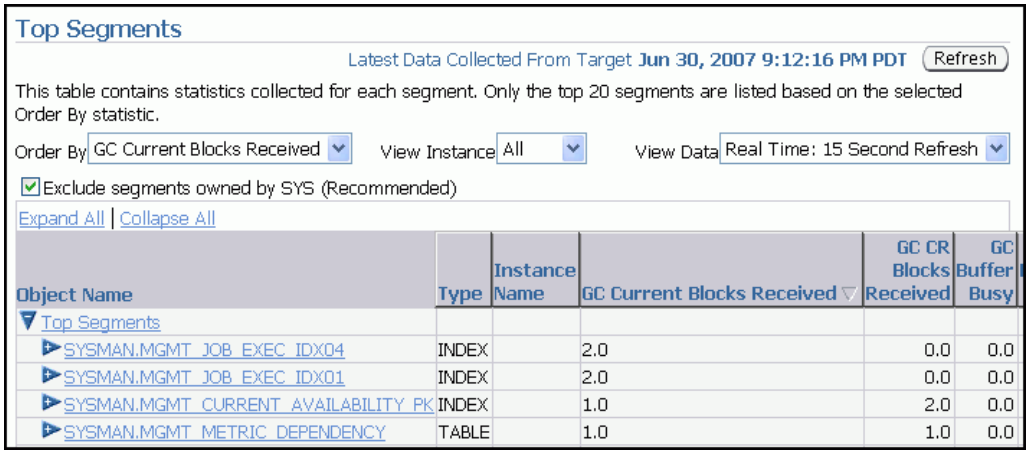
To access the Top Segments page:

1. On the Cluster Database Home page, select **Performance**.

   The Performance subpage appears.

2. Click **Top Segments** in the Additional Monitoring Links section at the bottom of the page.

You can view segments for all instances, or use a filter to see segments for a specific instance.



Description of the illustration top_segments.gif

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"

Accessing the Database Locks Page

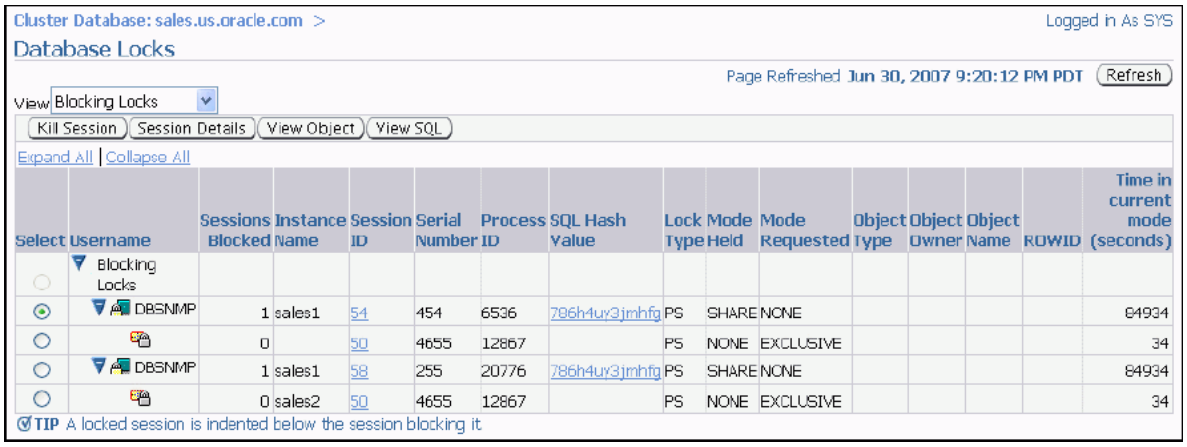
Use the Database Locks page to determine if multiple instances are holding locks for the same object. The page shows user locks, all database locks, or locks that are blocking other users or applications. You can use this information to stop a session that is unnecessarily locking an object.

To access the Database Locks page:

1. On the Cluster Database Home page, select **Performance**.

   The Performance subpage appears.

2. Click **Database Locks** in the Additional Monitoring Links section at the bottom of the page.



Description of the illustration database_locks.gif

See Also:

- "Monitoring Oracle RAC Database and Cluster Performance"
- *Oracle Database Administrator's Guide*