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Preface

This manual is a compilation of the Oracle Database and database-related target metrics provided in Oracle Enterprise Manager.

Audience

This document is intended for Oracle Enterprise Manager users interested in Oracle Database and database-related target metrics.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

Related Documents

For more information about Enterprise Manager, see the following manuals in the Oracle Enterprise Manager 13c documentation set:

- *Oracle Enterprise Manager Grid Control Basic Installation Guide*
- *Oracle Enterprise Manager Grid Control Advanced Installation and Configuration Guide*
- *Oracle Enterprise Manager Concepts*
- *Oracle Enterprise Manager Cloud Control Quick Start Guide*
- *Oracle Enterprise Manager Administration*
- *Oracle Enterprise Manager Framework, Host, and Services Metric Reference Manual*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

How to Use This Manual

The *Oracle Enterprise Manager Oracle Database Plug-in Metric Reference Manual* (hereafter referred to as the *Oracle Database Plug-in Metric Reference Manual*) lists all of the Oracle Database and database-related target metrics that Enterprise Manager monitors. This manual compiles in one place all of the database and database-related target metric help available online, eliminating the need to have the Database Control Console up and running.

This preface describes:

- [Structure of the Oracle Database Plug-in Metric Reference Manual](#)
- [About Metrics, Thresholds, and Alerts](#)

Structure of the Oracle Database Plug-in Metric Reference Manual

This manual contains a chapter for the Oracle Database target and database-related targets for which there are metrics.

The metrics in each chapter are in alphabetical order according to category.

Metric Information

Where available, each metric includes the following information:

- Description
Explanation following the metric name. This text defines the metric and, where available, provides additional information pertinent to the metric.
- Metric Summary Table
Where available, this table lists the target version, default collection frequency, default warning threshold, default critical threshold, and alert text for the metric.
- Data Source
How the metric is calculated. In some metrics, data source information is not available.
- User Action
Suggestions of how to solve the problem causing the alert.

Examples of Metric Summary Tables

This section provides examples of Metric Summary tables that you will see in the *Oracle Database Plug-in Metric Reference Manual*.

When default thresholds are not defined for a metric, only the target version and default collection frequency are available.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

The following table shows a metric where the server evaluation frequency is the same as the collection frequency.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 10 Minutes	10000000	12500000	Bytes sent by the server are %value%

Definitions of Columns in Metric Summary Tables

As previously mentioned, the Metric Summary table is part of the overall metric information. The following table provides descriptions of columns in the Metric Summary table.

Column Header	Column Definition
Target Version	Version of the target, for example, 10g and 11gR1.
Evaluation and Collection Frequency	The rate at which the metric is collected and evaluated to determine whether it has crossed its threshold. The evaluation frequency is the same as the collection frequency.
Collection Frequency	The rate at which the Management Agent collects data. The default collection frequency for a metric comes from the Enterprise Manager default collection file for that target type.
Default Warning Threshold	Value that indicates whether a warning alert should be initiated. If the evaluation of the warning threshold value returns a result of TRUE for the specified number of consecutive occurrences defined for the metric, an alert triggers at the warning severity level.
Default Critical Threshold	Value that indicates whether a critical alert should be initiated. If the evaluation of the critical threshold value returns a result of TRUE for the specified number of consecutive occurrences defined for the metric, an alert triggers at the critical severity level.
Alert Text	Message indicating why the alert was generated. Words that display between percent signs (%) denote variables. For example, Disk Utilization for %keyValue% is %value%% could translate to Disk Utilization for d0 is 80%.

Abbreviations and Acronyms

To reduce the page count in this document, the following abbreviations and acronyms are used:

Abbreviation/Acronym	Name
Agent	Oracle Management Agent
Listener	Oracle Listener

About Metrics, Thresholds, and Alerts

A metric is a unit of measurement used to determine the health of a target. It is through the use of metrics and associated thresholds that Enterprise Manager sends out alerts notifying you of problems with the target.

Thresholds are boundary values against which monitored metric values are compared. For example, for each disk device associated with the Disk Utilization (%) metric, you can define a different warning and critical threshold. Some of the thresholds are predefined by Oracle.

When a threshold is reached, Enterprise Manager generates an alert. An alert is an indicator signifying that a particular condition has been encountered and is triggered when one of the following conditions is true:

- A threshold is reached.
- An alert has been cleared.
- The availability of a monitored service changes. For example, the availability of an application server changes from up to down.
- A specific condition occurs. For example, an alert is triggered whenever an error message is written to a database alert log file.

Alerts are detected through a polling-based mechanism by checking for the monitored condition from a separate process at regular, predefined intervals.

See Also: See the *Oracle Enterprise Manager Concepts* manual and the Enterprise Manager online help for additional information about metrics, thresholds, and alerts

Accessing Metrics

To access metrics from the Cloud Control Console, use the All Metrics page:

1. From the Cloud Control Console, choose the target.
2. From the target's home page, select the target type name, then **Monitoring**, and then **All Metrics**.

Editing Metrics

Out of the box, Enterprise Manager comes with default thresholds for critical metrics. Enterprise Manager generates alerts when warning and critical thresholds are reached, letting you know of impending problems so that you can address them in a timely manner.

To better suit the monitoring needs of your organization, you can edit the thresholds provided by Enterprise Manager and define new thresholds.

When defining thresholds:

- Choose acceptable values to avoid unnecessary alerts, while still being notified of issues in a timely manner.
- Adjust your metric thresholds based on metric trends. One of the more important actions you can perform with your monitoring system is to track metric trends for some period of time so you can make informed decisions about what metrics are important as well as what levels your thresholds should be set at.
- Set the number of occurrences appropriately. If some events occur only once or twice, for example, you might not need to be notified of them. You can set the number of occurrences of a metric that must be reached before you are notified.

To modify metric thresholds:

1. From the Cloud Control console, right-click the target name, select **Monitoring**, and then **All Metrics**.
2. From the **All Metrics** page, select the metric that you want to modify.
3. Click **Modify Thresholds**.
4. In the Modify Thresholds window, you can set values for settings such as:
 - Warning Threshold
 - Critical Threshold
 - Occurrences Before Alert

Note: You must have at least OPERATOR privilege on the target to make changes. Without OPERATOR privilege, the content of the Metric Threshold table is read-only.

5. Click **Save Thresholds** to upload the new metric settings to the Management Repository.

Specifying Multiple Thresholds

The Specifying Multiple Thresholds functionality enables you to define various subsets of data that can have different thresholds. By specifying multiple thresholds, you can refine the data used to trigger alerts, which are one of the key benefits of using Enterprise Manager.

The key in specifying multiple thresholds is to determine how the comparison relates to the metric threshold as a whole. What benefit will be realized by defining a more stringent or lax threshold for that particular device, mount point, and so on?

For example, using the Average Disk I/O Service Time metric, you can define warning and critical thresholds to be applied to all disks (sd0 and sd1), or you can define different warning and critical thresholds for a specific disk (sd0). This enables you to adjust the thresholds for sd0 to be more stringent or lax for that particular disk.

Cluster ASM Metrics

This chapter provides information about the Cluster Automatic Storage Management (ASM) metrics.

1.1 ASM Cardinality

This metric category collects the number of ASM instances that are part of Cluster ASM. The default collection time is every five minutes.

1.1.1 Open Instance Count

This metric shows the ASM open instance count.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The data source is the status column in the gv\$instance view.

User Action

No user action is required.

1.2 ASM Cluster File System

The metrics in the ASM Cluster File System metric category show the space used by all of the ASM Cluster File Systems. These metrics are used to collect information about the ASM Cluster File System space usage and are used to show the trend of ASM Cluster File System space usage in the application. These metrics collect information for both mounted and dismounted ASM Cluster File Systems. This information is used to determine the following metrics for space usage: Allocated Space (GB), Size (GB), Free (GB), Used (GB), and Used (%). These metrics also collect information about whether the ASM Cluster File System is corrupt. For dismounted ASM Cluster File Systems, 0 is returned for the Free (GB), Used (GB), and Used (%) metrics.

These metrics only collect information about the ASM Cluster File System that is not specific to a node in a cluster. They collect space usage information which is the same across all nodes in the cluster. Information such as the state and availability of the ASM Cluster File System can be different across the nodes in a cluster and is collected by the ASM Cluster File System State metrics.

These metrics generate a warning alert if the ASM Cluster File System is 85% used and a critical alert if 97% used. These metrics also generate a critical alert if the ASM Cluster File System has sections that are corrupt.

These metrics are collected at a time interval of 15 minutes and the metrics will be collected at the cluster level if the target is Cluster ASM otherwise they will be collected at the instance level as a part of the ASM target type metrics. You can change the threshold limit as required.

1.2.1 ASM Cluster File System Corrupt

This metric shows if the mounted ASM Cluster File System has sections that are corrupt. A value of TRUE for this metric indicates that there are sections that are corrupt and therefore the Check and Repair operation should be run on the ASM Cluster File System to fix it. For dismounted ASM Cluster File Systems, it returns a value of Null for this metric.

This metric generates a warning alert if the ASM Cluster File System is dismounted on a given host. The metric also generates a critical alert if the mounted ASM Cluster File System is not available on a host.

This metric is collected at a time interval of 15 minutes. You can change the threshold limit as required.

This metric is collected with the help of a SQL query which queries the V\$ASM_FILESYSTEM, V\$ASM_VOLUME, V\$ASM_OFSVOLUMES views.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	TRUE	The ASM Cluster File System using volume device %ofs_volume_device% has sections that are corrupt. Run check and repair operation on the file system to fix the issue.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each unique combination of volume device and disk group objects.

If warning or critical threshold values are currently set for any unique combination of volume device and disk group objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of volume device and disk group objects, use the Edit Thresholds page.

Data Source

This metric is collected from the column CORRUPT in the V\$ASM_FILESYSTEM view for mounted ASM Cluster File Systems. For Dismounted File Systems, a value of Null is returned for this metric.

User Action

Run Check and Repair on the ASM Cluster File System to fix the corrupted sections.

1.2.2 ASM Cluster File System Used (%)

This metric shows if the percent of the ASM cluster file system that is used.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12cR1	Every 30 Minutes	Not Defined	TRUE	The ASM Cluster File System using volume device %ofs_volume_device% has sections that are corrupt. Run check and repair operation on the file system to fix the issue.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each unique combination of volume device and disk group objects.

If warning or critical threshold values are currently set for any unique combination of volume device and disk group objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of volume device and disk group objects, use the Edit Thresholds page.

1.2.3 Allocated Space (GB)

This metric shows the space allocated from the disk group for this ASM Cluster File System in GB.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column SPACE in the V\$ASM_FILE view.

User Action

No user action is required.

1.2.4 Free (GB)

This metric shows the unused capacity of the ASM Cluster File System in gigabytes. It gives an indication of the free space available in the ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column TOTAL_FREE in the V\$ASM_FILESYSTEM view. For dismounted ASM Cluster File Systems, a value of 0 is returned.

User Action

Consider resizing the ASM Cluster File System if there is not enough Free Space available.

1.2.5 Size (GB)

This metric shows the size in GB of the ASM Cluster File System.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column TOTAL_SIZE in the V\$ASM_FILESYSTEM view for mounted file systems and from the column SIZE_MB in the view V\$ASM_VOLUME for dismounted file systems.

User Action

Consider resizing the ASM Cluster File System to add space.

1.2.6 Snapshot Space Used (MB)

This metric shows the percentage of snapshot space that is used on the ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

1.2.7 Used (GB)

This metric shows the space in GB that is used on the mounted ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is calculated from the columns TOTAL_SIZE and TOTAL_FREE in the V\$ASM_FILESYSTEM view. This metric is calculated using the following formula:

`TOTAL_SIZE - TOTAL_FREE`

For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

User Action

Consider resizing the ASM Cluster File System to add more space.

1.2.8 Used (MB)

This metric shows the space in MB that is used on the mounted ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is calculated from the columns TOTAL_SIZE and TOTAL_FREE in the V\$ASM_FILESYSTEM view. This metric is calculated using the following formula:

`TOTAL_SIZE - TOTAL_FREE`

For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

User Action

Consider resizing the ASM Cluster File System to add more space.

1.2.9 Volume Name

This metric shows the volume name of the volume device used to create the ASM Cluster File System.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column VOLUME_NAME in the V\$ASM_VOLUME view.

User Action

No user action is required.

1.3 ASM Cluster File System State

The metrics in the ASM Cluster File System State metric category show the state of the ASM Cluster File System, whether it is mounted or dismounted on a given host. In a cluster environment, the ASM Cluster File System could be mounted only on specific hosts. If the ASM Cluster File System is mounted on a given host, the metrics also reports whether the system is available and the time since it was available. This is used to determine the following metrics: Mount Point, Mount State, Availability, and Available Time.

These metrics generate a warning alert if the ASM Cluster File System is dismounted on a given host. These metrics also generate a critical alert if the mounted ASM Cluster File System is not available on a host.

These metrics are collected with the help of a SQL query which queries the V\$ASM_FILESYSTEM, V\$ASM_VOLUME, V\$ASM_OFSVOLUMES views. If the target is Cluster ASM the metrics will be collected at cluster level, otherwise they will be collected at instance level as a part of ASM target type metrics.

1.3.1 ASM Cluster File System Availability

This metric shows if the mounted ASM Cluster File System is available on a given host in a cluster. For dismounted ASM Cluster File System's this metric returns a value of NULL.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 15 Minutes	Not Defined	Not Available	The ASM Cluster File System %ofs_mount_point% is not available on host %ofs_host%

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of volume device and host objects.

If warning or critical threshold values are currently set for any unique combination of volume device and host objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of volume device and host objects, use the Edit Thresholds page.

Data Source

This metric is collected from the column STATE in the V\$ASM_FILESYSTEM view.

User Action

No user action is required.

1.3.2 ASM Cluster File System Available Time

This metric shows the time since the mounted ASM Cluster File System has been available on a given host in a cluster. For dismounted ASM Cluster File Systems this metric returns a value of NULL.

Target Version	Collection Frequency	Alert Text
11gR2, 12c	Every 15 Minutes	The volume device %volume_device% is dismounted on host %ofs_host%

Data Source

This metric is collected from the column AVAILABLE_TIME in the V\$ASM_FILESYSTEM view.

User Action

No user action is required.

1.3.3 Mount Point

This metric shows the mount point of the ASM Cluster File System on a given host in a cluster. The same ASM Cluster File System could be mounted on different mount points, on different hosts in a cluster. For dismounted ASM Cluster File Systems it will return NULL if the OFS has never been mounted on the host or it will return the last mount point if it was mounted and then dismounted on the host.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

For mounted file systems this metric is collected from the column FS_NAME in the V\$ASM_FILESYSTEM view. For dismounted file systems this metric is collected from the column MOUNTPATH in the V\$ASM_VOLUME view.

User Action

No user action is required.

1.3.4 ASM Cluster File System Mount State

This metric shows the state of the ASM Cluster File Systems, whether it is mounted or dismounted on a given host. In a cluster environment the ASM Cluster File System could be mounted only on specific hosts.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 15 Minutes	Dismounted	Not Defined	The volume device %volume_device% is dismounted on host %ofs_host%

Multiple Thresholds

If warning or critical threshold values are currently set for any unique combination of volume device and host objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of volume device and host objects, use the Edit Thresholds page.

Data Source

An ASM Cluster File System is mounted if the usage of the volume_device is ACFS and the volume_device exists in the V\$ASM_ACFSVOLUMES view and the mount path exists in the V\$ASM_FILESYSTEM view.

An ASM Cluster File System is dismounted if the usage of the volume_device is ACFS and the volume_device does not exist in the V\$ASM_ACFSVOLUMES view and the mount path does not exist in the V\$ASM_FILESYSTEM view.

User Action

Mount the ASM Cluster File System on the given host in the cluster.

1.4 ASM Disk

The metrics in this configuration metric category collect ASM disk configuration data such as the disk group name. The default collection time is 24 hours and the metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.4.1 Disk

This metric shows the disk name of the ASM disk.

Target Version	Collection Frequency
10g 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the NAME column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.4.2 Disk Creation Date

This metric shows the creation date of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the CREATE_DATE column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.4.3 Disk Group

This metric shows the disk group name of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

This metric is collected from V\$ASM_DISKGROUP_STAT view.

User Action

No user action is required.

1.4.4 Disk Path

This metric shows the disk path of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the PATH column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.4.5 Fail Group Type

This metric shows the failure group type, REGULAR or QUORUM.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the FAILUREGROUP column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.4.6 Failure Group

This metric shows the failure group name of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the SPACE column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.4.7 Redundancy

This metric shows the level of redundancy of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the REDUNDANCY column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.4.8 Size (MB)

This metric shows the disk size in MB of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the TOTAL_MB column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.5 ASM Disk Group

The metrics in this configuration metric category collect ASM disk group configuration data such as member disk count, redundancy, and ASM and database compatibility.

The default collection time is 24 hours and the metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.5.1 Allocation Unit (MB)

This metric shows the allocation unit size in MB of the ASM disk group.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 hours

Data Source

The source for this metric is the ALLOCATION_UNIT_SIZE column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.5.2 Contains Voting Files

This metric shows whether there are voting files present.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the VOTING_FILES column in the V\$ASM_DISKGROUP_STAT view.

User Action

No user action is required.

1.5.3 Disk Count

This metric shows the number of disks in the ASM disk group.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the COUNT_OF_DISK column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

1.5.4 Disk Group

This metric shows the disk group name of the ASM disk group.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the NAME column in the V\$ASM_DISKGROUP_STAT view.

User Action

No user action is required.

1.5.5 Redundancy

This metric shows the level of redundancy of the ASM disk group.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the TYPE column in the V\$ASM_DISKGROUP_STAT view.

User Action

No user action is required.

1.5.6 Size (GB)

This metric shows the ASM disk group size in GB.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the TOTAL_MB column in the V\$ASM_DISKGROUP_STAT view.

User Action

No user action is required.

1.6 ASM Disk Group Attributes

The metrics in this configuration metric category collect ASM disk group Attribute data such as file access control, cell scan capability etc. The default collect time is 24 hours and the metrics will be collected at cluster level if the target is Cluster ASM, else they will be collected at instance level as a part of the ASM target type metrics.

1.6.1 Attribute Name

This metric shows the ASM disk group attribute name.

Target Version	Collection Frequency
11g, 12cR1	Every 24 Hours

Data Source

The source for this metric is the NAME column in the V\$ASM_ATTRIBUTE view.

User Action

No user action is required.

1.6.2 Disk Group Name

This metric shows the ASM disk group name.

Target Version	Collection Frequency
11g, 12cR1	Every 24 Hours

Data Source

The source for this metric is the NAME column in the V\$ASM_DISKGROUP_STAT view.

User Action

No user action is required.

1.6.3 Value

This metric shows the ASM disk group value.

Target Version	Collection Frequency
11g, 12cR1	Every 24 Hours

Data Source

The source for this metric is the VALUE column in the V\$ASM_ATTRIBUTE view.

User Action

No user action is required.

1.7 ASM INIT Params

The metrics in this configuration metric category collect initialization parameters for the ASM instance. The default collection time is 24 hours and the metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.7.1 Default

This metric shows the default value for the ASM instance.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the ISDEFAULT column in the V\$PARAMETER view.

User Action

No user action is required.

1.7.2 Name

This metric shows the name of the ASM instance.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the NAME column in the V\$PARAMETER view.

User Action

No user action is required.

1.7.3 Value

This metric shows the value for the ASM instance.

Target Version	Collection Frequency
11gR2, 12cR1	Every 24 Hours

Data Source

The source for this metric is the VALUE column in the V\$PARAMETER view.

User Action

No user action is required.

1.8 ASM Volumes

The metrics in the ASM Volumes metric category show information about the volumes created on a disk group. An ASM volume file is a file created on the disk group to provide storage for an ASM Cluster File System or a third-party file system. This is used to determine the following metrics for ASM volumes: Volume Name, Status, Usage, Mount Point, Size (GB), Allocated Space (GB), and Redundancy.

These metrics are collected with the help of the V\$ASM_VOLUME and GV\$ASM_DISKGROUP views. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.8.1 Allocated Space (GB)

This metric shows the space in MB allocated to the ASM Cluster File System on a given host in a cluster.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the MOUNTPATH column in the V\$ASM_VOLUME view.

User Action

No user action is required.

1.8.2 Mount Point

This metric shows the mount point of the ASM Cluster File System on a given host in a cluster.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the MOUNTPATH column in the V\$ASM_VOLUME view.

User Action

No user action is required.

1.8.3 Redundancy

This metric returns the redundancy for the ASM volume file. The ASM volume file can use whatever redundancy (external, normal=2-way mirror, high=3-way mirror) is available to the ASM disk group where the ASM volume file is created.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the REDUNDANCY column in the V\$ASM_VOLUME view.

User Action

No user action is required.

1.8.4 Size (GB)

This metric returns the size of the ASM volume in GB. The volume size is always created in multiples of the volume allocation unit.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the column SIZE_MB from the V\$ASM_VOLUME view.

User Action

No user action is required.

1.8.5 Status

This metric shows the Status of the ASM Volume, if it is enabled or disabled.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the column STATE from the V\$ASM_VOLUME view.

User Action

No user action is required.

1.8.6 Usage

This metric returns a string indicating what the ASM volume is used for: ACFS, EXT3, null. A value of null means that the usage of the volume is Unknown.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

This metric returns a string indicating what the ASM volume is used for: ACFS, EXT3, null. A value of null means the usage of the volume is Unknown.

User Action

No user action is required.

1.8.7 Volume Name

This metric returns the name of the ASM volume. This is the name entered when the user creates the ASM volume on the disk group.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the VOLUME_NAME column in the V\$ASM_VOLUME view.

User Action

No user action is required.

1.9 Checker Failure

The metrics in the ASM Volumes metric category show information about failures in the alert log checker.

1.9.1 Alert Log Name

This metric shows the name of the alert log.

Target Version	Collection Frequency
11g, 12c	Every 5 minutes

1.9.2 Checker Failure Detected

This metric shows if a failure in the alert log has been detected.

Target Version	Collection Frequency
11g, 12c	Every 5 minutes

1.9.3 Number of Failures

This metric shows the number of failures detected in the alert log.

Target Version	Collection Frequency
11g, 12c	Every 5 minutes

1.10 Cluster Volume Performance

The metrics in the Cluster Volume Performance metric category indicate the performance of the cluster volumes present in an ASM instance.

1.10.1 I/O Response Time

This metric shows the total read errors for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.2 I/O Per Second

This metric shows I/O per second for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.3 I/O Size (MB)

This metric shows the I/O size in MB for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.4 I/O Throughput

This metric shows the I/O throughput for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.5 Read Errors

This metric shows the total read errors for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.6 Read Response Time (MS)

This metric shows the total read response time in milliseconds for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.7 Read Size (MB)

This metric shows the total read size for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.8 Read Throughput

This metric shows the total read throughput for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.9 Reads Per Second

This metric shows the reads per second for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.10 Write Errors

This metric shows the detail of the total number of failed writes for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.11 Write Response Time (MS)

This metric shows the total I/O time (in seconds) for write requests for the volume cluster if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11gR2, 12c	Every hour

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.10.12 Write Size (MB)

This metric shows the total size of the writes in MB for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.13 Write Throughput

This metric shows the total write throughput for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.10.14 Writes Per Second

This metric shows the total size of the writes per second the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.11 Database Disk Group Usage**Data Source****1.11.1 Total Bytes**

This metric shows the total bytes of the disk group space used by a database. With the help of this metric you can determine the space used in a disk group by different database instance.

Target Version	Collection Frequency	Alert Text
10g, 11g, 12c	Every 30 Minutes	Usable total size for Disk Group %dg_name% has fallen to %value% (MB).

Data Source

This metric is calculated by taking the space used by a file using the V\$ASM_FILE view and joining it with the V\$ASM_ALIAS and V\$ASM_DISKGROUP views for 10g Release 1 and the V\$ASM_ALIAS, V\$ASM_DISKGROUP_STAT views for 10g Release 2 to get the disk group space used by a database instance.

User Action

No user action is required.

1.12 Disk Group Imbalance Status

The metrics in the Disk Group Imbalance Status metric category check if any disk groups are out of balance. Under normal operations, ASM automatically rebalances disk groups. These metrics detect conditions where manual rebalances may be required or the power level of a rebalance in progress may need to be raised to give it the necessary resources to complete faster. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.12.1 Actual Imbalance (%)

Actual Imbalance (%) measures the difference in space allocated to the fullest and emptiest disks in the disk group. The comparison is in percent full because ASM tries to keep all disks equally full as a percent of their size. The imbalance is relative to the space allocated not the space available. An imbalance of a couple percent is reasonable.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 minutes

Data Source

This metric is calculated using the following formula:

$$100 * (\max((\text{total_mb} - \text{free_mb}) / \text{total_mb}) - \min((\text{total_mb} - \text{free_mb}) / \text{total_mb})) / \max((\text{total_mb} - \text{free_mb}) / \text{total_mb})$$

where total_mb and free_mb are columns in V\$ASM_DISK_STAT

User Action

An imbalance of more than a couple percent may signal the need to initiate a manual rebalance of the disk group.

1.12.2 Actual Minimum Percent Free

The Actual Minimum Percent Free metric lists the amount of free disk space on the fullest disk as a percentage of the disk size. If the imbalance is zero, then this represents the total free space. Because all allocations are performed evenly across all disks, the minimum free space limits how much space can be used.

If one disk has only one percent free, then only one percent of the space in the disk group is really available for allocation, even if the rest of the disks are only half full.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 minutes

Data Source

The metric is calculated as $100 * (\min(\text{FREE_MB} / \text{TOTAL_MB}))$, where FREE_MB and TOTAL_MB are columns in the \$ASM_DISK_STAT view.

User Action

If the actual minimum percent free is a low number, a configuration change may be required to provide an even distribution of file extents and space usage across all disks in a disk group.

1.12.3 Disk Count

The Disk Count metric reports the number of disks in the disk group which gives a sense of how widely files can be spread.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 minutes

Data Source

Disk count is calculated using count(*) on all disks (V\$ASM_DISK_STAT) in a disk group (V\$ASM_DISKGROUP_STAT).

User Action

No user action is required.

1.12.4 Disk Group Percent Imbalance

The Disk Group Percent Imbalance (metric is used to determine if a disk group requires rebalance. Temporary imbalances (caused by a rebalance in progress) are ignored.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	10	Not Defined	Disk Group %diskGroup% requires rebalance because the space usage imbalance between disks is high.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

If a rebalance operation is not in progress, the value of the Disk Group Imbalance (%) without Rebalance metric is the same value as the value of the Actual Imbalance (%) metric, otherwise the value is 0.

User Action

A warning alert is generated if the value of the Disk Group Imbalance (%) without Rebalance metric is greater than or equal to 10%. In this case, a rebalance is necessary because the space usage imbalance between disks is high. You should manually initiate a rebalance operation.

1.12.5 Disk Maximum Used (%) with Rebalance

The Disk Maximum Used (%) with Rebalance metric is used to determine if a rebalance in progress needs a power boost to complete in a timely manner and prevent other errors from occurring due to space constraints.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	Not Defined	95	Increase the rebalance power for Disk Group %diskGroup% because at least one disk is critically low on space.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

If a rebalance is in progress and the power value is greater than 0, then the value of the Disk Maximum Used (%) with Rebalance metric is calculated as (100 - Actual Minimum Percent Free), otherwise the value is 0.

User Action

A critical alert is generated if the value of the Disk Maximum Used (%) with Rebalance metric is greater than or equal to 95%. In this case the rebalance power for the disk group must be increased because at least one disk is critically low on space. Increase the rebalance power (maximum power level is 11).

1.12.6 Disk Minimum Free (%) without Rebalance

The Disk Minimum Free (%) without Rebalance metric is used to determine if a disk group requires rebalance. Temporary imbalances (caused by a rebalance in progress) are ignored.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	20	10	Disk Group %diskGroup% requires rebalance because at least one disk is low on space.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

If a rebalance operation is not in progress, the value of the Disk Minimum Free (%) without Rebalance metric is the same as the value of the Actual Minimum Percent Free metric, otherwise the value is 100.

User Action

A warning alert will be generated if Disk Minimum Free (%) without Rebalance is less than or equal to 20%. In this case a rebalance is necessary because at least one disk is low on space. You should manually initiate a rebalance operation.

1.12.7 Disk Size Variance (%)

The Disk Size Variance (%) metric lists the percentage difference in size between the largest and smallest disks in the disk group. This is zero if best practices have been followed and all disks are the same size.

Small differences in size are acceptable. Large differences can result in some disks getting much more I/O than others. With normal or high redundancy disk groups, a large size variance can make it impossible to reduce the percent imbalance to a small value.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

Disk Size Variance (%) is calculated as $100 * (\max(\text{total_mb}) - \min(\text{total_mb})) / \max(\text{total_mb})$, where `total_mb` is a column in `V$ASM_DISK_STAT`

User Action

A large size variance may require a configuration change to provide an even distribution of file extents and space usage across all disks in a disk group.

1.12.8 Rebalance In Progress

The Rebalance In Progress metric returns Yes if a rebalance operation is in progress, No otherwise.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Rebalance In Progress metric is retrieved from the operation column of the `V$ASM_OPERATION.view`

User Action

No user action is required.

1.12.9 Resync In Progress

The Resync In Progress metric returns Yes if a resync operation is in progress, No otherwise.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

1.13 Disk Group Target Component

This configuration metric category collects ASM disk group target component information.

1.13.1 Disk Group Name

This metric shows the disk group target component name.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 minutes

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the column FREE_MB in the view V\$ASM_DISKGROUP for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

User Action

Consider adding more disks to the disk group or deleting existing files in the disk group.

1.13.2 Disk Count

The Disk Count metric reports the number of disks in the disk group which gives a indication of how widely files can be spread.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 minutes

Data Source

Disk count is calculated using count(*) on all disks (V\$ASM_DISK_STAT) in a disk group (V\$ASM_DISKGROUP_STAT).

User Action

No user action is required.

1.14 Disk Group Usage

The metrics in the Disk Group Usage metric category show the space used by all of the disk groups in the mounted state. These metrics are used to collect information about the disk usage and are used to show the trend of disk group space usage in the application. This information is used to determine the following metrics: Free MB, Total MB, Total Safely Usable MB, Type, Safely Usable File MB, Used %, and Used % of

Safely Usable of a disk group for 10g Release 2 and Free MB, Total MB, Type, and Used % for 10g Release 1.

These metrics generate a warning alert if the disk group is 75% used and a critical warning if 90% used. The thresholds for the Disk Group Usage alert should *not* be fixed at 75% and 90%, because the value depends on the redundancy. In version 10g Release 2, these metrics use the `USABLE_FILE_MB` column of the `V$ASM_DISKGROUP_STAT` view to indicate usable mirrored free space. This column displays the amount of free space that can be safely utilized taking mirroring into account, and yet is able to restore redundancy after disk failure.

Enterprise Manager issues alerts for the following:

- Critical alert when `USABLE_FILE_MB` ≤ 0
- Warning alert when `USABLE_FILE_MB` $< 0.1 * \text{REQUIRED_MIRROR_FREE_MB}$

This metric is collected every 15 minutes. You can change the threshold limit as required.

This metric is collected with the help of a SQL query which queries the `V$ASM_DISKGROUP` view for 10g Release 1 and the `V$ASM_DISKGROUP_STAT` view for 10g Release 2. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.14.1 Disk Group Free (MB)

This metric shows the unused capacity of the disk group in megabytes. It gives an indication of the free space available in a disk group.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Total free size for Disk Group %dg_name% has fallen to %value% (MB).

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the `FREE_MB` column in the `V$ASM_DISKGROUP` view for 10g Release 1 and the `V$ASM_DISKGROUP_STAT` view for 10g Release 2.

User Action

Consider adding more disks to the disk group or deleting existing files in the disk group.

1.14.2 Disk Group Usable (Free MB)

The usable free space of a disk group depends on the redundancy, so in 10g Release 2 it uses the `USABLE_FILE_MB` column of the `V$ASM_DISKGROUP_STAT` view to indicate usable mirrored free space. This column indicates the amount of free space

that can be safely utilized taking mirroring into account, and yet is able to restore redundancy after disk failure. This column is used to determine the usable free megabytes of a disk group.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Usable free size for Disk Group %dg_name% has fallen to %value% (MB).

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the column `USABLE_FILE_MB` in the `V$ASM_DISKGROUP_STAT` view for 10g Release 2.

User Action

Consider adding more disks to the disk group or removing existing files from the disk group.

1.14.3 Disk Group Usable (MB)

This metric shows the capacity of the disk group based on the type of the disk group. This column indicates the amount of free space that can be safely utilized taking mirroring into account, and yet is able to restore redundancy after disk failure.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Usable free size for Disk Group %dg_name% has fallen to %value% (MB).

Data Source

This metric value is calculated as follows, using the `V$ASM_DISKGROUP_STAT` view:

$$\text{Total Safely Usable MB} = (\text{total_mb} - \text{required_mirror_free_mb}) / \text{redundancy_factor}$$

In the preceding formula, *total_mb* and *required_mirror_free_mb* come from the view column, and *redundancy_factor* is 1 for External Redundancy Disk Group, 2 for Normal Redundancy Disk Group, and 3 for High Redundancy Disk Group.

User Action

Consider adding more disks to the disk group or removing existing files from the disk group.

1.14.4 Disk Group Used %

This metric shows the percentage of space used by a disk group. It generates a warning alert if the disk group is 75% used and a critical warning if it is 90% used. The threshold limit can be changed to generate alerts at different values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	75	90	Disk Group %dg_name% is %value%%% used.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric value is calculated as follows, using the V\$ASM_DISKGROUP view for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

$\text{Used \%} = (\text{total_mb} - \text{free_mb}) / \text{total_mb} * 100$

User Action

New disks can be added in a disk group to avoid the alerts. Go to the Disk Group general page and click **Add** to add a new disk to a disk group. You can also remove existing files from the disk group.

1.14.5 Redundancy

This metric shows the redundancy type of the disk group. It can be one of the three values: External, Normal, and High. This property determines how redundancy is restored after disk failure.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 Minutes

Data Source

This metric is collected from the column TYPE in the V\$ASM_DISKGROUP view for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

User Action

No user action is required.

1.14.6 Size (MB)

This metric shows the total capacity of the disk group in megabytes. It gives an indication of the size or the space used by the disk group.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 Minutes

Data Source

This metric is collected from the column TOTAL_MB in the V\$ASM_DISKGROUP view for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

User Action

Consider adding more disks to the disk group.

1.14.7 Used % of Safely Usable

This metric shows the percentage of safely usable space used by a disk group. Usable free space of a disk group depends on the redundancy. In 10g Release 2, it uses the USABLE_FILE_MB column of the V\$ASM_DISKGROUP_STAT view to indicate usable mirrored free space. This column displays the amount of free space that can be safely utilized taking mirroring into account and restores redundancy after disk failure. This column is used to determine the Used % of Safely Usable for a disk group.

This metric generates a warning alert if the disk group is using 90% of the safely usable space and critical warning for 100%. The threshold limit can be changed to generate an alert at different values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12cR1	Every 30 Minutes	75	90	Disk group %dg_name% has used %value%% of safely usable free space (space that can be allocated while still having enough space to recover from failure group failures).

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is calculated from the V\$ASM_DISKGROUP_STAT view for 10g Release 2 using the following formula:

$$\text{Used \% of Safely Usable} = 100 - (\text{usable_file_mb} / \text{usable_total_mb}) * 100$$

In this formula, *usable_total_mb* is derived as follows:

$$\text{total_mb} - \text{required_mirror_free_mb} / \text{redundancy_factor}$$

total_mb and *required_mirror_free_mb* are derived from the view column and *redundancy_factor* is 1 for External Redundancy Disk Group, 2 for Normal Redundancy Disk Group, and 3 for High Redundancy Disk Group.

User Action

New disks can be added in a disk group to avoid the alerts. Go to the Disk Group general page and click **Add** to add a new disk to a disk group. Also, you can remove existing files from the disk group.

1.15 Disk Path

The metrics in the Disk Path metric category show the disk name and disk path of all the disks. This information is collected at a time interval of 24 hours.

These metrics are collected using data from the V\$ASM_DISK view for 10g Release 1 and the V\$ASM_DISK_STAT view for 10g Release 2. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.15.1 Disk Name

This metric reports the name of the disk path.

Target Version
10gR2, 11g, 12c

Data Source

The source of this metric is the NAME column in the V\$ASM_DISK_STAT and V\$ASM_DISK views.

User Action

No user action is required.

1.15.2 Disk Path

This metric is the physical path of the disk.

Target Version
10gR2, 11g, 12c

Data Source

For databases prior to 10g Release 2, this metric uses the PATH column in the GV\$ASM_DISK view. For databases 10g Release 2 and higher, this metric uses the PATH column in the GV\$ASM_DISK_STAT view.

User Action

No user action is required.

1.15.3 Group Name

This metric provides the name of the group.

Target Version
10gR2, 11g, 12c

Data Source

For databases prior to 10g Release 2, this metric uses the PATH column in the GV\$ASM_DISK view. For databases 10g Release 2 and higher, this metric uses the PATH column in the GV\$ASM_DISK_STAT view.

User Action

No user action is required.

1.16 Disk Status

The metrics in the Disk Status metric category provide disk mode status (offline and online). A critical warning alert is generated if any of the disks are offline.

This metric is collected every 15 minutes. You can change the time limit and threshold limit as required. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.16.1 Disk Mode Status

This metric displays disk mode status (offline and online). A critical warning alert is generated if any of the disks go offline.

You can change the threshold limit.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	OFFLINE	Disk %dg_name%.%disk_name% is offline.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Disk Group Name and Disk Name objects.

If warning or critical threshold values are currently set for any unique combination of Disk Group Name and Disk Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Disk Group Name and Disk Name objects, use the Edit Thresholds page.

Data Source

This metric is collected from the GV\$ASM_DISK view for 10gRelease 1 and GV\$ASM_DISK_STAT view for 10g Release 2.

User Action

Try to bring the disk online. Currently Enterprise Manager does not support this feature.

1.17 Failure Group Imbalance Status

The metrics in the Failure Group Imbalance Status metric category check how even failure group disks are laid out for ASM disk groups. ASM strives for an even distribution of file extents and space usage across all disks in a disk group. It accomplishes this through rebalancing. If the disks are different sizes or the failure groups are different sizes then effective rebalancing cannot be achieved. In this situation, configuration changes are required.

These metrics only apply to disk groups with normal or high redundancy. These metrics will not return data for disk groups with external redundancy, because failure groups are not used in this configuration. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.17.1 Disk Count Imbalance Variance

Failure groups are used to store mirror copies of data: two copies for normal redundancy, three copies for high redundancy. The Disk Count Imbalance Variance metric reports the difference in the failure group disk count for the disk in the disk group with the highest failure group disk count and the disk with the lowest.

It may not be possible for every disk to have the same failure group disk count even when all the failure groups are the same size. However an imbalance of more than one indicates that the failure groups are different sizes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	2	Not Defined	Disk Group %diskGroup% has failure groups with different numbers of disks which may lead to suboptimal space usage. Changing the configuration may alleviate this problem.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

The value of the Disk Count Imbalance Variance metric is calculated using the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views, along with some internal ASM fixed tables.

User Action

A warning alert is generated when the Disk Count Imbalance Variance value is greater than 1 (the default value). Disk groups that have failure groups with different numbers of disks may lead to suboptimal space usage. To alleviate this problem, try changing the configuration.

1.17.2 Disk Size Imbalance (%)

Disk Size Imbalance (%) checks whether some disks have more space in their failure group disks than others. The space is calculated as a ratio between the size of a disk and the sum of the sizes of its active failure group disks. This ratio is compared for all the disks. The difference in the highest and lowest failure group disk space is reported as a percentage. An imbalance of 10% is acceptable.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	10	Not Defined	Disk Group %diskGroup% has failure groups with disks of different sizes which may lead to suboptimal space usage. Changing the configuration may alleviate this problem.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

The value of the Disk Size Imbalance metric is calculated using the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views, along with some internal ASM fixed tables.

User Action

A warning alert is generated when the Disk Size Imbalance (%) is greater than 10% (the default). Disk groups that have failure groups with disks of different sizes may lead to suboptimal space usage. To alleviate this problem, try changing the configuration.

1.17.3 Failure Group Count

Failure Group Count reports the number of failure groups per disk group.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Failure Group Count metric is retrieved from a calculation involving the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views, and some internal ASM fixed tables.

User Action

No user action is required.

1.18 Failure Group Status

The metrics in the Failure Group Status metric category check to see if all of the member disks of any failure group are offline. This is an undesirable condition which risks data loss, because mirror copies of data cannot be stored.

These metrics only apply to disk groups with normal or high redundancy. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.18.1 Available Disks

The Available Disks metric reports the number of disks in the failure group that are online.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Available Disks metric is calculated by subtracting the number of offline disks in the failure group from the number of total disks.

User Action

No user action is required.

1.18.2 Disk Count for Alerts

The Disk Count for Alerts metric has the same value as Available Disks metric if there is more than one disk in the failure group. If there is exactly one disk in the failure group, the value of Disk Count for Alerts is 1, regardless of whether or not that one disk is offline. The reason for this is to avoid duplicate alerts being generated for the same root cause. The disk_status metric generates a critical alert when a disk goes offline.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	Not Defined	0	Failure Group %diskGroup%.%failureGroup% is offline.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Disk Group and Failure Group objects.

If warning or critical threshold values are currently set for any unique combination of Disk Group and Failure Group objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Disk Group and Failure Group objects, use the Edit Thresholds page.

Data Source

The value of the Disk Count for Alerts metric is set to 1 if there is only one disk in the disk group, otherwise it is set to the value of the Available Disks metric.

User Action

A critical alert is generated if all disks comprising a failure group are taken offline. In this situation, data is not being mirrored despite the disk group having been configured with normal or high redundancy. Action must be taken to bring some of the disks in the failure group back online, or to add more disks to the disk group and assign them to that failure group.

1.18.3 Disk Count

The Disk Count metric reports the number of disks in the failure group.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Total Disks metric is retrieved from the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views.

User Action

No user action is required.

1.18.4 Online Disk Count for Failure Group with More than 1 Disk

This metric shows the online disk count for failure group with more than one disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 minutes

1.19 Instance Disk Performance

The metrics in the Instance Disk Performance metric category indicate the performance of the disks present in an ASM instance. These metrics report the disk performance parameters for all of the disks mounted on an ASM Instance.

These metrics are used to collect information, for example, total I/O and read/write requests, total I/O and read/write time, and the total number of bytes read/written to the disk. These metrics also report the response of the disk for read, write, and I/O throughput. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.19.1 Bytes Read

This metric reports the total number of bytes read from the disk.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.2 Bytes Written

This metric reports the total number of bytes written to the disk.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.3 Last Read Errors

This metric shows the most recent number of read errors for the disk.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 Minutes

1.19.4 Read Errors

This metric shows the total read errors for the disk.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.5 Read Response Time (MS)

This metric shows the total read response time in milliseconds for the disk.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.6 Read Time (MS)

This metric shows the total I/O time (in seconds) for read requests for the disk if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.7 Write Errors

This metric shows the detail of the total number of failed writes for the disk. This provides information about the total number of failed attempts of writes for the disk.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12cR1	Every 15 Minutes	Not Defined	0	Disk %dg_name%.%disk_name% has %value% Read/Write errors.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Instance ID, Disk Group Name, and Disk Name objects.

If warning or critical threshold values are currently set for any unique combination of Instance ID, Disk Group Name, and Disk Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Instance ID, Disk Group Name, and Disk Name objects, use the Edit Thresholds page.

Data Source

This metric is calculated using the GV\$ASM_DISKGROUP and GV\$ASM_DISK views for 10g Release 1 and the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views for 10g Release 2. From these views, the total number of failed read/writes for the disk is added to calculate the read write errors detail.

User Action

Investigate the issues behind read/write errors.

1.19.8 Reads

This metric shows the total number of I/O read requests for the disk.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.9 I/O Response Time (MS)

This metric shows the disk response time.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 Minutes

1.19.10 Total I/O Time (MS)

This metric shows the total I/O time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 Minutes

1.19.11 Write Response Time (MS)

This metric shows the total write response time in milliseconds.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.12 Write Time (MS)

This metric shows the total I/O time (in seconds) for write requests for the disk if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.19.13 Writes

This metric shows the total number of I/O write requests for the disk.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.20 Instance Disk Group Database Performance

The metrics in the Instance Disk Group Database Performance metric category report the performance of the disk group database present in an ASM instance. These metrics report the disk group database performance parameters for all of the disk groups in an ASM Instance.

1.20.1 Bytes Read

This metric reports the total number of bytes read from the disk group database.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.20.2 Bytes Written

This metric reports the total number of bytes written to the disks in the database disk group.

Target Version	Collection Frequency
11g 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.20.3 Read Time (MS)

This metric shows the total I/O time (in seconds) for read requests for the disks in the disk group database if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.20.4 Reads

This metric shows the total number of I/O read requests for the disks in the disk group database.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.20.5 Write Time (MS)

This metric shows the total I/O time (in seconds) for write requests for the disks in the disk group database if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.20.6 Writes

This metric shows the total number of I/O write requests for the disks in the disk group database.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.21 Instance Disk Group Performance

The metrics in the Instance Disk Group Performance metric category indicate the performance of the disk group present in an ASM instance. These metrics report the disk group performance parameters for all of the disk groups in an ASM Instance.

The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

1.21.1 Bytes Read

This metric reports the total number of bytes read from the disk.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.21.2 Bytes Written

This metric reports the total number of bytes written to the disks in the disk group.

Target Version	Collection Frequency
11g 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.21.3 Read Time (MS)

This metric shows the total I/O time (in seconds) for read requests for the disks in the disk group if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.21.4 Reads

This metric shows the total number of I/O read requests for the disks in the disk group.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.21.5 Write Time (MS)

This metric shows the total I/O time (in seconds) for write requests for the disks in the disk group if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.21.6 Writes

This metric shows the total number of I/O write requests for the disks in the disk group.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.22 Instance Volume Performance

The metrics in the Instance Volume Performance metric category indicate the performance of the instance volumes present in an ASM instance.

1.22.1 I/O Per Second

This metric shows I/O per second for the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.2 I/O Response Time

This metric shows the total read errors for the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.3 I/O Throughput

This metric shows the I/O throughput for the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.4 I/O Size (MB)

This metric shows the I/O size in MB for the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.5 Read Errors

This metric shows the total read errors for the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.6 Read Response Time (MS)

This metric shows the total read response time in milliseconds for the volume instance.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.7 Read Size (MB)

This metric shows the total read size for the volume instance.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.8 Read Throughput

This metric shows the total read throughput for the volume instance.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.9 Reads Per Second

This metric shows the reads per second for the volume instance.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.10 Write Errors

This metric shows the detail of the total number of failed writes for the volume instance.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.11 Write Response Time (MS)

This metric shows the total I/O time (in seconds) for write requests for the volume instance if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11gR2, 12c	Every hour

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

1.22.12 Write Size (MB)

This metric shows the total size of the writes in MB for the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.13 Write Throughput

This metric shows the total write throughput for the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.22.14 Writes Per Second

This metric shows the total size of the writes per second the instance volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

1.23 Offline Disk Count

The metrics in the Offline Disk Count metric category report the number of disks with the mode status offline. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of the ASM target type metrics.

You can change the time limit and threshold limit.

1.23.1 Offline Disk Count

This metric provides the number of disks with mode status offline. A critical alert is generated if the offline disk count changes or any of the disks go offline.

You can change the time limit and threshold limit as required.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	0	%offline_count% disks are offline.

Data Source

This metric is collected with the help of Disk Status metric which in turn collects data from the GV\$ASM_DISKGROUP and GV\$ASM_DISK views for 10g Release 1 and the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views for 10g Release 2.

User Action

Try to bring the disk online. Currently Enterprise Manager does not support this administration feature so it needs to be done manually.

1.24 Response

The Response metric category for Cluster ASM is a repository side metric. It displays whether Cluster ASM is up or down. A Cluster ASM is considered up if any one of the member instances is up and reachable. The check is performed every 5 minutes on each member instance. If the connection is successful on any instance, the status of Cluster ASM is updated as up.

1.24.1 Status

This metric shows the status of the Cluster ASM instance. It displays whether the instance is up or down. This check is performed every five minutes and returns the status of the connection as successful or it displays the ORA error for connection failure. An alert is generated for an individual ASM instance that is down.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	0	Failed to connect to ASM instance %oraerr%.

Data Source

You can establish a connection to the ASM instance with instance properties, and if the connection succeeds then the status is shown as Up, otherwise is displays as Down. It may also display as Down if there is an error in the metric collection.

User Action

Perform one of the following:

- Check that the configuration property saved for the ASM instance is correct.
- If it displays as Down, the ASM instance is down. Try to reestablish the connection using the startup/shutdown feature using the Enterprise Manager application. Alternately, you can restart the application manually.

Automatic Storage Management

This chapter provides information about the Automatic Storage Management (ASM) metrics.

2.1 Alert Log

The metrics in this category signify that the ASM target being monitored has generated errors to the ALERT log file since the last sample time. The ALERT log file is a special trace file containing a chronological log of messages and errors.

Critical Alerts are generated for different type of failure, for example, when archiver hung, data block corrupted and Media failure are found in the alert log with the following error code (ORA-00257, 16038, 01157,01578,27048). The metric shows you the line number and time when the error occurred.

Warning alerts are also generated when Session Terminated Error Stack (ORA- 00603) are present in the alert log. Many other critical alerts also occur when the Ora-15130 (Disk Group is being dismounted), Ora-15050 (Disk contains errors) and Ora-15051 (File contains errors) are present in alert log.

You can edit the metric threshold and change the value of error you want to collect under a different head. Also, you can modify the warning and critical alert values.

This metric is collected at a time interval of 15 minutes. You can change the threshold limit as per your requirements.

2.1.1 Alert Log Error Stack

This metric contains the information about different ORA- errors present in the alert log file. It ignores error patterns like ORA-0*(54 | 1142 | 1146) present in the alert log file and generate a warning alert when ORA-0*600x, ORA-07445, ORA-04[0-9][0-9][0-9][0-9][0-9] errors are present.

Edit the metric threshold and change the value of the ORA- error to generate the warning and critical alert for a different set of ORA- errors.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	ORA-0*(600? 7445 4[0-9][0-9][0-9][0-9][0-9]	Not Defined	ORA-error stack (%errCodes%) logged in %alertLogName%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. The alert log file is scanned for the ORA-errors ignoring the patterns like ORA-0*(54|1142|1146).

User Action

Examine the ALERT log for additional information.

2.1.2 Alert Log Error Stack Trace File Name

This metric provides information about the trace file name in which ORA- errors are present. It provides the detail of the trace file name and the line at which the error has occurred.

Target Version	Evaluation and Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The data comes from the Alert Log files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.1.3 Alert Log Name

This metric provides information about the alert log file in which ORA- errors are present. It displays the file name and the line at which the error has occurred.

Target Version	Evaluation and Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Examine the ALERT log for additional information.

2.1.4 Archive Hung Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Archive Hung in the alert log files. The errors ORA-00257 and ORA-16038 in the alert log indicates an archive-hung problem. This also generates a critical alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. Also, the warning and critical alert values can be modified or set.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	Not Defined	ORA-	The archiver hung at time/line number:%timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. Alert log file is scanned for the ORA-00257 and ORA-16038 error.

User Action

Examine the ALERT log for additional information.

2.1.5 Data Block Corruption Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Data Block Corruption errors in the alert log files. The errors ORA- 01157, ORA-01578, and ORA-27048 in the alert log indicates Data Block Corruption problems. This also generates a critical alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. Also, the warning and critical alert values can be modified or set.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	Not Defined	ORA-	The data block was corrupted at time/line number: %timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. Alert log file is scanned for the ORA- 01157, ORA-01578, and ORA-27048 error.

User Action

Examine the ALERT log for additional information.

2.1.6 Media Failure Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Media Failure Errors in the alert log files. The errors ORA-15130,ORA-15049, ORA-15050 and ORA-15051 in the alert log indicates Media Failure Error problems. This generates a critical alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. You can also set or modify the warning and critical alert values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	Not Defined	ORA-	Media failure was detected at time/line number: %timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. Alert log file is scanned for the ORA-15130,ORA-15049, ORA-15050and ORA-15051 error.

User Action

Examine the ALERT log for additional information.

2.1.7 Session Terminated Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Session Terminated problems in the alert log files. The ORA- 00603 error in the alert log indicates Session Terminated problems. This also generates a warning alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. Also, the warning and critical alert values can be modified or set.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	ORA-	Not Defined	A session was terminated at time/line number: %timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. The alert log file is scanned for the ORA-00603 error.

User Action

Examine the ALERT log for additional information.

2.2 Alert Log Error Status

The metrics in this category display the number of times an Alert has been generated for the Alert log metric. It provides information about the current status of different errors present in the alert log file.

This Metric is part of 10g Release 2 and generates a warning alert with any occurrence of ORA- Error [excluding ORA-0*(54 | 1142 | 1146)]. It also generates a Warning alert when it detects an Archiver Hung Error, Data Block Corruption Error, Media Failure Error and Session Terminated Error.

This metric is collected with the help Alert Log Metric, and the time interval for collection 5 Minutes. You can change the threshold limit count for the Warning alert and critical alert as required.

2.2.1 Archiver Hung Alert Log Error Status

This metric signifies the number of times the Archiver Hung error (ORA-00257 and ORA-16038) has been generated in the Alert log metric. It gives you an idea about the current status of the Archiver Hung error present in the alert log file. This also generates a warning alert when this count is greater than zero.

You can edit the metric threshold and change the value of the error you want to collect under a different head. You can also set or modify the warning and critical alert values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	0	Not Defined	Archiver hung errors have been found in the alert log.

Data Source

This metric is calculated based on the Archive Hung Error Stack Metric rollup.

User Action

Examine the ALERT log for additional information. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you need to manually clear the event after the problem is fixed.

2.2.2 Data Block Corruption Alert Log Error Status

This metric signifies the number of times the Data Block Corruption error (ORA-01157, ORA-01578, and ORA-27048) has been generated in the Alert log metric. It gives you an idea about the current status of Data Block Corruption errors present in the alert log file. This also generates a warning alert when this count is greater than zero.

You can edit the metric threshold and change the value of the error you want to collect under a different head. You can also set or modify the warning and critical alert values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	0	Not Defined	Data block corruption errors have been found in the alert log.

Data Source

This metric is calculated based on the Data Block Corruption Error Stack Metric rollup.

User Action

Examine the ALERT log for additional information. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you need to manually clear the event after the problem is fixed.

2.2.3 Generic Alert Log Error Status

This metric signifies the number of times the Generic Alert error (ORA-0*600x, ORA-07445, ORA-04 [0-9][0-9][0-9][^0-9]) has been generated in the Alert log metric. It gives you an idea about the current status of the Generic Alert (ORA-) error present in the alert log file. This also generates a warning alert when this count is greater than zero.

You can edit the metric threshold and change the value of the error if you want to collect data under a different heading. You can also set or modify the warning alert and critical alert values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	0	Not Defined	%value% distinct types of ORA- errors have been found in the alert log.

Data Source

This metric is calculated based on the Generic Alert Error Stack Metric rollup.

User Action

Examine the ALERT log for additional information.

2.2.4 Media Failure Alert Log Error Status

This metric signifies the number of times the Media Failure Alert error (ORA-15130,ORA-15049, ORA-15050and ORA-15051) has been generated in the Alert log metric. It gives the user an idea about the current status of Media Failure Alert (ORA-) error present in the alert log file. This also generates a warning alert when this count is greater than zero.

You can edit the metric threshold and change the value of the error you want to collect under a different head. You can also set or modify the warning and critical alert values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	0	Not Defined	Media failure errors have been found in the alert log.

Data Source

This metric is calculated based on the Media Failure Alert Error Stack Metric rollup.

User Action

Examine the ALERT log for additional information. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you need to manually clear the event after the problem is fixed.

2.2.5 Session Terminated Alert Log Error Status

This metric signifies the number of times the Session Terminated Alert error (ORA-00603) has been generated in the Alert log metric. It gives you an idea about the current status of Session Terminated Alert (ORA-) error present in the alert log file. This also generates a warning alert when this count is greater than zero.

You can edit the metric threshold and change the value of the error you want to collect under a different head. You can also set or modify the warning and critical alert values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	0	Not Defined	Session terminations have been found in the alert log.

Data Source

This metric is calculated based on the Session Terminated Alert Error Stack Metric rollup.

User Action

Examine the ALERT log for additional information. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you need to manually clear the event after the problem is fixed.

2.3 ASM Alert Log

The metrics in this category signify that the ASM target being monitored has generated errors to the ALERT log file since the last sample time. The ALERT log file is a special trace file containing a chronological log of messages and errors.

Critical Alerts are generated for different type of failure, for example, when archiver hung, data block corrupted and Media failure are found in the alert log with the following error code (ORA-00257, 16038, 01157,01578,27048). The metric shows you the line number and time when the error occurred.

Warning alerts are also generated when Session Terminated Error Stack (ORA- 00603) are present in the alert log. Many other critical alerts also occur when the Ora-15130 (Disk Group is being dismounted), Ora-15050 (Disk contains errors) and Ora-15051 (File contains errors) are present in alert log.

You can edit the metric threshold and change the value of error you want to collect under a different head. Also, you can modify the warning and critical alert values.

This metric is collected at a time interval of 15 minutes. You can change the threshold limit as per your requirements.

2.3.1 Alert Log Error Stack

This metric contains the information about different ORA- errors present in the alert log file. It ignores error patterns like ORA-0*(54 | 1142 | 1146) present in the alert log file and generate a warning alert when ORA-0*600x, ORA-07445, ORA-04[0-9][0-9][0-9][^0-9] errors are present.

Edit the metric threshold and change the value of the ORA- error to generate the warning and critical alert for a different set of ORA- errors.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	ORA-0*(600? 7445 4[0-9][0-9][0-9][^0-9])	Not Defined	ORA-error stack (%errCodes%) logged in %alertLogName%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. The alert log file is scanned for the ORA-errors ignoring the patterns like ORA-0*(54|1142|1146).

User Action

Examine the ALERT log for additional information.

2.3.2 Alert Log Error Stack Trace File Name

This metric provides information about the trace file name in which ORA- errors are present. It provides the detail of the trace file name and the line at which the error has occurred.

Target Version	Evaluation and Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The data comes from the Alert Log files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.3.3 Alert Log Name

This metric provides information about the alert log file in which ORA- errors are present. It displays the file name and the line at which the error has occurred.

Target Version	Evaluation and Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Examine the ALERT log for additional information.

2.3.4 Archive Hung Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Archive Hung in the alert log files. The errors ORA-00257 and ORA-16038 in the alert log indicates an archive-hung problem. This also generates a critical alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. Also, the warning and critical alert values can be modified or set.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	Not Defined	ORA-	The archiver hung at time/line number:%timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. Alert log file is scanned for the ORA-00257 and ORA-16038 error.

User Action

Examine the ALERT log for additional information.

2.3.5 Data Block Corruption Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Data Block Corruption errors in the alert log files. The errors ORA- 01157, ORA-01578, and ORA-27048 in the alert log indicates Data Block Corruption problems. This also generates a critical alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. Also, the warning and critical alert values can be modified or set.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	Not Defined	ORA-	The data block was corrupted at time/line number: %timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the

home of the Oracle Management Agent. Alert log file is scanned for the ORA- 01157, ORA-01578, and ORA-27048 error.

User Action

Examine the ALERT log for additional information.

2.3.6 Media Failure Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Media Failure Errors in the alert log files. The errors ORA-15130, ORA-15049, ORA-15050 and ORA-15051 in the alert log indicates Media Failure Error problems. This generates a critical alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. You can also set or modify the warning and critical alert values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	Not Defined	ORA-	Media failure was detected at time/line number: %timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. Alert log file is scanned for the ORA-15130, ORA-15049, ORA-15050 and ORA-15051 error.

User Action

Examine the ALERT log for additional information.

2.3.7 Session Terminated Error Stack

This metric contains the information about different ORA- errors, which indicate the presence of Session Terminated problems in the alert log files. The ORA- 00603 error in the alert log indicates Session Terminated problems. This also generates a warning alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. Also, the warning and critical alert values can be modified or set.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	ORA-	Not Defined	A session was terminated at time/line number: %timeLine%.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Timestamp/LineNumber object.

If warning or critical threshold values are currently set for any Timestamp/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Timestamp/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from Alert Log Files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. The alert log file is scanned for the ORA-00603 error.

User Action

Examine the ALERT log for additional information.

2.4 ASM Cluster File System

The metrics in the ASM Cluster File System metric category show the space used by all of the ASM Cluster File Systems. These metrics are used to collect information about the ASM Cluster File System space usage and are used to show the trend of ASM Cluster File System space usage in the application. These metrics collect information for both mounted and dismounted ASM Cluster File Systems. This information is used to determine the following metrics for space usage: Allocated Space (GB), Size (GB), Free (GB), Used (GB), and Used (%). These metrics also collect information about whether the ASM Cluster File System is corrupt. For dismounted ASM Cluster File Systems, 0 is returned for the Free (GB), Used (GB), and Used (%) metrics.

These metrics only collect information about the ASM Cluster File System that is not specific to a node in a cluster. They collect space usage information which is the same across all nodes in the cluster. Information such as the state and availability of the ASM Cluster File System can be different across the nodes in a cluster and is collected by the ASM Cluster File System State metrics.

These metrics generate a warning alert if the ASM Cluster File System is 85% used and a critical alert if 97% used. These metrics also generate a critical alert if the ASM Cluster File System has sections that are corrupt.

These metrics are collected at a time interval of 15 minutes and the metrics will be collected at the cluster level if the target is Cluster ASM otherwise they will be collected at the instance level as a part of the ASM target type metrics. You can change the threshold limit as required.

2.4.1 ASM Cluster File System Corrupt

This metric shows if the mounted ASM Cluster File System has sections that are corrupt. A value of TRUE for this metric indicates that there are sections that are

corrupt and therefore the Check and Repair operation should be run on the ASM Cluster File System to fix it. For dismounted ASM Cluster File Systems, it returns a value of Null for this metric.

This metric generates a warning alert if the ASM Cluster File System is dismounted on a given host. The metric also generates a critical alert if the mounted ASM Cluster File System is not available on a host.

This metric is collected at a time interval of 15 minutes. You can change the threshold limit as required.

This metric is collected with the help of a SQL query which queries the V\$ASM_FILESYSTEM, V\$ASM_VOLUME, V\$ASM_OFSVOLUMES views.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	TRUE	The ASM Cluster File System using volume device %ofs_volume_device% has sections that are corrupt. Run check and repair operation on the file system to fix the issue.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each unique combination of volume device and disk group objects.

If warning or critical threshold values are currently set for any unique combination of volume device and disk group objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of volume device and disk group objects, use the Edit Thresholds page.

Data Source

This metric is collected from the column CORRUPT in the V\$ASM_FILESYSTEM view for mounted ASM Cluster File Systems. For Dismounted File Systems, a value of Null is returned for this metric.

User Action

Run Check and Repair on the ASM Cluster File System to fix the corrupted sections.

2.4.2 ASM Cluster File System Used (%)

This metric shows if the percent of the ASM cluster file system that is used.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12cR1	Every 30 Minutes	Not Defined	TRUE	The ASM Cluster File System using volume device %ofs_volume_device% has sections that are corrupt. Run check and repair operation on the file system to fix the issue.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each unique combination of volume device and disk group objects.

If warning or critical threshold values are currently set for any unique combination of volume device and disk group objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of volume device and disk group objects, use the Edit Thresholds page.

2.4.3 Allocated Space (GB)

This metric shows the space allocated from the disk group for this ASM Cluster File System in GB.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column SPACE in the V\$ASM_FILE view.

User Action

No user action is required.

2.4.4 Free (GB)

This metric shows the unused capacity of the ASM Cluster File System in gigabytes. It gives an indication of the free space available in the ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column TOTAL_FREE in the V\$ASM_FILESYSTEM view. For dismounted ASM Cluster File Systems, a value of 0 is returned.

User Action

Consider resizing the ASM Cluster File System if there is not enough Free Space available.

2.4.5 Size (GB)

This metric shows the size in GB of the ASM Cluster File System.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column TOTAL_SIZE in the V\$ASM_FILESYSTEM view for mounted file systems and from the column SIZE_MB in the view V\$ASM_VOLUME for dismounted file systems.

User Action

Consider resizing the ASM Cluster File System to add space.

2.4.6 Snapshot Space Used (MB)

This metric shows the percentage of snapshot space that is used on the ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

2.4.7 Used (GB)

This metric shows the space in GB that is used on the mounted ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is calculated from the columns TOTAL_SIZE and TOTAL_FREE in the V\$ASM_FILESYSTEM view. This metric is calculated using the following formula:

$$\text{TOTAL_SIZE} - \text{TOTAL_FREE}$$

For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

User Action

Consider resizing the ASM Cluster File System to add more space.

2.4.8 Used (MB)

This metric shows the space in MB that is used on the mounted ASM Cluster File System. For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is calculated from the columns TOTAL_SIZE and TOTAL_FREE in the V\$ASM_FILESYSTEM view. This metric is calculated using the following formula:

$$\text{TOTAL_SIZE} - \text{TOTAL_FREE}$$

For dismounted ASM Cluster File Systems, a value of 0 is returned for this metric.

User Action

Consider resizing the ASM Cluster File System to add more space.

2.4.9 Volume Name

This metric shows the volume name of the volume device used to create the ASM Cluster File System.

Target Version	Collection Frequency
11gR2, 12c	Every 30 Minutes

Data Source

This metric is collected from the column VOLUME_NAME in the V\$ASM_VOLUME view.

User Action

No user action is required.

2.5 ASM Cluster File System State

The metrics in the ASM Cluster File System State metric category show the state of the ASM Cluster File System, whether it is MOUNTED or DISMOUNTED on a given host.

2.5.1 ASM Cluster File System Availability

This metric shows the availability of the ASM cluster file system.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

2.5.2 ASM Cluster File System Mount State

This metric shows the mount state of the ASM cluster file system.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

2.5.3 Mount Point

This metric shows the mount point of the ASM cluster file system.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

2.5.4 ASM Cluster File System Available Time

This metric shows the amount of time that the ASM cluster file system has been available.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

2.6 ASM Volumes

The metrics in the ASM Volumes metric category show information about the volumes created on a disk group. An ASM volume file is a file created on the disk group to provide storage for an ASM Cluster File System or a third-party file system. This is

used to determine the following metrics for ASM volumes: Volume Name, Status, Usage, Mount Point, Size (GB), Allocated Space (GB), and Redundancy.

These metrics are collected with the help of the V\$ASM_VOLUME and GV\$ASM_DISKGROUP views. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

2.6.1 Allocated Space (GB)

This metric shows the space in MB allocated to the ASM Cluster File System on a given host in a cluster.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the MOUNTPATH column in the V\$ASM_VOLUME view.

User Action

No user action is required.

2.6.2 Redundancy

This metric returns the redundancy for the ASM volume file. The ASM volume file can use whatever redundancy (external, normal=2-way mirror, high=3-way mirror) is available to the ASM disk group where the ASM volume file is created.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the REDUNDANCY column in the V\$ASM_VOLUME view.

User Action

No user action is required.

2.6.3 Size (GB)

This metric returns the size of the ASM volume in GB. The volume size is always created in multiples of the volume allocation unit.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the column SIZE_MB from the V\$ASM_VOLUME view.

User Action

No user action is required.

2.6.4 Usage

This metric returns a string indicating what the ASM volume is used for: ACFS, EXT3, null. A value of null means that the usage of the volume is Unknown.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

This metric returns a string indicating what the ASM volume is used for: ACFS, EXT3, null. A value of null means the usage of the volume is Unknown.

User Action

No user action is required.

2.6.5 Volume Name

This metric returns the name of the ASM volume. This is the name entered when the user creates the ASM volume on the disk group.

Target Version	Collection Frequency
11gR2, 12c	Every 24 hours

Data Source

The source of this metric is the VOLUME_NAME column in the V\$ASM_VOLUME view.

User Action

No user action is required.

2.7 Checker Failure

The metrics in this category are used to alert you to checker failures reported in the alert log. It contains the number of checker failures detected. It also generates a critical alert when these problems are found in the alert log.

The data comes from the alert log files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. Alert log file is scanned for messages similar to ASM Health Checker found 1 new failures.

2.7.1 Alert Log Name

This metric returns the name of the Alert Log file.

Target Version	Collection Frequency
11g, 12cR1	Every 5 Minutes

Data Source

The data comes from the alert log files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the

home of the Oracle Management Agent. Alert log file is scanned for messages similar to ASM Health Checker found 1 new failures.

User Action

Examine the alert log for additional information.

Note: This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you need to manually clear the event after the problem is fixed.

2.7.2 Checker Failure Detected

This metric is used to alert you to checker failures reported in the alert log. It contains the number of checker failures detected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	¹	Health checker runs found %numberOfFailures% new failures in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric column you can set different warning and critical threshold values for each for each Time/LineNumber object.

If warning or critical threshold values are currently set for any Time/LineNumber object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/LineNumber object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. Alert log file is scanned for messages similar to ASM Health Checker found 1 new failures.

User Action

Examine the alert log for additional information.

Note: This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you need to manually clear the event after the problem is fixed.

2.7.3 Number of Failures

This metric shows the number of failures detected in the alert log.

Target Version	Collection Frequency
11g, 12c	Every 5 minutes

2.8 Cluster Volume Performance

The metrics in the Cluster Volume Performance metric category indicate the performance of the cluster volumes present in an ASM instance.

2.8.1 I/O Response Time

This metric shows the total read errors for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.2 I/O Per Second

This metric shows I/O per second for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.3 I/O Size (MB)

This metric shows the I/O size in MB for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.4 I/O Throughput

This metric shows the I/O throughput for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.5 Read Errors

This metric shows the total read errors for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.6 Read Response Time (MS)

This metric shows the total read response time in milliseconds for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.7 Read Size (MB)

This metric shows the total read size for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.8 Read Throughput

This metric shows the total read throughput for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.9 Reads Per Second

This metric shows the reads per second for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.10 Write Errors

This metric shows the detail of the total number of failed writes for the volume cluster.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.11 Write Response Time (MS)

This metric shows the total I/O time (in seconds) for write requests for the volume cluster if the TIMED_STATISTICS initialization parameter is set to true, or 0 if set to false.

Target Version	Collection Frequency
11gR2, 12c	Every hour

Data Source

This metric is calculated using the data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_DISK_STAT views.

User Action

No user action is required.

2.8.12 Write Size (MB)

This metric shows the total size of the writes in MB for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.13 Write Throughput

This metric shows the total write throughput for the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.8.14 Writes Per Second

This metric shows the total size of the writes per second the cluster volume.

Target Version	Collection Frequency
11gR2, 12c	Every hour

2.9 Database Disk Group Usage

The metrics in this category show the detail of the disk group space used by a database. With the help of this metric, you can know the space used in a disk group by different database instances. The metrics will be collected at cluster level if the target is Cluster ASM else they will be collected at instance level as a part of Automatic Storage Management target type metrics.

2.9.1 Total Bytes

This metric shows the total bytes of the disk group space used by a database. With the help of this metric one can know the space used in a disk group by different database instance.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 Minutes

Data Source

This metric is calculated by taking the space used by a file using the V\$ASM_FILE view and joining it with the V\$ASM_ALIAS and V\$ASM_DISKGROUP views for 10g Release 1 and the V\$ASM_ALIAS, V\$ASM_DISKGROUP_STAT views for 10g Release 2 to get the disk group space used by a database instance.

User Action

No user action is required.

2.10 Database Sparse Disk Group Usage

This metric category uploads the physical usage of sparse disk groups by snap cloned databases.

This metric category is enabled when ASM stores on Oracle Exdata. It is not applicable for any other systems.

2.10.1 Database Name

This metric provides the name of the database.

Target Version	Collection Frequency
12cR2	Every 24 Hours

Data Source

v\$asm_diskgroup, v\$asm_alias

2.10.2 Disk Group Name

This metric provides the sparse disk group name.

Target Version	Collection Frequency
12cR2	Every 24 Hours

Data Source

v\$asm_diskgroup, v\$asm_alias

2.10.3 Total Physical Bytes

This metric provides the total number of physical bytes allocated to the database.

Target Version	Collection Frequency
12cR2	Every 24 Hours

Data Source

v\$asm_diskgroup, v\$asm_alias

2.11 Disk Group Imbalance Status

The metrics in the Disk Group Imbalance Status metric category check if any disk groups are out of balance. Under normal operations, ASM automatically rebalances disk groups. These metrics detect conditions where manual rebalances may be required or the power level of a rebalance in progress may need to be raised to give it the necessary resources to complete faster. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

2.11.1 Actual Imbalance (%)

Actual Imbalance (%) measures the difference in space allocated to the fullest and emptiest disks in the disk group. The comparison is in percent full because ASM tries to keep all disks equally full as a percent of their size. The imbalance is relative to the space allocated not the space available. An imbalance of a couple percent is reasonable.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 minutes

Data Source

This metric is calculated using the following formula:

```
100 * (max((total_mb - free_mb) / total_mb) - min((total_mb - free_mb) / total_mb)) / max((total_mb - free_mb) / total_mb)
where total_mb and free_mb are columns in V$ASM_DISK_STAT
```

User Action

An imbalance of more than a couple percent may signal the need to initiate a manual rebalance of the disk group.

2.11.2 Actual Minimum Percent Free

The Actual Minimum Percent Free metric lists the amount of free disk space on the fullest disk as a percentage of the disk size. If the imbalance is zero, then this represents the total free space. Because all allocations are performed evenly across all disks, the minimum free space limits how much space can be used.

If one disk has only one percent free, then only one percent of the space in the disk group is really available for allocation, even if the rest of the disks are only half full.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 minutes

Data Source

The metric is calculated as $100 * (\min(\text{FREE_MB} / \text{TOTAL_MB}))$, where FREE_MB and TOTAL_MB are columns in the \$ASM_DISK_STAT view.

User Action

If the actual minimum percent free is a low number, a configuration change may be required to provide an even distribution of file extents and space usage across all disks in a disk group.

2.11.3 Disk Count

The Disk Count metric reports the number of disks in the disk group which gives a sense of how widely files can be spread.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 minutes

Data Source

Disk count is calculated using count(*) on all disks (V\$ASM_DISK_STAT) in a disk group (V\$ASM_DISKGROUP_STAT).

User Action

No user action is required.

2.11.4 Disk Group Percent Imbalance

The Disk Group Percent Imbalance (metric is used to determine if a disk group requires rebalance. Temporary imbalances (caused by a rebalance in progress) are ignored.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	10	Not Defined	Disk Group %diskGroup% requires rebalance because the space usage imbalance between disks is high.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

If a rebalance operation is not in progress, the value of the Disk Group Imbalance (%) without Rebalance metric is the same value as the value of the Actual Imbalance (%) metric, otherwise the value is 0.

User Action

A warning alert is generated if the value of the Disk Group Imbalance (%) without Rebalance metric is greater than or equal to 10%. In this case, a rebalance is necessary because the space usage imbalance between disks is high. You should manually initiate a rebalance operation.

2.11.5 Disk Maximum Used (%) with Rebalance

The Disk Maximum Used (%) with Rebalance metric is used to determine if a rebalance in progress needs a power boost to complete in a timely manner and prevent other errors from occurring due to space constraints.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	Not Defined	95	Increase the rebalance power for Disk Group %diskGroup% because at least one disk is critically low on space.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

If a rebalance is in progress and the power value is greater than 0, then the value of the Disk Maximum Used (%) with Rebalance metric is calculated as (100 - Actual Minimum Percent Free), otherwise the value is 0.

User Action

A critical alert is generated if the value of the Disk Maximum Used (%) with Rebalance metric is greater than or equal to 95%. In this case the rebalance power for the disk group must be increased because at least one disk is critically low on space. Increase the rebalance power (maximum power level is 11).

2.11.6 Disk Minimum Free (%) without Rebalance

The Disk Minimum Free (%) without Rebalance metric is used to determine if a disk group requires rebalance. Temporary imbalances (caused by a rebalance in progress) are ignored.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	20	10	Disk Group %diskGroup% requires rebalance because at least one disk is low on space.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

If a rebalance operation is not in progress, the value of the Disk Minimum Free (%) without Rebalance metric is the same as the value of the Actual Minimum Percent Free metric, otherwise the value is 100.

User Action

A warning alert will be generated if Disk Minimum Free (%) without Rebalance is less than or equal to 20%. In this case a rebalance is necessary because at least one disk is low on space. You should manually initiate a rebalance operation.

2.11.7 Rebalance In Progress

The Rebalance In Progress metric returns Yes if a rebalance operation is in progress, No otherwise.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Rebalance In Progress metric is retrieved from the operation column of the V\$ASM_OPERATION.view

User Action

No user action is required.

2.11.8 Resync In Progress

The Resync In Progress metric returns Yes if a resync operation is in progress, No otherwise.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

2.12 Disk Group Status

This configuration metric category collects ASM disk group status information.

2.12.1 State

This metric shows the state of the ASM disk group.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.12.2 Disk Group Name

This metric shows the disk group name.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the column FREE_MB in the view V\$ASM_DISKGROUP for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

User Action

Consider adding more disks to the disk group or deleting existing files in the disk group.

2.13 Disk Group Usage

The metrics in this category show the space used by all the disk groups having the state as 'MOUNTED'. These metrics are used to collect information about the disk usage and is used to show the trend of disk group space usage in the application. This information is used to determine the following metrics: Free MB, Total MB, Total Safely Usable MB, Type, Safely Usable File MB, Used %, and Used % of Safely Usable of a disk group for 10g Release 2 and Free MB, Total MB, Type, and Used % for 10g Release 1.

These metrics generate a warning alert if the disk group is 75% used and a critical warning if 90% used. The thresholds for the Disk Group Usage alert should *not* be fixed at 75% and 90%, because the value depends on the redundancy. In version 10g Release 2, these metrics use the `USABLE_FILE_MB` column of the `V$ASM_DISKGROUP_STAT` view to indicate usable mirrored free space. This column displays the amount of free space that can be safely utilized taking mirroring into account, and yet is able to restore redundancy after disk failure.

Enterprise Manager issues alerts for the following:

- Critical alert when `USABLE_FILE_MB <= 0`
- Warning alert when `USABLE_FILE_MB < 0.1 * REQUIRED_MIRROR_FREE_MB`

This metric is collected at a time interval of 15 minutes. You can change the threshold limit as required.

This metric is collected with the help of a SQL query which queries the `V$ASM_DISKGROUP` view for 10g Release 1 and the `V$ASM_DISKGROUP_STAT` view for 10g Release 2. The metrics will be collected at cluster level if the target is Cluster ASM else they will be collected at instance level as a part of Automatic Storage Management target type metrics.

2.13.1 Disk Group Name

This metric shows the unused capacity of the disk group in megabytes. It gives an indication of the free space available in a disk group.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12cR1	Every 15 Minutes	Not Defined	Not Defined	Total free size for Disk Group %dg_name% has fallen to %value% (MB).

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the column `FREE_MB` in the view `V$ASM_DISKGROUP` for 10g Release 1 and the `V$ASM_DISKGROUP_STAT` view for 10g Release 2.

User Action

Consider adding more disks to the disk group or deleting existing files in the disk group.

2.13.2 Disk Group Free (MB)

This metric shows the unused capacity of the disk group in megabytes. It gives an indication of the free space available in a disk group.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12cR1	Every 15 Minutes	Not Defined	Not Defined	Total free size for Disk Group %dg_name% has fallen to %value% (MB).

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the column FREE_MB in the view V\$ASM_DISKGROUP for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

User Action

Consider adding more disks to the disk group or deleting existing files in the disk group.

2.13.3 Disk Group Usable (MB)

This metric shows the capacity of the disk group based on the type of the disk group. This column indicates the amount of free space that can be safely utilized taking mirroring into account, and yet is able to restore redundancy after disk failure.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12cR1	Every 15 Minutes	Not Defined	Not Defined	Usable free size for Disk Group %dg_name% has fallen to %value% (MB).

Data Source

This metric is collected using the V\$ASM_DISKGROUP_STAT view.

Total Safely Usable MB = (total_mb - required_mirror_free_mb)/redundancy_factor

Where *total_mb* and *required_mirror_free_mb* come from the view column, and *redundancy_factor* is 1 for External Redundancy Disk Group, 2 for Normal Redundancy Disk Group, and 3 for High Redundancy Disk Group.

User Action

Consider adding more disks to the disk group or removing existing files from the disk group

2.13.4 Disk Group Usable Free (MB)

The usable free space of a disk group depends on the redundancy, so in 10g Release 2 it uses the USABLE_FILE_MB column of the V\$ASM_DISKGROUP_STAT view to indicate usable mirrored free space. This column indicates the amount of free space that can be safely utilized taking mirroring into account, and yet is able to restore redundancy after disk failure. This column is used to determine the usable free megabytes of a disk group.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12cR1	Every 15 Minutes	Not Defined	Not Defined	Usable free size for Disk Group %dg_name% has fallen to %value% (MB).

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the column `USABLE_FILE_MB` in the `V$ASM_DISKGROUP_STAT` view for 10g Release 2.

User Action

Consider adding more disks to the disk group or removing existing files from the disk group.

2.13.5 Disk Group Used %

This metric shows the percentage of space used by a disk group. It generates a warning alert if the disk group is 75% used and a critical warning if 90 % used. The threshold limit can be changed to generate alerts at different values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12cR1	Every 15 Minutes	75	90	Disk Group %dg_name% is %value%%% used.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the `V$ASM_DISKGROUP` view for 10g Release 1 and the `V$ASM_DISKGROUP_STAT` view for 10g Release 2.

$$\text{Used \%} = (\text{total_mb} - \text{free_mb}) / \text{total_mb} * 100$$

User Action

New disks can be added in a disk group to avoid the alerts. Go to the Disk Group general page and click Add to add a new disk to a disk group. Also, you can remove existing files from the disk group.

2.13.6 Redundancy

This metric shows the Redundancy Type of the disk group. It can be one of the three values: External, Normal, and High. This property determines the restore redundancy after disk failure.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 Minutes

Data Source

This metric is collected from the column TYPE in the V\$ASM_DISKGROUP view for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

User Action

No user action is required.

2.13.7 Size (MB)

This metric shows the total capacity of the disk group in megabytes. It gives an indication of the size or the space used by the disk group.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 Minutes

Data Source

This metric is collected from the column TOTAL_MB in the V\$ASM_DISKGROUP view for 10g Release 1 and the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

User Action

Consider adding more disks to the disk group.

2.13.8 Used % of Safely Usable

This metric shows the percentage of safely usable space used by a disk group. Usable free space of a disk group depends on the redundancy. In 10g Release 2, it uses the USABLE_FILE_MB column of the V\$ASM_DISKGROUP_STAT view to indicate usable mirrored free space. This column displays the amount of free space that can be safely utilized taking mirroring into account and restores redundancy after disk failure. This column is used to determine the Used % of Safely Usable for a disk group.

This metric generates a warning alert if the disk group is using 90% of the safely usable space and critical warning for 100%. The threshold limit can be changed to generate an alert at different values.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12cR1	Every 15 Minutes	75	90	Disk group %dg_name% has used %value%% of safely usable free space (space that can be allocated while still having enough space to recover from failure group failures).

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Disk Group Name object.

If warning or critical threshold values are currently set for any Disk Group Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Disk Group Name object, use the Edit Thresholds page.

Data Source

This metric is collected from the V\$ASM_DISKGROUP_STAT view for 10g Release 2.

Used % of Safely Usable = $100 - (\text{usable_file_mb} / \text{usable_total_mb}) * 100$

Where $\text{usable_total_mb} = \text{total_mb} - \text{required_mirror_free_mb} / \text{redundancy_factor}$

total_mb and *required_mirror_free_mb* are derived from the view column and *redundancy_factor* is 1 for External Redundancy Disk Group, 2 for Normal Redundancy Disk Group, and 3 for High Redundancy Disk Group.

User Action

New disks can be added in a disk group to avoid the alerts. Go to the Disk Group general page and click Add to add a new disk to a disk group. Also, you can remove existing files from the disk group.

2.14 Disk Path

This configuration metric category collects ASM disk path.

2.14.1 Disk Name

This metric shows the name of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12c	Every 24 hours

2.14.2 Disk Path

This metric shows the path of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12c	Every 24 hours

2.14.3 Group Name

This metric shows the group name of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12c	Every 24 hours

2.15 Disk Status

This configuration metric category collects ASM disk status information.

2.15.1 Disk Mode Status

This metric shows the disk mode status of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 minutes

2.16 Disks

The metrics in this category collect ASM Disk configuration data such as disk group name. Default collection time is 24 hours and the metrics will be collected at cluster level if the target is Cluster ASM else they will be collected at instance level as a part of Automatic Storage Management target type metrics.

2.16.1 Disk

This metric shows the disk name of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the NAME column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

2.16.2 Disk Creation Date

This metric shows the disk creation date of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the CREATE_DATE column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

2.16.3 Disk Group

This metric shows the disk group name of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

This metric is collected from V\$ASM_DISKGROUP_STAT view.

User Action

No user action is required.

2.16.4 Disk Path

This metric shows the disk path of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the PATH column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

2.16.5 Failure Group Name

This metric shows the failure group name of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the SPACE column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

2.16.6 Failure Group Type

This metric shows the failure group type, REGULAR or QUORUM.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the FAILUREGROUP column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

2.16.7 Redundancy

This metric shows the level of redundancy of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the REDUNANCY column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

2.16.8 Size (MB)

This metric shows the disk size in MB of the ASM disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 24 hours

Data Source

The source for this metric is the TOTAL_MB column in the V\$ASM_DISK_STAT view.

User Action

No user action is required.

2.17 Failure Group Imbalance Status

The metrics in the Failure Group Imbalance Status metric category check how even failure group disks are laid out for ASM disk groups. ASM strives for an even distribution of file extents and space usage across all disks in a disk group. It accomplishes this through rebalancing. If the disks are different sizes or the failure groups are different sizes then effective rebalancing cannot be achieved. In this situation, configuration changes are required.

These metrics only apply to disk groups with normal or high redundancy. These metrics will not return data for disk groups with external redundancy, because failure groups are not used in this configuration. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

2.17.1 Disk Count Imbalance Variance

Failure groups are used to store mirror copies of data: two copies for normal redundancy, three copies for high redundancy. The Disk Count Imbalance Variance metric reports the difference in the failure group disk count for the disk in the disk group with the highest failure group disk count and the disk with the lowest.

It may not be possible for every disk to have the same failure group disk count even when all the failure groups are the same size. However an imbalance of more than one indicates that the failure groups are different sizes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	2	Not Defined	Disk Group %diskGroup% has failure groups with different numbers of disks which may lead to suboptimal space usage. Changing the configuration may alleviate this problem.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

The value of the Disk Count Imbalance Variance metric is calculated using the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views, along with some internal ASM fixed tables.

User Action

A warning alert is generated when the Disk Count Imbalance Variance value is greater than 1 (the default value). Disk groups that have failure groups with different numbers of disks may lead to suboptimal space usage. To alleviate this problem, try changing the configuration.

2.17.2 Disk Size Imbalance (%)

Disk Size Imbalance (%) checks whether some disks have more space in their failure group disks than others. The space is calculated as a ratio between the size of a disk and the sum of the sizes of its active failure group disks. This ratio is compared for all the disks. The difference in the highest and lowest failure group disk space is reported as a percentage. An imbalance of 10% is acceptable.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 15 Minutes	10	Not Defined	Disk Group %diskGroup% has failure groups with disks of different sizes which may lead to suboptimal space usage. Changing the configuration may alleviate this problem.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each disk group object.

If warning or critical threshold values are currently set for any disk group object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each disk group object, use the Edit Thresholds page.

Data Source

The value of the Disk Size Imbalance metric is calculated using the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views, along with some internal ASM fixed tables.

User Action

A warning alert is generated when the Disk Size Imbalance (%) is greater than 10% (the default). Disk groups that have failure groups with disks of different sizes may lead to suboptimal space usage. To alleviate this problem, try changing the configuration.

2.17.3 Failure Group Count

Failure Group Count reports the number of failure groups per disk group.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Failure Group Count metric is retrieved from a calculation involving the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views, and some internal ASM fixed tables.

User Action

No user action is required.

2.18 Failure Group Status

The metrics in the Failure Group Status metric category check to see if all of the member disks of any failure group are offline. This is an undesirable condition which risks data loss, because mirror copies of data cannot be stored.

These metrics only apply to disk groups with normal or high redundancy. The metrics are collected at the cluster level if the target is Cluster ASM. Otherwise, they are collected at the instance level as a part of ASM target type metrics.

2.18.1 Available Disks

The Available Disks metric reports the number of disks in the failure group that are online.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Available Disks metric is calculated by subtracting the number of offline disks in the failure group from the number of total disks.

User Action

No user action is required.

2.18.2 Disk Count

The Disk Count metric reports the number of disks in the failure group.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 15 Minutes

Data Source

The value of the Total Disks metric is retrieved from the V\$ASM_DISKGROUP_STAT and V\$ASM_DISK_STAT views.

User Action

No user action is required.

2.18.3 Online Disk Count for Failure Group with More than 1 Disk

This metric shows the online disk count for failure group with more than one disk.

Target Version	Collection Frequency
10g, 11g, 12cR1	Every 15 minutes

2.19 Incident

The metrics in this category represent incidents, for example, generic internal error, access violation, and so on as recorded in the ASM alert log file. Incidents refer to problems for which Automatic Diagnostic Repository (ADR) incidents are created. These type of problems usually require investigation, diagnostic data to be collected, and perhaps require interaction with Oracle Support for resolution. The alert log file has a chronological log of messages and errors.

Each metric signifies that the ASM being monitored has detected a critical error condition about the ASM and has generated an incident to the alert log file since the last sample time. The Support Workbench in Enterprise Manager contains more information about each generated incident.

Note: For more information about Incident metrics and Operational Error metrics, log in to My Oracle Support and search for the following Oracle Support Note:

Database Alert log monitoring in 12c explained (Doc ID 1538482.1)

<https://support.oracle.com/>

Setting Thresholds for Incident Metrics

To edit the thresholds for any of the following metrics, from the Cloud Control UI, right-click the target name, select **Monitoring**, then **Metric and Collection Settings**. The following settings provide examples of some of the possible settings:

- Warning Threshold: **Not Defined**; Critical Threshold: **.***
In this case, the Management Agent generates a critical error alert in Enterprise Manager when the incident occurs.
- Warning Threshold: **.***; Critical Threshold: **Not Defined**
In this case, the Management Agent generates a warning alert in Enterprise Manager when the incident occurs.
- Warning Threshold: **Not Defined**; Critical Threshold: **Not Defined**
In this case, the Management Agent does *not* generate an alert in Enterprise Manager when the incident occurs.

2.19.1 Access Violation

This metric signifies that the ASM has generated an incident due to some memory access violation. This type of incident is typically related to Oracle Exception messages

such as ORA-3113 and ORA-7445. The ASM can also generate this type of incident when it detects a SIGSEGV or SIGBUS signals.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	An access violation detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.2 Alert Log Error Trace File

This metric is the name of the trace file (if any) associated with the logged incident.

Target Version	Collection Frequency
11g, 12cR1	Every 5 Minutes

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.19.3 Alert Log Name

This metric is the name of the alert log file.

Target Version	Collection Frequency
11g, 12cR1	Every 5 Minutes

Data Source

The data comes from the alert log files. It is collected using the Perl script: \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.19.4 ASM Block Corruption

ASM Block corruption can happen due to many reasons over lifetime (for example head misalignment, dust spec, and so on). If the disk groups are mirrored, ASM automatically repairs the corrupted blocks from the mirror.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	An ASM data block was corrupted at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The source of this metric is the Incident metric.

User Action

You can execute check and remap commands which have been implemented in Enterprise Manager.

1. Check

This checks the consistency of disk group metadata and logs the result in alert log and may repair depending upon repair/norepair option provided. In case of corruptions, the result would look like: cache read a corrupted block group=NORM3 fn=1 blk=0 from disk 0 and so on.

2. Remap

This repairs a range of physical blocks that maps to a valid ASM file.

In addition, you can use Support Workbench in Enterprise Manager to examine the details of the incidents.

2.19.5 Cluster Error

This metric signifies that the ASM has generated an incident due to a member evicted from the group by a member of the cluster database. This type of incident is typically related to Oracle Exception message ORA-29740.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	A cluster error detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.6 Deadlock

This metric signifies that the ASM has generated an incident due to a deadlock detected while trying to lock a library object. This type of incident is typically related to Oracle Exception message ORA-4020.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	A deadlock error detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.7 ECID

The Execution Context ID (ECID) tracks requests as they move through the application server. This information is useful for diagnostic purposes because it can be used to correlate related problems encountered by a single user attempting to accomplish a single task.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The ECID is extracted from the database alert log.

User Action

Diagnostic incidents usually indicate software errors and should be reported to Oracle through the Enterprise Manager Support Workbench. When you package problems using Support Workbench, the Support Workbench uses ECID to correlate and include any additional problems in the package.

2.19.8 File Access Error

This metric signifies that the ASM has generated an incident due to failure to read a file at the time.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	A file access error detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.9 Generic Incident

This metric signifies that the ASM has generated an incident due to some error.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	Incident (%errCodes%) detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.10 Generic Internal Error

This metric signifies that the ASM has generated an incident due to an internal ASM error. This type of incident is typically related to Oracle Exception message ORA-600 or ORA-0060*.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	Internal error (%errCodes%) detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.11 Impact

This metric reports the impact of an incident. For a Generic Internal Error incident, the impact describes how the incident may affect the ASM.

Target Version	Collection Frequency
11g, 12cR1	Every 5 Minutes

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.19.12 Incident ID

This metric is a number identifying an incident. The Support Workbench in Enterprise Manager uses this ID to specify an incident.

Target Version	Collection Frequency
11g, 12cR1	Every 5 Minutes

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.19.13 Internal SQL Error

This metric signifies that the ASM has generated an incident due to an internal SQL error. This type of incident is typically related to Oracle Exception message ORA-604.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	An internal SQL error detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.14 Out of Memory

This metric signifies that the ASM has generated an incident due to failure to allocate memory. This type of incident is typically related to Oracle Exception message ORA-4030 or ORA-4031.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	. ¹	Out of memory detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.15 Redo Log Corruption

This metric signifies that the ASM has generated an incident due to an error with the redo log. This type of incident is typically related to Oracle Exception message ORA-353, ORA-355, or ORA-356.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g	Every 5 Minutes	Not Defined	. ¹	A data block was corrupted at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.19.16 Session Terminated

This metric contains the information about different ORA- errors, which indicate the presence of Session Terminated problems in the alert log files. The ORA- 00603 error in the alert log indicates Session Terminated problems. This also generates a warning alert when these problems are found in alert logs.

You can edit the metric threshold and change the value of the error you want to collect under a different head. Also, the warning and critical alert values can be modified or set.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g	Every 5 Minutes	Not Defined	¹	A session termination detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent. The alert log file is scanned for the ORA- 00603 error.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

2.20 Instance Disk Performance

The metrics in this category collect ASM instance disk performance data.

2.20.1 Bytes Read

This metric shows the number of bytes read.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.2 Bytes Written

This metric shows the number of bytes written.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.3 I/O Response Time (MS)

This metric shows the I/O response time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.4 Last Read Errors

This metric shows the last read errors.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.5 Read Errors

This metric shows the number of read errors.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.6 Read Response Time (MS)

This metric shows the read response time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.7 Read Time (MS)

This metric shows the read time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.8 Total I/O Time (MS)

This metric shows the total I/O time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.9 Write Errors

This metric shows the write errors.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.10 Write Response Time (MS)

This metric shows the write response time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.20.11 Write Time (MS)

This metric shows the write time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.21 Instance Diskgroup Database Performance

The metrics in this category collect ASM instance disk group database performance data.

2.21.1 Bytes Read

This metric shows the number of bytes read.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.21.2 Bytes Written

This metric shows the number of bytes written.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.21.3 Read Time (MS)

This metric shows the read time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.21.4 Reads

This metric shows the number of reads.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.21.5 Writes

This metric shows the number of writes.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.21.6 Write Time (MS)

This metric shows the write time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.22 Instance Diskgroup Performance

The metrics in this category collect ASM instance disk group performance data.

2.22.1 Bytes Read

This metric shows the number of bytes read.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.22.2 Bytes Written

This metric shows the number of bytes written.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.22.3 Read Time (MS)

This metric shows the read time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.22.4 Reads

This metric shows the number of reads.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.22.5 Write Time (MS)

This metric shows the write time in milliseconds.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.22.6 Writes

This metric shows the number of writes.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.23 Instance Volume Performance

The metrics in this category indicate the performance of the volumes present in an Automatic Storage Management (ASM) instance. These metrics show the volume performance parameters for all the volumes created on all disk groups mounted on an ASM Instance.

These metrics are used to collect information, for example, total I/O and read/write requests, total I/O and read/write time, and the total number of bytes read/written to the volume. These metrics also show the response of the volume for read, write, and I/O throughput and the Read Write Errors.

2.23.1 I/O Per Second

This metric shows the sum of ASM volume I/O performance per second in terms of total I/O requests for all the ASM Volumes. The data is displayed for all instances that are part of the cluster.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average I/Os per second for each volume, the total number of I/O responses is divided by the total I/O time during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.2 I/O Size (MB)

This metric shows the sum of all volume I/O for all volumes. The data is not aggregated for all instances.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average I/O size of each volume, the total number of bytes read and written is divided by the total number of I/Os during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.3 I/O Throughput

This metric shows the sum of I/O throughput for all volumes. The data is displayed for all instances that are part of the cluster.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average throughput of each volume, the total number of bytes read and written is divided by the total I/O time during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.4 Read Response Time (MS)

This metric shows the volume read response time detail of the volumes. This gives an indication of the volume response time in terms of total read requests for this volume.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average read response time for each volume, the total read time is divided by the total number of read responses during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.5 Read Size (MB)

This metric shows the sum of all volume reads for all volumes which are part of the cluster. The data is not aggregated for all instances.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average read size of each volume, the total number of bytes read are divided by the total number of reads during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.6 Read Throughput

This metric shows the read throughput detail of a volume created in an Automatic Storage Management (ASM) instance. This gives an indication for the total number of bytes read from the volume in proportion to the total read time for this volume in an instance.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average read throughput of each volume, the total number of bytes read is divided by the total read time during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.7 Read Write Errors

This metric shows the detail of the total number of failed read/writes for the volume. This provides information about the total number of failed attempts of reads and writes for the volume.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views. From these views, the total number of failed read/writes for the volume is added to calculate the read write errors detail.

User Action

Investigate the issues behind read/write errors.

2.23.8 Reads Per Second

This metric shows the detail of total read requests per second for a volume in a disk group in an Automatic Storage Management (ASM) instance. This metric shows the read performance of all the volumes included in an instance.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average reads per second for each volume, the total number of read responses is divided by the total read time during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.9 Response Time (MS)

This metric shows the I/O response time detail of volumes. For this volume, this metric indicates the response time in terms of total I/O requests for all the volumes.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average I/O response time for each volume, the total I/O time is divided by the total number of I/O responses during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.10 Write Response Time (MS)

This metric shows the write response time detail of the volumes. This gives an indication for the volume response time in terms of total write requests for this volume.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average write response time for each volume, the total write time is divided by the total number of write responses during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.11 Write Size (MB)

This metric shows the sum of all volume writes for all volumes which are part of the cluster. The data is not aggregated for all instances.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average write size of each volume, the total number of bytes written is divided by the total number of writes during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.12 Write Throughput

This metric shows the write throughput detail of a volume created on a disk group in an Automatic Storage Management (ASM) instance. This gives an indication for the total number of bytes written from the volume with proportion to the total write time for this volume in an instance.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average write throughput of each volume, the total number of bytes written is divided by the total write time during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.23.13 Writes Per Second

This metric shows the detail of total write requests per second for a Volume in an Automatic Storage Management (ASM) Instance. This metric shows the write performance of the volume.

Target Version	Collection Frequency
11g, 12cR1	Every Hour

Data Source

It is calculated using the Instance Volume Performance metric which in turn collects data from the GV\$ASM_DISKGROUP_STAT and GV\$ASM_VOLUME_STAT views.

To calculate the average writes per second for each volume, the total number of write responses is divided by the total write time during the collection interval. The data is displayed for all instances that are part of the cluster.

User Action

No user action is required.

2.24 Offline Disk Count

The metrics in this category collect ASM offline disk count information.

2.24.1 Offline Disk Count

This metric collects ASM offline disk count information.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 minutes

2.25 Operational Error

The metrics in this category represent errors that may affect the operation of the ASM, for example, data block corruption, media failure, and so on as recorded in the ASM alert log file. These errors are not triggered by ADR incidents but are day to day issues which you can handle without interaction with Oracle Support. The alert log file has a chronological log of messages and errors.

Each metric signifies that the ASM being monitored has detected a critical error condition that may affect the normal operation of the ASM and has generated an error message to the alert log file since the last sample time.

Note: For more information about Incident metrics and Operational Error metrics, log in to My Oracle Support and search for the following Oracle Support Note:

Database Alert log monitoring in 12c explained (Doc ID 1538482.1)

<https://support.oracle.com/>

2.25.1 Setting Thresholds for Operational Error Metrics

To edit the thresholds for any of the following metrics, from the Cloud Control UI, right-click the target name, select **Monitoring**, then **Metric and Collection Settings**. The following settings provide examples of some of the possible settings:

- Warning Threshold: **Not Defined**; Critical Threshold:
In this case, the Management Agent generates a critical error alert in Enterprise Manager when the error occurs.
- Warning Threshold: Critical Threshold: **Not Defined**
In this case, the Management Agent generates a warning alert in Enterprise Manager when the error occurs.
- Warning Threshold: **Not Defined**; Critical Threshold: **Not Defined**
In this case, the Management Agent does *not* generate an alert in Enterprise Manager when the error occurs.

2.25.2 Alert Log Error Trace File

This metric is the name of the trace file (if any) associated with the logged error.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.25.3 Alert Log Name

This metric is the name of the alert log file.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

No user action is required.

2.25.4 Data Block Corruption

This metric signifies that the ASM being monitored has generated a corrupted block error (ORA-01157 or ORA-27048) to the alert file since the last sample time. The alert file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when data block corrupted messages are written to the alert file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	¹	A data block was corrupted at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page. See Editing Thresholds for information on accessing the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the error.

2.25.5 Generic Operational Error

This metric signifies that the ASM being monitored has generated some error that may affect the normal operation of the ASM to the alert file since the last sample time. The alert file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when data block corrupted messages are written to the alert file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	¹	Operational error (%errCodes%) detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page. See Editing Thresholds for information on accessing the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the error.

2.25.6 Media Failure

This metric signifies that the ASM being monitored has generated a media failure error (ORA-01242 or ORA-01243) to the alert file since the last sample time. The alert file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when data block corrupted messages are written to the alert file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12cR1	Every 5 Minutes	Not Defined	¹	Media failure detected in %alertLogName% at time/line number: %timeLine%.

¹ After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page. See Editing Thresholds for information on accessing the Edit Thresholds page.

Data Source

The data comes from the alert log files. It is collected using the Perl script \$ORACLE_HOME/sysman/admin/scripts/alertlogAdr.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the error.

2.26 Response

The metrics in this category show the status of the Automatic Storage Management (ASM) instance. It shows whether the instance is up or down. The check is performed every five minutes and returns the status of the connection as successful or it displays the ORA error for connection failure. This generates a critical alert if the ASM instance is down.

2.26.1 Status

This metric shows the status of the Automatic Storage Management (ASM) instance. It displays whether the instance is up or down. This check is performed every five minutes and returns the status of the connection as successful or it displays the ORA error for connection failure. This generates a critical alert if the ASM instance is down.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	0	Failed to connect to ASM instance %oraerr%.

Data Source

You can establish a connection to the ASM instance with instance properties, and if the connection succeeds then the status is shown as Up, otherwise is displays as Down. It may also display as Down if there is an error in the metric collection.

User Action

Perform one of the following:

- Check that the configuration property saved for the ASM instance is correct.
- If it displays as Down, the ASM instance is down. Try to reestablish the connection using the startup/shutdown feature using the Enterprise Manager application. Alternately, you can restart the application manually.

2.27 Sparse Disk Group Usage

This metric category uploads the following metrics: physical usage, physical used percentage, and physical free of sparse disk groups.

This metric category is enabled when ASM stores on Oracle Exdata. It is not applicable for any other systems.

2.27.1 Disk Group Physical Free (MB)

This metric provides the physical free size in MB of the sparse disk group.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12cR2 and later	Every 30 Minutes	Not Defined	Not Defined	Physical free size for Sparse Disk Group %dg_name% has fallen to %value% (MB).

Data Source

v\$asm_diskgroup_sparse, v\$asm_diskgroup_stat

User Action

Add disks.

2.27.2 Disk Group Physical Used (%)

This metric provides the physical used percentage of the sparse disk groups.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12cR2 and later	Every 30 Minutes	75	90	Sparse Disk Group %dg_name% is %value%%% used.

Data Source

v\$asm_diskgroup_sparse, v\$asm_diskgroup_stat

User Action

Add disks.

2.27.3 Physical Size (MB)

This metric provides the size of physical usage in MB of the sparse disk groups.

Target Version	Collection Frequency
12cR2 and later	Every 30 Minutes

Oracle High Availability Service

This chapter provides information about the Oracle High Availability Service metrics. For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

3.1 CRS nodeapp Status

The metric in this category monitors the status of the Oracle Cluster Ready Services (CRS) node applications (nodeapps), Virtual Internet Protocol (IP), Global Services Daemon (GSD), and Oracle Notification System (ONS).

3.1.1 nodeapp Status

This metric monitors the status of the nodeapps, IP, GSD, and ONS. A critical alert is raised for the nodeapp if its status is OFFLINE NOT RESTARTING. A warning alert is raised for the nodeapp if its status is either UNKNOWN or OFFLINE.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11gR1	Every 5 minutes	UNKNOWN OFFLINE	OFFLINE NOT RESTARTING	CRS resource %nodeapps% is %status%

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each nodeapp object.

If warning or critical threshold values are currently set for any nodeapp object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each nodeapp object, use the Edit Thresholds page.

Data Source

Not available.

User Action

Refer to the *Real Application Clusters Administration and Deployment Guide* for node applications startup and troubleshooting information.

3.2 CRS Virtual IP Relocation Status

The metrics in this category provide information about whether there is a Virtual IP relocation taking place. When a Virtual IP is relocated from the host (node) on which it was originally configured, a critical alert is generated.

3.2.1 Virtual IP Relocated

This metric shows whether the Virtual Internet protocol has relocated from the host (node) where it was originally configured. The value is TRUE if relocation occurred. Otherwise it is FALSE. When the value is TRUE, a critical alert is raised.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11gR1	Every 5 minutes	Not Defined	TRUE	CRS resource %vip% was relocated to %current_node%

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Virtual IP Name object.

If warning or critical threshold values are currently set for any Virtual IP Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Virtual IP Name object, use the Edit Thresholds page.

Data Source

Not available.

User Actions

The required actions are specific to your site.

3.3 Incident

This metrics category provides information about the Incident target.

3.3.1 Alert Log Error Trace File

The alert log error trace file is the name of an associated server trace file generated when the problem causing this incident occurred. If no additional trace file was generated, this field is blank.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The alert log error trace file name is extracted from the database alert log.

User Action

Examine the alert log error trace file for more information about the problem that occurred.

3.3.2 Alert Log Name

This metric contains the fully specified name of the current XML alert log file (including directory path).

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

This name is retrieved by searching the `OMS_ADR_HOME/alert` directory for the most recent (current) log file.

User Action

Examine the alert log file for more information about the problem that occurred.

3.3.3 ECID

The Execution Context ID (ECID) tracks requests as they move through the application server. This information is useful for diagnostic purposes because it can be used to correlate related problems encountered by a single user attempting to accomplish a single task.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The ECID is extracted from the database alert log.

User Action

Diagnostic incidents usually indicate software errors and should be reported to Oracle through the Enterprise Manager Support Workbench. When you package problems using Support Workbench, the Support Workbench uses ECID to correlate and include any additional problems in the package.

3.3.4 Impact

This metric provides an optional field that reports the impact of the problem that occurred. It may be empty.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The impact is extracted from the database alert log.

User Action

This field is informational. Diagnostic incidents usually indicate software errors and should be reported to Oracle using the Enterprise Manager Support Workbench.

3.3.5 Incident ID

This metric reports the incident ID, a number that uniquely identifies a diagnostic incident (a single occurrence of a problem).

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The incident ID is extracted from the database alert log.

User Action

Diagnostic incidents usually indicate software errors and should be reported to Oracle using the Enterprise Manager Support Workbench. A problem is one or more occurrences of the same incident. If you use Support Workbench, the incident ID can be used to select the correct problem to package and send to Oracle. If you use the command line tool ADRCI, you can use the Show Incident command with the incident ID to retrieve details about the incident.

3.3.6 Generic Incident

This metric reports the number of Generic Incident type incidents observed the last time that Oracle Enterprise Manager scanned the alert log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 minutes	Not Defined	.*	Incident (%adr_problemKey%) detected in %alertLogName% at time/line number: %timeLine%.

Data Source

The source for this metric is the Incident metric.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incidents.

3.3.7 Generic Internal Error

This metric reflects the number of Generic Internal Error incidents observed the last time Enterprise Manager scanned the alert log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 minutes	Not Defined	.*	Internal error (%adr_problemKey%) detected in %alertLogName% at time/line number: %timeLine%.

Data Source

The source for this metric is the Incident metric.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incidents.

3.4 Operational Error

This metric category contains metrics representing errors that might affect the operation of the database as recorded in the database alert log file. The alert log file has a chronological log of messages and errors.

3.4.1 Generic Operational Error

This metric reports the number of generic operation errors observed the last time Enterprise Manager scanned the alert log file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 minutes	Not Defined	.*	Operational error (%errorCodes%) detected in %alertLogName% at time/line number: %timeLine%.

3.4.2 User-Defined Error

This metric reports the number of user-defined errors observed the last time Enterprise Manager scanned the alert log file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 minutes	Not Defined	Not Defined	Error (%errorCodes%) detected in %alertLogName% at time/line number: %timeLine%.

3.4.3 User-Defined Warning

This metric reflects the number of user-defined warnings witnessed the last time Enterprise Manager scanned the alert log file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 minutes	Not Defined	Not Defined	Warning (%errorCodes%) detected in %alertLogName% at time/line number: %timeLine%.

3.5 Oracle High Availability Service Alert Log

The metrics in this category provide information about the Oracle high availability service alert log.

3.5.1 Alert Log Name

This metric reports the name and full path of the CRS alert log.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

Not available.

User Action

The required actions are specific to your site.

3.5.2 CRS Resource Alert Log Error

This resource collects CRS-1203, CRS-1205 and CRS-1206 messages in the CRS alert log at the host level and issues CRS Resource Alert Log Error alerts at a critical level.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 minutes	Not Defined	CRS-120(3 5 6)	%resourceErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	CRS-(2765 2878)	CRS-120(3 5 6) CRS-(2768 2769 2771)	%resourceErrStack% See %alertLogName% for details.

Note: After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

Not available.

User Action

The required actions are specific to your site.

3.5.3 OCR Alert Log Error

This metric collects CRS-1009 messages in the CRS alert log at the host level and issues OCR Alert Log Error type alerts. OCR refers to Oracle Cluster Registry.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-100(1 2 3 4 5 7)	CRS-(1006 1008 1010 1011 1009)	%ocrErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	CRS-(1021 1022)	CRS-(1006 1009 1011 1013 1015 1016 1017 1018 1019 1021)	%ocrErrStack% See %alertLogName% for details

Note: After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

Not available.

User Action

The required actions are specific to your site.

3.5.4 OLR Alert Log Error

The Oracle Local Registry (OLR) Alert Log Error metric collects certain CRS error messages and issues OLR Alert Log Error type alerts.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 5 Minutes	CRS-(2106)	-*	%olrErrStack% See %alertLogName% for details.

3.5.5 Oracle High Availability Service Alert Log Error

This metric collects CRS-1012, CRS-1201, CRS-1202 and CRS-1401, CRS-1402, CRS-1602, and CRS-1603 messages in the CRS alert log at the host level.

CRS-1201, CRS-1401, CRS-1012, alert log messages trigger warning alerts.

CRS-1202, CRS-1402, CRS-1602, and CRS-1603 alert log messages trigger critical alerts.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-(1601 1201 1401 1012)	CRS-(1202 1402 1602 1603 1604)	%clusterwareErrStack% See %alertLogName% for details.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	CRS-(2412 8000 8001 8002 8003 8004 8005 8006 8007 8009 80010 8016 8018 8019 8020 1601)	CRS-(2402 2406 2413 2414 1202 1207 1208 1209 1210 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1223 1229 1231 1232 1233 1234 1235 1236 1237 1238 1239 1305 1306 1307 1308 1308 1310 1339 1402 1403 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 5601 10100 10101 10102 10103 1602 1603 1604)	%clusterwareErrStack% See %alertLogName% for details.

Note: After an alert is triggered for this metric, it must be manually cleared.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

Not available.

User Action

The required actions are specific to your site.

3.6 Oracle High Availability Service Alert Log Error

This metric category provides information about node-specific alerts that are obtained by mining the CRS alert file on that node. The mined alerts are for the categories of node-specific Oracle High Availability/Clusterware Stack, CRS Resource, OCR, OLR, Node Configuration.

3.6.1 Alert Log Name

This metric reports the name and full path of the CRS alert log.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

3.6.2 Alert Time

This is the timestamp of the alert in the CRS Alert log file.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

3.6.3 OCR Alert Log Error

This metric collects CRS-1009 messages in the CRS alert log and issues OCR Alert Log Error type alerts. OCR refers to Oracle Cluster Registry.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-100(1 2 3 4 5 7)	CRS-(1006 1008 1010 1011 1009)	%ocrErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	CRS-(1021 1022)	CRS-(1006 1009 1011 1013 1015 1016 1017 1018 1019 1021)	%ocrErrStack% See %alertLogName% for details.

3.6.4 OLR Alert Log Error

The Oracle Local Registry (OLR) Alert Log Error metric collects certain CRS error messages and issues OLR Alert Log Error type alerts.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 5 Minutes	Not Defined	CRS-(2106)	%olrErrStack% See %alertLogName% for details.

3.6.5 CRS Resource Alert Log Error

This resource collects CRS-1203, CRS-1205 and CRS-1206 messages in the CRS alert log and issues CRS Resource Alert Log Error alerts at a critical level.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 minutes	Not Defined	CRS-120(3 5 6)	%resourceErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	CRS-(2765 2878)	CRS-120(3 5 6) CRS-(2768 2769 2771)	%resourceErrStack% See %alertLogName% for details.

3.6.6 Oracle High Availability Service Alert Log Error

This metris displays the node-specific Oracle High Availability/Clusterware Stack errors from the CRS Alert log file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-(1601 1201 1401 1012)	CRS-(1202 1402 1602 1603 1604)	%clusterwareErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	CRS-(2412 8000 8001 8002 8003 8004 8005 8006 8007 8009 80010 8016 8018 8019 8020 1601)	CRS-(2402 2406 2413 2414 1202 1207 1208 1209 1210 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1223 1229 1231 1232 1233 1234 1235 1236 1237 1238 1239 1305 1306 1307 1308 1308 1310 1339 1402 1403 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 5601 10100 10101 10102 10103 1602 1603 1604)	%clusterwareErrStack% See %alertLogName% for details.

3.6.7 Witnessed Error Codes

This metric displays the node-specific Oracle High Availability/Clusterware Stack errors from the CRS Alert log file.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

3.6.8 Node Configuration Alert Log Error

This metric displays the node-specific node configuration errors from the CRS Alert log file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-180(2 3 4 5)	CRS-1607	%nodeErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	CRS-(1801 1802 1803 1804 1113 1121 1123)	CRS-(1110 1111 1112 1116 1117 1118 1119 1805 1806 1807 1809)	%nodeErrStack% See %alertLogName% for details.

3.6.9 Time/Line Number

This metric displays the timestamp and the line number of the alert in the CRS Alert log file of that alert.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

3.7 Resource State

This metric category provides information about resources changing states.

3.7.1 State Change

This metric tracks and raises an alert when a resource changes to a state defined in the thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	COMPLETE_ INTERMEDIATE P ARTIALLY_ UNKNOWN PARTIALLY_ OFFLINE PARTIALLY_ INTERMEDIATE	COMPLETE_ UNKNOWN COMPLETE_ OFFLINE ADD DOWN	%crs_entity_name% has %resource_status_ alert_count% instances in %resource_status_ alert_state% State %resource_status_ additional_mesg%

3.8 Response

The metrics in this category report the status of the host (whether it is up or down).

3.8.1 Status

This metric indicates whether or not the host is reachable. A host can be unreachable for various reasons, for example, when the network is down or the Management Agent on the host is down (which can be because the host itself is shut down).

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	Not Defined	0	Oracle High Availability Service has problems on this host %CRS_output%

This chapter provides information about the Cluster metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

4.1 Clusterware

The metrics in this metric category provide an overview of the clusterware status for this cluster, how many nodes in this cluster have problems, and the Cluster Verification (CLUVFY) utility output for all the nodes of this cluster. Generally, the clusterware is up if the clusterware on at least one host is up.

4.1.1 Cluster Verification Output

This metric shows the CLUVFY output of clusterware for all nodes of this cluster.

Data Source

The following command is data source for metric where node1, node2 is the node list for the cluster:

```
cluvfy comp crs -n node1, node2 ...
```

User Action

Search for the Cluster Verification (CLUVFY) utility in the *Oracle Clusterware Administration and Deployment Guide*.

4.1.2 Clusterware Status

This metric shows the overall clusterware status for this cluster. The clusterware is up if the clusterware on at least one host is up.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 5 Minutes	2	0	Clusterware has problems on the master agent host %CRS_output%

Data Source

The following command is data source for metric where node1, node2 is the node list for the cluster:

```
cluvfy comp crs -n node1, node2 ...
```

User Action

Search for the Cluster Verification (CLUVFY) utility in the *Oracle Clusterware Administration and Deployment Guide*.

4.2 Clusterware Alert Log

The metrics in this metric category provide details about the Cluster Alert Log metrics.

4.2.1 Clusterware Service Alert Log Error

This metric collects certain error messages in the CRS alert log at the cluster level.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-1601	Not Defined	%clusterwareErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	CRS-(8011 8013 8014 8015)	Not Defined	%clusterwareErrStack% See %alertLogName% for details.

Note: Do *not* modify the default warning and critical thresholds for this metric.

4.2.2 Node Configuration Alert Log Error

This column collects CRS-1607, 1802, 1803, 1804 and 1805 messages from the CRS alert log at the cluster level, and issues alerts based on the error code.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-180(2 3 4 5)	CRS-1607	%nodeErrStack% See %alertLogName% for details.
11gR2, 12c	Every 5 Minutes	Not Defined	CRS-1607	%nodeErrStack% See %alertLogName% for details.

Note: Do *not* modify the default warning and critical thresholds for this metric.

4.2.3 OCR Alert Log Error

This column collects CRS-1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1010 and 1011 messages from CRS alert log at the cluster level and issue alerts based on the error code.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	CRS-100(1 2 3 4 5 7)	CRS-(1006 1008 1010 1011)	%ocrErrStack% See %alertLogName for details.

Note: Do *not* modify the default warning and critical thresholds for this metric.

4.2.4 Voting Disk Alert Log Error

This column collects CRS-1607, 1802, 1803, 1804 and 1805 messages from the CRS alert log at the cluster level, and issues alerts based on the error code.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	CRS-160(4 5 6)	%votingErrStack% See %alertLogName for details.
11gR2, 12c	Every 5 Minutes	Not Defined	CRS-160(4 5 6)	%votingErrStack% See %alertLogName% for details.

Note: Do *not* modify the default warning and critical thresholds for this metric.

4.3 QoS Events

The metrics in this metric category provide information about the Quality of Service (QoS) events.

4.3.1 Compliance State

For a database to be managed by Oracle Database QoS Management, the database must be compliant.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	-	Not Defined	NOT_COMPLIANT	Server pool %wlm_entity_name% has a violation. Please refer to the Grid Operations Manager log for details

4.3.2 Memory Pressure Analysis Risk State

Oracle Database QoS Management detects memory pressure on a server in real time and redirects new sessions to other servers to prevent using all available memory on the stressed server.

This metric indicates that the database server is experiencing memory pressure.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	-	RED	Not Defined	Server %wlm_server% is under elevated memory pressure and services on all instances on this server will be stopped

4.3.3 QoS State Change

This metric displays the reason for a change in the Oracle Database QoS Management state.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	-	USER_DISABLED	EXCEPTION_DISABLED	QoSM service is disabled due to %wlm_qosm_state%.

4.4 Resource State

The metrics in this metric category provide information about the Cluster Resource State (CRS).

4.4.1 State Change

This is the CRS resource status change metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 24 Hours	COMPLETE INTERMEDIATE PARTIALLY UNKNOWN PARTIALLY OFFLINE PARTIALLY INTERMEDIATE	COMPLETE UNKNOWN COMPLETE OFFLINE ADD DOWN	%crs_entity_name% has %resource_status_alert_count% instances in %resource_status_alert_state% State %resource_status_additional_mesg%

Database Instance

This chapter provides information about the Database Instance metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

5.1 Alert Log

Note: Oracle recommends using the DB Alert Log metrics instead of the Alert Log metrics.

For information about the DB Alert Log metrics, see [Section 5.25, "DB Alert Log"](#).

The metrics in this category are used to create alerts by parsing the database alert log, for example, data block corruption, terminated session, and so on. The Alert Log metrics raise an alert containing the Error text and, when relevant, a link to the trace file for each ORA error that is reported in the alert log that matches the warning or critical thresholds defined for each category of error returned by the metric as defined in Metrics and Policy Settings but does not match the Alert Log Filter Expression.

Note: The Alert Log and Alert Log Error Status metrics only return ORA errors from the Alert log. If the error is not an ORA error it will not be recognized by this metric. If you need to alert for non-ORA errors in the Alert Log it is suggested that you create a UDM for these purposes. See My Oracle Support Note 735137.1 for details.

Alert Log Filter Expression

The Alert Log Filter Expression is used (at the discretion of the Cloud Control administrator responsible for that target) to prevent errors that can be ignored resulting in alerts being raised in Cloud Control. It is a Perl regular expression that is used to filter all rows returned by the Alert Log metric.

The filtering takes place during the retrieval of errors from the Alert log and therefore no errors that match the expression are considered by either the Alert Log metric or, by

definition, the Alert Log Error Status metric. Only those errors that do not match the Alert Log Filter Expression are compared against the Alert Log metric thresholds or counted for the Alert Log Error Status metric.

You can configure the Alert Log Filter Expression from several locations in Cloud Control for each target. For example, to configure the Alert Log Filter Expression, do one of the following:

- Click the link next to 'Alert Log' under 'Diagnostic Summary' from the DB Target home page and then click **Generic Alert Log Error Monitoring Configuration** under **Related Links**.
- Use any of the Metrics and Policy Settings pages for configuring the thresholds for each category of each metric.

Note: The Alert Log Filter Expression is set at target level. No matter which page you use to configure it, you are configuring the same expression.

5.1.1 Alert Log Error Trace File

This metric reports the name of the trace file (if any) associated with the logged error.

Target Version	Collection Frequency
All versions	Every 15 minutes

Data Source

The following command is the data source for this metric where \$ORACLE_HOME refers to the home of the Oracle Management Agent:

\$ORACLE_HOME/sysman/admin/scripts/alertlog.pl

User Action

No user action is required.

5.1.2 Alert Log Name

This metric reports the name of the alert log file.

Target Version	Collection Frequency
All versions	Every 15 minutes

Data Source

The following command is the data source for this metric where \$ORACLE_HOME refers to the home of the Oracle Management Agent:

\$ORACLE_HOME/sysman/admin/scripts/alertlog.pl

User Action

No user action is required.

5.1.3 Archiver Hung Alert Log Error

This metric signifies that the archiver of the database being monitored has been temporarily suspended since the last sample time.

If the database is running in ARCHIVELOG mode, an alert is displayed when archiving is hung (ORA-00257 and ORA-16038) messages are written to the ALERT file. The ALERT file is a special trace file containing a chronological log of messages and errors.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	Not Defined	ORA-	The archiver hung at time/line number: %timeLine%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The following command is the data source for this metric where \$ORACLE_HOME refers to the home of the Oracle Management Agent:

```
$ORACLE_HOME/sysman/admin/scripts/alertlog.pl
```

User Action

Examine the ALERT log and archiver trace file for additional information. However, the most likely cause of this message is that the destination device is out of space to store the redo log file. Verify the device specified in the initialization parameter ARCHIVE_LOG_DEST is set up properly for archiving. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you must manually clear the event after the problem is fixed.

5.1.4 Data Block Corruption Alert Log Error

This metric signifies that the database being monitored has generated a corrupted block error to the ALERT file since the last sample time. The ALERT file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when data block corrupted messages (ORA-01157, ORA-01578, and ORA-27048) are written to the ALERT file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	Not Defined	ORA-	A data block was corrupted at time/line number: %timeLine%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The following command is the data source for this metric where \$ORACLE_HOME refers to the home of the Oracle Management Agent:

```
$ORACLE_HOME/sysman/admin/scripts/alertlog.pl
```

User Action

Examine the ALERT log for additional information. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you must manually clear the event after the problem is fixed.

5.1.5 Generic Alert Log Error

This metric signifies that the database being monitored has generated errors to the ALERT log file since the last sample time. The ALERT log file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when Oracle Exception (ORA-006xx) messages are written to the ALERT log file. A warning is displayed when other ORA messages are written to the ALERT log file.

- For all supported databases monitored by Enterprise Manager release 10.2.0.4 Management Agent:

Alert Log Filter - up to 1024 characters

Warning or Critical Threshold - up to 256 characters

- For all supported databases monitored by Enterprise Manager release 10.2.0.5 Management Agent:

Alert Log Filter - up to 4000 characters

Warning or Critical Threshold - up to 4000 characters

Archiver hung (ORA-00257) and data block corrupted (ORA-01578) messages are sent out as separate metrics.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	ORA-0*(600? 7445 4[0-9][0-9][0-9])[^\0-9]	Not Defined	ORA-error stack (%errCodes%) logged in %alertLogName%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The following command is the data source for this metric where \$ORACLE_HOME refers to the home of the Oracle Management Agent:

\$ORACLE_HOME/sysman/admin/scripts/alertlog.pl

User Action

Examine the ALERT log for additional information. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you must manually clear the event after the problem is fixed.

5.1.6 Media Failure Alert Log Error

This metric represents the media failure alert log error. An alert event is triggered when messages ORA-01242 and ORA-01243 are written to the ALERT file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	Not Defined	ORA-	Media failure was detected at time/line number: %timeLine%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

Not available.

User Action

No user action is required.

5.1.7 Session Terminated Alert Log Error

This metric signifies that a session terminated unexpectedly since the last sample time. The ALERT file is a special trace file containing a chronological log of messages and errors. An alert is displayed when session unexpectedly terminated (ORA-00603) messages are written to the ALERT file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	ORA-	Not Defined	A session was terminated at time/line number: %timeLine%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time/Line Number object.

If warning or critical threshold values are currently set for any Time/Line Number object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time/Line Number object, use the Edit Thresholds page.

Data Source

The source for this metric is \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Examine the ALERT log and the session trace file for additional information. **Note:** This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you must manually clear the event after the problem is fixed.

5.2 Alert Log Error Status

Note: Oracle recommends that you use DB Alert Log Error Status metrics instead of Alert Log Error Status metrics.

For information about the DB Alert Log Error Status metrics, see [Section 5.26, "DB Alert Log Error Status"](#).

The metrics in this category count the number of errors returned in each category by the Alert Log Error metric after the Alert Log Filter expression has been taken into account but without taking the thresholds of the Alert Log Error metric into account and raises an alert if the number is greater than that specified in the Warning or Critical thresholds for that category. Therefore, it is possible for no alert to be raised by the Alert Log Error metric but still for the Alert Log Error Status metric to fire (even if the thresholds defined for the Alert Log Error metric are not matched). For more information on the Alert Log Filter Expression, see [Alert Log Filter Expression](#).

5.2.1 Archiver Hung Alert Log Error Status

This metric reflects the number of Archiver Hung alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	0	Not Defined	Archiver hung errors have been found in the alert log.

Data Source

The source of this metric is the Alert Log metric.

User Action

Examine the Alert Log.

5.2.2 Data Block Corruption Alert Log Error Status

This metric reflects the number of Data Block Corruption alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	0	Not Defined	Data block corruption errors have been found in the alert log.

Data Source

The source of this metric is the Alert Log metric.

User Action

Examine the Alert Log.

5.2.3 Generic Alert Log Error Status

This metric reflects the number of Generic alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	0	Not Defined	%value% distinct types of ORA- errors have been found in the alert log.

Data Source

The source of this metric is the Alert Log metric.

User Action

Examine the Alert Log.

5.2.4 Media Failure Alert Log Error Status

This metric represents the media failure alert log error status.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	0	Not Defined	Media failure errors have been found in the alert log.

Data Source

Not available.

User Action

No user action is required.

5.2.5 Session Terminated Alert Log Error Status

This metric reflects the number of Session Terminated alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 Minutes	0	Not Defined	Session terminations have been found in the alert log.

Data Source

The source of this metric is the Alert Log metric.

User Action

Examine the Alert Log.

5.3 Archive Area

This metric category contains the metrics representing the utilization of the archive areas.

If the database is running in ARCHIVELOG mode, these metrics check for available redo log destinations. If the database is not running in ARCHIVELOG mode, these metrics fail to register. For each destination, this metric category returns the total, used, and free space.

5.3.1 Archive Area Used (%)

The Archive Full (%) metric returns the percentage of space used on the archive area destination. If the space used is more than the threshold value given in the threshold arguments, then a warning or critical alert is generated.

If the database is running in ARCHIVELOG mode, these metrics check the space in the available local redo log destinations. If the database is not running in ARCHIVELOG mode, these metrics are not applicable. For each local destination, this metric category returns the total, used, and free space.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	80	Not Defined	%value%% of archive area %archDir% is used.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Archive Area Destination object.

If warning or critical threshold values are currently set for any Archive Area Destination object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Archive Area Destination object, use the Edit Thresholds page.

Data Source

If no quota is set for archive area, the percentage is calculated using the UNIX `df -k` command.

If a quota is set, the following formula is used:

$$\text{archive area used (\%)} = (\text{total area used} / \text{total archive area}) * 100$$

User Action

Verify the device specified in the initialization parameter `LOG_ARCHIVE_DEST` is set up properly for archiving.

There are two methods you can use to specify archive destinations. These destinations can be setup using Enterprise Manager. For each database target, you can drill-down to the database **Availability** tab, and access the **Recovery Settings** page.

- The first method is to use the `LOG_ARCHIVE_DEST_n` parameter (where n is an integer from 1 to 10) to specify from one to ten different destinations for archival. Each numerically-suffixed parameter uniquely identifies an individual destination, for example, `LOG_ARCHIVE_DEST_1`, `LOG_ARCHIVE_DEST_2`, and so on.
- The second method, which allows you to specify a maximum of two locations, is to use the `LOG_ARCHIVE_DEST` parameter to specify a primary archive destination and the `LOG_ARCHIVE_DUPLEX_DEST` parameter to determine an optional secondary location.

If the `LOG_ARCHIVE_DEST` initialization parameter is set up correctly and this metric triggers, then free up more space in the destination specified by the archive destination parameters.

5.3.2 Archive Area Used (KB)

This metric represents the total space used (in KB) on the device containing the archive destination directory.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

If no quota is set for archive area, this is calculated through the UNIX `df -k` command.

`total area used = quota_used * db_block_size (in KB)`

User Action

Verify the device specified in the initialization parameter `LOG_ARCHIVE_DEST` is set up properly for archiving.

There are two methods you can use to specify archive destinations. These destinations can be setup using Enterprise Manager. For each database target, you can drill-down to the database **Availability** tab, and access the **Recovery Settings** page.

- The first method is to use the `LOG_ARCHIVE_DEST_n` parameter (where n is an integer from 1 to 10) to specify from one to ten different destinations for archival. Each numerically-suffixed parameter uniquely identifies an individual destination, for example, `LOG_ARCHIVE_DEST_1`, `LOG_ARCHIVE_DEST_2`, and so on.
- The second method, which allows you to specify a maximum of two locations, is to use the `LOG_ARCHIVE_DEST` parameter to specify a primary archive destination and the `LOG_ARCHIVE_DUPLEX_DEST` parameter to determine an optional secondary location.

If the `LOG_ARCHIVE_DEST` initialization parameter is set up correctly and this metric triggers, then free up more space in the destination specified by the archive destination parameters.

5.3.3 Free Archive Area (KB)

When running a database in ARCHIVELOG mode, the archiving of the online redo log is enabled. Filled groups of the online redo log are archived, by default, to the destination specified by the `LOG_ARCHIVE_DEST` initialization parameter. If this destination device becomes full, the database operation is temporarily suspended until disk space is available.

If the database is running in ARCHIVELOG mode, this metric checks for available redo log destination devices.

If the database is not running in ARCHIVELOG mode, this metric fails to register.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Archive area %archDir% has %value% free KB remaining.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Archive Area Destination object.

If warning or critical threshold values are currently set for any Archive Area Destination object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Archive Area Destination object, use the Edit Thresholds page.

Data Source

If the database is in NOARCHIVELOG mode, then nothing is collected.

If the database is in ARCHIVELOG mode, log_archive_destination from v\$parameter is queried to obtain the current list of archivelog destinations. The results are obtained by directly checking the disk usage (df -kl).

User Action

Verify the device specified in the initialization parameter LOG_ARCHIVE_DEST is set up properly for archiving.

There are two methods you can use to specify archive destinations. These destinations can be setup using Enterprise Manager. For each database target, you can drill-down to the database **Availability** tab, and access the **Recovery Settings** page.

- The first method is to use the LOG_ARCHIVE_DEST_n parameter (where n is an integer from 1 to 10) to specify from one to ten different destinations for archival. Each numerically-suffixed parameter uniquely identifies an individual destination, for example, LOG_ARCHIVE_DEST_1, LOG_ARCHIVE_DEST_2, and so on.
- The second method, which allows you to specify a maximum of two locations, is to use the LOG_ARCHIVE_DEST parameter to specify a primary archive destination and the LOG_ARCHIVE_DUPLEX_DEST parameter to determine an optional secondary location.

If the LOG_ARCHIVE_DEST initialization parameter is set up correctly and this metric triggers, then free up more space in the destination specified by the archive destination parameters.

5.3.4 Total Archive Area (KB)

This metric represents the total space (in KB) on the device containing the archive destination directory.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

If no quota is set for archive area, the data is calculated through the UNIX `df -k` command.

If a quota is set, the following formula is used:

`total archive area = quota_size * db_block_size (in KB)`

User Action

Oracle recommends that multiple archivelog destinations across different disks be configured. When at least one archivelog destination gets full, Oracle recommends the following:

- If tape is being used, back up archive logs to tape and delete the archive logs.
- If tape is not being used, back up the database and remove obsolete files. This also removes archive logs that are no longer needed based on the database retention policy.
- If archivelog destination `quota_size` is being used, raise the `quota_size`.

5.4 Collect SQL Response Time

The metrics in the this category represent the SQL response time.

5.4.1 SQL Response Time (%)

This metric represents the SQL response time.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

Not available.

User Action

No user action is required.

5.5 Data Failure

Enterprise Manager uses the metrics in this category to alert you to checker failures reported in the alert log. It contains the number of checker failures detected. It also generates a critical alert by default when these problems are found in the alert log.

The alert log file provides this data. It is collected using the perl script \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Management Agent.

5.5.1 Alert Log Name

This metric reports the name of the alert log file.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_ *n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

No user action is required.

5.5.2 Data Failure Detected

This metric signifies that a database health checker has detected one or more persistent data failures. Examples of data failures include missing files, corrupt files, inconsistent files, and corrupt blocks. The alert shows the number of data failures detected by a checker run. Details of individual data failures can be accessed from the Perform Recovery page in Enterprise Manager.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	. ¹	Checker run found %numberOfFailures% new persistent data failures.

¹ After an alert is triggered for this metric, it must be manually cleared.

Setting Thresholds

To edit the thresholds for any of the following metrics, from the Cloud Control UI, right-click the target name, select **Monitoring**, then **Metric and Collection Settings**. The following settings provide examples of some of the possible settings:

- Warning Threshold: Not Defined; Critical Threshold: .*

In this case, the Management Agent generates a critical error alert in Enterprise Manager when a data failure occurs.

- Warning Threshold: .*; Critical Threshold: Not Defined

In this case, the Management Agent generates a warning alert in Enterprise Manager when a data failure occurs.

- Warning Threshold: Not Defined; Critical Threshold: Not Defined

In this case, the Management Agent does not generate an alert in Enterprise Manager when a data failure occurs.

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Details of individual data failures can be accessed from the Perform Recovery page in Enterprise Manager.

Note: This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you must manually clear the event after the problem is fixed.

5.6 Data Guard Status

The metrics in this category check the status, data not received, and data not applied for the databases in the Data Guard configuration.

5.6.1 Data Guard Status

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Use the Data Guard Status metric to check the status of each database in the Data Guard configuration.

By default, a critical and warning threshold value is set for this metric column. Alerts will be generated when threshold values are reached. You can edit the value for a threshold as required.

Table 5–1 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 5 Minutes	Warning	Error	The Data Guard status of %dg_name% is %value%.

User Action

1. Check the Edit Properties General page for the primary and standby databases for detailed information.
2. Examine the database alert logs and the Data Guard broker logs for additional information.

5.7 Data Guard - 9.2 Database

The metrics in this category check the status, data not received, and data not applied for the databases in the Data Guard configuration. The metrics run on the primary database and cover conditions for all databases in the Data Guard configuration, including the primary and all physical and logical standby databases. They are applicable to both broker and non-broker Data Guard configurations.

5.7.1 Data Not Applied (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log that was successfully archived to the standby database. Redo data in all subsequent log files are counted as logs not applied. If the primary database goes down at this point, the redo data from these log files can be applied on the standby database. If there is a gap in the log files received on the standby database, any log files received after the gap cannot be applied.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database and log apply services is currently applying log 1, log apply services can continue to apply up to log 3. Log apply services cannot apply any more log files because log 4 is missing.

Even though log files 6, 7, and 9 are received, they cannot be applied and they will not be counted as data not applied.

If all the archived log files on the standby database are continuous, and standby redo logs are used, the standby redo logs are also counted as data not applied, unless real-time apply is turned on and log apply services is already working on the standby redo log files.

If the standby redo logs are multithreaded, the broker computes the highest applied SCN for every thread and totals the numbers. If there are multiple incarnations and the standby database is in a different incarnation from the primary database, each incarnation is computed separately and the results are then totaled.

Table 5–2 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2	Every 5 Minutes	1	3	Standby database %dg_name% has not applied the last %value% received logs.

5.7.2 Data Not Received (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log file that was successfully archived to the standby database. Redo data in all subsequent log files, including the current online redo log file, are counted as log files for potential data loss and will be unrecoverable if the primary database goes down at this point.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database, and if log 10 is the current online log file, and if log apply services are currently applying log 1, the last continuous log after the highest applied SCN is log 3. All log files after log 3, that is log files 4 through 10, are counted as data not received. If the primary database

goes down at this point, all redo data in log files 4 through 10 are lost on the standby database.

If the primary database is multithreaded (in a RAC database), the broker computes the highest applied SCN for every thread and totals the numbers. If the primary database has multiple incarnations (for example, due to a flashback operation) and the standby database is in a different incarnation from the primary database, the computation is done on each incarnation and the results are then totaled.

Table 5–3 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2	Every 5 Minutes	1	3	Standby database %dg_name% has not received the last %value% logs from the primary database.

5.7.3 Data Guard Status - 9.2 Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Use the Data Guard Status metric to check the status of each database in the Data Guard configuration.

By default, a critical and warning threshold value was set for this metric column. Alerts will be generated when threshold values are reached. You can edit the value for a threshold as required.

Table 5–4 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2	Every 5 Minutes	Warning	Error	The Data Guard status of %dg_name% is %value%.

5.8 Data Guard - 10.1 Database

The metrics in this category check the status, data not received, and data not applied for the databases in the Data Guard configuration. The metrics run on the primary database and cover conditions for all databases in the Data Guard configuration, including the primary and all physical and logical standby databases. It is applicable to both broker and non-broker Data Guard configurations.

For non-broker configurations, the metrics are limited to monitoring primary database redo transport destination errors (as reflected in the ERRORS column of v\$archive_dest).

For broker configurations, the metrics are based on the Data Guard broker health check, which covers a much broader range of issues.

5.8.1 Data Guard Status - 10.1 Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Use the Data Guard Status metric to check the status of each database in the Data Guard configuration.

By default, a critical and warning threshold value is set for this metric column. Alerts will be generated when threshold values are reached. You can edit the value for a threshold as required.

Table 5–5 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	Warning	Error	The Data Guard status of %dg_name% is %value%.

Data Source

The source of the data is:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

User Action

1. Check the Edit Properties General page for the primary and standby databases for detailed information.
2. Examine the database alert logs and the Data Guard broker logs for additional information.

5.8.2 Data Not Applied (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log that was successfully archived to the standby database. Redo data in all subsequent log files are counted as logs not applied. If the primary database goes down at this point, the redo data from these log files can be applied on the standby database. If there is a gap in the log files received on the standby database, any log files received after the gap cannot be applied.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database and log apply services is currently applying log 1, log apply services can continue to apply up to log 3. Log apply services cannot apply any more log files because log 4 is missing. Even though log files 6, 7, and 9 are received, they cannot be applied and they will not be counted as data not applied.

If all the archived log files on the standby database are continuous, and standby redo logs are used, the standby redo logs are also counted as data not applied, unless real-time apply is turned on and log apply services is already working on the standby redo log files.

If the standby redo logs are multithreaded, the broker computes the highest applied SCN for every thread and totals the numbers. If there are multiple incarnations and the standby database is in a different incarnation from the primary database, each incarnation is computed separately and the results are then totaled.

Table 5–6 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	1	3	Standby database %dg_name% has not applied the last %value% received logs.

Data Source

The source of the data is:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

5.8.3 Data Not Applied (MB)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log that was archived to the standby database. The size of redo data in all subsequent log files are counted as data not applied. If the primary database goes down at this point, redo from these log files can be applied on the standby database. If there is a gap in the log files received on the standby database, any log files received after the gap cannot be applied.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database and log apply services is currently applying log 1, log apply services can continue to apply up to log 3. Log apply services cannot apply any more log files because log 4 is missing. Even though log files 6, 7, and 9 are received, they cannot be applied and they will not be counted as data not applied. In this case, the total size of log files 1, 2, and 3 is the size of Data Not Applied.

If all the archived log files on the standby database are continuous, and standby redo log files are used, the standby redo log files are also counted as data not applied, unless real-time apply is turned on and log apply services is already working on the standby redo log files. The size of an archived log file is its file size. However, the size of a standby redo log is the size of the actual redo in the log and not the file size.

If the standby redo log files are multithreaded, the broker computes the highest applied SCN for every thread and totals the numbers. If there are multiple incarnations and the standby database is in a different incarnation from the primary database, each incarnation is computed separately and the results are then totaled.

Table 5–7 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	Not Defined	Not Defined	Standby database %dg_name% has not applied the last %value% megabytes of data received.

Data Source

The source of the data is:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

5.8.4 Data Not Received (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log file that was successfully archived to the standby database. Redo data in all subsequent log files, including the current online redo log file, are counted as log files for potential data loss and will be unrecoverable if the primary database goes down at this point.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database, and if log 10 is the current online log file, and if log apply services are currently applying log 1, the last continuous log after the highest applied SCN is log 3. All log files after log 3, that is log files 4 through 10, are counted as data not received. If the primary database goes down at this point, all redo data in log files 4 through 10 are lost on the standby database.

If the primary database is multithreaded (in a RAC database), the broker computes the highest applied SCN for every thread and totals the numbers. If the primary database has multiple incarnations (for example, due to a flashback operation) and the standby database is in a different incarnation from the primary database, the computation is done on each incarnation and the results are then totaled.

Table 5–8 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	1	3	Standby database %dg_name% has not received the last %value% logs from the primary database.

Data Source

The source of the data is:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

5.8.5 Data Not Received (MB)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log file that was successfully archived to the standby database. The size of redo data in all subsequent log files, including the current online redo log file, are counted as data for potential data loss and will be unrecoverable if the primary database goes down at this point. The size of an archived log file is its file size, and the size of the online redo log file is the size of the actual redo in the online log file, not the file size of the online redo log file.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database, and if log 10 is the current online log file, and if log apply services is currently applying log 1, the last continuous log after the highest applied SCN is log 3. All log files after log 3,

that is log files 4 through 10, are counted as data not received and the total size of redo data in these log files is the size of Data Not Received.

If the primary database is multithreaded (in a RAC database), the broker computes the highest applied SCN for every thread and totals the numbers. If the primary database has multiple incarnations (for example, due to a flashback operation) and the standby database is in a different incarnation from the primary database, the computation is done on each incarnation and the results are then totaled.

Table 5–9 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	Not Defined	Not Defined	Standby database %dg_name% has not received the last %value% megabytes of data from the primary database.

Data Source

The source of the data is:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

5.9 Data Guard Fast-Start Failover

The metrics in this category are database-level metrics. For cluster databases, these metrics are monitored at the cluster database target level and not by member instances.

5.9.1 Fast-Start Failover Occurred

This metric indicates the time that a fast-start failover occurred when the primary database became unavailable.

Table 5–10 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2	Every 5 Minutes	Not Defined	1	A fast-start failover occurred at %dg_fs_time%.

5.10 Data Guard Fast-Start Failover Observer

The metrics in this category monitor the state of the fast-start failover observer.

5.10.1 Observer Status

This metric generates a critical alert on the primary database if the fast-start failover (FSFO) configuration is in an unobserved condition, indicating that FSFO is not currently possible.

Table 5–11 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 1 Minute	Not Defined	Error	The Data Guard fast-start failover observer status is %value%.

User Action

If the Data Guard configuration was configured in Cloud Control to use the automatic Observer restart feature, the alert will clear after a new observer process is restarted. Otherwise, determine the cause of the unobserved condition, and restart the Observer process if necessary.

5.11 Data Guard Fast-Start Failover Observer - 10.2 Database

The metrics in this category monitor the state of the fast-start failover observer.

5.11.1 Observer Status - 10.2 Database

This metric generates a critical alert on the primary database if the fast-start failover (FSFO) configuration is in an unobserved condition, indicating that FSFO is not currently possible.

Table 5–12 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2	Every 5 Minutes	Not Defined	Error	The Data Guard fast-start failover observer status is %value%.

User Action

If the Data Guard configuration was configured in Cloud Control to use the automatic Observer restart feature, the alert will clear after a new observer process is restarted. Otherwise, determine the cause of the unobserved condition, and restart the Observer process if necessary.

5.12 Data Guard Performance

The metrics in this category report on Data Guard performance.

5.12.1 Apply Lag (seconds)

This metric displays (in seconds) how far the standby is behind the primary.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Table 5–13 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	The standby database is approximately %value% seconds behind the primary database.

Data Source

The source of the data is the v\$dataguard_stats('apply lag') view.

5.12.2 Estimated Failover Time (seconds)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric shows the approximate number of seconds required to failover to this standby database. This accounts for the startup time, if necessary, plus the remaining time required to apply all the available redo on the standby. If a bounce is not required, it is only the remaining apply time.

Table 5–14 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	The estimated time to failover is approximately %value% seconds.

Data Source

The data is derived from the following formula:

v\$dataguard_stats ('estimated startup time','apply finish time','standby has been open')

5.12.3 Redo Apply Rate (KB/second)

This metric displays the Redo Apply Rate in KB/second on this standby.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Table 5–15 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	The redo apply rate is %value% KB/sec.

5.12.4 Redo Generation Rate (KB/second)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Table 5–16 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2,11g,12c	Every 5 Minutes	Not Defined	Not Defined	The redo generation rate is %value% KB/sec.

5.12.5 Transport Lag (seconds)

The approximate number of seconds of redo not yet available on this standby database. This may be because the redo has not yet been shipped or there may be a gap.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Data Source

The data is derived from the following formula:

```
v$sqlguard_stats('transport lag')
```

Table 5–17 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	The standby database is approximately %value% seconds behind the primary database.

5.13 Data Guard Performance - 11.1 and Prior Database

The metrics in this category report on Data Guard performance.

5.13.1 Estimated Failover Time (seconds) - 11.1 and Prior Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric shows the approximate number of seconds required to failover to this standby database. This accounts for the startup time, if necessary, plus the remaining time required to apply all the available redo on the standby. If a bounce is not required, it is only the remaining apply time.

Table 5–18 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	The estimated time to failover is approximately %value% seconds.

5.13.2 Apply Lag (seconds) - 11.1 and Prior Database

This metric displays (in seconds) how far the standby is behind the primary.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Table 5–19 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	The standby database is approximately %value% seconds behind the primary database.

5.13.3 Transport Lag (seconds) - 11.1 and Prior Database

The approximate number of seconds of redo not yet available on this standby database. This may be because the redo has not yet been shipped or there may be a gap.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Table 5–20 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	There are approximately %value% seconds of redo not yet available on this standby database.

5.13.4 Redo Apply Rate (KB/second) - 11.1 and Prior Database

This metric displays the Redo Apply Rate in KB/second on this standby.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Table 5–21 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	The redo apply rate is %value% KB/sec.

5.14 Database Files

The metrics in this category represent the average file read time and average file write time for the database files.

5.14.1 Average File Read Time (centi-seconds)

This metric represents the average file read time, measured in hundredths of a second.

Target Version	Server Evaluation Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each File Name object.

If warning or critical threshold values are currently set for any File Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each File Name object, use the Edit Thresholds page.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.14.2 Average File Write Time (centi-seconds)

This metric represents the average file write time, measured in hundredths of a second.

Target Version	Server Evaluation Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each File Name object.

If warning or critical threshold values are currently set for any File Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each File Name object, use the Edit Thresholds page.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.15 Database Job Status

The metrics in this category represent the health of database jobs registered through the DBMS_SCHEDULER interface.

5.15.1 Broken Job Count

The Oracle Server job queue is a database table that stores information about local jobs such as the PL/SQL call to execute for a job such as when to run a job. Database

replication is also managed by using the Oracle job queue mechanism using jobs to push deferred transactions to remote master sites, to purge applied transactions from the deferred transaction queue or to refresh snapshot refresh groups.

A job can be broken in two ways:

- Oracle failed to successfully execute the job after a specified number of attempts (defined in the job).
- The job is explicitly marked as broken by using the procedure DBMS_JOB.BROKEN.

This metric checks for broken DBMS jobs. A critical alert is generated if the number of broken jobs exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	0	Not Defined	%value% job(s) are broken.

Data Source

The data is derived from the following formula:

```
SUM(broken)
FROM (SELECT DECODE(broken, 'N', 0, 1) broken
      FROM dba_jobs
      UNION ALL
      SELECT DECODE(STATE, 'BROKEN', 1, 0) broken
      FROM dba_scheduler_jobs
```

User Action

From the Cloud Control console, check the Scheduler Job History page or query the ALL_SCHEDULER_JOB_RUN_DETAILS view for error information.

Correct the problem that is preventing the job from running. Force immediate re-execution of the job by calling DBMS_SCHEDULER.RUN.

5.15.2 Failed Job Count

The Oracle Server job queue is a database table that stores information about local jobs such as the PL/SQL call to execute for a job such as when to run a job. Database replication is also managed by using the Oracle job queue mechanism using jobs to push deferred transactions to remote master sites, to purge applied transactions from the deferred transaction queue or to refresh snapshot refresh groups.

If a job returns an error while Oracle is attempting to execute it, the job fails. Oracle repeatedly tries to execute the job doubling the interval of each attempt. If the job fails after a specified number of times (specified in the job definition), Oracle automatically marks the job as broken and no longer tries to execute it.

This metric checks for failed DBMS jobs. An alert is generated if the number of failed job exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	0	Not Defined	%value% job(s) are broken.

Data Source

The data is derived from the following formula:

```
SELECT SUM(failed)
      FROM (SELECT DECODE(NVL(failures,0), 0, 0, 1) failed
            FROM dba_jobs
      UNION ALL
            SELECT DECODE(STATUS
      , 'FAILED', DECODE(STATE, 'BROKEN', 0, 'DISABLED', 0, 1), 0) failed FROM (SELECT all_
      jobs.OWNER,
                                all_jobs.JOB_NAME,
                                all_runs.STATUS,
                                all_jobs.STATE
      FROM (SELECT OWNER,
                                JOB_NAME, MAX(ACTUAL_START_DATE) AS START_
      DATE
                                FROM DBA_SCHEDULER_JOB_RUN_DETAILS
      GROUP BY OWNER, JOB_NAME) last_run , DBA_SCHEDULER_
      JOB_RUN_DETAILS all_runs,
                                DBA_SCHEDULER_JOBS all_jobs
      WHERE all_runs.OWNER(+) = all_jobs.OWNER
      AND all_runs.JOB_NAME(+) = all_jobs.JOB_NAME
      AND last_run.OWNER(+) = all_jobs.OWNER
      AND last_run.JOB_NAME(+) = all_jobs.JOB_NAME
      AND all_runs.ACTUAL_START_DATE = last_run.START_DATE))
```

User Action

From the Cloud Control console, check the Scheduler Job History page or query the ALL_SCHEDULER_JOB_RUN_DETAILS view for error information. Correct the problem that is preventing the job from running.

5.16 Database Limits

The metrics in this category represent the percentage of resource limitations at which the Oracle Server is operating.

5.16.1 Current Logons Count

This metric represents the current number of logons.

Note: Unlike most metrics, which accept thresholds as real numbers, this metric can only accept an integer as a threshold.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text

Data Source

The data is derived from the current logins.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.16.2 Current Open Cursors Count

This metric represents the current number of opened cursors.

Note: Unlike most metrics, which accept thresholds as real numbers, this metric can only accept an integer as a threshold.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 minutes	Not Defines	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text

Data Source

The data is derived from the current open cursors.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.16.3 Lock Limit Usage (%)

The DML_LOCKS initialization parameter specifies the maximum number of DML locks. The purpose of DML locks is to guarantee the integrity of data being accessed concurrently by multiple users. DML locks prevent destructive interference of simultaneous conflicting DML and/or DDL operations.

This metric checks for the utilization of the lock resource against the values (percentage) specified by the threshold arguments. If the percentage of all active DML locks to the limit set in the DML_LOCKS initialization parameter exceeds the values specified in the threshold arguments, then a warning or critical alert is generated.

If DML_LOCKS is 0, this test fails to register. A value of 0 indicates that enqueues are disabled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 15 Minutes	Not Defined	Not Defined	%target% has reached %value%%% of the lock limit.

Data Source

The data is derived from the following formula:

```
SELECT resource_name name,
```

```

100*DECODE(initial_allocation, ' UNLIMITED', 0, current_utilization /
initial_allocation) usage
FROM v$resource_limit
WHERE LTRIM(limit_value)
!= '0' AND LTRIM(initial_allocation) != '0' AND resource_name = 'dml_locks'

```

User Action

Increase the DML_LOCKS instance parameter by 10%.

5.16.4 Process Limit Usage (%)

The PROCESSES initialization parameter specifies the maximum number of operating system user processes that can simultaneously connect to a database at the same time. This number also includes background processes utilized by the instance.

This metric checks for the utilization of the process resource against the values (percentage) specified by the threshold arguments. If the percentage of all current processes to the limit set in the PROCESSES initialization parameter exceeds the values specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 15 Minutes	Not Defined	Not Defined	%target% has reached %value%% of the process limit.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Depending on your release, one of the following derives the data:

- Oracle 9i Release 2 and earlier

```

SELECT usage
FROM (select RESOURCE_NAME name, 100*DECODE(initial_allocation, '
UNLIMITED', 0, current_utilization /
initial_allocation) usage
from v$resource_limit
where LTRIM(limit_value) != '0' and LTRIM(initial_allocation) != '0'
and resource_name in ('dml_locks', 'processes', 'sessions')
union all
select 'user' name
, 100* DECODE(sessions_max, 0, 0, sessions_current/sessions_max) usage
from v$license
)
order by name

```

- Oracle 10g and later

The fifth column provides process usage. You can get this information from the `inst_perf.xmlp` file located in the plug-in installation directory (`plugins/oracle.sysman.db.agent.plugin_version/metadata`).

```
SELECT /*+ ORDERED */
      TO_CHAR( FROM_TZ( CAST(m.end_time AS TIMESTAMP),
                        TO_CHAR(systimestamp, 'tztz') )
            AT TIME ZONE sessiontimezone,
            'YYYY-MM-DD HH24:MI:SS'),
      SUM(CASE WHEN a.internal_metric_name = 'logons'
            THEN m.value ELSE 0 END) logons,
      SUM(CASE WHEN a.internal_metric_name = 'opencursors'
            THEN m.value ELSE 0 END) opencursors,
      SUM(CASE WHEN a.internal_metric_name = 'user_limit'
            THEN m.value ELSE 0 END) user_limit,
      SUM(CASE WHEN a.internal_metric_name = 'process_usage'
            THEN m.value ELSE 0 END) process_usage,
      SUM(CASE WHEN a.internal_metric_name = 'session_usage'
            THEN m.value ELSE 0 END) session_usage
FROM v$alert_types a, v$threshold_types t, v$sysmetric m
WHERE a.internal_metric_category = 'Database_Resource_Usage'
      AND a.reason_id = t.alert_reason_id
      AND t.metrics_id = m.metric_id
      AND m.group_id = 2
      AND :1 != 'BASIC'
      AND m.end_time <= SYSDATE
GROUP BY m.end_time
ORDER BY m.end_time ASC
```

User Action

Verify that the current PROCESSES instance parameter setting has not exceeded the operating system-dependent maximum. Increase the number of processes to be at least 6 + the maximum number of concurrent users expected to log in to the instance.

5.16.5 Session Limit Usage (%)

The SESSIONS initialization parameter specifies the maximum number of concurrent connections that the database will allow.

This metric checks for the utilization of the session resource against the values (percentage) specified by the threshold arguments. If the percentage of the number of sessions, including background processes, to the limit set in the SESSIONS initialization parameter exceeds the values specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 15 Minutes	Not Defined	Not Defined	%target% has reached %value%% of the session limit.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

```
SELECT resource_name name,
       100*DECODE(initial_allocation, ' UNLIMITED', 0, current_utilization) != '0'
       AND resource_name = 'sessions'
```

User Action

Increase the SESSIONS instance parameter. For XA environments, confirm that SESSIONS is at least 2.73 * PROCESSES. For shared server environments, confirm that SESSIONS is at least 1.1 * maximum number of connections.

5.16.6 User Limit Usage (%)

The LICENSE_MAX_SESSIONS initialization parameter specifies the maximum number of concurrent user sessions allowed simultaneously.

This metric checks whether the number of users logged on is reaching the license limit. If the percentage of the number of concurrent user sessions to the limit set in the LICENSE_MAX_SESSIONS initialization parameter exceeds the values specified in the threshold arguments, then a warning or critical alert is generated. If LICENSE_MAX_SESSIONS is not explicitly set to a value, the test does not trigger.

Note: This metric is most useful when session licensing is enabled. Refer to the *Oracle Server Reference Manual* for more information on LICENSE_MAX_SESSIONS and LICENSE_MAX_USERS.

Note: Unlike most metrics, which accept thresholds as real numbers, this metric can only accept an integer as a threshold.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 15 Minutes	Not Defined	Not Defined	%target% has reached %value%% of the user limit.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text

Data Source

The data is derived from the following formula:

```
SELECT 'user' name,
       100*DECODE(session_max, 0, 0, sessions_current/session_max) usage
FROM v$sqllicense
```

User Action

This typically indicates that the license limit for the database has been reached. You must acquire additional licenses, then increase `LICENSE_MAX_SESSIONS` to reflect the new value.

5.17 Database Replay

The metrics in this category show the current status (on/off) of database workload capture and replay.

5.17.1 Workload Capture Status

This metric shows if the database workload capture is in progress.

This metric is available for Oracle Database 11g Release 2 and Oracle Database 12c.

Data Source

The source of the data is the server-generated alert triggered by the target database when a capture is started.

User Action

No user action is required.

5.17.2 Workload Replay Status

This metric shows if database workload replay is in progress.

This metric is available for Oracle Database 11g Release 2 and Oracle Database 12c.

Data Source

The source of the data is the server-generated alert triggered by the target database when a replay is started.

User Action

No user action is required.

5.18 Database Replay Client

The metrics in this category show the resource usage of the replay clients during database workload replay.

5.18.1 Average I/O Latency (milliseconds)

This metric reflects the average response time for a single I/O for a database replay client.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
11gR2, 12c	null

Data Source

The source of the data is the server-generated alert triggered by the target database when an alarming condition is detected in a replay client.

User Action

Run the calibrate utility of the replay client and restart a replay with the suggested number of replay clients, distributed between machines with the necessary capacity.

5.18.2 Replay Threads (%) Performing I/O

This metric represents the number of replay client connections performing I/O operation concurrently.

The rest of the information in this section is only valid for this metric when it appears in either the Enterprise Manager Cloud Control or the Enterprise Manager Database Control (if applicable).

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
11gR2, 12c	null

Data Source

The source of the data is the server-generated alert triggered by the target database when an alarming condition is detected in a replay client.

User Action

Run the calibrate utility of the replay client and restart a replay with the suggested number of replay clients, distributed between machines with the necessary capacity.

5.18.3 Replay Threads (%) Using CPU

This metric represents the number of replay client connections using the CPU concurrently.

Target Version	Collection Frequency
11gR2, 12c	null

Data Source

The source of the data is the server-generated alert triggered by the target database when an alarming condition is detected in a replay client.

User Action

Run the calibrate utility of the replay client and restart a replay with the suggested number of replay clients, distributed between machines with the necessary capacity.

5.19 Database Services

The metrics in this category include the service CPU time and service response time.

5.19.1 Service CPU Time (per user call) (microseconds)

This metric represents the average CPU time, in microseconds, for calls to a particular database service.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	10 minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Service Name object.

If warning or critical threshold values are currently set for any Service Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Service Name object, use the Edit Thresholds page.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.19.2 Service Response Time (per user call) (microseconds)

This metric represents the average elapsed time, in microseconds, for calls to a particular database service.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	10 minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Service Name object.

If warning or critical threshold values are currently set for any Service Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Service Name object, use the Edit Thresholds page.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.20 Database Vault Attempted Violations - Command Rules

The metrics in this category monitor violation attempts against the Database Vault database.

5.20.1 Database Vault Attempted Violations Count - Command Rules

This metric is used to enable Database Vault Security Analyst to keep a watch on the violation attempts against the Database Vault database. Database Vault Security Analysts can pick the command rules that they would like to get alerted on and even further filter them based on the different types of attempts by mentioning different thresholds to match SQL commands causing the violations.

This metric is not enabled out of the box. You must enable it from Metrics and Policy Settings page. By default, this metric is collected every 1 hour, but you can change the collection frequency.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every Hour	Not Defined	Not Defined	%ACTION_OBJECT_NAME% got violated at %VIOLATIONTIMESTAMP%

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Database Vault Command Rule and Violation Time objects.

If warning or critical threshold values are currently set for any unique combination of Database Vault Command Rule and Violation Time objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Database Vault Command Rule and Violation Time objects, use the Edit Thresholds page.

Data Source

The attempted violations are picked up from the target's database vault audit trail. Only audit entries related to a command rule, which represent failed attempts to execute a SQL, are selected. Specified thresholds should match the SQL command causing command rule violation.

User Action

To know more about the violations, for example, the command that was violated, which database user triggered the violation, what action triggered this violation, and at what time this violation happened, login to the target's Database Vault Home Page and use the Attempted Violations charts.

5.21 Database Vault Attempted Violations - Realms

The metrics in this category monitor the violation attempts against the Database Vault database.

5.21.1 Database Vault Attempted Violations - Realms

This metric is used to enable Database Vault Security Analyst to keep a watch on the violation attempts against the Database Vault database. Database Vault Security Analysts can pick the realms that they would like to get alerted on and even further filter them based on the different types of attempts by mentioning different thresholds to match SQL commands causing the violations.

This metric is not enabled out of the box. You must enable it from Metrics and Policy Settings page. By default, this metric is collected every 1 hour, but you can specify the collection frequency.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every Hour	Not Defined	Not Defined	%ACTION_OBJECT_NAME% got violated at %VIOLATIONTIMESTAMP%

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Database Vault Realm and Violation Time objects.

If warning or critical threshold values are currently set for any unique combination of Database Vault Realm and Violation Time objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Database Vault Realm and Violation Time objects, use the Edit Thresholds page.

Data Source

The attempted violations are picked up from the target's Database Vault audit trail. Only audit entries related to realms, which represent failed attempts to execute a SQL, are selected. Specified thresholds should match the SQL command causing command rule violation.

User Action

To know more about the violations, for example, the realm that was violated, which database user triggered the violation, what action triggered this violation, and at what time this violation happened, login to the target's Database Vault Home Page and use the Attempted Violations charts.

5.22 Database Vault Configuration Issues - Command Rules

The metrics in this category track users' actions and raise alerts when there is a misconfiguration on a command rule that requires administrator attention.

5.22.1 DV (Command Rule) - Configuration Issue Count

After the Database Vault policies are defined and configured to protect the database, further user actions over the course of time can disturb these configurations. This metric tracks the users' actions and raises an alert when there is a misconfiguration on a Command Rule that needs administrator attention. This metric is enabled out of the box. By default this metric is collected every 1 hour, but you can change the collection frequency.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every Hour	Not Defined	0	%ACTION_OBJECT_NAME% has configuration issues.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Database Vault Command Rule object.

If warning or critical threshold values are currently set for any Database Vault Command Rule object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Database Vault Command Rule object, use the Edit Thresholds page.

Data Source

The configuration issues are picked from scanning the realm and command rule definitions.

User Action

To know the cause of the command rule misconfiguration, navigate to the target's Database Vault Home page, launch Database Vault Administrator, and view the Database Vault Configuration Issues Reports. These alerts are automatically cleared when the configuration issue is resolved.

5.23 Database Vault Configuration Issues - Realms

The metrics in this category track users' actions and raise alerts when there is a misconfiguration on a realm that requires administrator attention.

5.23.1 Database Vault Configuration Issues Count - Realms

After the Database Vault policies are defined and configured to protect the database, further user actions over the course of time can disturb these configurations. This metric tracks the users' actions and raises an alert when there is a misconfiguration on a Realm that needs administrator attention. This metric is enabled out of the box. By default this metric is collected every 1 hour, but you can change the collection frequency.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every Hour	Not Defined	0	%ACTION_OBJECT_NAME% has configuration issues.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Database Vault Realm object.

If warning or critical threshold values are currently set for any Database Vault Realm object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Database Vault Realm object, use the Edit Thresholds page. See Editing Thresholds for information on accessing the Edit Thresholds page.

Data Source

The configuration issues are picked from scanning the realm and ruleset definitions.

User Action

To know the cause of the realm misconfiguration, navigate to the target's Database Vault Home page, launch Database Vault Administrator, and view the Database Vault Configuration Issues Reports. These alerts are automatically cleared when the configuration issue is resolved.

5.24 Database Vault Policy Changes

The metrics in this category track the Database Vault policies.

5.24.1 Database Vault Policy Changes Count

After the Database Vault policies are defined, further changes to it is tracked by this metric. On any changes to the Database Vault policies, this metric will raise an alert. This metric is enabled out of the box. By default this metric is collected every 1 hour, but you can change the collection frequency.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every Hour	Not Defined	0	%POLICY_CATEGORY_NAMES% has Policy changes

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of DV Policy Change Category and DV Policy Change Time objects.

If warning or critical threshold values are currently set for any unique combination of DV Policy Change Category and DV Policy Change Time objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of DV Policy Change Category and DV Policy Change Time objects, use the Edit Thresholds page. See Editing Thresholds for information on accessing the Edit Thresholds page

Data Source

The policy changes are picked up from scanning the records in the Database Audit Trail related to Database Vault Schemas.

User Action

To know more about the policy changes, for example which object was changed, which database user changed the policy, what was the user action, and at what time this policy was changed, login to the target's Database Vault Home Page and view the Policy Changes Report.

5.25 DB Alert Log

The metrics in this category are used to create alerts by parsing the database alert log, for example, data block corruption, terminated session, and so on. The DB alert log metrics raise an alert containing the error text and, when relevant, a link to the trace file for each ORA error that is reported in the alert log that matches the warning or critical thresholds defined for each category of error returned by the metric as defined in the Metrics and Policy Settings but does not match the Alert Log Filter Expression.

Note: If there is more than one ORA-error with the same error code or combination of error codes in one collection, only one error is uploaded. Duplicates are eliminated. De-duplication of recurring events for the same issue into a single event across collections is done alone for this metric.

Alert Log Filter Expression

The Alert Log Filter Expression is used (at the discretion of the Cloud Control administrator responsible for that target) to prevent errors that can be ignored resulting in alerts being raised in Cloud Control. It is a Perl regular expression that is used to filter all rows returned by the Alert Log metric.

The filtering takes place during the retrieval of errors from the Alert log and therefore no errors that match the expression are considered by either the Alert Log metric or, by definition, the Alert Log Error Status metric. Only those errors that do not match the Alert Log Filter Expression are compared against the Alert Log metric thresholds or counted for the Alert Log Error Status metric.

You can configure the Alert Log Filter Expression from several locations in Cloud Control for each target. To configure the Alert Log Filter Expression, do either of the following:

- Click the link next to **Alert Log** under **Diagnostic Summary** from the DB Target home page and then click **Generic Alert Log Error Monitoring Configuration** under **Related Links**.
- Use any of the **Metrics and Policy Settings** pages for configuring the thresholds for each category of each metric.

5.25.1 Archiver Hung Alert Log Error

This metric signifies that the archiver of the database being monitored has been temporarily suspended since the last sample time.

If the database is running in ARCHIVELOG mode, an alert is displayed when archiving is hung (ORA-00257 and ORA-16038) messages are written to the ALERT file. The ALERT file is a special trace file containing a chronological log of messages and errors.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	Not Defined	ORA-	The archiver hung at time/line number: %timeLine%.

Data Source

The source of the data is \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Examine the ALERT log and archiver trace file for additional information. However, the most likely cause of this message is that the destination device is out of space to store the redo log file. Verify the device specified in the initialization parameter ARCHIVE_LOG_DEST is set up properly for archiving.

Note: This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you must manually clear the event after the problem is fixed.

5.25.2 Data Block Corruption Alert Log Error

This metric signifies that the database being monitored has generated a corrupted block error to the ALERT file since the last sample time. The ALERT file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when data block corrupted messages (ORA-01157, ORA-01578, and ORA-27048) are written to the ALERT file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	Not Defined	ORA-	A data block was corrupted at time/line number: %timeLine%.

Data Source

The source of the data is \$ORACLE_HOME/sysman/admin/scripts/alertlog.pl where \$ORACLE_HOME refers to the home of the Oracle Management Agent.

User Action

Examine the ALERT log for additional information.

Note: This event does not automatically clear because there is no automatic way of determining when the problem has been resolved. Therefore, you must manually clear the event after the problem is fixed.

5.25.3 Generic Alert Log Error

This metric signifies that the database being monitored has generated errors to the ALERT log file since the last sample time. The ALERT log file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when Oracle Exception (ORA-006xx) messages are written to the ALERT log file. A warning is displayed when other ORA messages are written to the ALERT log file.

- For all supported databases monitored by Enterprise Manager release 10.2.0.4 Management Agent:

Alert Log Filter - up to 1024 characters

Warning or Critical Threshold - up to 256 characters

- For all supported databases monitored by Enterprise Manager release 10.2.0.5 Management Agent:

Alert Log Filter - up to 4000 characters

Warning or Critical Threshold - up to 4000 characters

Archiver hung (ORA-00257) and data block corrupted (ORA-01578) messages are sent out as separate metrics.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	ORA-0*(600? 7445 4[0-9][0-9][0-9])[^0-9]	Not Defined	ORA-error stack (%errCodes%) logged in %alertLogName%.

5.25.4 Media Failure Alert Log Error

This metric indicates that the database being monitored has generated a media failure error to the ALERT file since the last sample time.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	Not Defined	ORA-	Media failure was detected at time/line number: %timeLine%.

5.25.5 Session Terminated Alert Log Error

This metric indicates that the database being monitored has generated a session terminated message to the ALERT file since the last sample time.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	ORA-	Not Defined	A session was terminated at time/line number: %timeLine%.

5.26 DB Alert Log Error Status

The metrics in this category count the number of errors returned in each category by the DB Alert Log Error metric after the Alert Log Filter expression has been taken into account but without taking the thresholds of the DB Alert Log Error metric into account and raises an alert if the number is greater than that specified in the Warning or Critical thresholds for that category. Therefore, it is possible for no alert to be raised by the metrics in the DB Alert Log Error category but still for the DB Alert Log Error Status metric to fire (even if the thresholds defined for the DB Alert Log Error metric are not matched).

5.26.1 Archiver Hung Alert Log Error Status

This metric reflects the number of Archiver Hung alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	0	Not Defined	%value% distinct types of ORA- errors have been found in the alert log.

5.26.2 Data Block Corruption Alert Log Error Status

This metric reflects the number of Data Block Corruption alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	0	Not Defined	Data block corruption errors have been found in the alert log.

5.26.3 Generic Alert Log Error Status

This metric reflects the number of Generic alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	0	Not Defined	%value% distinct types of ORA- errors have been found in the alert log.

5.26.4 Media Failure Alert Log Error Status

This metric represents the media failure alert log error status.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	0	Not Defined	Media failure errors have been found in the alert log.

5.26.5 Session Terminated Alert Log Error Status

This metric reflects the number of Session Terminated alert log errors witnessed the last time Enterprise Manager scanned the Alert Log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 15 minutes	0	Not Defined	Session terminations have been found in the alert log.

5.27 DB Managed by Single Instance

The metrics in this category collect the configuration information for an Oracle Database for Single Instance High Availability (HA) registration.

5.27.1 CRS Home Directory

This metric reports on the Oracle Home directory if a Single Instance HA is installed on the machine.

5.27.2 DB Managed by Single Instance HA

This metric indicates whether the database is managed by Single Instance HA. If the Oracle Database is not managed by Single Instance HA, indicates if a Single Instance HA is available for Oracle Database registration.

5.28 Deferred Transactions

The metrics in this category are associated with this distributed database's deferred transactions.

5.28.1 Deferred Transaction Count

Oracle uses deferred transactions to propagate data-level changes asynchronously among master sites in an advanced replication system as well as from an updatable snapshot to its master table.

This metric checks for the number of deferred transactions. An alert is generated if the number of deferred transactions exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	100	Not Defined	Number of deferred transactions is %value%.

Data Source

The source of the data is the following formula:

```
SELECT count(*) FROM sys.deftran
```

User Action

When the advanced replication facility pushes a deferred transaction to a remote site, it uses a distributed transaction to ensure that the transaction has been properly committed at the remote site before the transaction is removed for the queue at the local site. If transactions are not being pushed to a given remote site, verify that the destination for the transaction was correctly specified. If you specify a destination database when calling DBMS_DEFER_SYS.SCHEDULE_EXECUTION using the DBLINK parameter or DBMS_DEFER_SYS.EXECUTE using the DESTINATION parameter, make sure the full database link is provided.

Wrong view destinations can lead to erroneous deferred transaction behavior. Verify the DEFCALLEST and DEFTRANDEST views are the definitions from the CATREPC.SQL not the ones from CATDEFER.SQL.

5.28.2 Deferred Transaction Error Count

Oracle uses deferred transactions to propagate data-level changes asynchronously among master sites in an advanced replication system as well as from an updatable snapshot to its master table. If a transaction is not successfully propagated to the remote site, Oracle rolls back the transaction, logs the transaction in the SYS.DEFERROR view in the remote destination database.

This metric checks for the number of transactions in SYS.DEFERROR view and raises an alert if it exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	0	Not Defined	Number of deferred transactions with errors is %value%.

Data Source

The source of the data is the following formula:

```
SELECT count(*) FROM sys.deferror
```

User Action

An error in applying a deferred transaction may be the result of a database problem, such as a lack of available space in the table is to be updated or may be the result of an unresolved insert, update or delete conflict. The SYS.DEFERROR view provides the ID of the transaction that could not be applied. Use this ID to locate the queued calls associated with the transaction. These calls are stored in the SYS.DEFCALL view. You can use the procedures in the DBMS_DEFER_QUERY package to determine the arguments to the procedures listed in the SYS.DEFCALL view.

5.29 Dump Area

The metrics in this category check for the percentage of used space of the dump destination devices.

5.29.1 Dump Area Directory

This metric reports the directory represented by this metric index's dump destination.

Each server and background process can write to an associated trace file to log messages and errors.

Background processes and the ALERT file are written to the destination specified by BACKGROUND_DUMP_DEST. Trace files for server processes are written to the destination specified by USER_DUMP_DEST.

Target Version	Collection Frequency
All Versions	Every 30 Minutes

Data Source

The source of the data is the v\$parameter view.

User Action

Verify the device specified in the initialization parameters BACKGROUND_DUMP_DEST, USER_DUMP_DEST, and CORE_DUMP_DEST are set up properly for archiving.

If the BACKGROUND_DUMP_DEST, USER_DUMP_DEST, and CORE_DUMP_DEST initialization parameters are set up correctly and this metric triggers, then free up more space in the destination specified by the dump destination parameters.

5.29.2 Dump Area Used (%)

This metric returns the percentage of used space of the dump area destinations.

If the space used is more than the threshold value given in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 30 Minutes	95	Not Defined	%value%% of %dumpType% dump area is used.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Type of Dump Area object.

If warning or critical threshold values are currently set for any Type of Dump Area object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Type of Dump Area object, use the Edit Thresholds page.

Data Source

Calculated using the UNIX `df -k` command.

- Critical threshold: Percentage of free space threshold for critical alert.
- Warning threshold: Percentage of free space threshold for warning alert.

User Action

Verify the device specified in the initialization parameters BACKGROUND_DUMP_DEST, USER_DUMP_DEST, and CORE_DUMP_DEST are set up properly for archiving.

If the BACKGROUND_DUMP_DEST, USER_DUMP_DEST, and CORE_DUMP_DEST initialization parameters are set up correctly and this metric triggers, then free up more space in the destination specified by the dump destination parameters.

5.29.3 Dump Area Used (KB)

This metric represents the total space used (in KB) on the device containing the dump destination directory.

Target Version	Collection Frequency
All Versions	Every 30 Minutes

Data Source

The the data is calculated using the UNIX `df -k` command.

User Action

Verify the device specified in the initialization parameters `BACKGROUND_DUMP_DEST`, `USER_DUMP_DEST`, and `CORE_DUMP_DEST` are set up properly for archiving.

If the `BACKGROUND_DUMP_DEST`, `USER_DUMP_DEST`, and `CORE_DUMP_DEST` initialization parameters are set up correctly and this metric triggers, then free up more space in the destination specified by the dump destination parameters.

5.29.4 Free Dump Area (KB)

Each server and background process can write to an associated trace file in order to log messages and errors. Background processes and the ALERT file are written to the destination specified by `BACKGROUND_DUMP_DEST`.

Trace files for server processes are written to the destination specified by `USER_DUMP_DEST`.

This metric checks for available free space on these dump destination devices. If the space available is less than the threshold value given in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	Not Defined	Not Defined	%value% free KB remains in %dumpType% dump area.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Type of Dump Area object.

If warning or critical threshold values are currently set for any Type of Dump Area object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Type of Dump Area object, use the Edit Thresholds page.

Data Source

The data is calculated using the UNIX `df -k` command.

User Action

Verify the device specified in the initialization parameters `BACKGROUND_DUMP_DEST`, `USER_DUMP_DEST`, and `CORE_DUMP_DEST` are set up properly for archiving.

If the `BACKGROUND_DUMP_DEST`, `USER_DUMP_DEST`, and `CORE_DUMP_DEST` initialization parameters are set up correctly and this metric triggers, then free up more space in the destination specified by the dump destination parameters.

5.29.5 Total Dump Area (KB)

This metric represents the total space (in KB) available on the device containing the dump destination directory.

Target Version	Collection Frequency
All Versions	Every 30 Minutes

Data Source

The data is calculated using the UNIX `df -k` command.

User Action

Verify the device specified in the initialization parameters `BACKGROUND_DUMP_DEST`, `USER_DUMP_DEST`, and `CORE_DUMP_DEST` are set up properly for archiving.

If the `BACKGROUND_DUMP_DEST`, `USER_DUMP_DEST`, and `CORE_DUMP_DEST` initialization parameters are set up correctly and this metric triggers, then free up more space in the destination specified by the dump destination parameters.

5.30 Efficiency

This metric category contains the metrics that have traditionally been considered to represent the efficiency of some resource. Interpreting the wait interface is generally accepted as a much more accurate approach to measuring efficiency, and is recommended as an alternative to these hit ratios.

5.30.1 Buffer Cache Hit (%)

This metric represents the data block buffer cache efficiency, as measured by the percentage of times the data block requested by the query is in memory.

Effective use of the buffer cache can greatly reduce the I/O load on the database. If the buffer cache is too small, frequently accessed data will be flushed from the buffer cache too quickly which forces the information to be re-fetched from disk. Because disk access is much slower than memory access, application performance will suffer. In addition, the extra burden imposed on the I/O subsystem could introduce a bottleneck at one or more devices that would further degrade performance.

This test checks the percentage of buffer requests that were already in buffer cache. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Buffer cache hit ratio is %value%%.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the $((\text{DeltaLogicalGets} - (\text{DeltaPhysicalReads} - \text{DeltaPhysicalReadsDirect})) / \text{DeltaLogicalGets}) * 100$ formula where:

- DeltaLogicalGets: difference in 'select value from v\$sysstat where name='session logical reads' between sample end and start
- DeltaPhysicalReads: difference in 'select value from v\$sysstat where name='physical reads' between sample end and start
- DeltaPhysicalReadsDirect: difference in 'select value from v\$sysstat where name='physical reads direct' between sample end and start (Oracle8i)

User Action

A low buffer cache hit ratio means that the server must often go to disk to retrieve the buffers required to satisfy a query. The queries that perform the most physical reads lower the numerical value of this statistic. Typically queries that perform full table scans force large amounts of buffers into the cache, aging out other buffers that may be required by other queries later. The Top Sessions page sorted by Physical Reads will show the sessions performing the most reads and through further drilldown their associated queries can be identified. Similarly, the Top SQL page sorted by Physical Reads shows which SQL statements are performing the most physical reads. The statements performing the most I/O should be looked at for tuning.

The difference between the two is that the Top Sessions chart shows the sessions that are responsible for the physical reads at any given moment. The Top SQL view shows all SQL that is still in the cache. The top statement may not be executing currently, and thus not responsible for the current poor buffer cache hit ratio.

If the queries seem to be well tuned, the size of the buffer cache also determines how often buffers must be fetched from disk. The DB_BLOCK_BUFFERS initialization parameter determines the number of database buffers available in the buffer cache. It is one of the primary parameters that contribute to the total memory requirements of the SGA on the instance. The DB_BLOCK_BUFFERS parameter, together with the DB_BLOCK_SIZE parameter, controls the total size of the buffer cache. Because DB_BLOCK_SIZE can only be specified when the database is first created, normally the size of the buffer cache size is controlled using the DB_BLOCK_BUFFERS parameter.

Consider increasing the DB_BLOCK_BUFFERS initialization parameter to increase the size of the buffer cache. This increase allows the Oracle Server to keep more information in memory, thus reducing the number of I/O operations required to do an equivalent amount of work using the current cache size.

5.30.2 CPU Usage (per second)

This metric represents the CPU usage per second by the database processes, measured in hundredths of a second. A change in the metric value may occur because of a change in either workload mix or workload throughput being performed by the database. Although there is no *correct* value for this metric, it can be used to detect a change in the operation of a system. For example, an increase in Database CPU usage from 500 to 750 indicates that the database is using 50% more CPU. (*No correct value* means that there is no single value that can be applied to any database. The value is a characteristic of the system and the applications running on the system.)

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. ADDM can help to identify database operations that are consuming CPU. ADDM reports are available from a number of locations including the Database Home page and Advisor Central.

5.30.3 CPU Usage (per transaction)

This metric represents the average CPU usage per transaction expressed as a number of seconds of CPU time. A change in this metric can occur either because of changing workload on the system, such as the addition of a new module, or because of a change in the way that the workload is performed in the database, such as changes in the plan for a SQL statement. The threshold for this metric should be set based on the actual values observed on your system.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. ADDM will provide information about which operations are using the CPU resources.

5.30.4 Cursor Cache Hit (%)

This metric represents the percentage of soft parses satisfied within the session cursor cache.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

`session cursor cache hits / (parse count (total) - parse count (hard))`

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.5 Data Dictionary Hit (%)

This metric represents dictionary cache efficiency as measured by the percentage of requests against the dictionary data that were already in memory. It is important to determine whether the misses on the data dictionary are actually affecting the performance of the Oracle Server. The shared pool is an area in the SGA that contains the library cache of shared SQL requests, the dictionary cache, and the other cache structures that are specific to a particular instance configuration.

Misses on the data dictionary cache are to be expected in some cases. Upon instance startup, the data dictionary cache contains no data, so any SQL statement issued is likely to result in cache misses. As more data is read into the cache, the likelihood of cache misses should decrease. Eventually the database should reach a steady state in which the most frequently used dictionary data is in the cache. At this point, very few cache misses should occur. To tune the cache, examine its activity only after your application has been running.

This test checks the percentage of requests against the data dictionary that were found in the Shared Pool. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i,	Every 10 Minutes	Not Defined	Not Defined	Data dictionary hit ratio is %value%%.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is $(1 - \text{Misses/Gets}) * 100$ where:

- Misses: select sum(getmisses) from v\$rowcache
- Gets: select sum(gets) from v\$rowcache

User Action

If the percentage of gets is below 90% to 85%, consider increasing SHARED_POOL_SIZE to decrease the frequency in which dictionary data is being flushed from the shared pool to make room for new data. To increase the memory available to the cache, increase the value of the initialization parameter SHARED_POOL_SIZE.

5.30.6 Database CPU Time (%)

This metric represents the percentage of database call time that is spent on the CPU. Although there is no *correct* value for this metric, it can be used to detect a change in the operation of a system, for example, a drop in Database CPU time from 50% to 25%. (*No correct value* means that there is no single value that can be applied to any database. The value is a characteristic of the system and the applications running on the system.)

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Not available.

User Action

Investigate if the change is CPU usage by using Automatic Database Diagnostic Monitor (ADDM). ADDM reports are available from a number of locations including the Database Home page and Advisor Central. Examine the report for increased time spent in wait events.

5.30.7 Library Cache Hit (%)

This metric represents the library cache efficiency, as measured by the percentage of times the fully parsed or compiled representation of PL/SQL blocks and SQL statements are already in memory.

The shared pool is an area in the SGA that contains the library cache of shared SQL requests, the dictionary cache and the other cache structures that are specific to a particular instance configuration.

The shared pool mechanism can greatly reduce system resource consumption in at least three ways: Parse time is avoided if the SQL statement is already in the shared pool.

Application memory overhead is reduced, because all applications use the same pool of shared SQL statements and dictionary resources.

I/O resources are saved, because dictionary elements that are in the shared pool do not require access.

If the shared pool is too small, users will consume additional resources to complete a database operation. For library cache access, the overhead is primarily the additional CPU resources required to re-parse the SQL statement.

This test checks the percentage of parse requests where cursor already in cache. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Library cache hit ratio is %value%%.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the $(\text{DeltaPinHits} / \text{DeltaPins}) * 100$ formula where:

- DeltaPinHits: difference in 'select sum(pinhits) from v\$librarycache' between sample end and start
- DeltaPins: difference in 'select sum(pins) from v\$librarycache' between sample end and start

User Action

The Top Sessions page sorted by Hard Parses lists the sessions incurring the most hard parses. Hard parses occur when the server parses a query and cannot find an exact match for the query in the library cache. You can avoid hard parses by sharing SQL statements efficiently. The use of bind variables instead of literals in queries is one method to increase sharing.

By showing you which sessions are incurring the most hard parses, this page can identify the application or programs that are the best candidates for SQL rewrites.

Also, examine SQL statements that can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The SHARED_POOL_SIZE initialization parameter controls the total size of the shared pool. Consider increasing the SHARED_POOL_SIZE to decrease the frequency in which SQL requests are being flushed from the shared pool to make room for new requests.

To take advantage of the additional memory available for shared SQL areas, you may also need to increase the number of cursors permitted per session. You can increase this limit by increasing the value of the initialization parameter OPEN_CURSORS.

5.30.8 Library Cache Miss (%)

This metric represents the percentage of parse requests where the cursor is not in the cache.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

`1 - pinhits / pins`

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.9 Parallel Execution Downgraded (per second)

This metric represents the number of times per second parallel execution was requested and the degree of parallelism was reduced because of insufficient parallel execution servers.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

`(parallel operations downgraded 1 to 25 percent
+ parallel operations downgraded 25 to 50 percent
+ parallel operations downgraded 50 to 75 percent
+ parallel operations downgraded 75 to 99 percent)
/ time`

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.10 Parallel Execution Downgraded 25% or more (per second)

Number of times per second parallel execution was requested and the degree of parallelism was reduced to 25% and more because of insufficient parallel execution servers.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

```
(parallel operations downgraded 25 to 50 percent
+ parallel operations downgraded 50 to 75 percent
+ parallel operations downgraded 75 to 99 percent)
/ time
```

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.11 Parallel Execution Downgraded 50% or more (per second)

This metric reports the number of times per second parallel execution was requested and the degree of parallelism was reduced to 50% and more because of insufficient parallel execution servers.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

```
(parallel operations downgraded 50 to 75 percent
+ parallel operations downgraded 75 to 99 percent)
/ time
```

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.12 Parallel Execution Downgraded 75% or more (per second)

This metric reports the number of times per second parallel execution was requested and the degree of parallelism was reduced to 75% or more because of insufficient parallel execution servers.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

(parallel operations downgraded 75 to 99 percent) / time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.13 Parallel Execution Downgraded to Serial (per second)

This metric reports the number of times per second parallel execution was requested but execution was serial because of insufficient parallel execution servers.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

parallel operations downgraded to serial / time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.14 Parallel Execution Downgraded to Serial (per transaction)

This metric reports the number of times per transaction parallel execution was requested but execution was serial because of insufficient parallel execution servers.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 minutes	Not Defined	Not Defined	Not Defined

Data Source

The source of the data is the following formula:

parallel operations downgraded to serial / transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.15 PGA Cache Hit (%)

This metric represents the total number of bytes processed in the PGA versus the total number of bytes processed plus extra bytes read/written in extra passes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.16 Redo Log Allocation Hit (%)

Redo log entries contain a record of changes that have been made to the database block buffers. The log writer (LGWR) process writes redo log entries from the log buffer to a redo log file. The log buffer should be sized so that space is available in the log buffer for new entries, even when access to the redo log is heavy. When the log buffer is undersized, user process will be delayed as they wait for the LGWR to free space in the redo log buffer.

The redo log buffer efficiency, as measured by the hit ratio, records the percentage of times users did not have to wait for the log writer to free space in the redo log buffer.

This metric monitors the redo log buffer hit ratio (percentage of success) against the values specified by the threshold arguments. If the number of occurrences is smaller than the values specified, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i,	Every 10 Minutes	Not Defined	Not Defined	Redo log allocation hit ratio is %value%%.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

```
100 * (redo_entries_delta - redo_space_requests_delta)
/redo_entries_delta
where:
```

- redo_entries_delta = difference between "SELECT value FROM v\$sysstat WHERE name = 'redo entries'" at the beginning and ending of the interval
- redo_space_requests_delta = difference between "SELECT value FROM v\$sysstat WHERE name = 'redo log space requests'" at the beginning and ending of the interval

User Action

The LOG_BUFFER initialization parameter determines the amount of memory that is used when buffering redo entries to the redo log file.

Consider increasing the LOG_BUFFER initialization parameter in order to increase the size of the redo log buffer. Redo log entries contain a record of the changes that have been made to the database block buffers. The log writer process (LGWR) writes redo log entries from the log buffer to a redo log. The redo log buffer should be sized so space is available in the log buffer for new entries, even when access to the redo log is heavy.

Note: For Oracle Management Agent release 9*i*, this metric has been obsoleted. It is recommended that you use the Redo NoWait Ratio metric. This metric is kept for backward compatibility with older versions of the Management Agent.

5.30.17 Response Time (per transaction)

This metric represents the time spent in database operations per transaction. It is derived from the total time that user calls spend in the database (DB time) and the number of commits and rollbacks performed. A change in this value indicates that either the workload has changed or that the databases ability to process the workload has changed because of either resource constraints or contention.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page. Changes in the response time per transaction will appear as increased time spent in the database, either on CPU or in wait events and ADDM will report the sources of contention for both hardware and software resources.

5.30.18 Row Cache Miss Ratio (%)

This metric represents the percentage of row cache miss ratio.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every10 Minutes	Not Defined	Not Defined	Management Agent generates alert message.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.30.19 Sorts in Memory (%)

This metric represents the sort efficiency as measured by the percentage of times sorts were performed in memory as opposed to going to disk.

For best performance, most sorts should occur in memory because sorts to disks are less efficient. If the sort area is too small, extra sort runs will be required during the sort operation. This increases CPU and I/O resource consumption.

This test checks the percentage of sorts performed in memory rather than to disk. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every10 Minutes	Not Defined	Not Defined	%value%% of sorts are performed in memory.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is $(\text{DeltaMemorySorts} / (\text{DeltaDiskSorts} + \text{DeltaMemorySorts})) * 100$ where:

- DeltaMemorySorts: difference in 'select value from v\$sysstat where name='sorts (memory)' between sample end and start
- DeltaDiskSorts: difference in 'select value from v\$sysstat where name='sorts (disk)' between sample end and start

User Action

The sessions that are performing the most sorts should be identified such that the SQL they are executing can be further identified. The sort area sizes for the database may be sized correctly, and the application SQL may be performing unwanted or excessive sorts. The sessions performing the most sorts are available through the Top Sessions page sorted by Disk Sorts.

Further drilldown into the session performing the most disk sorts with the Current SQL page shows you the SQL statement responsible for the disk sorts.

The Top SQL page sorted by Sorts provides a mechanism to quickly display the SQL statements in the cache, presented in sorted order by their number sort operations. This is an alternative to viewing a sort of current sessions. It allows you to view sort activity via SQL statements and contains cumulative statistics for all executions of that statement.

If excessive sorts are taking place on disk and the queries are correct, consider increasing the SORT_AREA_SIZE initialization parameter to increase the size of the sort area. A larger sort area allows the Oracle Server to maintain sorts in memory, reducing the number of I/O operations required to do an equivalent amount of work using the current sort area size.

5.31 Exadata Module Version Failure

This metric category provides information about the amount of times an Exadata module version error occurs.

5.31.1 Error Count

This metric displays the number of times that the error occurred.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 24 Hours	0	Not Defined	%errorCode% occurrences of %errorCount%.

5.32 Failed Logins

The metrics in this category check for the number of failed logins on the target database. This check is performed every interval specified by the collection frequency and returns the number of failed logins for the last 30 minutes. These metrics will only work for databases where the audit_trail initialization parameter is set to DB or XML and the session is being audited.

5.32.1 Failed Login Count

This metric checks for the number of failed logins on the target database. This check is performed every interval specified by the collection frequency and returns the number of failed logins for the last 30 minutes. This metric will only work for databases where the `audit_trail` initialization parameter is set to DB or XML and the session is being audited.

If the failed login count crosses the values specified in the threshold arguments, then a warning or critical alert is generated. Because it is important to know every time a significant number of failed logins occurs on a system, on every collection, this metric determines the number of failed login attempts in the last 30 minutes and overrides the current alert instead of a new alert. You can manually clear these alerts. They will not automatically be cleared after the next collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	150	300	There have been %value% failed login attempts in the last %failed_login_interval_min% minutes.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Time object.

If warning or critical threshold values are currently set for any Time object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Time object, use the Edit Thresholds page.

Data Source

The database stores login information in different views, based on the `audit_trail` setting. The database views used are:

- DB or DB_EXTENDED: DBA_AUDIT_SESSION
- XML (10g Release 2 only): DBA_COMMON_AUDIT_TRAIL

User Action

No user action is required.

5.33 Fast Recovery

The Fast Recovery metrics relate to the fast recovery area.

5.33.1 Fast Recovery Area

Formerly referred to as flash recovery area, the metrics in this category return an optional disk location that you can use to store recovery-related files such as control file and online redo log copies, archived redo log files, flashback logs, and RMAN backups.

Oracle Database and RMAN manage the files in the fast recovery area automatically. You can specify the disk quota, which is the maximum size of the fast recovery area.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

```
SELECT value
  FROM v$parameter
 WHERE name='db_recovery_file_dest';
```

User Action

No user action is required.

5.33.2 Fast Recovery Area Size

This metric returns the Fast Recovery Area Size.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

```
SELECT value
  INTO l_fast_recovery_size
  FROM v$parameter
 WHERE name='db_recovery_file_dest_size';
```

User Action

No user action is required.

5.33.3 Flashback On

This metric returns whether or not flashback logging is enabled - YES, NO, or RESTORE POINT ONLY. For the RESTORE POINT ONLY option, flashback is ON but you can only flashback to guaranteed restore points.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

```
SELECT flashback_on
  FROM v$database;
```

User Action

No user action is required.

5.33.4 Log Mode

This metric returns the log mode of the database - ARCHIVELOG or NOARCHIVELOG.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

```
SELECT log_mode
FROM v$database;
```

User Action

No user action is required.

5.33.5 Non-Reclaimable Fast Recovery Area (%)

This metric represents the percentage of space non-reclaimable (spaced used minus space reclaimable) in the fast recovery area.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

Non-reclaimable = space used - space reclaimable

Space Used:

```
SELECT SUM(PERCENT_SPACE_USED)
FROM v$fast_recovery_area_usage;
```

Space Reclaimable:

```
SELECT SUM(PERCENT_SPACE_RECLAIMABLE)
FROM v$fast_recovery_area_usage;
```

User Action

No user action is required.

5.33.6 Oldest Flashback Time

This metric returns the oldest point-in-time to which you can flashback your database.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

```
SELECT to_char(oldest_flashback_time, 'YYYY-MM-DD HH24:MI:SS')
```

```
FROM v$flashback_database_log;
```

User Action

No user action is required.

5.33.7 Reclaimable Fast Recovery Area (%)

This metric represents the percentage of space reclaimable in the fast recovery area.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

```
Space Reclaimable:
SELECT SUM(PERCENT_SPACE_RECLAIMABLE)
FROM v$fast_recovery_area_usage;
```

User Action

No user action is required.

5.33.8 Usable Fast Recovery Area (%)

This metric represents the percentage of space usable in the fast recovery area. The space usable is composed of the space that is free in addition to the space that is reclaimable.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The source of the data is the following formula:

```
SELECT (CASE WHEN PERCENT_USED > 100 THEN 0 ELSE (100-PERCENT_USED) END)
PERCENT_FREE
FROM (SELECT (SUM(PERCENT_SPACE_USED)-SUM(PERCENT_SPACE_RECLAIMABLE))
PERCENT_USED
FROM V$FAST_RECOVERY_AREA_USAGE);
```

User Action

No user action is required.

5.34 Global Cache Statistics

The metrics in this category are associated with global cache statistics.

5.34.1 Global Cache Average Convert Time (centi-seconds)

This metric represents the average convert time, measured in hundredths of a second.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	0.3	0.6	Global cache converts time is %value% cs.

Data Source

The source of the data is the following formula:

global cache convert time * 10 / global cache converts

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.34.2 Global Cache Average CR Block Request Time (centi-seconds)

This metric represents the average time, measured in hundredths of a second, that CR block was received.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	0.5	1	Global cache CR Block request time is %value% cs.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	1	2	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

global cache CR block receive time * 10 / global cache current blocks received

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.34.3 Global Cache Average Current Block Request Time (centi-seconds)

This metric represents the average time, measured in hundredths of a second, to get a current block.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	0.5	1	Global cache Current Block request time is %value% cs.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	1	2	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

global cache current block send time * 10 / global cache current blocks served

User Action

The required actions are specific to your site.

5.34.4 Global Cache Average Get Time (centi-seconds)

This metric represents the average get time, measured in hundredths of a second.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	0.3	0.6	Global cache gets time is %value% cs.

Data Source

The source of the data is the following formula:

global cache get time * 10 / global cache gets

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.34.5 Global Cache Blocks Corrupt

This metric represents the number of blocks that encountered a corruption or checksum failure during interconnect over the user-defined observation period.

Note: Unlike most metrics, which accept thresholds as real numbers, this metric can only accept an integer as a threshold.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	0	0	Total global cache blocks corrupt is %value%.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	0	0	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is the following formula:

global cache blocks corrupted

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.34.6 Global Cache Blocks Lost

This metric represents the number of global cache blocks lost over the user-defined observation period.

Note: Unlike most metrics, which accept thresholds as real numbers, this metric can only accept an integer as a threshold.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9.0.1.x, 9.2.0.x	Every 5 Minutes	1	3	Total global cache block lost is %value%.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	1	3	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The source of the data is global cache blocks lost.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.35 Incident

This metric category contains the metrics representing incidents, such as generic internal error, or access violation, as recorded in the database alert log file. Incidents refer to problems for which Automatic Diagnostic Repository (ADR) incidents are created. These type of problems usually require investigation, diagnostic data to be collected, and possibly interaction with Oracle Support for resolution. The alert log file has a chronological log of messages and errors.

Each metric signifies that the database being monitored has detected a critical error condition about the database and has generated an incident to the alert log file since the last sample time. The Support Workbench in Enterprise Manager contains more information about each generated incident.

Note: For more information about Incident metrics and Operational Error metrics, log in to My Oracle Support and search for the following Oracle Support note:

Database Alert log monitoring in 12c explained (Doc ID 1538482.1)

<https://support.oracle.com/>

5.35.1 Setting Thresholds for Incident Metrics

To edit the thresholds for any of the following metrics, from the Cloud Control UI, right-click the target name, select **Monitoring**, then **Metric and Collection Settings**. The following settings provide examples of some of the possible settings:

- Warning Threshold: Not Defined; Critical Threshold: .*
In this case, the Management Agent generates a critical error alert in Enterprise Manager when the incident occurs.
- Warning Threshold: .*; Critical Threshold: Not Defined
In this case, the Management Agent generates a warning alert in Enterprise Manager when the incident occurs.
- Warning Threshold: Not Defined; Critical Threshold: Not Defined
In this case, the Management Agent does *not* generate an alert in Enterprise Manager when the incident occurs.

5.35.2 Access Violation

This metric signifies that the database has generated an incident due to some memory access violation. This type of incident is typically related to Oracle Exception messages such as ORA-3113 and ORA-7445. The database can also generate this type of incident when it detects a SIGSEGV or SIGBUS signals.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	An access violation detected in %alertLogName% at time/line number: %tmeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.3 Alert Log Error Trace File

This metric reports the name of the trace file (if any) associated with the logged incident.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

No user action is required.

5.35.4 Alert Log Name

This metric reports the name of the alert log file.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

No user action is required.

5.35.5 Cluster Error

This metric signifies that the database has generated an incident due to a member evicted from the group by a member of the cluster database. This type of incident is typically related to Oracle Exception message ORA-29740.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	A cluster error detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.6 Deadlock

This metric signifies that the database has generated an incident due to a deadlock detected while trying to lock a library object. This type of incident is typically related to Oracle Exception message ORA-4020.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	A deadlock detected in \$alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.7 File Access Error

This metric signifies that the database has generated an incident due to failure to read a file at the time.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	A file access error detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see "[Setting Thresholds for Incident Metrics](#)".

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.8 Generic Incident

This metric signifies that the database has generated an incident due to some database error.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	Incident (%adr_problemKey%) detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.9 Generic Internal Error

This metric signifies that the database has generated an incident due to an internal database error. This type of incident is typically related to Oracle Exception message ORA-600 or ORA-0060*.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	Internal error (%adr_problemKey%) detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.10 Impact

This metric reports the impact of an incident. For a Generic Internal Error incident, the impact describes how the incident may affect the database.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

No user action is required.

5.35.11 Incident ID

This metric reports a number identifying an incident. The Support Workbench in Enterprise Manager uses this ID to specify an incident.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

No user action is required.

5.35.12 Inconsistent DB State

This metric signifies that the database has generated an incident due to an inconsistent database state such as an invalid ROWID. This type of incident is typically related to Oracle Exception message ORA-1410.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g,12c	Every 5 Minutes	Not Defined	.*	An inconsistent DB state detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see "[Setting Thresholds for Incident Metrics](#)".

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.13 Internal SQL Error

This metric signifies that the database has generated an incident due to an internal SQL error. This type of incident is typically related to Oracle Exception message ORA-604.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	An internal SQL error detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see "[Setting Thresholds for Incident Metrics](#)".

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.14 Oracle Data Block Corruption

This metric signifies that the database has generated an incident due to an ORACLE data block corruption. This type of incident is typically related to Oracle Exception message ORA-1578.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	An Oracle data block corruption detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.15 Out of Memory

This metric signifies that the database has generated an incident due to failure to allocate memory. This type of incident is typically related to Oracle Exception message ORA-4030 or ORA-4031.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	Out of memory detected in %alertLogName% at tme/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see "[Setting Thresholds for Incident Metrics](#)".

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.16 Redo Log Corruption

This metric signifies that the database has generated an incident due to an error with the redo log. This type of incident is typically related to Oracle Exception message ORA-353, ORA-355, or ORA-356.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	A redo log corruption detected in %alertLogName% at time/line number: %timeLome%/

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see "[Setting Thresholds for Incident Metrics](#)".

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.35.17 Session Terminated

This metric signifies that the database has generated an incident due to an unexpected session termination. This type of incident is typically related to Oracle Exception message ORA-603.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	A session termination detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of incident as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the incident.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.36 Interconnect

The metrics in this category collect the information about network interfaces used by cluster database instances as internode communication.

5.36.1 Interface Type

Cluster database instances should use private interconnects for internode communication. This metric monitors whether the network interface used by the cluster instance is a private one. If the network interface is known to be public, a critical alert is generated. If the network interface type is unknown, a warning alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 12 Hours	Unknown	Public	The instance is using interface '%if_name%' of type '%value%'.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Interface Name object.

If warning or critical threshold values are currently set for any Interface Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Interface Name object, use the Edit Thresholds page.

Data Source

The data is derived from the following views:

V\$CLUSTER_INTERCONNECTS

V\$CONFIGURED_INTERCONNECTS

User Action

Use oifcfg in the CRS home to correctly configure the private interfaces in OCR.

5.37 Interconnect Traffic

The metrics in this category monitor the internode data transfer rate of cluster database instances.

5.37.1 Transfer Rate (MB/s)

This metric collects the internode communication traffic of a cluster database instance. This is an estimation using the following formula:

```
(gc cr blocks received/sec + gc current blocks received/sec + gc cr blocks
served/sec + gc current blocks served/sec) * db_block_size
+
( messages sent directly/sec + messages send indirectly/sec + messages
received/sec ) * 200 bytes
```

The critical and warning thresholds of this metric are not set by default. Users can set them according to the speed of their cluster interconnects.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 5 Minutes	Not Defined	Not Defined	Not Defined

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Instance Name object.

If warning or critical threshold values are currently set for any Instance Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Instance Name object, use the Edit Thresholds page.

Data Source

The data is derived from the following views:

V\$SYSSTAT

V\$DLM_MISC

V\$PARAMETER

User Action

No user action is required.

5.38 Invalid Objects

The metrics in this category represent the metrics associated with invalid objects.

5.38.1 Total Invalid Object Count

This metric represents the total invalid object count.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	%value% object(s) are invalid in the database.

Data Source

The data is derived from the SYS.OBJ\$ and SYS.USER\$ tables.

User Action

The required actions are specific to your site.

5.39 Invalid Objects by Schema

The metrics in this category represent the number of invalid objects in each schema.

5.39.1 Owner's Invalid Object Count

This metric represents the invalid object count by owner.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	%value% object(s) are invalid in the %owner% schema.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Invalid Object Owner object.

If warning or critical threshold values are currently set for any Invalid Object Owner object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Invalid Object Owner object, use the Edit Thresholds page.

Data Source

The data is derived from the SYS.OBJ\$ and SYS.USER\$ tables.

User Action

View the status of the database objects in the schema identified by the Invalid Object Owner metric. Recompile objects as necessary.

5.40 Messages Per Buffered Queue

The metrics in this category monitor the age and state of the first (top of the queue) message for each buffered queue in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

5.40.1 Average Age of Messages Per Buffered Queue (Seconds)

This metric provides the average age (in seconds) of the messages in the buffered queue for all nonsystem queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages in %schema%.%queue_name% queue is %value% seconds.

5.40.2 First Message Age in Buffered Queue Per Queue (Seconds)

This metric gives the age (in seconds) of the first message in the buffered queue for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message in %schema%.%queue_name% buffered queue is %value% seconds.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

This metric is calculated by finding the age of the first message in all the subscribers of the queue and then the oldest amongst all is taken.

The following views and tables are used for the calculation:

1. <SCHEMA>.AQ\$<QUEUE_TABLE>
2. v\$buffered_queues

User Action

When using buffered queues for storing and propagating messages, monitor this metric to get the age of first message in the queue.

5.40.3 Messages processed per buffered queue (%)

This metric gives the messages processed percentage per minute per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for queue %schema%.%queue_name% is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

This is calculated as the percent of total number of messages processed per minute and total number of messages received per minute in the last collection interval per buffered queue.

User Action

When using queues for storing/propagating messages, monitor this metric to get the messages processed percent (or throughput) per minute in the last collection interval for the queue.

5.40.4 Messages Processed Per Buffered Queue (%) Per Minute

This metric gives the messages processed percentage per minute in the last interval per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for queue %schema%.%queue_name% is %value% .

5.40.5 Spilled Messages

This metric displays the current number of overflow messages spilled to disk from the buffered queue.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Current number of overflow messages spilled to disk from the buffered queue %schema%.%queue_name% is %value%

5.40.6 Total Messages Processed per Buffered Queue per Minute

This metric gives the total number of messages processed per minute per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages processed per minute in the last interval for queue %schema%.%queue_name% is %value% .

5.40.7 Total Messages Received per Buffered Queue per Minute

This metric gives the total number of messages received or enqueued into the buffered queue per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for queue %schema%.%queue_name% is %value% .

5.41 Message Per Buffered Queue Per Subscriber

This metric category monitors the messages for buffered queues per subscriber in the database.

5.41.1 Average Age of Messages Per Buffered Queue Per Subscriber (Seconds)

This metric display's the average age of messages in the buffered queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

5.41.2 First Message Age in Buffered Queue per Subscriber (Seconds)

This metric displays the age of the first message in the buffered queue per queue per subscriber in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message for subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

5.41.3 Messages Processed Per Buffered Queue Per Subscriber (%)

This metric gives the messages processed percentage for the buffered queue per subscriber. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% percent.

5.41.4 Messages Processed Per Buffered Queue (%) Per Subscriber Per Minute

This metric gives the total number of messages processed per minute per buffered queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%

5.41.5 Total Messages Processed Per Buffered Queue Per Subscriber Per Minute

This metric gives the total number of messages processed per minute per buffered queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

5.41.6 Total Messages Received Per Buffered Queue Per Subscriber Per Minute

This metric gives the total number of messages received or enqueued into the queue per subscriber per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

5.42 Messages Per Persistent Queue

The metrics in this category monitor the age and state of the first (top of the queue) message for each persistent queue in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

5.42.1 Age of the First Message in Persistent Queue Per Queue

This metric gives the age (in seconds) of the first message in the persistent queue for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message in %schema%.%queue_name% queue is %value% seconds.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

This metric is calculated by finding the age of the first message in all the subscribers of the queue and then the oldest amongst all is taken.

The following views/tables are used for the calculation:

1. <SCHEMA>.AQ\$_<QUEUE_TABLE>_S

2. <SCHEMA>.AQ\$_<QUEUE_TABLE>_I

3. <SCHEMA>.AQ\$<QUEUE_TABLE>

User Action

When using persistent queues for storing and propagating messages, monitor this metric to get the age of first message in the queue.

5.42.2 Average Age of Messages Per Persistent Queue (Seconds)

This metric displays the average age of messages in the persistent queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages in %schema%.%queue_name% queue is %value% seconds.

5.42.3 Messages Processed Per Persistent Queue (%)

This metric gives the messages processed percentage for the persistent queue. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for queue %schema%.%queue_name% is %value% percent.

5.42.4 Messages Processed Per Persistent Queue (%) Per Minute

This metric gives the messages processed percentage per minute per persistent queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for queue %schema%.%queue_name% is %value%

5.42.5 Total Messages Processed per Persistent Queue per Minute

This metric gives the total number of messages processed per minute per persistent queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages processed per minute in the last interval for queue %schema%.%queue_name% is %value% .

5.42.6 Total Messages Received per Persistent Queue per Minute

This metric gives the total number of messages received or enqueued into the queue per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for queue %schema%.%queue_name% is %value% .

5.43 Messages Per Persistent Queue Per Subscriber

The metrics in this category monitor the age and state of the first (top of the queue) message for each persistent queue per queue subscriber in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

5.43.1 Average Age of Messages Per Persistent Queue Per Subscriber (Seconds)

This metric display's the average age of messages in the persistent queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

5.43.2 Age of the First Message in Persistent Queue Per Subscriber

This metric gives the age (in seconds) of the first message in the persistent queue per subscriber for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message for subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

5.43.3 Messages Processed Per Persistent Queue Per Subscriber (%)

This metric gives the messages processed percentage for the persistent queue per subscriber. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% percent.

5.43.4 Messages Processed Per Persistent Queue (%) Per Subscriber Per Minute

This metric gives the messages processed percentage per minute per persistent queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

5.43.5 Total Messages Processed Per Persistent Queue Per Subscriber Per Minute

This metric gives the messages processed percentage per minute per persistent queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

5.43.6 Total Messages Received Per Persistent Queue Per Subscriber Per Minute

This metric gives the total number of messages received or enqueued into the queue per subscriber per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

5.44 Memory Usage

The metric in this category provides information about the total memory used by the database instance.

5.44.1 Total Memory Usage (MB)

This metric displays the total amount of memory used in MB.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i, 10g, 11g, 12c	Every 15 Minutes	Not Defined	Not Defined	Total memory usage is %value% MB.

5.45 OCM Instrumentation

The metrics in this category determine whether the database has been instrumented with Oracle Configuration Manager (OCM). Oracle Configuration Manager is used to personalize the support experience by collecting configuration information and uploading it to the Oracle repository.

When customer configuration data is uploaded on a regular basis, customer support representatives can analyze this data and provide better service to the customers. For example, when a customer logs a service request, he can associate the configuration data directly with that service request. The customer support representative can then view the list of systems associated with the customer and solve problems accordingly.

5.45.1 Instrumentation Present

This metric determines whether the database has been instrumented with Oracle Configuration Manager.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

This metric tests for the existence of the MGMT_DB_LL_METRICS package body owned by the ORACLE_OCM user.

User Action

No user action is required.

5.45.2 Need to Instrument with OCM

This metric determines that Oracle Configuration Manager needs to be instrumented in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	1	Not Defined	OCM Instrumentation should be installed in database. Please use \$ORACLE_HOME/ccr/admin/scripts/installCCRSQL script with collectconfig parameter.

Data Source

This metric tests for the existence of the emCCR executable in the \$ORACLE_HOME/ccr/bin/ directory. If the emCCR executable is present, then Enterprise Manager checks to see if the MGMT_DB_LL_METRICS package body, owned by the ORACLE_OCM user, exists in the Management Repository.

If the emCCR executable is present but the MGMT_DB_LL_METRICS package body is missing, then this metric returns 1, indicating that the database must be instrumented.

User Action

Install Oracle Configuration Manager (OCM) in the database.

5.45.3 OCM Configured

This metric determines how the Oracle Configuration Manager is configured.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

This metric tests for the existence of the emCCR executable in the \$ORACLE_HOME/ccr/bin directory.

User Action

No user action is required.

5.46 Operational Error

This metric category contains the metrics representing errors that might affect the operation of the database, such as archiver hung, or media failure as recorded in the database alert log file. These errors are not triggered by ADR incidents but are daily issues which you can handle without interaction with Oracle Support. The alert log file has a chronological log of messages and errors.

Each metric signifies that the database being monitored has detected a critical error condition that might affect the normal operation of the database and has generated an error message to the alert log file since the last sample time. The Support Workbench in Enterprise Manager might contain more information about the error.

Note: For more information about Incident metrics and Operational Error metrics, log in to My Oracle Support and search for the following Oracle Support note:

Database Alert log monitoring in 12c explained (Doc ID 1538482.1)

<https://support.oracle.com/>

Setting Thresholds for Operational Errors

To edit the thresholds for any of the following metrics, from the Cloud Control UI, right-click the target name, select Monitoring, then Metric and Collection Settings. The following settings provide examples of some of the possible settings:

- Warning Threshold: Not Defined; Critical Threshold: .*
 - Warning Threshold: .*; Critical Threshold: Not Defined
- In this case, the Management Agent generates a critical error alert in Enterprise Manager when the error occurs.

In this case, the Management Agent generates a warning alert in Enterprise Manager when the error occurs.

- Warning Threshold: Not Defined; Critical Threshold: Not Defined

In this case, the Management Agent does not generate an alert in Enterprise Manager when the error occurs.

5.46.1 Alert Log Error Trace File

This metric reports the name of the trace file (if any) associated with the logged error.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

No user action is required.

5.46.2 Alert Log Name

This metric reports the name of the alert log file.

Target Version	Collection Frequency
11g, 12c	Every 5 Minutes

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

No user action is required.

5.46.3 Archiver Hung

This metric signifies that the archiver of the database being monitored has been temporarily suspended since the last sample time.

If the database is running in ARCHIVELOG mode, an alert is displayed when archiving is hung (ORA-00257 or ORA-16038) messages are written to the alert file. The alert file is a special trace file containing a chronological log of messages and errors.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	Archiver hang detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of error as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the error. However, the most likely cause of this message is that the destination device is out of space to store the redo log file. Verify the device specified in the initialization parameter ARCHIVE_LOG_DEST is set up properly for archiving.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.46.4 Data Block Corruption

This metric signifies that the database being monitored has generated a corrupted block error (ORA-01157 or ORA-27048) to the alert file since the last sample time. The alert file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when data block corrupted messages are written to the alert file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	A datablock corruption detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of error as Critical. For information about modifying threshold values, see ["Setting Thresholds for Incident Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the error.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.46.5 Generic Operational Error

This metric signifies that the database being monitored has generated some error that may affect the normal operation of the database to the alert file since the last sample time. The alert file is a special trace file containing a chronological log of messages and errors. An alert event is triggered when data block corrupted messages are written to the alert file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	Operational error (%errorCodes%) detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of error as Critical. For information about modifying threshold values, see ["Setting Thresholds for Operational Error Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_*n.n.n.n*/scripts/alertlogAdp.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the error.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.46.6 Media Failure

This metric signifies that the database being monitored has generated a media failure error (ORA-01242 or ORA-01243) to the alert file since the last sample time. The alert file is a special trace file containing a chronological log of messages and errors. An

alert event is triggered when data block corrupted messages are written to the alert file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	.*	Media Failure detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

By default, Enterprise Manager reports this type of error as Critical. For information about modifying threshold values, see ["Setting Thresholds for Operational Error Metrics"](#).

Data Source

The source of the data is \$AGENT_BASE/plugins/oracle.sysman.db.agent.plugin_n.n.n.n/scripts/alertlogAdr.pl.

In the preceding directory path, \$AGENT_BASE refers to the home of the Oracle Management Agent and *n.n.n.n* refers to the release version of the Oracle Database plug-in, such as plug-in release 13.1.0.0.

User Action

Use Support Workbench in Enterprise Manager to examine the details of the error.

Note: This event does not clear automatically because there is no automatic way of determining when the problem has been resolved. Therefore, you must clear the event manually after the problem is fixed.

5.46.7 User-Defined Error

This metric displays the user-defined error.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	Not Defined	Error (%errorCodes%) detected in %alertLogName% at time/line number: %timeLine%.

5.46.8 User-Defined Text

This metric displays user-defined text. You can use this metric to raise alerts for custom text found in the XML alert log.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	Not Defined	Matching text (%errorCodes%) detected in %alertLogName% at time/line number: %timeLine%.

Multiple Thresholds

Use the thresholds to define the custom text (regular expression). An alert will be raised for any entry in the XML alert log with text matching the custom text entered here.

5.46.9 User-Defined Warning

This metric displays the user-defined warning.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 5 Minutes	Not Defined	Not Defined	Warning (%errorCodes%) detected in %alertLogName% at time/line number: %timeLine%.

5.47 Operating System Audit Records

This metrics in this category check target database OS audit trail files. It checks for aud, bin, and .xml file extensions in either a user-configured location or the default location.

5.47.1 Size of Audit Files (MB)

This metric displays the cumulative size of audit files. Due to different reasons, if audit trails can't be written to the database, then they are written to the file system, and with time, the files grow. If the cumulative size of audit files exceeds more than 1 GB, it is marked as a warning alert. You must configure the critical threshold if you want to define a critical alert.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 6 Hours	1024	Not Defined	%FILE_SIZE% MB of Audit Trail files collected (.aud: %AUD_FILE_SIZE% MB, .xml: %XML_FILE_SIZE% MB, .bin: %BIN_FILE_SIZE% MB)

Data Source

OS audit files of the target database

User Action

Load the audit files back to the database and find out why the audit trails are written to the OS file system.

5.48 Recovery

The metrics in this category are related to database recovery.

5.48.1 Corrupt Data Block Count

This metric represents the count of corrupt data blocks.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i, 10g	Every 15 Minutes	Not Defined	0	Number of corrupt data blocks is %value%.

Data Source

The data is derived from the following formula:

```
SELECT nvl(sum(blocks), 0)
FROM v$database_block_corruption;
```

User Action

Perform a database recovery.

5.48.2 Datafiles Need Media Recovery

This metric represents the count of data files that require recovery.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i, 10g	Every 15 Minutes	Not Defined	0	Number of data files needing media recovery is %value%.

Data Source

The data is derived from the following formula:

```
SELECT count(file#)
INTO l_datafiles_need_recovery
FROM v$datafile_header
WHERE recover = 'YES';
```

User Action

Perform a database recovery.

5.48.3 Missing Media File Count

This metric returns the count of missing media files.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i, 10g	Every 15 Minutes	Not Defined	0	Number of missing media files is %value%.

Data Source

The data is derived from the following formula:

```
SELECT count(file#)
INTO l_missing_media_files
FROM v$datafile_header
```

WHERE error is not null AND error is 'OFFLINE NORMAL';

User Action

Perform a database recovery.

5.49 Response

The metrics in this category represent the responsiveness of the Oracle Server, with respect to a client.

5.49.1 State

This metric represents the state of the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Seconds	MOUNTED	DOWN UNKNOWN. *	The database status is %value%.

Data Source

Not available.

User Action

The required actions are specific to your site. The required actions are specific to your site.

5.49.2 Status

This metric checks whether a new connection can be established to a database. If the maximum number of users is exceeded or the listener is down, this test is triggered.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Seconds	Not Defined	0	Failed to connect to database instance %oraerr%.

Data Source

Perl returns 1 when a connection can be made to the database (using Management Agent monitoring connection details), 0 otherwise.

User Action

Check the status of the listener to make sure it is running on the node where the event was triggered. If the listener is running, check to see if the number of users is at the session limit. **Note:** The choice of user credentials for the Probe metric should be considered. If the preferred user has the RESTRICTED SESSION privilege, the user will be able to connect to a database even if the LICENSE_MAX_SESSIONS limit is reached.

5.50 SCN Growth Statistics

This metric category provides information about the Systems Change Number (SCN) in the database environment and reports on the health of the SCN growth in the database.

5.50.1 Current SCN

This metric displays the value of the current SCN.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Hour	Not Defined	Not Defined	The current SCN is %current_scn%.

5.50.2 Current SCN Compatibility

This metric displays the current SCN compatibility for the database.

Note: This is for internal customers only.

Target Version	Collection Frequency
10g, 11g, 12c	Every 60 Minutes

5.50.3 Max Rate

This metric displays the rate at which the SCN growth is calculated, such as 16k/32k.

Note: This metric is used by internal users.

Target Version	Collection Frequency
10g, 11g, 12c	Every 60 Minutes

5.50.4 Maximum SCN Compatibility

This metric displays the maximum SCN compatibility for the database.

Note: This is for internal customers only.

Target Version	Collection Frequency
10g, 11g, 12c	Every 60 Minutes

5.50.5 SCN Health

This metric displays the SCN health of the database, that is, headroom or the number of days before the database runs out of SCN at the current SCN consumption rate.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Hour	62	10	The SCN health is %scn_health%.

5.50.6 SCN Total Growth Rate (per sec)

This metric displays the total SCN growth rate over the previous 24 hours.

SCNs occur in a monotonically increasing sequence (that is, each SCN is greater than or equal to the one before it), and there is a very large upper limit to how many SCNs Oracle Database can use. Because there is an upper limit, it is important that Oracle Database does not run out of available SCNs and therefore it is important to monitor the SCN growth rate.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Hour	Not Defined	Not Defined	The total SCN Growth rate per second (last 24 hours) is %scn_total_growth%.

5.51 SCN Instance Statistics

This metric category provides information about the SCN growth rate due to intrinsic activity.

5.51.1 SCN Intrinsic Growth Rate (per sec)

This metric displays the rate at which the SCN of the database increases only due to database transactions, and not due to database links. It is averaged per second over the last 24 hours. The rate is displayed in SCNs per second.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Hour	Not Defined	Not Defined	The intrinsic SCN Growth rate per second is %scn_intrinsic_growth_rate%.

5.52 SCN Max Statistics

This metric category provides information about the maximum value of the SCN.

5.52.1 Max SCN Jump in one second (last 24 hours)

This metric displays the maximum SCN jump in one second over the previous 24 hours.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Hour	Not Defined	Not Defined	The maximum SCN jump in one second (last 24 hours) is %scn_max_jump%.

5.53 Segment Advisor Recommendations

The metrics in this category provide segment advisor recommendations. Oracle uses the Automatic Segment Advisor job to detect segment issues regularly within maintenance windows. It determines whether the segments have unused space that can be released. The Number of recommendations is the number of segments that

have Reclaimable Space. The recommendations come from all runs of the automatic segment advisor job and any user scheduled segment advisor jobs.

5.53.1 Number of Recommendations

Oracle uses the Automatic Segment Advisor job to detect segment issues regularly within maintenance windows. It determines whether the segments have unused space that can be released. The Number of recommendations is the number of segments that have Reclaimable Space. The recommendations come from all runs of the automatic segment advisor job and any user scheduled segment advisor jobs.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 60 Minutes

Data Source

Not available.

User Action

Oracle recommends shrinking or reorganizing these segments to release unused space.

5.54 Session Suspended

The metrics in this category represent the number of resumable sessions that are suspended due to some correctable error.

5.54.1 Session Suspended by Data Object Limitation

This metric represents the session suspended by data object limitation.

This metric is collected for the following targets: 10g, 11g.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.54.2 Session Suspended by Quota Limitation

This metric represents the session suspended by quota limitation.

This metric is collected for the following targets: 10g, 11g.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.54.3 Session Suspended by Rollback Segment Limitation

This metric represents the session suspended by rollback segment limitation.

This metric is collected for the following targets: 10g, 11g.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.54.4 Session Suspended by Tablespace Limitation

This metric represents the session suspended by a tablespace limitation.

This metric is collected for the following targets: 10g, 11g.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.55 SGA Pool Wastage

The metrics in this category represent the percentage of the various pools in the SGA that are being wasted.

5.55.1 Java Pool Free (%)

This metric represents the percentage of the Java Pool that is currently marked as free.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 15 Minutes	Not Defined	Not Defined	%value%% of the Java pool is free.
10g, 11g, 12c	Every 15 Minutes	Not Defined	Not Defined	%value%% of the Java pool is free.

Data Source

The data is derived from the formula $((\text{Free}/\text{Total}) \times 100)$ where:

- Free: select sum(decode(name,'free memory',bytes)) from v\$sgastat where pool = 'java pool'
- Total: select sum(bytes) from v\$sgastat where pool = 'java pool'

User Action

If this pool size is too small, the database JVM (Java Virtual Machine) may not have sufficient memory to satisfy future calls, leading potentially to unexpected database request failures.

5.55.2 Large Pool Free (%)

This metric represents the percentage of the Large Pool that is currently marked as free.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 15 Minutes	Not Defined	Not Defined	%value%%% of the Java pool is free.
10g, 11g, 12c	Every 15 Minutes	Not Defined	Not Defined	%value%%% of the Java pool is free.

Data Source

The data is derived from the formula $((\text{Free}/\text{Total}) * 100)$ where:

- Free: select sum(decode(name,'free memory',bytes)) from v\$sgastat where pool = 'large pool'
- Total: select sum(bytes) from v\$sgastat where pool = 'large pool'

User Action

Consider enlarging the large pool or utilizing it more sparingly. This reduces the possibility of large memory areas competing with the library cache and dictionary cache for available memory in the shared pool.

5.55.3 Shared Pool Free (%)

This metric represents the percentage of the Shared Pool that is currently marked as free.

This test checks the percentage of Shared Pool that is currently free. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 15 Minutes	Not Defined	Not Defined	%value%%% of the shared pool is free.
10g, 11g, 12c	Every 15 Minutes	Not Defined	Not Defined	Generated By Database Server

Data Source

The data is derived from the formula $((\text{Free}/\text{Total}) * 100)$ where:

- free: select sum(decode(name,'free memory',bytes)) from v\$sgastat where pool = 'shared pool'
- total: select sum(bytes) from v\$sgastat where pool = 'shared pool'

User Action

If the percentage of Free Memory in the Shared Pool rises above 50%, too much memory has been allocated to the shared pool. This extra memory could be better utilized by other applications on the machine. In this case the size of the Shared Pool should be decreased. This can be accomplished by modifying the `shared_pool_size` initialization parameter.

5.56 Snapshot Too Old

The metrics in this category represent the snapshots that are too old due to rollback segment limit or tablespace limit.

5.56.1 Snapshot Too Old Due to Rollback Segment Limit

This metric represents the snapshot too old because of the rollback segment limit.

This metric is collected for the following targets: 10g, 11g.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.56.2 Snapshot Too Old Due to Tablespace Limit

This metric represents the snapshot too old because of the tablespace limit.

This metric is collected for the following targets: 10g, 11g.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.57 Space Usage by Buffered Queues

The metrics in this category monitor the space usage of buffered queues with respect to the streams pool size.

5.57.1 Queue Size (MB)

This metric display's the size of buffered queue, which is the total number of megabytes allocated for all messages and metadata.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Size of buffered queue %schema%.%queue_name% is %value% MB.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

The data is derived from the INSTANCE_NAME column in the GV\$INSTANCE view.

User Action

When using queues for storing or propagating messages, monitor this metric to get the instance in which the buffered queue is available.

5.57.2 Space Usage of Buffered Queue With Respect to Streams Pool Size (%)

This metric gives the space usage percentage of buffered queue with respect to streams pool size per buffered queue.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Buffered queue %schema%.%queue_name% has consumed %value% percent of streams pool size.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

The data is derived from the QUEUE_SIZE AND CURRENT_SIZE columns from GV\$BUFFERED_QUEUES and GV\$SGA_DYNAMIC_COMPONENTS views.

User Action

When using buffered queues for storing or propagating messages, monitor this metric to get the space usage percentage of buffered queue with respect to the allocated streams pool size.

5.58 SQL Response Time

The metrics in this category approximate the responsiveness of SQL.

5.58.1 Baseline SQL Response Time

This metric contains the response time of the baseline.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

Not available.

User Action

No user action is required.

5.58.2 Current SQL Response Time

This metric contains the response time of the latest collection.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

Not available.

User Action

No user action is required.

5.58.3 SQL Response Time (%)

SQL Response Time is the average elapsed time per execution of a representative set of SQL statements, relative to a baseline. It is expressed as a percentage.

This metric is not available in versions 8.1.7 and earlier.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 10 Minutes	Not Defined	Not Defined	SQL response time is %value%%% of baseline.

Data Source

The data is derived from the PL/SQL packaged procedure `mgmt_response.get_metric_curs`.

User Action

If the SQL Response Time is less than 100%, then SQL statements are taking less time to execute when compared to the baseline. Response Time greater than 100% indicates that the database is not performing well when compared to the baseline.

SQL Response Time is a percentage of the baseline, not a simple percentage. So, for example, 100% of baseline means the SQL Response Time is the same as the baseline. 200% of baseline means the SQL Response Time is two times slower than the baseline. 50% of baseline means SQL Response Time is two times faster than baseline. A warning threshold of 200% indicates that the database is two times slower than the baseline, while a critical threshold of 500% indicates the database is 5 times slower than the baseline.

Representative statements are selected when two V\$SQL snapshots are taken. All calculations are based on the deltas between these two snapshots. First, the median elapsed_time/execution for all statements that were executed in the time interval between the two snapshots are calculated. Then all statements that have an elapsed_time/execution > median elapsed_time/execution are taken, and the top 25 most frequently executed statements are displayed.

Pre-requisites for Monitoring SQL Response Time

Some tables and a PL/SQL package must be installed on the monitored database. This can be done by going to the database targets page and pressing the Configure button for your database. If a database has not been configured, the message Not Configured will be displayed for SQL Response Time.

Configuring the Baseline

The baseline is configured on demand, automatically. The first time the agent calls the stored procedure to get the value of the metric, a snapshot of V\$SQL is taken. The second time, another snapshot is taken. Then the representative statements are picked and stored in a table. The next time the agent requests the value of the metric, the relative SQL response time is calculated and returned.

Because of baseline configuration, there will be a delay between the time the database is configured and the value of the metric is displayed. During this period, the message of the collection status will be displayed for SQL Response Time.

Enterprise Manager will automatically configure the baseline against which SQL Response Time will be compared. However, in order for the SQL Response Time metric to be truly representative, the DBA must reconfigure the baseline at a time when the load on the database is typical.

To reconfigure the baseline, click on the link titled Edit Reference Collection located next to the SQL Response Time value on the Database Home Page. The SQL statements used for tracking the SQL Response Time and baseline values are displayed. Click **Reset Reference Collection**. This clears the list of statements and the baseline values. Enterprise Manager will then automatically reconfigure the baseline within minutes.

If the database was lightly loaded at the time the baseline was taken, then the metric can indicate that the database is performing poorly under typical load when such is not the case. In this case, the DBA must reset the baseline. If the DBA has never manually reset the baseline, then the metric value will not be representative.

5.59 Streams Apply Aborted

The metrics in this category check for the Streams Apply processes.

Note: This is a server-generated alert.

5.59.1 Streams Apply Process Aborted

This metric detects when a Streams Apply process configured on this database aborts. This metric indicates a critical error.

Data Source

The DBA_APPLY view STATUS column indicates ABORTED if the apply process has aborted.

User Action

Obtain the exact error message in dba_apply, take the appropriate action for this error, then restart the apply process using dbms_apply_adm.start_apply.

Using the DBA_APPLY_ERROR view, identify the specific change record which encountered an error(MESSAGE_NUMBER) within a failed transaction and the complete error message (ERROR_MESSAGE). Detailed information about the transaction can be found using Enterprise Manager or by using the scripts described in the documentation Displaying Detailed Information about Apply Errors.

If DBA_APPLY error message is ORA-26714, then consider setting the 'DISABLE_ON_ERROR' apply parameter to 'N' to avoid aborting on future user errors.

5.59.2 Streams Apply Process Error

This metric indicates that the apply process encountered an error when it was applying a transaction.

Data Source

Not available.

User Action

Look at the contents of the error queue as well as dba_apply_error to determine the cause of the error. After the errors are resolved, reexecute them using dbms_apply_adm.execute_error or dbms_apply_adm.execute_all_errors.

5.60 Streams Apply Coordinator Statistics

The metrics in this category show statistics about the transactions processed by the coordinator process of each apply process. The **Total Number of Transactions Received** field shows the total number of transactions received by a coordinator process. The **Number of Transactions Assigned** field shows the total number of transactions assigned by a coordinator process to apply servers. The **Total Number of Transactions Applied** field shows the total number of transactions successfully applied by the apply process.

The values for an apply process are reset to zero if the apply process is restarted.

5.60.1 Total Number of Transactions Assigned

This metric shows statistics about the total number of transactions assigned by the coordinator process to apply servers since the apply process last started. For target version 10gR1, the collection frequency for this metric is every 10 minutes.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The data is derived from the TOTAL_ASSIGNED column in the following query shows this metric for an apply process:

```
SELECT APPLY_NAME, TOTAL_RECEIVED, TOTAL_ASSIGNED, TOTAL_APPLIED  
FROM V$STREAMS_APPLY_COORDINATOR;
```

User Action

When an apply process is enabled, monitor this metric to ensure that the apply process assigning transactions to apply servers.

5.60.2 Rate of Transactions Applied (per Sec)

This metric reports the rate (per second) at which transactions are applied by the apply process.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The data is derived from the target database, gv%streams_apply_coordinator table.

User Action

No user action is required.

5.60.3 Rate of Transactions Assigned (per Sec)

This metric reports the rate (per second) at which transactions are assigned to the apply servers.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The data is derived from the target database, gv%streams_apply_coordinator table.

User Action

No user action is required.

5.60.4 Rate of Transactions Received (per Sec)

This metric reports the rate (per second) at which apply coordinator is receiving the transactions.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The data is derived from the target database, gv%streams_apply_coordinator table.

User Action

No user action is required.

5.60.5 Total Number of Transactions Applied

This metric shows statistics about the total number of transactions applied by the apply process since the apply process last started.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The TOTAL_APPLIED column in the following query shows this metric for an apply process:

```
SELECT APPLY_NAME, TOTAL_RECEIVED, TOTAL_ASSIGNED, TOTAL_APPLIED
FROM V$STREAMS_APPLY_COORDINATOR;
```

User Action

When an apply process is enabled, monitor this metric to ensure that the apply process is applying transactions.

5.60.6 Total Number of Transactions Received

This metric shows statistics about the total number of transactions received by the coordinator process since the apply process last started.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The TOTAL_RECEIVED column in the following query shows this metric for an apply process:

```
SELECT APPLY_NAME, TOTAL_RECEIVED, TOTAL_ASSIGNED, TOTAL_APPLIED
FROM V$STREAMS_APPLY_COORDINATOR;
```

User Action

When an apply process is enabled, monitor this metric to ensure that the apply process is receiving transactions.

5.61 Streams Apply Errors

The metrics in this category collect information about Apply Errors and Error transactions.

5.61.1 Error Message

This metric reports the error message of the error raised by the transaction.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is target database, dba_apply_error table.

User Action

No user action is required.

5.61.2 Error Number

This metric reports the error code of the error raised by the transaction.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is target database, dba_apply_error table.

User Action

No user action is required.

5.61.3 Local Transaction ID

This metric reports the local transaction ID for the error transaction.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

Data source for this metric is the target database, dba_apply_error table.

User Action

No user action is required.

5.61.4 Message Count

This metric reports the total number of events inside the error transaction.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database, dba_apply_error table.

User Action

No user action is required.

5.61.5 Source Transaction ID

This metric reports the original transaction ID at the source database, for the error transaction.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database, dba_apply_error table.

User Action

No user action is required.

5.62 Streams Apply Queue - Buffered

The metrics in this category show the current total number of messages in a buffered queue to be dequeued by each apply process and the total number of messages to be dequeued by each apply process that have spilled from memory into the persistent queue table.

5.62.1 Streams Apply - (%) Spilled Messages

This metric usually indicates that transactions are staying longer in memory.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Spilled messages for Apply process [%APPLY_NAME%] queue is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Apply Name object.

If warning or critical threshold values are currently set for any Apply Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Apply Name object, use the Edit Thresholds page.

Data Source

The data source for this metric is the target database, gv\$buffered_queues, gv\$buffered_subscribers tables.

User Action

Either increase Streams Pool size and /or increase Apply Parallelism to speed up Apply processing.

5.63 Streams Apply Queue - Persistent

The metrics in this category show the number of messages in a persistent queue in READY state and WAITING state for each apply process.

5.63.1 Streams Apply - (%) Messages in Waiting State

This metric shows the percentage of messages in a wait state.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages waiting for Apply process [%APPLY_NAME%] queue is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Apply Name and Messages Delivery Mode objects.

If warning or critical threshold values are currently set for any unique combination of Apply Name and Messages Delivery Mode objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Apply Name and Messages Delivery Mode objects, use the Edit Thresholds page.

Data Source

The data source for this metric is Target Database and Apply Queue.

User Action

No user action is required.

5.64 Streams Apply Reader Statistics

The reader server for an apply process dequeues messages from the queue. The reader server computes dependencies between LCRs and assembles messages into transactions. The reader server then returns the assembled transactions to the coordinator, which assigns them to idle apply servers.

The metrics in this category shows the total number of messages dequeued by the reader server for the apply process since the last time the apply process was started.

5.64.1 Rate at Which Messages Are Getting Spilled (per Sec)

The reader server for an apply process dequeues messages from the queue. The reader server computes dependencies between LCRs and assembles messages into transactions. The reader server then returns the assembled transactions to the coordinator, which assigns them to idle apply servers.

This metric shows the rate at which message are getting spilled (per second) by the reader server for the apply process since the last time the apply process was started.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Total number of spilled messages for Apply Process [%APPLY_NAME%] is %value% .

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Apply Name object.

If warning or critical threshold values are currently set for any Apply Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Apply Name object, use the Edit Thresholds page.

Data Source

For this metric, the data source is Target database, gv\$streams_apply_reader view.

User Action

No user action is required.

5.64.2 Total Number of Messages Dequeued

The reader server for an apply process dequeues messages from the queue. The reader server computes dependencies between LCRs and assembles messages into transactions. The reader server then returns the assembled transactions to the coordinator, which assigns them to idle apply servers.

This metric shows the total number of messages dequeued by the reader server for the apply process since the last time the apply process was started.

Target Version	Collection Frequency
9iR2, 10g, 11g,12c	Every 30 Minutes

Data Source

The TOTAL_MESSAGES_DEQUEUED column in the following query shows this metric for an apply process:

```
SELECT APPLY_NAME, TOTAL_MESSAGES_DEQUEUED FROM V$STREAMS_APPLY_READER;
```

User Action

When an apply process is enabled, monitor this metric to ensure that the apply process is dequeuing messages.

5.64.3 Total Number of Spilled Messages

The reader server for an apply process dequeues messages from the queue. The reader server computes dependencies between LCRs and assembles messages into transactions. The reader server then returns the assembled transactions to the coordinator, which assigns them to idle apply servers.

This metric shows the total number of messages spilled by the reader server for the apply process since the last time the apply process was started.

Target Version	Collection Frequency
9iR2, 10g, 11g,12c	Every 30 Minutes

Data Source

For this metric, the data source is Target database, gv\$streams_apply_reader view.

User Action

No user action is required.

5.65 Streams Capture Message Statistics

The metrics in this category show the number of messages captured and the number of messages enqueued by each capture process since the capture process last started.

The **Total Messages Captured** field shows the total number of redo entries passed by LogMiner to the capture process for detailed rule evaluation. A capture process converts a redo entry into a message and performs detailed rule evaluation on the message when capture process prefiltering cannot discard the redo entry. After detailed rule evaluation, the message is enqueued if it satisfies the capture process rule sets, or the message is discarded if it does not satisfy the capture process rule sets. The **Total Messages Enqueued** field shows the total number of messages enqueued. The number of captured messages captured can be higher than the number of enqueued messages.

The total messages enqueued includes enqueued logical change records (LCRs) that encapsulate data manipulation language (DML) and data definition language (DDL) changes. The total messages enqueued also includes messages that contain transaction control statements. These messages contain directives such as COMMIT and ROLLBACK. Therefore, the total messages enqueued is higher than the number of row changes and DDL changes enqueued by a capture process.

5.65.1 Message Capture Rate (per Sec)

This metric shows the number of messages captured by each capture process since the capture process last started.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

For this metric, the data source is Target database, gv\$streams_capture view.

User Action

No user action is required.

5.65.2 Messages Enqueue Rate (per Sec)

This metric shows the number of messages enqueued by each capture process since the capture process last started.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

Not available.

User Action

The required actions are specific to your site.

5.65.3 Total Messages Captured

This metric shows information about the number of redo entries passed by LogMiner to the capture process for detailed rule evaluation. A capture process converts a redo entry into a message and performs detailed rule evaluation on the message when capture process prefiltering cannot discard the change.

After detailed rule evaluation, the message is enqueued if it satisfies the capture process rule sets, or the message is discarded if it does not satisfy the capture process rule sets.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The TOTAL_MESSAGES_CAPTURED column in the following query shows this metric for a capture process:

```
SELECT CAPTURE_NAME, TOTAL_MESSAGES_CAPTURED, TOTAL_MESSAGES_ENQUEUED
FROM V$STREAMS_CAPTURE;
```

User Action

When a capture process is enabled, monitor this metric to ensure that the capture process is scanning redo entries.

5.65.4 Total Messages Enqueued

This metric shows information about the number of messages enqueued by a capture process. The number of messages enqueued includes logical change records (LCRs) that encapsulate data manipulation language (DML) and data definition language (DDL) changes. The number of messages enqueued also includes messages that contain transaction control statements. These messages contain directives such as COMMIT and ROLLBACK. Therefore, the number of messages enqueued is higher than the number of row changes and DDL changes enqueued by a capture process.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The TOTAL_MESSAGES_ENQUEUED column in the following query shows this metric for a capture process:

```
SELECT CAPTURE_NAME, TOTAL_MESSAGES_CAPTURED, TOTAL_MESSAGES_ENQUEUED
FROM V$STREAMS_CAPTURE;
```

User Action

When a capture process is enabled, monitor this metric to ensure that the capture process is enqueueing messages. If you know that there were source database changes that should be captured by the capture process, and the capture process is not capturing these changes, then there might be a problem with the rules used by the capture process.

5.66 Streams Capture Queue Statistics

The metrics in this category show the current total number of messages in a buffered queue that were enqueued by each capture process and the total number of messages enqueued by each capture process that have spilled from memory into the queue spill table.

If queue publishers other than the capture process enqueue messages into a buffered queue, then the values shown can include messages from these other queue publishers.

5.66.1 Capture Queue - Cumulative Number of Messages

This metric shows information about the cumulative number of messages enqueued by a capture process in a buffered queue.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 Minutes

Data Source

Not available.

User Action

The required actions are specific to your site.

5.66.2 Capture Queue - Cumulative Number of Spilled Messages

This metric shows information about the cumulative number of spilled messages enqueued by a capture process in a buffered queue.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 Minutes

Data Source

Not available.

User Action

The required actions are specific to your site.

5.66.3 Capture Queue - Number of Messages

This metric shows information about the number of messages enqueued by a capture process in a buffered queue. This number includes both messages in memory and messages spilled from memory.

If queue publishers other than the capture process enqueue messages into a buffered queue, then the values shown can include messages from these other queue publishers.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 Minutes

Data Source

The NUM_MSGS column in the following query shows this metric for a capture process:

```
SELECT CAPTURE_NAME, P.NUM_MSGS NUM_MSGS, Q.SPILL_MSGS SPILL_MSGS
FROM V$BUFFERED_PUBLISHERS P, V$BUFFERED_QUEUES Q, DBA_CAPTURE C
WHERE C.QUEUE_NAME = P.QUEUE_NAME
      AND C.QUEUE_OWNER = P.QUEUE_SCHEMA
      AND C.QUEUE_NAME = Q.QUEUE_NAME
      AND C.QUEUE_OWNER = Q.QUEUE_SCHEMA
      AND C.CAPTURE_NAME = P.SENDER_NAME
      AND P.SENDER_ADDRESS IS NULL
      AND P.SENDER_PROTOCOL = 1;
```

User Action

When a capture process is enabled, monitor this metric to ensure that the capture process enqueueing messages.

5.66.4 Capture Queue - Number of Spilled Messages

This metric shows information about the number of messages enqueued by a capture process that have spilled from memory to the queue spill table. Messages in a buffered queue can spill from memory into the queue spill table if they have been staged in the buffered queue for a period of time without being dequeued, or if there is not enough space in memory to hold all of the messages.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 Minutes

Data Source

The SPILL_MSGS column in the following query shows this metric for a capture process:

```
SELECT CAPTURE_NAME, P.NUM_MSGS NUM_MSGS, Q.SPILL_MSGS SPILL_MSGS
FROM V$BUFFERED_PUBLISHERS P, V$BUFFERED_QUEUES Q, DBA_CAPTURE C
WHERE C.QUEUE_NAME = P.QUEUE_NAME
      AND C.QUEUE_OWNER = P.QUEUE_SCHEMA
      AND C.QUEUE_NAME = Q.QUEUE_NAME
      AND C.QUEUE_OWNER = Q.QUEUE_SCHEMA
      AND C.CAPTURE_NAME = P.SENDER_NAME
      AND P.SENDER_ADDRESS IS NULL
      AND P.SENDER_PROTOCOL = 1;
```

User Action

The number of spilled messages should be kept as low as possible for the best performance. A high number of spilled messages can result in the following cases:

- There might be a problem with a propagation that propagates the messages captured by the capture process, or there might be a problem with an apply process that applies messages captured by the capture process. When this happens, the number of messages can build in a queue because they are not being consumed. In this case, make sure the relevant propagations and apply processes are enabled, and correct any problems with these propagations and apply processes.
- The Streams pool might be too small to hold the captured messages. In this case, increase the size of the Streams pool. If the database is Oracle Database 10g release

2 (10.2) or higher, then you can configure Automatic Shared Memory Management to manage the size of the Streams pool automatically. Set the `SGA_TARGET` initialization parameter to use Automatic Shared Memory Management.

5.66.5 Streams Capture - (%) Cumulative Spilled Messages

The percentage of Cumulative spilled messages indicate the messages are staying in memory longer. It can also indicate that the Propagation or Apply Process is slow to consume the enqueued messages.

Target Version	Collection Frequency
10g, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database, `gv$buffered_queues` table.

User Action

No user action is required.

5.66.6 Streams Capture - (%) Spilled Messages

Queue spill indicates the messages are staying in memory longer. It can also indicate that the Propagation or Apply Process is slow to consume the enqueued messages.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Spilled messages for Capture process %CAPTURE_NAME% queue is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Capture Name object.

If warning or critical threshold values are currently set for any Capture Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Capture Name object, use the Edit Thresholds page.

Data Source

The data source for this metric is the target database, `gv$buffered_queues` table.

User Action

Increase Streams Pool Size to avoid queue spills.

5.67 Streams Latency and Throughput

The metrics in this category collect information about latency and throughput for each capture, propagation and apply component in the database. Latency and throughput are important indicators for the overall performance of the streams path.

5.67.1 Latency

This metric reports latency. High Latency indicates that the components are slow.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Latency for Streams %streams_process_type% Process %streams_process_name% is %value% seconds.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects.

If warning or critical threshold values are currently set for any unique combination of Streams Process Name and Streams Process Type objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects, use the Edit Thresholds page.

Data Source

The data source for this metric is the target database, gv\$streams_capture, gv\$propagation_sender, and gv\$streams_apply_server views.

User Action

Identify and correct the least performing component in the streams configuration.

5.67.2 Throughput (per sec)

This metric collects information about throughput for each capture, propagation and apply component in the database

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Throughput for Streams %streams_process_type% Process %streams_process_name% is %value% messages/sec.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects.

If warning or critical threshold values are currently set for any unique combination of Streams Process Name and Streams Process Type objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects, use the Edit Thresholds page.

Data Source

Not available.

User Action

The required actions are specific to your site.

5.67.3 Total Messages

This metric collects the total number of messages for each capture, propagation and apply component in the database.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

Not available.

User Action

The required actions are specific to your site.

5.68 Streams Pool Usage

The metrics in this category check for the memory usage of the Streams pool.

5.68.1 Streams Pool Full

This alert is generated when the memory usage of the Streams pool has exceeded the percentage specified by the STREAMS_POOL_USED_PCT metric. This alert can be raised only if the database is not using Automatic Memory Management or Automatic Shared Memory Management.

Data Source

Not available.

User Action

If the currently running workload is typical, consider increasing the size of the Streams pool.

5.69 Streams Processes Count

The metrics in this category show the total number of Streams capture processes, propagations, and apply processes at the local database. This metric also shows the number of capture processes, propagations, and apply processes that have encountered errors.

5.69.1 Number of Apply Processes Having Errors

This metric shows the number of apply processes that have encountered errors at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The information in this metric is in the DBA_APPLY data dictionary view.

User Action

If an apply process has encountered errors, then correct the conditions that caused the errors.

5.69.2 Number of Capture Processes Having Errors

This metric shows the number of capture processes that have encountered errors at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The information in this metric is in the DBA_CAPTURE data dictionary view.

User Action

If a capture process has encountered errors, then correct the conditions that caused the errors.

5.69.3 Number of Apply Processes

This metric shows the number of apply processes at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The information in this metric is in the DBA_APPLY data dictionary view.

User Action

Use this metric to determine the total number of apply processes at the local database.

5.69.4 Number of Capture Processes

This metric shows the number of capture processes at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The information in this metric is in the DBA_CAPTURE data dictionary view.

User Action

Use this metric to determine the total number of capture processes at the local database.

5.69.5 Number of Propagation Jobs

This metric shows the number of propagations at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The information in this metric is in the DBA_PROPAGATION data dictionary view.

User Action

Use this metric to determine the total number of propagations at the local database.

5.69.6 Number of Propagations Having Errors

This metric shows the number of propagations that have encountered errors at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The information in this metric is in the DBA_PROPAGATION data dictionary view.

User Action

If a propagation has encountered errors, then correct the conditions that caused the errors.

5.69.7 Total Number of Propagation Errors

This metric provides the total number of propagation errors.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

Data Source

The data source for this metric is the target database, DBA_Propagation view.

User Action

No user action is required.

5.70 Streams Processes Status

The metrics in this category collect the current status and number of errors for each capture, propagation and apply process in the database.

5.70.1 Streams Process Errors

This metric collects the number of errors for each capture, propagation and apply process in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	0	Not Defined	Stream component %streams_process_name% has %value% errors.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects.

If warning or critical threshold values are currently set for any unique combination of Streams Process Name and Streams Process Type objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects, use the Edit Thresholds page.

Data Source

Not available.

User Action

The required actions are specific to your site.

5.70.2 Streams Process Status

This metric collects the current status and number of errors for each capture, propagation, and apply process in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	DISABLED	ABORTED	Status for Streams process %streams_process_name% is %streams_process_status%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects.

If warning or critical threshold values are currently set for any unique combination of Streams Process Name and Streams Process Type objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects, use the Edit Thresholds page.

Data Source

The data source for this metric is the target database, DBA_CAPTURE, dba_propagation, dba_apply views.

User Action

Analyze status change reason and enable the disabled/aborted component.

5.71 Streams Propagation - Messages State Stats

The metrics in this category collect the number of messages in Ready and Waiting state for each Propagation process.

5.71.1 Number of Ready Messages

This metric collects the number of messages in Ready state for each Propagation process.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database, source and destination queues.

User Action

No user action is required.

5.71.2 Number of Waiting Messages

This metric collects the number of messages in Waiting state for each Propagation process.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database, source and destination queues.

User Action

No user action is required.

5.71.3 Streams Prop - (%) Messages in Waiting State

This metric collects the percentage of messages in Waiting state for each Propagation process.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages waiting for %PROPAGATION_NAME% queue is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Propagation Name and Messages Delivery Mode objects.

If warning or critical threshold values are currently set for any unique combination of Propagation Name and Messages Delivery Mode objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Propagation Name and Messages Delivery Mode objects, use the Edit Thresholds page.

Data Source

The data source for this metric is the target database, source and destination queues.

User Action

No user action is required.

5.72 Streams Propagation - Queue Propagation

The metrics in this category collect propagation statistics in terms of number of messages and number of Kbytes propagated by each propagation process.

5.72.1 Message Propagation Rate (per Sec)

This metric collects propagation statistics in terms of the rate of messages propagated by each propagation process.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database - DBA_PROPAGATION.

User Action

No user action is required.

5.72.2 Rate of KBytes Propagated (per Sec)

This metric collects propagation statistics in terms of the rate of Kbytes propagated by each propagation process.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database - DBA_PROPAGATION.

User Action

No user action is required.

5.72.3 Total Number of KBytes Propagated

This metric collects propagation statistics in terms of total number of Kbytes propagated by each propagation process.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database - DBA_PROPAGATION.

User Action

No user action is required.

5.72.4 Total Number of Messages Propagated

This metric collects propagation statistics in terms of the total number of messages propagated by each propagation process.

Target Version	Collection Frequency
10gR2, 11g, 12c	Every 30 Minutes

Data Source

The data source for this metric is the target database - DBA_PROPAGATION.

User Action

No user action is required.

5.73 Streams Propagation Aborted

The metrics in this category check for the Streams Propagation processes.

Note: This is a server-generated alert.

5.73.1 Streams Propagation Process Aborted

This metric detected when a Streams Propagation process configured on this database aborts. This alert indicates a critical error.

Data Source

Not Available

User Action

Obtain the exact error message in `dba_queue_schedules`, take the appropriate action for this error, and restart the propagation process using `dbms_propagation_adm.start_propagation`.

5.74 Suspended Session

This metric category contains the metrics that represent the number of resumable sessions that are suspended due to some correctable error.

5.74.1 Suspended Session Count

This metric represents the number of resumable sessions currently suspended in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i	Every 5 Minutes	0	Not Defined	%value% session(s) are suspended.

Data Source

The data source for this metric is the following formula:

```
SELECT count(*)
FROM v$resumable
WHERE status = 'SUSPENDED' and enabled = 'YES'
```

User Action

Query the v\$resumable view to see what the correctable errors are that are causing the suspension. The way to correct each error depends on the nature of the error.

5.75 System Response Time Per Call

The metrics in this category represent the system response time.

5.75.1 Response Time (centi-seconds per call)

This metric represents the average time taken for each call (both user calls and recursive calls) within the database. A change in this value indicates that either the workload has changed or that the database's ability to process the workload has changed because of either resource constraints or contention.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Not Defined

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.76 System Sessions Waiting

The metrics in this category represent the number of sessions waiting.

5.76.1 Waiting Session Count

This metric represents the number of sessions waiting at the sample time.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	%value% sessions are waiting.

Data Source

The data source for this metric is the following formula:

```
SELECT count(*)
  FROM v$session_wait
 WHERE wait_time = 0 and event not in IdleEvents
```

User Action

When this count is high, the system is doing more waiting than anything else. Evaluate the various types of wait activity using the real-time and historical performance monitoring capabilities of Enterprise Manager.

5.77 Tablespace Allocation

The metrics in this category check the amount of space used and the amount of space allocated to each tablespace. The used space can then be compared to the allocated space to determine how much space is unused in the tablespace. This metric is not intended for alerts. Rather it is intended for reporting. Historical views of unused allocated free space can help DBAs to correctly size their tablespaces, eliminating wasted space.

5.77.1 Tablespace Allocated Space (MB)

The allocated space of a tablespace is the sum of the current size of its datafiles. A portion of this allocated space is used to store data while some may be free space. If segments are added to a tablespace, or if existing segments grow, they will use the allocated free space. The allocated free space is only available to segments within the tablespace. If, over time, the segments within a tablespace are not using this free space, then the allocated free space is being unused.

This metric calculates the space allocated for each tablespace. It is not intended to generate alerts. Rather it should be used in conjunction with the Allocated Space Used (MB) metric to produce an historical view of the amount of space being used and unused by each tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Tablespace Allocated Space (MB) is calculated by querying the DBA_TABLESPACES, DBA_UNDO_EXTENTS, DBA_DATA_FILES, DBA_FREE_SPACE and DBA_TEMP_FILES data dictionary views.

User Action

Specific to your site.

5.77.2 Tablespace Used Space (MB)

The allocated space of a tablespace is the sum of the current size of its datafiles. Some of this allocated space is used to store data and some of it may be free space. If segments are added to a tablespace, or if existing segments grow, they will use the allocated free space. The allocated free space is only available to segments within the tablespace. If, over time, the segments within a tablespace are not using this free space, then the allocated free space is being wasted.

This metric calculates the space used for each tablespace. It is not intended to generate alerts. Rather it should be used in conjunction with the Tablespace Allocated Space (MB) metric to produce an historical view of the amount of space being used and unused by each tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Tablespace Used Space (MB) is Tablespace Allocated Space (MB) - Tablespace Allocated Free Space (MB) where:

- Tablespace Allocated Space (MB) is calculated by looping through the tablespace's data files and totaling the size of the data files.
- Tablespace Allocated Free Space (MB) is calculated by looping through the tablespace's data files and totaling the size of the free space in each data file.

User Action

Specific to you site.

5.78 Tablespaces Full

The metrics in this category check for the amount of space used by each tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space takes into account the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if datafiles can extend and there is enough disk space available for them to extend.

5.78.1 Tablespace Free Space (MB)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning datafiles have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each tablespace. This metric is intended for larger tablespaces, where the Available Space Used (%) metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

Note: This metric collects data for locally managed permanent tablespaces only. The [Tablespace Free Space \(MB\) \(Temp\)](#) metric collects data for temporary tablespaces. The [Tablespace Free Space \(MB\) \(Undo\)](#) metric collects data for Undo tablespaces.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] has [%value% mbytes] free
10gR2 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] only has [%value% megabytes] free space

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Tablespace Name object.

You can also set default warning and critical thresholds that will be used for all tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The Metric and Collection Settings page appears.
2. Click the pencil icon for the Tablespaces Full metric to access the Edit Advanced Settings.

Data Source

The data for this metric is derived from the MaximumSize - Total Used Space formula where:

- TotalUsedSpace: total used space in MB of tablespace.
- MaximumSize: Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thus increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

5.78.2 Tablespace Space Used (%)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning datafiles have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

Note: This metric collects data for locally managed permanent tablespaces only. The [Tablespace Space Used \(%\) \(Temp\)](#) metric collects data for temporary tablespaces. The [Tablespace Space Used \(%\) \(Undo\)](#) metric collects data for Undo tablespaces.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 30 Minutes	85	97	Tablespace [%name%] is [%value% percent] full

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Every 30 Minutes	85	97	Management Agent generates alert message. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Tablespace Name object. You can also set default warning and critical thresholds that will be used for all tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The Metric and Collection Settings page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is derived from the $(\text{TotalUsedSpace} / \text{MaximumSize}) * 100$ formula where:

- **TotalUsedSpace:** total used space in MB of tablespace.
- **MaximumSize:** Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespace's data files.

For additional information about the data source, refer to the fullTbsp.pl Perl script located in the sysman/admin/scripts directory (for Oracle 8i and 9i) or refer to the DBA_TABLESPACE_USAGE_METRICS dictionary view (for Oracle 10g and later).

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.

- Relocate segments to another tablespace, thus increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

5.79 Tablespaces Full (Dictionary Managed)

The metrics in this category check for the amount of space used by each tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space takes into account the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if datafiles can extend and there is enough disk space available for them to extend.

5.79.1 Tablespace Free Space (MB) (Dictionary Managed)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning datafiles have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each tablespace. This metric is intended for larger tablespaces, where the Available Space Used (%) metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] has [%value% mbytes] free

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Tablespace Name object. You can also set default warning and critical thresholds that will be used for all tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The Metric and Collection Settings page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is derived from the MaximumSize - Total Used Space formula where:

- TotalUsedSpace: total used space in MB of tablespace
- MaximumSize: Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

Note: For additional information about the data source, see the fullTbsp.pl Perl script located in the sysman/admin/scripts directory.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thus increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

5.79.2 Tablespace Space Used (%) (Dictionary Managed)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning datafiles have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks the Available Space Used (%) for each tablespace. If the percentage of used space is greater than the values specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	85	97	Tablespace [%name%] is [%value% percent] full

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Tablespace Name object. You can also set default warning and critical thresholds which will be used for all tablespaces that do not have their own thresholds defined.

If warning or critical threshold values are currently set for any Tablespace Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The Metric and Collection Settings page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is derived from the $\text{Total Used Space} / \text{MaximumSize} * 100$ formula where:

- TotalUsedSpace: total used space in MB of tablespace.

- **MaximumSize:** Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files.

Note: For additional information about the data source, see the `fullTbsp.pl` Perl script located in the `sysman/admin/scripts` directory.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thus increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

5.80 Tablespaces Full (Temp)

The metrics in this category check for the amount of space used by each locally managed temporary tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space takes into account the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if data files can extend and there is enough disk space available for them to extend.

Note: These metrics collect data for locally managed temporary tablespaces. The [Tablespaces Full \(Dictionary Managed\)](#) metrics collect the data for dictionary managed temporary tablespaces.

Note: Temporary tablespaces do not typically grow in a steady manner but are subject to spikes of high usage. For this reason, thresholds for both **Tablespace Free Space (MB) (Temp)** and **Tablespace Space Used (%) (Temp)** are not defined. Take care when you are setting thresholds for these metrics to avoid unwanted alerts.

5.80.1 Tablespace Free Space (MB) (Temp)

As segments within a tablespace grow, the available free space decreases. If there is no more free space available, that is, the data files have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each temporary tablespace. This metric is intended for larger temporary tablespaces, where the **Available Space Used (%)** metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g,12c	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] has [%value% mbytes] free

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each locally managed temporary Tablespace Name object.

You can also set default warning and critical thresholds that will be used for all locally managed temporary tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, you can view those thresholds from the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The Metric and Collection Settings page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is retrieved from the DBA_TABLESPACE_USAGE_METRICS data dictionary view.

MB Free: TABLESPACE_SIZE (Total size of the tablespace) - USED_SPACE (Total space consumed by the tablespace)

User Action

Perform one of the following:

- Increase the size of the tablespace by either enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Create additional temporary tablespaces.

5.80.2 Tablespace Space Used (%) (Temp)

As segments within a tablespace grow, the available free space decreases. If there is no more free space available, that is, the data files have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g,12c	Every 30 Minutes	Not Defined	Not Defined	[%name%] is [%value% percent] full

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each locally managed temporary Tablespace Name object. You can also set default warning and critical thresholds that will be used for all locally managed temporary tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, you can view those thresholds from the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The **Metric and Collection Settings** page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is retrieved from the DBA_TABLESPACE_USAGE_METRICS data dictionary view.

Used Percent: USED_PERCENT, Percentage of used space, as a function of the maximum possible tablespace size

User Action

Perform one of the following:

- Increase the size of the tablespace by either enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Create additional temporary tablespaces.

5.81 Tablespaces Full (Undo)

The metrics in this category check for the amount of space used by each Undo tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space takes into account the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if data files can extend and there is enough disk space available for them to extend.

Note: Undo tablespaces do not typically grow in a steady manner but are subject to spikes of high usage. For this reason, thresholds for both Tablespace Free Space (MB) (Undo) and Tablespace Space Used (%) (Undo) are not defined. Take care when setting thresholds for these metrics to avoid unwanted alerts.

5.81.1 Tablespace Free Space (MB) (Undo)

As segments within a tablespace grow, the available free space decreases. If there is no more free space available, that is, the data files have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each Undo tablespace. This metric is intended for larger Undo tablespaces, where the Available Space Used (%)

metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] has [%value% mbytes] free

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Undo Tablespace Name object.

You can also set default warning and critical thresholds that will be used for all Undo tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, you can view those thresholds from the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The **Metric and Collection Settings** page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is retrieved from the DBA_TABLESPACE_USAGE_METRICS data dictionary view.

MB Free: TABLESPACE_SIZE (Total size of the tablespace) - USED_SPACE (Total space consumed by the tablespace)

User Action

Perform one of the following:

- Increase the size of the tablespace by either enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, then consider reorganizing the entire tablespace.
- Use Undo Advisor (Automatic Undo Management) to obtain sizing advice and manage the Undo tablespaces.

5.81.2 Tablespace Space Used (%) (Undo)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g,12c	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] is [%value% percent] full

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Undo Tablespace Name object. You can also set default warning and critical thresholds that will be used for all Undo tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The **Metric and Collection Settings** page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is retrieved from the DBA_TABLESPACE_USAGE_METRICS data dictionary view.

Used Percent: USED_PERCENT, Percentage of used space, as a function of the maximum possible tablespace size

User Action

Perform one of the following:

- Increase the size of the tablespace by either enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, then consider reorganizing the entire tablespace.
- Use Undo Advisor (Automatic Undo Management) to obtain sizing advice and manage the Undo tablespaces.

5.82 Tablespaces With Problem Segments

The metrics in this category check for the following:

- The largest chunk-free space in the tablespace. If any table, index, cluster, or rollback segment within the tablespace cannot allocate one additional extent, then an alert is generated.
- Whether any of the segments in the tablespace are approaching their maximum extents. If, for any segment, the maximum number of extents minus the number of existing extents is less than 2, then an alert is generated.

Only the tablespaces with problem segments are returned as results.

5.82.1 Segments Approaching Maximum Extents

This metric reports segments which are nearing the upper limit of maximum extents.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The data for this metric is derived from the first 10 segments names which are approaching their MaxExtent in the tablespace.

User Action

If possible, increase the value of the segments MAXEXTENTS storage parameter.

Otherwise, rebuild the segment with a larger extent size ensuring the extents within a segment are the same size by specifying STORAGE parameters where NEXT=INITIAL and PCTINCREASE = 0.

For segments that are linearly scanned, choose an extent size that is a multiple of the number of blocks read during each multiblock read. This will ensure that the Oracle multiblock read capability is used efficiently.

5.82.2 Segments Approaching Maximum Extents Count

This metric checks for segments which are nearing the upper limit of the number of maximum extents. If the number of segments is greater than the values specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0	Not Defined	%value% segments in %name% tablespace approaching max extents.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Tablespace Name object. You can also set default warning and critical thresholds that will be used for all tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The Metric and Collection Settings page appears.
2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

The data for this metric is derived by calculating the number of segments for which the maximum number of extents minus the number of existing extents is less than 2.

For additional information about the data source, refer to the problemTbsp.pl Perl script located in the sysman/admin/scripts directory.

User Action

If possible, increase the value of the segments MAXEXTENTS storage parameter.

Otherwise, rebuild the segment with a larger extent size ensuring the extents within a segment are the same size by using a locally managed tablespace. In the case of a dictionary managed tablespace, specify STORAGE parameters where NEXT=INITIAL and PCTINCREASE = 0.

5.82.3 Segments Not Able to Extend

This metric identifies which segments cannot allocate an additional extent.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The data source for this metric is the first 10 segments names which cannot allocate an additional extent in the tablespace.

User Action

Perform one of the following:

- Increase the size of the tablespace by enabling automatic extension for one of its existing data files, manually resizing one of its existing data files. or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.

5.82.4 Segments Not Able to Extend Count

This metric checks for segments which cannot allocate an additional extent. If the number of segments is greater than the values specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0	Not Defined	%value% segments in %name% tablespace unable to extend.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Tablespace Name object. You can also set default warning and critical thresholds that will be used for all tablespaces that do not have their own defined thresholds.

If warning or critical threshold values are currently set for any Tablespace Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Tablespace Name object:

1. From the target's home page menu, select **Monitoring**, then **Metric and Collection Settings**. The Metric and Collection Settings page appears.

2. Click the pencil icon for the required metric to access the Edit Advanced Settings.

Data Source

After checking for the largest chunk free space in the tablespace, this is the number of segments which cannot allocate an additional extent.

For additional information about the data source, refer to the `problemTbsp.pl` Perl script located in the `sysman/admin/scripts` directory.

User Action

Perform one of the following:

- Increase the size of the tablespace by enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace thus increasing the free space in this tablespace.

5.83 Temporary File Status

The metrics in this category provide the name and status of temporary files.

5.83.1 Status

This metric displays the status of a temporary file.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i, 10g, 11g, 12c	Every 30 Minutes	OFFLINE	Not Defined	The temporary file %NAME% is %STATUS%.

User Action

Temporary files that are offline can be placed online by selecting the **Place Online** action from the **Datafiles** page in the Cloud Control console.

To access the **Datafiles** page, from the database target's home page, select **Administration**, then **Storage**, and then **Datafiles**.

5.84 Throughput

The metrics in this category represent rates of resource consumption or throughput.

5.84.1 Average Active Sessions

This metric represents the average active sessions at a point in time. It is the number of sessions that are either working or waiting.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Not Defined

Data Source

Not available.

User Action

No user action is required.

5.84.2 Average Synchronous Single-Block Read Latency (ms)

The average latency in milliseconds of a synchronous single-block read. Synchronous single-block reads are a reasonably accurate way of assessing the performance of the storage subsystem. High latencies are typically caused by a high I/O request load. Excessively high CPU load can also cause the latencies to increase.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Not Defined	Not Defined	Not Defined	Not Defined

Data Source

The source of the data is the v\$sysmetric view.

User Action

First, verify that your storage subsystem is not operating with component failures, for example, disk, network, or HBA failures. If no issues are found, consider upgrading your storage subsystem.

5.84.3 BG Checkpoints (per second)

This metric represents the BG checkpoints per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Not available.

User Action

The required actions are specific to your site.

5.84.4 Branch Node Splits (per second)

Number of times per second an index branch block was split because of the insertion of an additional value.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

the branch node splits / time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.5 Branch Node Splits (per transaction)

Number of times per transaction an index branch block was split because of the insertion of an additional value.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

branch node splits / transaction

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.6 Consistent Read Blocks Created (per second)

This metric represents the number of current blocks per second cloned to create consistent read (CR) blocks.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 5 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

CR blocks created / time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.7 Consistent Read Blocks Created (per transaction)

This metric represents the number of current blocks per transaction cloned to create consistent read (CR) blocks.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

CR blocks created / transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.8 Consistent Read Changes (per second)

This metric represents the number of times per second a user process has applied rollback entries to perform a consistent read on the block.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

consistent changes / time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.9 Consistent Read Changes (per transaction)

This metric represents the number of times per transaction a user process has applied rollback entries to perform a consistent read on the block.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

consistent changes / transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.10 Consistent Read Gets (per second)

This metric represents the number of times per second a consistent read was requested for a block.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

consistent gets/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.11 Consistent Read Gets (per transaction)

This metric represents the number of times per transaction a consistent read was requested for a block.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

consistent gets/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.12 Consistent Read Undo Records Applied (per second)

This metric represents the number of undo records applied for consistent read per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

current blocks converted for CR/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.13 Consistent Read Undo Records Applied (per transaction)

This metric represents the consistent read undo records applied per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

Not available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.14 Cumulative Logons (per second)

This metric represents the number of logons per second during the sample period.

This test checks the number of logons that occurred per second during the sample period. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	100	Not Defined	Cumulative logon rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	100	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds. The 'Consecutive Number of Occurrences Preceding Notification' column indicates the consecutive number of times the comparison against thresholds should hold TRUE before an alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Cumulative logon rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

DeltaLogons / Seconds where:

- DeltaLogons: difference in 'select value from v\$sysstat where name='logons cumulative' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

A high logon rate may indicate that an application is inefficiently accessing the database. Database logon's are a costly operation. If an application is performing a

logon for every SQL access, that application will experience poor performance as well as affect the performance of other applications on the database. If there is a high logon rate, try to identify the application that is performing the logons to determine if it could be redesigned such that session connections could be pooled, reused, or shared.

5.84.15 Cumulative Logons (per transaction)

This metric represents the number of logons per transaction during the sample period.

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the number of logons that occurred per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Cumulative logon rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Cumulative logon rate is %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

DeltaLogons/Transactions where:

- DeltaLogons: difference in 'select value from v\$sysstat where name='logons cumulative' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

A high logon rate may indicate that an application is inefficiently accessing the database. Database logon's are a costly operation. If an application is performing a logon for every SQL access, that application will experience poor performance as well as affect the performance of other applications on the database. If there is a high logon rate try to identify the application that is performing the logons to determine if it could be redesigned such that session connections could be pooled, reused or shared.

5.84.16 Database Block Changes (per second)

This metric represents the total number of changes per second that were part of an update or delete operation that were made to all blocks in the SGA.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12g	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

db block changes/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.17 Database Block Changes (per transaction)

This metric represents the total number of changes per transaction that were part of an update or delete operation that were made to all blocks in the SGA.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

db block changes/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.18 Database Block Gets (per second)

This metric represents the number of times per second a current block was requested.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

db block gets/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.19 Database Block Gets (per transaction)

This metric represents the number of times per transaction a current block was requested.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

db block gets/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.20 Database Time (centiseconds per second)

This metric denotes the database time.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Not Defined	Not Defined	Not Defined	Not Defined

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Not Defined

Data Source

Not available.

User Action

The required actions are specific to your site.

5.84.21 DBWR Checkpoints (per second)

This metric represents the number of times, per second, during this sample period DBWn was asked to scan the cache and write all blocks marked for a checkpoint.

The database writer process (DBWn) writes the contents of buffers to datafiles. The DBWn processes are responsible for writing modified (dirty) buffers in the database buffer cache to disk.

When a buffer in the database buffer cache is modified, it is marked dirty. The primary job of the DBWn process is to keep the buffer cache clean by writing dirty buffers to disk. As user processes dirty buffers, the number of free buffers diminishes. If the number of free buffers drops too low, user processes that must read blocks from disk into the cache are not able to find free buffers. DBWn manages the buffer cache so that user processes can always find free buffers.

When the Oracle Server process cannot find a clean reusable buffer after scanning a threshold of buffers, it signals DBWn to write. When this request to make free buffers is received, DBWn writes the least recently used (LRU) buffers to disk. By writing the least recently used dirty buffers to disk, DBWn improves the performance of finding free buffers while keeping recently used buffers resident in memory. For example, blocks that are part of frequently accessed small tables or indexes are kept in the cache so that they do not need to be read in again from disk. The LRU algorithm keeps more

frequently accessed blocks in the buffer cache so that when a buffer is written to disk, it is unlikely to contain data that may be useful soon.

Additionally, DBWn periodically writes buffers to advance the checkpoint that is the position in the redo log from which crash or instance recovery must begin.

This test checks the number of times DBWR was asked to advance the checkpoint. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	DBWR checkpoint rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	DBWR checkpoint rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

DeltaCheckpoints/Seconds where:

- DeltaCheckpoints: difference in 'select value from v\$sysstat where name='DBWR checkpoints' between sample end and start
- Seconds: number of seconds in sample period

User Action

A checkpoint tells the DBWR to write out modified buffers to disk. This write operation is different from the make free request in that the modified buffers are not marked as free by the DBWR process. Dirty buffers may also be written to disk at this time and freed.

The write size is dictated by the `_db_block_checkpoint_batch` parameter. If writing, and subsequently waiting for checkpoints to complete is a problem, the checkpoint completed event displays in the Top Waits page sorted by Time Waited or the Sessions Waiting for this Event page.

If the database is often waiting for checkpoints to complete you may want to increase the time between checkpoints by checking the `init.ora` parameter `db_block_checkpoint_batch`: select name, value, is default from v\$parameter where name = `db_block_checkpoint_batch`. The value should be large enough to take advantage of parallel writes. The DBWR uses a write batch that is calculated like this: $(db_files * db_file_simultaneous_writes) / 2$. The `write_batch` is also limited by two other factors:

- A port specific limit on the numbers of I/Os (compile time constant).
- 1/4 of the number of buffers in the SGA.

The `db_block_checkpoint_batch` is always smaller or equal to the `_db_block_write_batch`. You can also consider enabling the check point process.

5.84.22 Enqueue Deadlocks (per second)

This metric represents the number of times per second that a process detected a potential deadlock when exchanging two buffers and raised an internal, restartable error.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue deadlocks/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.23 Enqueue Deadlocks (per transaction)

This metric represents the number of times per transaction that a process detected a potential deadlock when exchanging two buffers and raised an internal, restartable error.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue deadlocks/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.24 Enqueue Requests (per second)

This metric represents the total number of table or row locks acquired per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue requests/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.25 Enqueue Requests (per transaction)

This metric represents the total number of table or row locks acquired per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue requests/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.26 Enqueue Timeout (per second)

This metric represents the total number of table and row locks (acquired and converted) per second that time out before they could complete.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue timeouts/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.27 Enqueue Timeout (per transaction)

This metric represents the total number of table and row locks (acquired and converted) per transaction that timed out before they could complete.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue timeouts/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.28 Enqueue Waits (per second)

This metric represents the total number of waits per second that occurred during an enqueue convert or get because the enqueue get was deferred.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue waits/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.29 Enqueue Waits (per transaction)

This metric represents the total number of waits per transaction that occurred during an enqueue convert or get because the enqueue get was deferred.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

enqueue waits / transaction

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.30 Executes (per second)

This metric represents the rate of SQL command executions over the sampling interval.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

DeltaExecutions / Seconds where:

- DeltaExecutions: difference in 'select value from v\$sysstat where name='execute count'' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

No user action is necessary.

5.84.31 Executes Performed without Parses (%)

This metric represents the percentage of statement executions that do not require a corresponding parse. A perfect system would parse all statements once and then execute the parsed statement over and over without reparsing. This ratio provides an indication as to how often the application is parsing statements as compared to their overall execution rate. A higher number is better.

This test checks the percentage of executes that do not require parses. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Only %value%% of executes are performed without parses.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Only %value%%% of executes are performed without parses.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

$((\text{DeltaExecuteCount} - (\text{DeltaParseCountTotal})) / \text{DeltaExecuteCount}) * 100$ where:

- DeltaParseCountTotal: difference in 'select value from v\$sysstat where name='parse count (total)' between sample end and start
- DeltaExecuteCount: difference in 'select value from v\$sysstat where name='execute count' between sample end and start

User Action

An execute to parse ratio of less than 70% indicates that the application may be parsing statements more often than it should. Reparsing the statement, even if it is a soft parse, requires a network round trip from the application to the database, as well as requiring the processing time to locate the previously compiled statement in the cache. Reducing network round trips and unnecessary processing improves application performance.

Use the Top Sessions page sorted by Parses to identify the sessions responsible for the bulk of the parse activity within the database. Start with these sessions to determine whether the application could be modified to make more efficient use of its cursors.

5.84.32 Full Index Scans (per second)

This metric represents the number of fast full index scans per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 5 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

index fast full scans (full)/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.33 Full Index Scans (per transaction)

This metric represents the number of fast full index scans per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

index fast full scans (full)/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.34 Hard Parses (per second)

This metric represents the number of hard parses per second during this sample period. A hard parse occurs when a SQL statement has to be loaded into the shared pool. In this case, the Oracle Server has to allocate memory in the shared pool and parse the statement.

Each time a particular SQL cursor is parsed, this count will increase by one. There are certain operations that will cause a SQL cursor to be parsed. Parsing a SQL statement breaks it down into atomic steps, which the optimizer will evaluate when generating an execution plan for the cursor.

This test checks the number of parses of statements that were not already in the cache. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Hard parse rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Hard parse rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

DeltaParses / Seconds where:

- DeltaParses: difference in 'select value from v\$sysstat where name='parse count (hard)'" between end and start of sample period
- Seconds: number of seconds in sample period

User Action

If there appears to be excessive time spent parsing, evaluate SQL statements to determine those that can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The Top Sessions page sorted by Hard Parses will show you which sessions are incurring the most hard parses. Hard parses happen when the server parses a query and cannot find an exact match for the query in the library cache. Hard parses can be avoided by sharing SQL statements efficiently. The use of bind variables instead of literals in queries is one method to increase sharing.

By showing you which sessions are incurring the most hard parses, this page may lead you to the application or programs that are the best candidates for SQL rewrites.

Also, examine SQL statements which can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The SHARED_POOL_SIZE initialization parameter controls the total size of the shared pool. Consider increasing the SHARED_POOL_SIZE to decrease the frequency in which SQL requests are being flushed from the shared pool to make room for new requests.

To take advantage of the additional memory available for shared SQL areas, you may also need to increase the number of cursors permitted per session. You can increase this limit by increasing the value of the initialization parameter OPEN_CURSORS.

5.84.35 Hard Parses (per transaction)

This metric represents the number of hard parses per second during this sample period. A hard parse occurs when a SQL statement has to be loaded into the shared pool. In this case, the Oracle Server has to allocate memory in the shared pool and parse the statement.

Each time a particular SQL cursor is parsed, this count will increase by one. There are certain operations which will cause a SQL cursor to be parsed. Parsing a SQL statement breaks it down into atomic steps which the optimizer will evaluate when generating an execution plan for the cursor. The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the number of hard parses per second during this sample period. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Hard parse rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Hard parse rate is %value%/ transaction.

Target Version	Server Evaluation Frequency	Operator	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	>	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data for this metric is derived by the following formula:

DeltaParses/Transactions where:

- DeltaParses: difference in 'select value from v\$sysstat where name='parse count (hard)' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

If there appears to be excessive time spent parsing, evaluate SQL statements to determine which can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The Top Sessions page sorted by Hard Parses will show you which sessions are incurring the most hard parses. Hard parses happen when the server parses a query

and cannot find an exact match for the query in the library cache. Hard parses can be avoided by sharing SQL statements efficiently. The use of bind variables instead of literals in queries is one method to increase sharing.

By showing you which sessions are incurring the most hard parses, this page may lead you to the application or programs that are the best candidates for SQL rewrites.

Also, examine SQL statements which can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The SHARED_POOL_SIZE initialization parameter controls the total size of the shared pool. Consider increasing the SHARED_POOL_SIZE to decrease the frequency in which SQL requests are being flushed from the shared pool to make room for new requests.

To take advantage of the additional memory available for shared SQL areas, you may also need to increase the number of cursors permitted per session. You can increase this limit by increasing the value of the initialization parameter OPEN_CURSORS.

5.84.36 I/O Megabytes (per second)

The total I/O throughput of the database for both reads and writes in megabytes per second. A very high value indicates that the database is generating a significant volume of I/O data.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Not Defined	Not Defined	Not Defined	Not Defined

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Not Defined

Data Source

The source of the data is the v\$sysmetric view.

User Action

A high I/O throughput value is not in itself problematic. However, if high I/O latencies (for example, Synchronous Single-Block Read Latencies are causing a performance problem, then reducing the total I/O throughput may help. The source of

the I/O throughput can be investigated by viewing a breakdown by either Component or Resource Consumer Group.

5.84.37 I/O Requests (per second)

This metric represents the total rate of I/O read and write requests for the database.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Not Defined	Not Defined	Not Defined	Not Defined

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Not Defined

Data Source

The source of the data is the v\$sqlsysmetric view.

User Action

A high I/O request rate is not in itself problematic. However, if high I/O latencies (for example, Synchronous Single-Block Read Latencies are causing a performance problem, then reducing the total I/O request rate may help. The source of the I/O requests can be investigated by viewing a breakdown by either Component or Resource Consumer Group.

5.84.38 Leaf Node Splits (per second)

Number of times per second an index leaf node was split because of the insertion of an additional value.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

leaf node splits / time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.39 Leaf Node Splits (per transaction)

This metric reports the number of times per transaction an index leaf node was split because of the insertion of an additional value.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

leaf node splits / transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.40 Network Bytes (per second)

This metric represents the total number of bytes sent and received through the SQL Net layer to and from the database.

This test checks the network read/write per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Bytes transmitted via SQL*Net is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Bytes transmitted via SQL*Net is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

(DeltaBytesFromClient+DeltaBytesFromDbli nk+DeltaBytesToClient+DeltaBytesToDbli nk) / Seconds where:

- Delta Bytes From Client: difference in 'select s.value from v\$sysstat s, visitation n where n.name='bytes received via SQL*Net from client' and n.statistic#=s.statistic#' between end and start of sample period
- DeltaBytesFromClient: difference in 'select s.value from v\$sysstat s, v\$statname n where n.name='bytes received via SQL*Net from dblink' and n.statistic#=s.statistic#' between end and start of sample period
- DeltaBytesFromClient: difference in 'select s.value from v\$sysstat s, v\$statname n where n.name='bytes sent via SQL*Net to client' and n.statistic#=s.statistic#' between end and start of sample period
- DeltaBytesFromClient: difference in 'select s.value from v\$sysstat s, v\$statname n where n.name='bytes sent via SQL*Net to dblink' and n.statistic#=s.statistic#' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

This metric represents the amount of network traffic in and out of the database. This number may only be useful when compared to historical levels to understand network traffic usage related to a specific database.

5.84.41 Number of Transactions (per second)

This metric represents the total number of commits and rollbacks performed during this sample period.

This test checks the number of commits and rollbacks performed during sample period. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Transaction rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Transaction rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaCommits + DeltaRollbacks where:

- DeltaCommits: difference of 'select value from v\$sysstat where name='user commits' between sample end and start
- DeltaRollbacks: difference of 'select value from v\$sysstat where name='user rollbacks' between sample end and start

User Action

This statistic is an indication of how much work is being accomplished within the database. A spike in the transaction rate may not necessarily be bad. If response times stay close to normal, it means your system can handle the added load. Actually, a drop in transaction rates and an increase in response time may be indicators of problems. Depending upon the application, transaction loads may vary widely across different times of the day.

5.84.42 Open Cursors (per second)

This metric represents the total number of cursors opened per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

opened cursors cumulative/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.43 Open Cursors (per transaction)

This metric represents the total number of cursors opened per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

opened cursors cumulative/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.44 Parse Failure Count (per second)

This metric represents the total number of parse failures per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

parse count (failures)/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.45 Parse Failure Count (per transaction)

This metric represents the total number of parse failures per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

parse count (failures)/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.46 Physical Reads (per second)

This metric represents the number of data blocks read from disk per second during this sample period. When a user performs a SQL query, Oracle tries to retrieve the data from the database buffer cache (memory) first, then searches the disk if it is not already in memory. Reading data blocks from disk is much more inefficient than reading the data blocks from memory. The goal with Oracle should always be to maximize memory utilization.

This test checks the data blocks read from disk per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Physical reads are %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Physical reads are %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaPhysicalReads/Seconds where:

- DeltaPhysicalReads: difference in 'select s.value from v\$sysstat s, v\$statname n where n.name='physical reads' and n.statistic#=s.statistic#' between sample end and start
- Seconds: number of seconds in sample period

User Action

Block reads are inevitable so the aim should be to minimize unnecessary IO. This is best achieved by good application design and efficient execution plans. Changes to execution plans can yield profound changes in performance. Tweaking at system level usually only achieves percentage gains.

To view I/O on a per session basis to determine which sessions are responsible for your physical reads, you should visit the Top Sessions page sorted by Physical Reads. This approach allows you to identify problematic sessions and then drill down to their current SQL statement and perform tuning from there.

To identify the SQL that is responsible for the largest portion of physical reads, visit the Top SQL page sorted by Physical Reads. This page allows you to quickly determine which SQL statements are the causing your I/O activity. From this display you can view the full text of the SQL statement.

The difference between the two methods for identifying problematic SQL is that the Top Sessions view displays sessions that are performing the most physical reads at the moment. The Top SQL view displays the SQL statements that are still in the SQL cache that have performed the most I/O over their lifetime. A SQL statement could show up in the Top SQL view that is not currently being executed.

If the SQL statements are properly tuned and optimized, consider the following suggestions. A larger buffer cache may help - test this by actually increasing DB_BLOCK_BUFFERS. Do not use DB_BLOCK_LRU_EXTENDED_STATISTICS, as this may introduce other performance issues. Never increase the SGA size if it may induce additional paging or swapping on the system.

A less obvious issue which can affect the I/O rates is how well data is clustered physically. For example, assume that you frequently fetch rows from a table where a column is between two values via an index scan. If there are 100 rows in each index block then the two extremes are: 1. Each of the table rows is in a different physical

block (100 blocks must be read for each index block). 2. The table rows are all located in the few adjacent blocks (a handful of blocks must be read for each index block).

Pre-sorting or reorganizing data can improve this situation in severe situations as well.

5.84.47 Physical Reads (per transaction)

This metric represents the number of disk reads per transaction during the sample period. When a user performs a SQL query, Oracle tries to retrieve the data from the database buffer cache (memory) first, then goes to disk if it is not in memory already. Reading data blocks from disk is much more expensive than reading the data blocks from memory. The goal with Oracle should always be to maximize memory utilization.

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the data blocks read from disk per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Physical reads are %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Physical reads are %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaReads/Transactions where:

- DeltaReads: difference in 'select value from v\$sysstat where name='physical reads' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

Block reads are inevitable so the aim should be to minimize unnecessary IO. This is best achieved by good application design and efficient execution plans. Changes to execution plans can yield orders of magnitude changes in performance. Tweaking at system level usually only achieves percentage gains.

To identify the SQL that is responsible for the largest portion of physical reads, visit the Top SQL page sorted by Physical Reads. This view will allow you to quickly determine which SQL statements are causing the I/O activity. From this display you can view the full text of the SQL statement.

To view I/O on a per session basis to determine which sessions are responsible for your physical reads, you can visit the Top Sessions page sorted by Physical Reads. This approach allows you to identify problematic sessions and then drill down to their current SQL statement to perform tuning.

If the SQL statements are properly tuned and optimized the following suggestions may help. A larger buffer cache may help - test this by actually increasing DB_BLOCK_BUFFERS and not by using DB_BLOCK_LRU_EXTENDED_STATISTICS. Never increase the SGA size if it will induce additional paging or swapping on the system.

A less obvious issue which can affect the I/O rates is how well data is clustered physically. For example, assume that you frequently fetch rows from a table where a column is between two values via an index scan. If there are 100 rows in each index block then the two extremes are: 1. Each of the table rows is in a different physical block (100 blocks must be read for each index block). 2. The table rows are all located in the few adjacent blocks (a handful of blocks must be read for each index block).

Pre-sorting or reorganizing data can help to tackle this in severe situations as well.

5.84.48 Physical Reads Direct (per second)

This metric represents the number of direct physical reads per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

physical reads direct/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.49 Physical Reads Direct (per transaction)

This metric represents the number of direct physical reads per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

physical reads direct/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.50 Physical Reads Direct Lobs (per second)

This metric represents the number of direct large object (LOB) physical reads per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

physical reads direct (lob)/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.51 Physical Reads Direct Lobs (per transaction)

This metric represents the number of direct large object (LOB) physical reads per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived using the following formula:

physical reads direct (lob)/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.52 Physical Writes (per second)

This metric represents the number of disk writes per second during the sample period. This statistic represents the rate of database blocks written from the SGA buffer cached to disk by the DBWR background process, and from the PGA by processes performing direct writes.

This test checks the data blocks written disk per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Physical writes are %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Physical writes are %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaWrites/Seconds where:

- DeltaWrites: difference in 'select value from v\$sysstat where name='physical writes' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

Because this statistic shows both DBWR writes as well as direct writes by sessions, you should view the physical writes directly to determine where the write activity is actually occurring. If the physical writes direct value comprises a large portion of the writes, then there are probably many sorts or writes to temporary tablespaces occurring.

If the majority of the writes are not direct, they are being performed by the DBWR writes process. This is only be a problem if log writer or redo waits are showing up in the Sessions Waiting for this Event page or the Top Waits page sorted by Time Waited.

5.84.53 Physical Writes (per transaction)

This metric represents the number of disk writes per transaction during the sample period.

The value of this statistic is zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name is a better indicator of current performance.

This test checks the data blocks written disk per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Physical writes are %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Physical writes are %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived using the following formula:

DeltaWrites/Transactions where:

- DeltaWrites: difference in 'select value from v\$sysstat where name='physical writes' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

Because this statistic shows both DBWR writes as well as direct writes by sessions, you should view the physical writes directly to determine where the write activity is really occurring. If the physical writes direct value comprises a large portion of the writes, then there are likely many sorts or writes to temporary tablespaces that are occurring.

If the majority of the writes are not direct, they are being performed by the DBWR writes process. This will typically only be a problem if log writer or redo waits are showing up in the Sessions Waiting for this Event page or the Top Waits page sorted by Time Waited.

5.84.54 Physical Writes Direct (per second)

This metric represents the number of direct physical writes per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

physical writes direct/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central on the Database Home page.

5.84.55 Physical Writes Direct (per transaction)

This metric represents the number of direct physical writes per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

physical writes direct/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.56 Physical Writes Direct Lobs (per second)

This metric represents the number of direct large object (LOB) physical writes per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

physical writes direct (lob)/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.57 Physical Writes Direct Lobs (per transaction)

This metric represents the number of direct large object (LOB) physical writes per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

physical writes direct (lob)/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.58 Recursive Calls (per second)

This metric represents the number of recursive calls, per second during the sample period.

Sometimes, to execute a SQL statement issued by a user, the Oracle Server must issue additional statements. Such statements are called recursive calls or recursive SQL statements. For example, if you insert a row into a table that does not have enough space to hold that row, the Oracle Server makes recursive calls to allocate the space dynamically if dictionary managed tablespaces are being used. Recursive calls are also generated:

- When data dictionary information is not available in the data dictionary cache and must be retrieved from disk
- In the firing of database triggers

- In the execution of DDL statements
- In the execution of SQL statements within stored procedures, functions, packages and anonymous PL/SQL blocks
- In the enforcement of referential integrity constraints

This test checks the number of recursive SQL calls per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Recursive call rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Recursive call rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaRecursiveCalls/Seconds where:

- DeltaRecursiveCalls: difference in 'select value from v\$sysstat where name='recursive calls' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

If the Oracle Server appears to be making excessive recursive calls while your application is running, determine what activity is causing these recursive calls. If you determine that the recursive calls are caused by dynamic extension, either reduce the frequency of extension by allocating larger extents or, if you are using Oracle8i, considering taking advantage of locally managed tablespaces.

5.84.59 Recursive Calls (per transaction)

This metric represents the number of recursive calls, per second during the sample period.

Sometimes, to execute a SQL statement issued by a user, the Oracle Server must issue additional statements. Such statements are called recursive calls or recursive SQL statements. For example, if you insert a row into a table that does not have enough space to hold that row, the Oracle Server makes recursive calls to allocate the space dynamically if dictionary managed tablespaces are being used. Recursive calls are also generated:

- When data dictionary information is not available in the data dictionary cache and must be retrieved from disk
- In the firing of database triggers
- In the execution of DDL statements
- In the execution of SQL statements within stored procedures, functions, packages and anonymous PL/SQL blocks
- In the enforcement of referential integrity constraints

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the number of calls that result in changes to internal tables. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Recursive call rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Recursive rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaRecursiveCalls/Transactions where:

- DeltaRecursiveCalls: difference in 'select value from v\$sysstat where name='recursive calls' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

If the Oracle Server appears to be making excessive recursive calls while your application is running, determine what activity is causing these recursive calls. If you determine that the recursive calls are caused by dynamic extension, either reduce the frequency of extension by allocating larger extents or, if you are using Oracle8i, considering taking advantage of locally managed tablespaces.

5.84.60 Redo Generated (per second)

This metric represents the amount of redo, in bytes, generated per second during this sample period.

The redo log buffer is a circular buffer in the SGA that holds information about changes made to the database. This information is stored in redo entries. Redo entries contain the information necessary to reconstruct, or redo, changes made to the database by INSERT, UPDATE, DELETE, CREATE, ALTER or DROP operations. Redo entries can be used for database recovery if necessary.

This test checks the amount of redo in bytes generated per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Redo generated is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Redo generated is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaRedoSize/Seconds where:

- DeltaRedoSize: difference in 'select value from v\$sysstat where name='redo size' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

The LOG_BUFFER initialization parameter determines the amount of memory that is used when redo entries are buffered to the redo log file.

Consider increasing the LOG_BUFFER initialization parameter to increase the size of the redo log buffer should waiting be a problem. Redo log entries contain a record of the changes that have been made to the database block buffers. The log writer process (LGWR) writes redo log entries from the log buffer to a redo log. The redo log buffer should be sized so space is available in the log buffer for new entries, even when access to the redo log is heavy.

5.84.61 Redo Generated (per transaction)

This metric represents the amount of redo, in bytes, generated per transaction during this sample period.

The redo log buffer is a circular buffer in the SGA that holds information about changes made to the database. This information is stored in redo entries. Redo entries contain the information necessary to reconstruct, or redo, changes made to the database by INSERT, UPDATE, DELETE, CREATE, ALTER or DROP operations. Redo entries are used for database recovery, if necessary.

The value of this statistic is zero if there have been no write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the amount of redo in bytes generated per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Redo generated is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Redo generated is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

$\Delta \text{RedoSize} / \Delta \text{Transactions}$ where:

- $\Delta \text{RedoSize}$: difference in 'select value from v\$sysstat where name='redo size' between end and start of sample period
- Transactions: difference in 'select value from v\$sysstat where name = 'user commits' between end and start of sample period

User Action

The LOG_BUFFER initialization parameter determines the amount of memory that is used when buffering redo entries to the redo log file.

Consider increasing the LOG_BUFFER initialization parameter to increase the size of the redo log buffer should waiting be a problem. Redo log entries contain a record of the changes that have been made to the database block buffers. The log writer process (LGWR) writes redo log entries from the log buffer to a redo log. The redo log buffer should be sized so space is available in the log buffer for new entries, even when access to the redo log is heavy.

5.84.62 Redo Writes (per second)

This metric represents the number redo write operations per second during this sample period.

The redo log buffer is a circular buffer in the SGA that holds information about changes made to the database. This information is stored in redo entries. Redo entries contain the information necessary to reconstruct, or redo, changes made to the database by INSERT, UPDATE, DELETE, CREATE, ALTER or DROP operations. Redo entries can be used for database recovery if necessary.

The log writer processes (LGWR) is responsible for redo log buffer management, that is, writing the redo log buffer to a redo log file on disk.

This test checks the number of writes by LGWR to the redo log files per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Redo write rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Redo write rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaRedoWrites/Seconds where:

- DeltaRedoWrites: difference in 'select value from v\$sysstat where name='redo writes' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

The LOG_BUFFER initialization parameter determines the amount of memory that is used when redo entries are buffered to the redo log file.

Should waiting be a problem, consider increasing the LOG_BUFFER initialization parameter to increase the size of the redo log buffer. Redo log entries contain a record of the changes that have been made to the database block buffers. The log writer process (LGWR) writes redo log entries from the log buffer to a redo log. The redo log buffer should be sized so space is available in the log buffer for new entries, even when access to the redo log is heavy.

5.84.63 Redo Writes (per transaction)

This metric represents the number of redo write operations per second during this sample period.

The redo log buffer is a circular buffer in the SGA that holds information about changes made to the database. This information is stored in redo entries. Redo entries contain the information necessary to reconstruct, or redo, changes made to the database by INSERT, UPDATE, DELETE, CREATE, ALTER or DROP operations. Redo entries are used for database recovery, if necessary.

The log writer process (LGWR) is responsible for redo log buffer management, that is writing the redo log buffer to a redo log file on disk.

This test checks the number of writes by LGWR to the redo log files per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Redo write rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds. The 'Consecutive Number of Occurrences Preceding Notification' column indicates the consecutive number of times the comparison against thresholds should hold TRUE before an alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Redo write rate is %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaRedoWrites/(DeltaCommits+DeltaRollbacks) where:

- DeltaRedoWrites: difference in 'select s.value from v\$sysstat s, v\$statname n where n.name='redo writes' and n.statistic#=s.statistic#' between sample end and start
- DeltaCommits: difference in 'select s.value from v\$sysstat s, v\$statname n where n.name='user commits' and n.statistic#=s.statistic#' between sample end and sample start
- DeltaRollbacks: difference in 'select s.value from v\$sysstat s, v\$statname n where n.name='user commits' and n.statistic#=s.statistic#' between sample end and sample start

User Action

The LOG_BUFFER initialization parameter determines the amount of memory that is used when buffering redo entries to the redo log file.

Consider increasing the LOG_BUFFER initialization parameter to increase the size of the redo log buffer should waiting be a problem. Redo log entries contain a record of the changes that have been made to the database block buffers. The log writer process (LGWR) writes redo log entries from the log buffer to a redo log. The redo log buffer should be sized so space is available in the log buffer for new entries, even when access to the redo log is heavy.

5.84.64 Rows Processed (per sort)

This metric represents the average number of rows per sort during this sample period.

This test checks the average number of rows per sort during sample period. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Average sort size is %value% rows.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Average sort size is %value% rows.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

$(\text{DeltaSortRows} / (\text{DeltaDiskSorts} + \text{DeltaMemorySorts})) * 100$ where:

- DeltaSortRows: difference in 'select value from v\$sysstat where name='sorts (rows)'" between sample end and start
- DeltaMemorySorts: difference in 'select value from v\$sysstat where name='sorts (memory)'" between sample end and start
- DeltaDiskSorts: difference in 'select value from v\$sysstat where name='sorts (disk)'" between sample end and start

User Action

This statistic displays the average number of rows that are being processed per sort. The size provides information about the sort size of the database. This can help you to determine the SORT_AREA_SIZE appropriately. If the rows per sort are high, you should investigate the sessions and SQL performing the most sorts to see if those SQL statements can be tuned to reduce the size of the sort sample set.

The sessions that are performing the most sorts should be identified, such that the SQL they are executing can be further identified. The sort area sizes for the database may be sized correctly and the application SQL may be performing unwanted or excessive sorts. The sessions performing the most sorts are available through the Top Sessions page sorted by Disk Sorts.

Further drilldown into the session performing the most disk sorts with the Current SQL page displays the SQL statement responsible for the disk sorts.

The Top SQL page sorted by Sorts provides a mechanism to quickly display the SQL statements in the cache presented in sorted order by their number of sort operations. This is an alternative to viewing the sort of current sessions. It allows you to view sort activity via SQL statements and contains cumulative statistics for all executions of that statement.

If excessive sorts are taking place on disk and the queries are correct, consider increasing the SORT_AREA_SIZE initialization parameter to increase the size of the sort area. A larger sort area allows the Oracle Server to keep sorts in memory, reducing the number of I/O operations required to do an equivalent amount of work using the current sort area size.

5.84.65 Scans on Long Tables (per second)

This metric represents the number of long table scans per second during sample period. A table is considered 'long' if the table is not cached and if its high-water mark is greater than 5 blocks.

This test checks the long table scans per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Rate of scans on long tables is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Rate of scans on long tables is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaScans/Seconds where:

- DeltaScans: difference in 'select value from v\$sysstat where name='table scans (long tables)'" between end and start of sample period
- Seconds: number of seconds in sample period

User Action

A table scan means that the entire table is being scanned record by record in order to satisfy the query. For small tables that can easily be read into and kept in the buffer cache this may be advantageous. But for larger tables this will force a lot of physical reads and potentially push other needed buffers out of the cache. SQL statements with large physical read and logical read counts are candidates for table scans. They can be identified either through the Top SQL page sorted by Physical Reads, or through the Top Sessions page sorted by Physical Reads, with a drilldown to the current SQL for a session.

5.84.66 Scans on Long Tables (per transaction)

This metric represents the number of long table scans per transaction during sample period. A table is considered 'long' if the table is not cached and if its high-water mark is greater than 5 blocks.

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the number of long table scans per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Rate of scans on long tables is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Rate of scans on long tables is %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaScans/Transactions where:

- DeltaScans: difference in 'select value from v\$sysstat where name='table scans (long tables)'" between end and start of sample period
- Transactions: number of transactions in sample period

User Action

A table scan means that the entire table is being scanned record by record in order to satisfy the query. For small tables that can easily be read into and kept in the buffer cache this may be advantageous. But for larger tables this will force a lot of physical reads and potentially push other needed buffers out of the cache. SQL statements with large physical read and logical read counts are candidates for table scans. They can be identified either through the Top SQL page sorted by Physical Reads, or through the Top Sessions page sorted by Physical Reads, with a drilldown to the current SQL for a session.

5.84.67 Session Logical Reads (per second)

This metric represents the number of logical reads per second during the sample period. A logical read is a read request for a data block from the SGA. Logical reads may result in a physical read if the requested block does not reside with the buffer cache.

This test checks the logical(db block gets + consistent gets) reads per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Session logical reads are %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Session logical reads are %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

LogicalReads/Seconds where:

- LogicalReads: difference in 'select value from v\$sysstat where name='session logical reads' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

Excessive logical reads, even if they do not result in physical reads, can still represent an area that should be considered for performance tuning. Typically large values for this statistic indicate that full table scans are being performed. To identify the SQL that is performing the most logical reads (buffer gets), use the Top SQL page sorted by Buffer Gets. This quickly identifies the SQL responsible for the bulk of the logical reads. You can further investigate these SQL statements via drilldowns. Tuning these SQL statements will reduce your buffer cache access.

5.84.68 Session Logical Reads (per transaction)

This metric represents the number of logical reads per transaction during the sample period.

The value of this statistic is zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the logical (db block gets + consistent gets) reads per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Session logical reads are %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Session logical reads are %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaReads/Transactions where:

- DeltaReads: difference in 'select value from v\$sysstat where name='session logical reads' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

Excessive logical reads, even if they do not result in physical reads, can still represent an area that should be considered for performance tuning. Typically large values for this statistic indicate that full table scans are being performed. To identify the SQL that is performing the most logical reads (buffer gets) use the Top SQL page sorted by Buffer Gets. This quickly identifies the SQL responsible for the bulk of the logical reads.

5.84.69 Soft Parse (%)

A soft parse is recorded when the Oracle Server checks the shared pool for a SQL statement and finds a version of the statement that it can reuse.

This metric represents the percentage of parse requests where the cursor was already in the cursor cache compared to the number of total parses. This ratio provides an indication as to how often the application is parsing statements that already reside in the cache as compared to hard parses of statements that are not in the cache.

This test checks the percentage of soft parse requests to total parse requests. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Only %value%% of parses are soft parses.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Only %value%% of parses are soft parses.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

$((\text{DeltaParseCountTotal} - \text{DeltaParseCountHard}) / \text{DeltaParseCountTotal}) * 100$ where:

- DeltaParseCountTotal: difference in 'select value from v\$sysstat where name='parse count (total)'' between sample end and start
- DeltaParseCountHard: difference in 'select value from v\$sysstat where name='parse count (hard)'' between sample end and start

User Action

Soft parses consume less resources than hard parses, so the larger the value for this item, the better. But many soft parses indicate the application is using SQL inefficiently. Reparsing the statement, even if it is a soft parse, requires a network round trip from the application to the database, as well as requiring the processing time to locate the previously compiled statement in the cache. Reducing network round trips and unnecessary processing will improve application performance.

If this metric value is below 80% you should look at the Top Sessions page sorted by Hard Parses. This page lists the sessions that are currently performing the most hard parses. Starting with these sessions and the SQL statements they are executing will indicate which applications and corresponding SQL statements are being used inefficiently.

If the metric is currently showing a high value, the expensive hard parses are not occurring but the application can still be tuned by reducing the amount of soft parses. Visit the Top SQL page sorted by Parses to identify the SQL statements that have been most parsed. This will allow you to quickly identify SQL that is being re-parsed unnecessarily. You should investigate these statements first for possible application logic changes such that cursors are opened once, and executed or fetched from many times.

5.84.70 Sorts to Disk (per second)

This metric represents the number of sorts going to disk per second for this sample period. For best performance, most sorts should occur in memory, because sorts to disks are expensive to perform. If the sort area is too small, extra sort runs will be required during the sort operation. This increases CPU and I/O resource consumption.

This test checks the number of sorts performed to disk per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	The rate of sorts to disk is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	The rate of sorts to disk is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaDiskSorts/Seconds where:

- DeltaDiskSorts: difference in 'select value from v\$sysstat where name='sorts (disk)'" between end and start of sample period
- Seconds: number of seconds in sample period

User Action

The sessions that are performing the most sorts should be identified, such that the SQL they are executing can be further identified. The sort area sizes for the database may be sized correctly, the application SQL may be performing unwanted or excessive sorts. The sessions performing the most sorts are available through the Top Sessions sorted by Disk Sorts page.

Further drilldown into the session performing the most disk sorts with the Current SQL page will show you the SQL statement responsible for the disk sorts.

The Top SQL page sorted by Sorts provides a mechanism to quickly display the SQL statements in the cache, presented in sorted order by their number sort operations. This is an alternative to viewing sort of current sessions, it allows you to view sort activity via SQL statements, and will contain cumulative statistics for all executions of that statement.

If excessive sorts are taking place on disk, and the query's are correct, consider increasing the SORT_AREA_SIZE initialization parameter to increase the size of the sort area. A larger sort area will allow the Oracle Server to keep sorts in memory, reducing the number of I/O operations required to do an equivalent amount of work using the current sort area size.

5.84.71 Sorts to Disk (per transaction)

This metric represents the number of sorts going to disk per transactions for this sample period. For best performance, most sorts should occur in memory, because sorts to disks are expensive to perform. If the sort area is too small, extra sort runs will be required during the sort operation. This increases CPU and I/O resource consumption.

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the number of sorts performed to disk per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	The rate of sorts to disk is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	The rate of sorts to disk is %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaDiskSorts/Transactions where:

- DeltaDiskSorts: difference in 'select value from v\$sysstat where name='sorts (disk)'' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

The sessions that are performing the most sorts should be identified, such that the SQL they are executing can be further identified. The sort area sizes for the database may be sized correctly, the application SQL may be performing unwanted or excessive sorts. The sessions performing the most sorts are available through the Top Sessions page sorted by Disk Sorts.

Further drilldown into the session performing the most disk sorts with the Current SQL page will show you the SQL statement responsible for the disk sorts.

The Top SQL page sorted by Sorts provides a mechanism to quickly display the SQL statements in the cache, presented in sorted order by their number sort operations.

This is an alternative to viewing sort of current sessions, it allows you to view sort activity via SQL statements, and will contain cumulative statistics for all executions of that statement.

If excessive sorts are taking place on disk, and the query's are correct, consider increasing the SORT_AREA_SIZE initialization parameter to increase the size of the sort area. A larger sort area will allow the Oracle Server to keep sorts in memory, reducing the number of I/O operations required to do an equivalent amount of work using the current sort area size.

5.84.72 Total Index Scans (per second)

This metric represents the total number of index scans per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

index scans kdiixs1/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.73 Total Index Scans (per transaction)

This metric represents the total number of index scans per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

index scans kdiixsl/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.74 Total Parses (per second)

This number reflects the total number of parses per second, both hard and soft. A hard parse occurs when a SQL statement has to be loaded into the shared pool. In this case, the Oracle Server has to allocate memory in the shared pool and parse the statement. A soft parse is recorded when the Oracle Server checks the shared pool for a SQL statement and finds a version of the statement that it can reuse.

Each time a particular SQL cursor is parsed, this count will increase by one. There are certain operations which will cause a SQL cursor to be parsed. Parsing a SQL statement breaks it down into atomic steps which the optimizer will evaluate when generating an execution plan for the cursor.

This test checks the number of parse calls per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Total parse rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Total parse rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaParses/Seconds where:

- DeltaParses: difference in 'select value from v\$sysstat where name='parse count (total)' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

If there appears to be excessive time spent parsing, evaluate SQL statements to determine which can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The Top Sessions page sorted by Hard Parses will show you which sessions are incurring the most hard parses. Hard parses happen when the server parses a query and cannot find an exact match for the query in the library cache. Hard parses can be avoided by sharing SQL statements efficiently. The use of bind variables instead of literals in queries is one method to increase sharing.

By showing you which sessions are incurring the most hard parses, this page may lead you to the application or programs that are the best candidates for SQL rewrites.

Also, examine SQL statements which can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The SHARED_POOL_SIZE initialization parameter controls the total size of the shared pool. Consider increasing the SHARED_POOL_SIZE to decrease the frequency in which SQL requests are being flushed from the shared pool to make room for new requests.

To take advantage of the additional memory available for shared SQL areas, you may also need to increase the number of cursors permitted per session. You can increase this limit by increasing the value of the initialization parameter OPEN_CURSORS.

5.84.75 Total Parses (per transaction)

This number reflects the total number of parses per transaction, both hard and soft. A hard parse occurs when a SQL statement has to be loaded into the shared pool. In this case, the Oracle Server has to allocate memory in the shared pool and parse the statement. A soft parse is recorded when the Oracle Server checks the shared pool for a SQL statement and finds a version of the statement that it can reuse.

Each time a particular SQL cursor is parsed, this count will increase by one. There are certain operations which will cause a SQL cursor to be parsed. Parsing a SQL statement breaks it down into atomic steps which the optimizer will evaluate when generating an execution plan for the cursor.

This test checks the number of parse calls per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Total parse rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Total parse rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaParses/Transactions where:

- DeltaParses: difference in 'select value from v\$sysstat where name='parse count (total)'" between end and start of sample period
- Transactions: number of transactions in sample period

User Action

If there appears to be excessive time spent parsing, evaluate SQL statements to determine which can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The Top Sessions page sorted by Hard Parses will show you which sessions are incurring the most hard parses. Hard parses happen when the server parses a query and cannot find an exact match for the query in the library cache. Hard parses can be avoided by sharing SQL statements efficiently. The use of bind variables instead of literals in queries is one method to increase sharing.

By showing you which sessions are incurring the most hard parses, this page may lead you to the application or programs that are the best candidates for SQL rewrites.

Also, examine SQL statements which can be modified to optimize shared SQL pool memory use and avoid unnecessary statement reparsing. This type of problem is commonly caused when similar SQL statements are written which differ in space, case, or some combination of the two. You may also consider using bind variables rather than explicitly specified constants in your statements whenever possible.

The SHARED_POOL_SIZE initialization parameter controls the total size of the shared pool. Consider increasing the SHARED_POOL_SIZE to decrease the frequency in which SQL requests are being flushed from the shared pool to make room for new requests.

To take advantage of the additional memory available for shared SQL areas, you may also need to increase the number of cursors permitted per session. You can increase this limit by increasing the value of the initialization parameter OPEN_CURSORS.

5.84.76 Total Table Scans (per second)

This metric represents the number of long and short table scans per second during the sample period. A table is considered 'long' if the table is not cached and if its high-water mark is greater than 5 blocks.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Total table scan rate is %value%/sec.
10g, 11g, 12c	Not Defined	Not Defined	Not Defined	Not Defined

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Total table scan rate is %value%/sec.
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Not Defined

Data Source

The data is derived from the following formula:

$(\text{DeltaLongScans} + \text{DeltaShortScans}) / \text{Seconds}$:

- DeltaLongScans: difference in 'select value from v\$sysstat where name='table scans (long tables)'' between end and start of sample period
- DeltaShortScans: difference in 'select value from v\$sysstat where name='table scans (short tables)'' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

A table scan indicates that the entire table is being scanned record-by-record in order to satisfy the query. For small tables that can easily be read into and kept in the buffer cache, this may be advantageous. But larger tables will force many physical reads and potentially push other required buffers out of the cache. SQL statements with large physical read and logical read counts are candidates for table scans. They can be identified through two different methods. The Top Sessions page sorted by Physical Reads displays sessions that are responsible for the current I/O activity. The Top SQL page sorted by Physical Reads lists the SQL statements in the cache by the amount of I/O they have performed. Some of these SQL statements may have high I/O numbers but they may not be attributing to the current I/O load.

5.84.77 Total Table Scans (per transaction)

This metric represents the number of long and short table scans per transaction during the sample period. A table is considered 'long' if the table is not cached and if its high-water mark is greater than 5 blocks.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Total table scan rate is %value% / transaction.
10g, 11g, 12c	Not Defined	Not Defined	Not Defined	Not Defined

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	Total table scan rate is %value% / transaction.
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Not Defined

Data Source

The data is derived from the following formula:

$(\text{DeltaLongScans} + \text{DeltaShortScans}) / \text{Transactions}$:

- DeltaLongScans: difference in 'select value from v\$sysstat where name='table scans (long tables)'' between end and start of sample period
- DeltaShortScans: difference in 'select value from v\$sysstat where name='table scans (short tables)'' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

A table scan indicates that the entire table is being scanned record-by-record in order to satisfy the query. For small tables that can easily be read into and kept in the buffer cache, this may be advantageous. But larger tables will force many physical reads and potentially push other required buffers out of the cache. SQL statements with large physical read and logical read counts are candidates for table scans. They can be identified through two different methods. The Top Sessions page sorted by Physical Reads displays sessions that are responsible for the current I/O activity. The Top SQL page sorted by Physical Reads lists the SQL statements in the cache by the amount of I/O they have performed. Some of these SQL statements may have high I/O numbers but they may not be attributing to the current I/O load.

5.84.78 User Calls (%)

This metric represents the percentage of user calls to recursive calls.

Occasionally, to execute a SQL statement issued by a user, the Oracle Server must issue additional statements. Such statements are called recursive calls or recursive SQL statements. For example, if you insert a row into a table that does not have enough space to hold that row, the Oracle Server makes recursive calls to allocate the space dynamically if dictionary managed tablespaces are being used. Recursive calls are also generated:

When data dictionary information is not available in the data dictionary cache and must be retrieved from disk.

- In the firing of database triggers
- In the execution of DDL statements
- In the execution of SQL statements within stored procedures, functions, packages and anonymous PL/SQL blocks
- In the enforcement of referential integrity constraints

This test checks the percentage of user calls to recursive calls. If the value is less than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	%value%% of calls are user calls.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	User call rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

$(\text{DeltaUserCalls} / (\text{DeltaRecursiveCalls} + \text{DeltaUserCalls})) * 100$ where:

- DeltaRecursiveCalls: difference in 'select value from v\$sysstat where name='recursive calls' between sample end and start
- DeltaUserCalls: difference in 'select value from v\$sysstat where name='user calls' between sample end and start

User Action

A low value for this metric means that the Oracle Server is making a large number of recursive calls. If the Oracle Server appears to be making excessive recursive calls while your application is running, determine what activity is causing these recursive calls. If you determine that the recursive calls are caused by dynamic extension, either reduce the frequency of extension by allocating larger extents or, if you are using Oracle8i, considering taking advantage of locally managed tablespaces.

5.84.79 User Calls (per second)

This metric represents the number of logins, parses, or execute calls per second during the sample period.

This test checks the number of logins, parses, or execute calls. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	User call rate is %value%/sec.

Target Version	Server Evaluation Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	User call rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaUserCalls/Seconds where:

- DeltaUserCalls: difference in 'select value from v\$sysstat where name='user calls' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

This statistic is a reflection of how much activity is going on within the database. Spikes in the total user call rate should be investigated to determine which of the underlying calls is actually increasing. Parse, execute and logon calls each signify different types of user or application actions and should be addressed individually. User Calls is an overall activity level monitor.

5.84.80 User Calls (per transaction)

This metric represents the number of logins, parses, or execute calls per transaction during the sample period.

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the number of logins, parses, or execute calls per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	User call rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	User call rate is %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaUserCalls/Transactions where:

- DeltaUserCalls: difference in 'select value from v\$sysstat where name='user calls' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

This statistic is a reflection of how much activity is going on within the database. Spikes in the total user call rate should be investigated to determine which of the underlying calls is actually increasing. Parse, execute and logon calls each signify different types of user or application actions and should be addressed individually. User Calls is an overall activity level monitor.

5.84.81 User Commits (per second)

This metric represents the number of user commits performed, per second during the sample period. When a user commits a transaction, the redo generated that reflects the changes made to database blocks must be written to disk. Commits often represent the closest thing to a user transaction rate.

This test checks the number of user commits per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	User commit rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	User commit rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaCommits/Seconds where:

- DeltaCommits: difference in 'select value from v\$sysstat where name='user commits' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

This statistic is an indication of how much work is being accomplished within the database. A spike in the transaction rate may not necessarily be bad. If response times stay close to normal, it means your system can handle the added load. Actually, a drop in transaction rates and an increase in response time may be indicators of problems. Depending upon the application, transaction loads may vary widely across different times of the day.

5.84.82 User Commits (per transaction)

This metric represents the number of user commits performed, per transaction during the sample period. When a user commits a transaction, the redo generated that reflects the changes made to database blocks must be written to disk. Commits often represent the closest thing to a user transaction rate.

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the number of user commits per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	User commit rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	User commit rate is %value%/ transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaCommits/Transactions where:

- DeltaCommits: difference in 'select value from v\$sysstat where name='user commits' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

This statistic is an indication of how much work is being accomplished within the database. A spike in the transaction rate may not necessarily be bad. If response times stay close to normal, it means your system can handle the added load. Actually, a drop in transaction rates and an increase in response time may be indicators of problems. Depending upon the application, transaction loads may vary widely across different times of the day.

5.84.83 User Rollback Undo Records Applied (per second)

This metric represents the number of undo records applied to user-requested rollback changes per second.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

(rollback changes - undo records applied)/time

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.84 User Rollback Undo Records Applied (per transaction)

This metric represents the number of undo records applied to user-requested rollback changes per transaction.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

(rollback changes - undo records applied)/transactions

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.84.85 User Rollbacks (per second)

This metric represents the number of times, per second during the sample period, that users manually issue the ROLLBACK statement or an error occurred during a user's transactions.

This test checks the number of rollbacks per second. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	User rollback rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	User rollback rate is %value%/sec.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaRollbacks/Seconds where:

- DeltaRollbacks: difference in 'select value from v\$sysstat where name='user rollbacks' between end and start of sample period
- Seconds: number of seconds in sample period

User Action

This value shows how often users are issuing the ROLLBACK statement or encountering errors in their transactions. Further investigation should be made to determine if the rollbacks are part of some faulty application logic or due to errors occurring through database access.

5.84.86 User Rollbacks (per transaction)

This metric represents the number of times, per transaction during the sample period, that users manually issue the ROLLBACK statement or an error occurred during a user's transactions.

The value of this statistic will be zero if there have not been any write or update transactions committed or rolled back during the last sample period. If the bulk of the activity to the database is read only, the corresponding per second metric of the same name will be a better indicator of current performance.

This test checks the Number of rollbacks per transaction. If the value is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	User rollback rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Not Defined	Not Defined	Not Defined	Generated By Database Server

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	User rollback rate is %value% / transaction.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived from the following formula:

DeltaRollbacks/Transactions where:

- DeltaRollbacks: difference in 'select value from v\$sysstat where name='user rollbacks' between end and start of sample period
- Transactions: number of transactions in sample period

User Action

This value shows how often users are issuing the ROLLBACK statement or encountering errors in their transactions. Further investigation should be made to determine if the rollbacks are part of some faulty application logic or due to errors occurring through database access.

5.85 Total Objects by Schema

The metrics in this category contain the metric that provides the number of database objects in a schema.

5.85.1 Total Object Count

This metric displays the total number of database objects in a schema.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	%value% object(s) exist in the %owner% schema.

5.86 Total Tables by Schema

The metrics in this category contain the metric that provides the number of tables in a schema.

5.86.1 Total Table Count

This metric displays the total number of tables in a schema.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	%value% table(s) exist in the %owner% schema.

5.87 User Audit

The metrics in this category contain the metrics used to represent logons to the database by audited users (such as SYS).

5.87.1 Audited User

This metric monitors specified database user connections. For example, an alert is displayed when a particular database user connection, specified by the User name filter argument, has been detected.

Metric Summary for Database Control

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	SYS	Not Defined	User %value% logged on from %machine%.

Metric Summary for Cloud Control

The following tables show how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 15 Minutes	SYS	-	User %value% logged on from %machine%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Username_Machine object.

If warning or critical threshold values are currently set for any Username_Machine object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Username_Machine object, use the Edit Thresholds page.

Data Source

The following command is the data source for each metric index:

```
SELECT uname, mname, TO_CHAR(count(uname)) , concat(concat(uname,'_'), mname)
username_machine FROM
      (SELECT TRIM(TRANSLATE(username,CHR(0),' ')) uname,
TRIM(TRANSLATE(machine,CHR(0),' ')) mname
      FROM v$session where type != 'BACKGROUND' and lower(program) not like
'rman%' and username is not null )
      GROUP by uname, mname
```

User Action

User actions may vary depending on the user connection that is detected.

5.87.2 Audited User - Host

This metric represents the host system from which the audited user's login originated.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The following command is the data source for each metric index:

```
SELECT uname, mname, TO_CHAR(count(uname)) , concat(concat(uname,'_'), mname)
username_machine FROM
      (SELECT TRIM(TRANSLATE(username,CHR(0),' ')) uname,
TRIM(TRANSLATE(machine,CHR(0),' ')) mname
      FROM v$session where type != 'BACKGROUND' and lower(program) not like
'rman%' and username is not null )
      GROUP by uname, mname
```

User Action

Review the access to the database from this client machine.

5.87.3 Audited User Session Count

This metric represents the number of logons the audited user has from a given machine.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The following command is the data source for each metric index:

```
SELECT uname, mname, TO_CHAR(count(uname)) , concat(concat(uname,'_'), mname)
username_machine from
      (SELECT TRIM(TRANSLATE(username,CHR(0),' ')) uname,
TRIM(TRANSLATE(machine,CHR(0),' ')) mname
      FROM v$session where type != 'BACKGROUND' and lower(program) not like
'rman%' and username is not null )
GROUP by uname, mname
```

User Action

No user action is necessary.

5.88 User Block

The metrics in this category contain the metrics that tell to what extent, and how consistently, a given session is blocking multiple other sessions.

5.88.1 Blocking Session Count

This metric signifies that a database user is blocking at least one other user from performing an action, such as updating a table. An alert is generated if the number of consecutive blocking occurrences reaches the specified value.

Note: The catblock.sql script needs to be run on the managed database prior to using the User Blocks test. This script creates some additional tables, view, and public synonyms that are required by the User Blocks test.

Note: Unlike most metrics, which accept thresholds as real numbers, this metric can only accept an integer as a threshold.

For metrics available in Database Control, no data is collected. Only alerts are generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	Session %sid% blocking %value% other sessions.

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 15 Minutes	Not Defined	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Blocking Session ID object.

If warning or critical threshold values are currently set for any Blocking Session ID object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Blocking Session ID object, use the Edit Thresholds page.

Data Source

The data is derived from the following formula:

```
SELECT SUM(num_blocked)
FROM (SELECT id1, id2, MAX(DECODE(block, 1, sid, 0)) blocking_sid,
      SUM(DECODE(request, 0, 0, 1)) num_blocked
FROM v$lock
      WHERE block = 1 OR request>0
      GROUP BY id1, id2)
GROUP BY blocking SID
```

User Action

Either have user who is blocking other users rollback the transaction, or wait until the blocking transaction has been committed.

5.89 User Block Chain

The metrics in this category collect information on lock chains, including DB time currently accumulated per chain and the blocked sessions for each chain.

5.89.1 Blocking Session Count

This metric represents the total number of sessions blocked in this chain.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 Minutes

Data Source

The data is derived from the v\$lock and v\$session views.

User Action

No user action is required.

5.89.2 Blocking Session DB Time

This metric represents the total DB time currently accumulated in this chain.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	Total db time %value% seconds is consumed by %count% sessions blocked by session (%blocker_session_info%).

Data Source

The data is derived from the v\$lock and v\$session views.

User Action

No user action is required.

5.90 User Locks

The metrics in this category provide information regarding user locks.

Enterprise Manager will issue the alert when the Maximum Blocked Session Count or maximum blocked DB time (seconds) of transactional locks: TM, TX, UL reach the threshold.

5.90.1 Maximum Blocked DB Time (seconds)

This metric represents the maximum time wasted in any given lock chain, not for the total time wasted by everyone in any lock chain.

Target Version	Key	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i, 10g, 11g, 12c	lockType: "TM"	Every 10 Minutes	Not Defined	Not Defined	%value% seconds in DB Time is spent waiting for %lockType% lock.
9i, 10g, 11g, 12g	lockType: "TX"	Every 10 Minutes	Not Defined	Not Defined	%value% seconds in DB Time is spent waiting for %lockType% lock.
9i, 10g, 11g, 12c	lockType: "UL"	Every 10 Minutes	Not Defined	Not Defined	%value% seconds in DB Time is spent waiting for %lockType% lock.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each User Lock Type object.

If warning or critical threshold values are currently set for any User Lock Type object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each User Lock Type object, use the Edit Thresholds page.

Data Source

The data for the metric is retrieved from database view gv\$session.

User Action

User can set the threshold for warning alert or critical alert for maximum Blocked DB Time (seconds). When maximum time wasted in any given lock chain reaches the threshold, Enterprise Manager will issue the alert.

5.90.2 Maximum Blocked Session Count

This metric represents the maximum length of any lock chain, not for the total number of people stuck in lock chains.

Target Version	Key	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i, 10g, 11g, 12c	lockType: "TM"	Every 10 Minutes	Not Defined	Not Defined	%value% sessions are blocked by %lockType% lock.
9i, 10g, 11g, 12c	lockType: "TX"	Every 10 Minutes	Not Defined	Not Defined	%value% sessions are blocked by %lockType% lock.
9i, 10g, 11g, 12c	lockType: "UL"	Every 10 Minutes	Not Defined	Not Defined	%value% sessions are blocked by %lockType% lock.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each User Lock Type object.

If warning or critical threshold values are currently set for any User Lock Type object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each User Lock Type object, use the Edit Thresholds page.

Data Source

The data for the metric is retrieved from database view gv\$session.

User Action

User can set the threshold for warning alert or critical alert for Maximum Blocked Session Count. When maximum length of any lock chain reaches the threshold, Enterprise Manager will issue the alert.

5.91 User-Defined SQL

The metrics in this category enable you to execute your own SQL statements. The data returned by these SQL statements can be compared against thresholds and generate severity alerts similar to alerts in predefined metrics.

5.91.1 User-Defined Numeric Metric

This metric contains a value if the value type is NUMBER. Otherwise, the value is "", if the value is STRING.

Data Source

The data source is a SQL statement which can be either a Select statement or function that returns a single scalar value (numeric or string).

5.91.2 User-Defined String Metric

Contains a value if the value type is STRING. Otherwise, the value is "", if the value is NUMBER.

Data Source

The data source is a SQL statement which can be either a Select statement or function that returns a single scalar value (numeric or string).

5.92 Wait Bottlenecks

This metric category contains the metrics that approximate the percentage of time spent waiting by user sessions. This approximation takes system-wide totals and discounts the effects of sessions belonging to background processes.

5.92.1 Active Sessions Waiting: I/O

This metric represents the active sessions waiting for I/O.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

5.92.2 Active Sessions Waiting: Other

This metric represents all the waits that are neither idle nor user I/O.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

5.92.3 Buffer busy waits (%)

This wait happens when a session wants to access a database block in the buffer cache but it cannot because the buffer is busy. Another session is modifying the block and the contents of the block are in flux during the modification. To guarantee that the reader has a coherent image of the block with either all of the changes or none of the changes, the session modifying the block marks the block header with a flag letting other users know a change is taking place and to wait until the complete change is applied.

The two main cases where this wait can occur are:

- Another session is reading the block into the buffer
- Another session holds the buffer in an incompatible mode to our request

While the block is being changed, the block is marked as unreadable by others. The changes that are being made should last under a few hundredths of a second. A disk read should be under 20 milliseconds and a block modification should be under one millisecond. Therefore it will take a lot of buffer busy waits to cause a problem.

However, in a problem situation, there is usually a hot block, such as the first block on the free list of a table, with high concurrent inserts. All users will insert into that block at the same time, until it fills up, then users start inserting into the next free block on the list, and so on.

Another example of a problem is of multiple users running full table scans on the same large table at the same time. One user will actually read the block physically off disk, and the other users will wait on Buffer Busy Wait for the physical I/O to complete.

Table 5–22 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every Minute	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'buffer busy waits' event.

Data Source

The data is derived from the following formula:

$(\text{DeltaBufferBusyWaitsTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaBufferBusyWaitsTime: difference of 'sum of time waited for sessions of foreground processes on the 'buffer busy waits' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Look at v\$waitstat (or the buffer busy drill down page) and determine the block type with the highest waits.

Block Type and Action:

- Undo Header - Use Automatic Undo Management (AUM) or add more RBS segments)
- Undo Block - Use AUM (or increase RBS sizes)
- Data Block - First determine if it is an I/O problem. The Buffer Busy Waits drill-down page should provide this information. Otherwise, sample from v\$session_wait:

```
SELECT p3, count(*)
FROM v$session_wait
WHERE event='buffer busy wait' ;
```

If p3 is less than 200 then it is an I/O problem. Either improve I/O performance or change application. Applications running concurrent batch jobs that do full table scans on the same large tables run into this problem.

- Free List - Use ASSM (or freelists groups).

5.92.4 CPU Time Delta (sec)

This metric represents the time spent using CPU during the interval, measured in hundredths of a second.

Target Version	Collection Frequency
8i, 9i, 9i	Every 10 Minutes

Data Source

The difference of sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start.

User Action

No user action is necessary.

5.92.5 DB file scattered read (%)

This is the same type of event as "db file sequential read", except that Oracle will read multiple data blocks. Multi-block reads are typically used on full table scans. The name "scattered read" refers to the fact that multiple blocks are read into database block buffers that are 'scattered' throughout memory.

Table 5–23 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'db file scattered read' event.

Data Source

The data is derived from the following formula:

$(\text{DeltaDbFileScatteredReadTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaDbFileScatteredReadTime: difference of 'sum of time waited for sessions of foreground processes on the 'db file scattered read' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

If the TIME spent waiting for multiblock reads is significant, then it is helpful to determine against which segments Oracle is performing the reads. The files where the reads are occurring can be found by looking at the V\$FILESTAT view where BLKS_READ / READS > 1. (A ratio greater than one indicates there are some multiblock reads occurring).

It is also useful to see which sessions are performing scans and trace them to see if the scans are expected. This statement can be used to see which sessions may be worth tracing:

```
SELECT sid, total_waits, time_waited
FROM v$session_event
WHERE event='db file scattered read' and total_waits>0
ORDER BY 3,2 ;
```

You can also look at:

- Statements with high DISK_READS in the V\$SQL view
- Sessions with high table scans blocks gotten in the V\$SESSTAT view

5.92.6 DB file sequential read (%)

This event shows a wait for a foreground process while doing a sequential read from the database. The I/O is generally issued as a single I/O request to the OS. The wait blocks until the I/O request completes.

Table 5–24 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'db file sequential read' event.

Data Source

The data is derived from the following formula:

$(\text{DeltaDbFileSequentialReadTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaDbFileSequentialReadTime: difference of 'sum of time waited for sessions of foreground processes on the 'db file sequential read' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Because I/O is a normal activity, take notice of unnecessary or slow I/O activity. If the TIME spent waiting for I/Os is significant, then it can be determined for which segments Oracle has to go to disk. See the "Tablespace I/O" and "File I/O" sections of the ESTAT or STATSPACK reports to get information on which tablespaces and files are servicing the most I/O requests, and to get an indication of the speed of the I/O subsystem.

If the TIME spent waiting for reads is significant, then determine against which segments Oracle is performing the reads. The files where the reads are occurring can be found by looking at the V\$FILESTAT view.

Also, see which sessions are performing reads and trace them to see if the I/Os are expected. You can use this statement to see which sessions are worth tracing:

```
SELECT sid, total_waits, time_waited
FROM v$session_event
WHERE event='db file sequential read' and total_waits>0
ORDER BY 3,2 ;
```

You can also look at:

- Statements with high DISK_READS in the V\$SQL view
- Sessions with high physical reads in the V\$SESSTAT view

5.92.7 DB file single write (%)

This event is used to wait for the writing of the file headers.

Table 5–25 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'db file single write' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaDbFileSingleWriteTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaDbFileSingleWriteTime: difference of 'sum of time waited for sessions of foreground processes on the 'db file single write' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

No user action is necessary.

5.92.8 Direct path read (%)

The session is waiting for a direct read to complete. A direct read is a physical I/O from a data file that bypasses the buffer cache and reads the data block directly into process-private memory.

If asynchronous I/O is supported (and in use), then Oracle can submit I/O requests and continue processing. Oracle can then pick up the results of the I/O request later and wait on "direct path read" until the required I/O completes.

If asynchronous I/O is not being used, then the I/O requests block until completed but these do **not** show as waits at the time the I/O is issued. The session returns later to pick up the completed I/O data but can then show a wait on "direct path read" even though this wait will return immediately.

This wait event is very misleading because:

- The total number of waits does not reflect the number of I/O requests.
- The total time spent in "direct path read" does not always reflect the true wait time.

This style of read request is typically used for:

- Sort I/O (when a sort does not fit in memory)
- Parallel Query slaves
- Read ahead (where a process may issue an I/O request for a block it expects to need in the near future)

Table 5–26 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'direct path read' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaDirectPathReadTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaDirectPathReadTime: difference of 'sum of time waited for sessions of foreground processes on the 'direct path read' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

In DSS type systems, or during heavy batch periods, waits on "direct path read" are normal. However, if the waits are significant on an OLTP style system, there may be a problem.

You can:

- Examine the V\$SESSION_EVENT view to identify sessions with high numbers of waits.
- Examine the V\$SESSTAT view to identify sessions with high "physical reads direct" (statistic only present in newer Oracle releases).
- Examine the V\$FILESTAT view to see where the I/O is occurring.
- Examine the V\$SQLAREA view for statements with SORTS and high DISK_READS (which may or may not be due to direct reads).
- Determine whether the file indicates a temporary tablespace check for unexpected disk sort operations.
- Ensure that the DISK_ASYNCH_IO parameter is set to TRUE. This is unlikely to reduce wait times from the wait event timings but may reduce sessions elapsed times (as synchronous direct I/O is not accounted for in wait event timings).
- Ensure the OS asynchronous I/O is configured correctly.
- Check for I/O heavy sessions and SQL and see if the amount of I/O can be reduced.
- Ensure no disks are I/O bound.

5.92.9 Direct path read (lob) (%)

The session is waiting for a direct read of a large object (lob) to complete. A direct read is a physical I/O from a data file that bypasses the buffer cache and reads the data block directly into process-private memory.

If asynchronous I/O is supported (and in use), then Oracle can submit I/O requests and continue processing. Oracle can then pick up the results of the I/O request later and wait on "direct path read" until the required I/O completes.

If asynchronous I/O is not being used, then the I/O requests block until completed but these do **not** show as waits at the time the I/O is issued. The session returns later to pick up the completed I/O data but can then show a wait on "direct path read" even though this wait will return immediately.

This wait event is very misleading because:

- The total number of waits does not reflect the number of I/O requests.
- The total time spent in "direct path read" does not always reflect the true wait time.

This style of read request is typically used for:

- Sort I/O (when a sort does not fit in memory)
- Parallel Query slaves
- Read ahead (where a process may issue an I/O request for a block it expects to need in the near future)

Table 5–27 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'direct path read (lob)' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaDirectPathReadLobTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaDirectPathReadLobTime: difference of 'sum of time waited for sessions of foreground processes on the 'direct path read (lob)' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

For noncached lob segments, it is helpful to place the data files where the LOB SEGMENTS reside on a buffered disk, for example, on a File system disk. This placement allows the direct reads to benefit from a cache not on Oracle for data read operations.

5.92.10 Direct path write (%)

Session is waiting for a direct write to complete.

Direct path writes allow a session to queue an I/O write request and continue processing while the OS handles the I/O. If the session needs to know if an outstanding write is complete, then it waits for this wait event. This can happen because the session is either out of free slots and needs an empty buffer (it waits on the oldest I/O) or it needs to ensure all writes are flushed.

If asynchronous I/O is not being used, then the I/O write request blocks until it is completed but this does not show as a wait at the time the I/O is issued. The session

returns later to pick up the completed I/O data but can then show a wait on "direct path write" even though this wait will return immediately.

This wait event is misleading because:

- The total number of waits does not reflect the number of I/O requests.
- The total time spent in "direct path write" does not always reflect the true wait time.

This style of read request is typically used for:

- Sort I/O (when a sort does not fit in memory)
- Parallel DML are issued to create and populate objects
- Direct load operations, for example, Create Table as Select (CTAS)

Table 5–28 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'direct path write' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaDirectPathWriteTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaDirectPathWriteTime: difference of 'sum of time waited for sessions of foreground processes on the 'direct path write' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

It is unusual to see lots of waits on "direct path write" except for specific jobs. If the figure is a large proportion of the overall wait time it is best to identify where the writes are coming from.

You can:

- Examine the V\$SESSION_EVENT view to identify sessions with high numbers of waits.
- Examine the V\$SESSTAT view to identify sessions with high "physical writes direct" (statistic only present in newer Oracle releases).
- Examine the V\$FILESTAT view to see where the I/O is occurring.
- Determine whether the file indicates a temporary tablespace check for unexpected disk sort operations.
- Ensure the DISK_ASYNCH_IO parameter is set to TRUE. This is unlikely to reduce wait times from the wait event timings but may reduce sessions elapsed times because synchronous direct I/O is not accounted for in wait event timings.
- Ensure the OS asynchronous I/O is configured correctly.
- Ensure no disks are I/O bound.

- For parallel DML, check the I/O distribution across disks and make sure that the I/O subsystem is adequately sized for the degree of parallelism.

5.92.11 Direct path write (lob) (%)

Direct path write to a large object (LOB). The session is waiting on the operating system to complete the write operation.

Table 5–29 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'direct path write (lob)' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaDirectPathWriteLobTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaDirectPathWriteLobTime: difference of 'sum of time waited for sessions of foreground processes on the 'direct path write (lob)' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

It is unusual to see lots of waits on "direct path write (lob)" except for specific jobs. If the figure is a large proportion of the overall wait time it is best to identify where the writes are coming from.

You can:

- Examine the V\$SESSION_EVENT view to identify sessions with high numbers of waits.
- Examine the V\$SESSTAT view to identify sessions with high "physical writes direct" (statistic only present in newer Oracle releases).
- Examine the V\$FILESTAT view to see where the I/O is occurring.
- Determine whether the file indicates a temporary tablespace check for unexpected disk sort operations.
- Ensure the DISK_ASYNCH_IO parameter is set to TRUE. This is unlikely to reduce wait times from the wait event timings but may reduce sessions elapsed times because synchronous direct I/O is not accounted for in wait event timings.
- Ensure the OS asynchronous I/O is configured correctly.
- Ensure no disks are I/O bound.
- For parallel DML, check the I/O distribution across disks and make sure that the I/O subsystem is adequately sized for the degree of parallelism.

5.92.12 Enqueue - other (%)

Enqueues are local locks that serialize access to various resources. This wait event indicates a wait for a lock that is held by another session (or sessions) in an incompatible mode to the requested mode.

Table 5–30 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'enqueue' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaEnqueueTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaEnqueueTime: difference of 'sum of time waited for sessions of foreground processes on the 'enqueue' event, or any other 'enqueue:' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

The action to take depends on the lock type which is causing the most problems. The most common lock waits are generally for:

- TX: Transaction Lock -- Generally due to application or table setup issues, for example row level locking conflicts and ITL allocation.
- TM: DML enqueue -- Generally due to application issues, particularly if foreign key constraints have not been indexed.
- ST: Space management enqueue -- Usually caused by too much space management occurring (for example, small extent sizes, lots of sorting, and so on).
- HW: High Water Mark -- Concurrent users trying to extend a segment's high-water mark for space allocated.

In Oracle9i and earlier releases, all enqueue wait times are included in this alert.

To determine which enqueues are causing the most waits systemwide:

- In Oracle9i and later, examine the V\$ENQUEUE_STAT view thus:

```
SELECT eq_type "Lock", total_req# "Gets", total_wait# "Waits", cum_wait_time
FROM V$enqueue_stat
WHERE Total_wait# > 0 ;
```

- In Oracle8i and earlier, examine the X\$KSQST view thus:

```
SELECT ksqsttyp "Lock", ksqstget "Gets", ksqstwat "Waits"
FROM X$KSQST
where KSQSTWAT>0 ;
```

The above give the systemwide number of waits for each lock type. Remember that it only takes one long wait to distort the average wait time figures.

You can also examine:

- Sessions with high numbers of "enqueue waits" in the V\$SESSTAT view
- Sampling of the V\$LOCK view to find waiting / blocking sessions

5.92.13 Enqueue: DML - contention (%)

TM Per table locks are acquired during the execution of a transaction when referencing a table with a DML statement so that the object is not dropped or altered during the execution of the transaction, if and only if the dml_locks parameter is non-zero.

TM Locks are held for base table/partition operations under the following conditions:

- Enabling of referential constraints
- Changing constraints from DIASABLE NOVALIDATE to DISABLE VALIDATE
- Rebuild of an IOT
- Create View or Alter View operations
- Analyze table compute statistics or validate structure
- Parallel DML operations

Table 5–31 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'enqueue: DML - contention' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaEnqueueDMLTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaEnqueueDMLTime: difference of 'sum of time waited for sessions of foreground processes on the 'enqueue: DML - contention' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Examine the database locks page and determine the user who is blocking another user and why, then decide the appropriate action.

5.92.14 Enqueue: HW, Segment High Water Mark - contention (%)

The HW enqueue is used to serialize the allocation of space above the high-water mark in an object.

This lock is acquired when a segment's high-water mark is moved, which typically is the case during heavy inserts.

Table 5–32 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'enqueue: HW, Segment High Water Mark - contention' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaEnqueueHWTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaEnqueueHWTime: difference of 'sum of time waited for sessions of foreground processes on the 'enqueue: Segment High Water Mark - contention' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Use Locally Managed Tablespaces.

For version dictionary managed tablespaces:

- Recreate the objects and preallocate extents with the following: ALTER TABLE...ALLOCATE EXTENT statements.
- Increasing the number of free lists may help, as well as moving the high-water mark. This depends on the number of freelists.

5.92.15 Enqueue: ST, Space Transaction - contention (%)

When Oracle needs to perform a space management operation (such as allocating temporary segments for a sort) the user session acquires a special enqueue called the 'ST' enqueue.

Table 5–33 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'enqueue: ST, Space Transaction - contention' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaEnqueueSTTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaEnqueueSTTime: difference of 'sum of time waited for sessions of foreground processes on the 'enqueue: Space Transaction - contention' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Ensure that temporary tablespaces are proper temporary tablespaces of type "temporary".

5.92.16 Enqueue: TM, TX, Transaction - row lock contention (%)

Two users are attempting to change the same row.

These locks are of type TX.

Table 5–34 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'enqueue: TM,TX, Transaction - row lock contention' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaEnqueueRowLockTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaEnqueueRowLockTime: difference of 'sum of time waited for sessions of foreground processes on the 'enqueue: Transaction - row lock contention' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Examine the database locks page and determine the user who is blocking another user and why, then decide the appropriate action.

5.92.17 Enqueue: TX mode 4, Transaction - allocate ITL entry (%)

Oracle keeps note of which rows are locked by which transaction in an area at the top of each data block known as the 'interested transaction list'. The number of ITL slots in any block in an object is controlled by the INITRANS and MAXTRANS attributes. INITRANS is the number of slots initially created in a block when it is first used, while MAXTRANS places an upper bound on the number of entries allowed. Each transaction which wants to modify a block requires a slot in this 'ITL' list in the block.

Table 5–35 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'enqueue: TX mode 4, Transaction - allocate ITL entry' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaEnqueueAllocITLTime} / \text{DeltaServiceTime}) * 100$ where:

- **DeltaEnqueueAllocITLTime**: difference of 'sum of time waited for sessions of foreground processes on the 'enqueue: TX mode 4, Transaction - allocate ITL entry' event' between sample end and start
- **DeltaServiceTime**: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

To increase the number of ITL slots, recreate the table and increase the INITRANS parameter for the object with the contention. An alter table statement can be run to increase the ITL slots by increasing the value for INITRANS, but this will only take effect for new blocks.

5.92.18 Enqueue: UL: User-defined - contention (%)

The metric reports issues caused by the application explicitly running commands of the nature "lock table".

Table 5–36 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'enqueue: UL: User-defined - contention' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaEnqueueUserDefTime} / \text{DeltaServiceTime}) * 100$ where:

- **DeltaEnqueueUserDefTime**: difference of 'sum of time waited for sessions of foreground processes on the 'enqueue: User-defined - contention' event' between sample end and start
- **DeltaServiceTime**: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

This is an application issue. Determine where the application code is locking objects and why. Make relevant application changes if necessary.

Use the Blocking Sessions page to find lock holds and waits.

5.92.19 Free buffer waits (%)

This event occurs mainly when a server process is trying to read a new buffer into the buffer cache but too many buffers are either pinned or dirty and thus unavailable for reuse. The session posts to DBWR then waits for DBWR to create free buffers by writing out dirty buffers to disk.

DBWR may not be keeping up with writing dirty buffers in the following situations:

- The I/O system is slow.
- There are resources it is waiting for, such as latches.

- The buffer cache is so small that DBWR spends most of its time cleaning out buffers for server processes.
- The buffer cache is so big that one DBWR process is not enough to free enough buffers in the cache to satisfy requests.

Table 5–37 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'free buffer waits' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaFreeBufferWaitsTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaFreeBufferWaitsTime: difference of 'sum of time waited for sessions of foreground processes on the 'free buffer waits' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Sometimes the easy solution is to increase the buffer cache to allow for more free blocks. This works in many cases, but if the application is generating a sustained amount of dirty blocks then increasing the buffer cache may only help or delay the problem but not solve it.

If this event occurs frequently, examine the session waits for DBWR to see whether there is anything delaying DBWR.

Run this query to see if the I/O is evenly distributed.

```
SELECT name, phyrd, phywrts
FROM v$filestat a, v$datafile b
WHERE a.file# = b.file#
```

Also look for files having full table scans, using this query:

```
SELECT name, phyrd, phyblkrd, phywrts
FROM v$filestat a, v$datafile b
WHERE a.file# = b.file#
AND phyrd != phyblkrd
```

5.92.20 Latch free - other (%)

A latch is a low-level internal lock used by Oracle to protect memory structures. Latches are similar to short duration locks that protect critical bits of code. This wait indicates that the process is waiting for a latch that is currently busy (held by another process).

The latch free event is updated when a server process attempts to get a latch, and the latch is unavailable on the first attempt.

Table 5–38 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'latch free' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLatchFreeTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLatchFreeTime: difference of 'sum of time waited for sessions of foreground processes on the 'latch free' event, or any other 'latch:' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Determine which latch is causing the highest amount of contention.

To find the problem latches since database startup, run the following query:

```
SELECT n.name, l.sleeps
FROM v$latch l, v$latchname n
WHERE n.latch#=l.latch# and l.sleeps > 0 order by l.sleeps ;
```

To see latches that are currently a problem on the database run:

```
SELECT n.name, SUM(w.p3) Sleeps
FROM V$SESSION_WAIT w, V$LATCHNAME n
WHERE w.event = 'latch free'
AND w.p2 = n.latch#
GROUP BY n.name;
```

Take action based on the latch with the highest number of sleeps.

5.92.21 Latch: cache buffer chains (%)

The cache buffers chains latches are used to protect a buffer list in the buffer cache. These latches are used when searching for, adding, or removing a buffer from the buffer cache.

Blocks in the buffer cache are placed on linked lists (cache buffer chains) which hang off a hash table. The hash chain that a block is placed on is based on the DBA and CLASS of the block. Each hash chain is protected by a single child latch. Processes must get the relevant latch to allow them to scan a hash chain for a buffer so that the linked list does not change underneath them.

Contention on this latch usually means that there is a block that is in great contention (known as a hot block).

Table 5–39 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'latch: cache buffer chains' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLatchCacheBufferChainsTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLatchCacheBufferChainsTime: difference of 'sum of time waited for sessions of foreground processes on the 'latch: cache buffer chains' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

To identify the heavily accessed buffer chain, and therefore the contended for block, look at latch statistics for the cache buffers chains latches using the V\$LATCH_CHILDREN view. If there is a specific cache buffers chains child latch that has many more GETS, MISSES, and SLEEPS when compared with the other child latches, then this is the contended for child latch.

This latch has a memory address, identified by the ADDR column.

```
SELECT addr, sleeps
FROM v$latch_children c, v$latchname n
WHERE n.name='cache buffers chains'
      and c.latch#=n.latch# and sleeps > 100
ORDER BY sleeps /
```

Use the value in the ADDR column joined with the V\$BH view to identify the blocks protected by this latch. For example, given the address (V\$LATCH_CHILDREN.ADDR) of a heavily contended latch, this queries the file and block numbers:

```
SELECT file#, dbablk, class, state, TCH
FROM X$BH WHERE HLADDR='address of latch';
```

X\$BH.TCH is a touch count for the buffer. A high value for X\$BH.TCH indicates a hot block.

Many blocks are protected by each latch. One of these buffers will probably be the hot block. Any block with a high TCH value is a potential hot block. Perform this query a number of times, and identify the block that consistently appears in the output.

After you have identified the hot block, query DBA_EXTENTS using the file number and block number to identify the segment.

5.92.22 Latch: library cache (%)

There are multiple library cache latches. Each one protects a range of 'hash buckets' and the latch covers all heaps.

Table 5–40 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value% of service time is spent waiting on the 'latch: library cache' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLatchLibraryCacheTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLatchLibraryCacheTime: difference of 'sum of time waited for sessions of foreground processes on the 'latch: library cache' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Contention for the library cache latches can be caused by excessive parsing of literal SQL. It is advisable to use sharable SQL wherever possible.

5.92.23 Latch: redo copy (%)

When a sessions redo buffer is larger than *Parameter: log_small_entry_max_size* the kernel first allocates a redo copy buffer, protected by a redo copy latch.

The buffer will not be used until space is allocated on the log buffer and some header has been set. However, the redo copy latch is acquired to reduce the code inside the allocation latch holding and to prevent further contention.

Table 5–41 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value% of service time is spent waiting on the 'latch: redo copy' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLatchRedoCopyTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLatchRedoCopyTime: difference of 'sum of time waited for sessions of foreground processes on the 'latch: redo copy' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

The number of redo copy latches is controlled by the init.ora *Parameter:log_simultaneous_copies*. If the parameter is not set, it defaults to the number of CPUs.

For log generating processes, the latch get is made in an immediate mode, then it will be convenient to have enough redo copy latches to reduce contention of foreground processes.

Before flushing out the log buffer, the LGWR will acquire all redo copy latches in a willing-to-wait mode. Thus an excessive number of copy latches will cause contention in the log buffer flushing process.

The number of LWGR redo copy latch allocations is redo writes * No.redo copy latches.

5.92.24 Latch: shared pool (%)

This latch protects the allocation of memory from the shared pool.

If there is contention on this latch, it is often an indication that the shared pool is fragmented.

Table 5–42 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'latch: shared pool' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLatchSharedPoolTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLatchSharedPoolTime: difference of 'sum of time waited for sessions of foreground processes on the 'latch: shared pool' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Shared pool latch contention is often an indication of high hard parsing usually caused by the use of literal values in SQL statements. These statements could otherwise be shared if bind variables were used.

Prior to Oracle Server release 8.1.6, shared pool fragmentation could be exacerbated by a shared pool that was too large. Reducing the size of the shared pool would reduce the contention for this latch.

For Oracle Server release 8.1.6 and later, there should be very little shared pool latch contention. If there is, it is probably a symptom of an application using literals. One possible solution is to use the init.ora parameter `cursor_sharing=FORCE`.

5.92.25 Library cache load lock (%)

Oracle tries to find the load lock for the database object so that it can load the object. The load lock is always gotten in Exclusive mode, so that no other process can load the same object. If the load lock is busy the session will wait on this event until the lock becomes available.

Table 5–43 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'library cache load lock' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLibraryCacheLoadLockTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLibraryCacheLoadLockTime: difference of 'sum of time waited for sessions of foreground processes on the 'library cache load lock' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

To be waiting for a load lock means that there is a blocker with a higher or incompatible mode. This event in itself is not affected by the parallel server. However, you must have acquired the 'library cache lock' before you get to this point. The 'cache lock' is a DFS lock.

5.92.26 Library cache lock (%)

The library cache lock controls the concurrency between clients of the library cache by acquiring a lock on the object handle so that one client can prevent other clients from accessing the same object or the client can maintain a dependency for a long time (no other client can change the object). This lock is also gotten to locate an object in the library cache.

Blocking situations can occur when two sessions compile the same PL/SQL package, or one session is recreating an index while another session is trying to execute a SQL statement that depends on that index.

Table 5–44 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'library cache lock' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLibraryCacheLockTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLibraryCacheLockTime: difference of 'sum of time waited for sessions of foreground processes on the 'library cache lock' event' between sample end and start

- **DeltaServiceTime**: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Waiting for a load lock indicates that there is a blocker with a higher or incompatible mode. Locks map to Instance Locks.

The following query will list waiters and the holder of the resource along with the event the resource holder is waiting for.

```
column h_wait format A20
SELECT s.sid,
       waiter.plraw w_plr,
       waiter.p2raw w_p2r,
       holder.event h_wait,
       holder.plraw h_plr,
       holder.p2raw h_p2r,
       count(s.sid) users_blocked,
       sql.hash_value
FROM
  v$sql sql,
  v$session s,
  x$kgllk l,
  v$session_wait waiter,
  v$session_wait holder
WHERE
  s.sql_hash_value = sql.hash_value and
  l.KGLLKADR=waiter.p2raw and
  s.saddr=l.kgllkuse and
  waiter.event like 'library cache lock' and
  holder.sid=s.sid
GROUP BY
  s.sid,
  waiter.plraw ,
  waiter.p2raw ,
  holder.event ,
  holder.plraw ,
  holder.p2raw , s
  ql.hash_value ;
```

5.92.27 Library cache pin (%)

Library cache pins are used to manage library cache concurrency. Pinning an object causes the heaps to be loaded into memory (if not already loaded). PINS can be acquired in NULL, SHARE or EXCLUSIVE modes and can be considered like a special form of lock. A wait for a library cache pin implies some other session holds that PIN in an incompatible mode.

Table 5–45 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'library cache pin' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLibraryCachePinTime} / \text{DeltaServiceTime}) * 100$ where:

- **DeltaLibraryCachePinTime:** difference of 'sum of time waited for sessions of foreground processes on the 'library cache pin' event' between sample end and start
- **DeltaServiceTime:** difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

What to do to reduce these waits depends heavily on what blocking scenario is occurring. A common problem scenario is the use of DYNAMIC SQL from within a PL/SQL procedure where the PL/SQL code is recompiled and the DYNAMIC SQL calls something which depends on the calling procedure.

- If there is general widespread waiting then the shared pool may need tuning.
- If there is a blocking scenario, collect evidence as described in the following query and contact Oracle support.

The following query will list the waiters and the session holding the pin, along with the wait event the holder is waiting for.

```
column h_wait format A20
SELECT s.sid,
       waiter.plraw w_plr,
       holder.event h_wait,
       holder.plraw h_plr,
       holder.p2raw h_p2r,
       holder.p3raw h_p2r,
       count(s.sid) users_blocked,
       sql.hash_value
FROM
  v$sql sql,
  v$session s,
  x$kglnp p,
  v$session_wait waiter,
  v$session_wait holder
WHERE
  s.sql_hash_value = sql.hash_value and
  p.kglnhdl=waiter.plraw and
  s.saddr=p.kglnpuse and
  waiter.event like 'library cache pin' and
  holder.sid=s.sid
GROUP BY
  s.sid,
  waiter.plraw ,
  holder.event ,
  holder.plraw ,
  holder.p2raw ,
  holder.p3raw ,
  sql.hash_value ;
```

5.92.28 Local write wait (%)

The wait event can be caused by truncate operations. Truncate operations cause the DBWR to be posted to flush out the space header.

Table 5–46 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'local write wait' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLocalWriteWaitTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLocalWriteWaitTime: difference of 'sum of time waited for sessions of foreground processes on the 'local write wait' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

Wait time: Up to one second, then loop back and check that buffer is clean.

Parameters:

P1: Absolute file number

P2: Block number

User Action

No user action is necessary.

5.92.29 Log buffer space (%)

The system is waiting for space in the log buffer because data is being written into the log buffer faster than LGWR can write it out.

Table 5–47 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every Minute	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'log buffer space' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLogBufferSpaceTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLogBufferSpaceTime: difference of 'sum of time waited for sessions of foreground processes on the 'log buffer space' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Consider making the log buffer bigger if it is small, or moving the log files to faster disks such as striped disks.

5.92.30 Log file switch (archiving needed) (%)

This metric reports when the system is waiting for a log switch because the log being switched into has not been archived yet.

Table 5–48 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'log file switch (archiving needed)' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLogFileSwitchArchTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLogFileSwitchArchTime: difference of 'sum of time waited for sessions of foreground processes on the 'log file switch (archiving needed)' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Check the alert file to make sure that archiving has not stopped due to a failed archive write. To speed up archiving consider adding more archive processes or putting the archive files on striped disks.

If the archiver is slow, then it might be prudent to prevent I/O contention between the archiver process and LGWR by ensuring that archiver reads and LGWR writes are separated. This is achieved by placing logs on alternating drives.

5.92.31 Log file switch (checkpoint complete) (%)

This metric reports when the system is waiting for a log switch because the system cannot wrap into the next log because the checkpoint for that log has not completed.

Table 5–49 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'log file switch (checkpoint complete)' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLogFileSwitchCkptTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLogFileSwitchCkptTime: difference of 'sum of time waited for sessions of foreground processes on the 'log file switch (checkpoint complete)' event' between sample end and start

- **DeltaServiceTime**: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Increase the redo log sizes.

To speed up checkpoint, consider making the buffer cache smaller, or increasing *Parameter:DB_BLOCK_CHECKPOINT_BATCH*, or adding more DBWR processes. You can also enable the checkpoint process by setting the init.ora *Parameter:CHECKPOINT_PROCESS* = TRUE.

5.92.32 Log file switch completion (%)

This metric reports when the system is waiting for log switch because current log is full and LGWR needs to complete writing to current log and open the new log or some other request to switch log files.

Table 5–50 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'log file switch completion' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLogFileSwitchCompleteTime} / \text{DeltaServiceTime}) * 100$ where:

- **DeltaLogFileSwitchCompleteTime**: difference of 'sum of time waited for sessions of foreground processes on the 'log file switch completion' event' between sample end and start
- **DeltaServiceTime**: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

For the log file switch (checkpoint incomplete) event:

- Check if there are too few, or too small redo logs. If there are a few redo logs or small redo logs, and the system produces enough redo to cycle through all the logs before DBWR has been able to complete the checkpoint, then increase the size or number of redo logs. This is often the easiest solution but may increase time to recovery.
- Check if DBWR is slow, possibly due to an overloaded or slow I/O system. Check the DBWR write times, check the I/O system, and distribute I/O if necessary.

5.92.33 Log file sync (%)

This metric reports when a user session commits (or rolls back), the sessions redo information needs to be flushed to the redo log file. The user session will post the LGWR to write all redo required from the log buffer to the redo log file. When the LGWR has finished it will post the user session. The user session waits on this wait

event while waiting for LGWR to post it back to confirm all redo changes are safely on disk.

Table 5–51 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every Minute	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'log file sync' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLogFileSyncTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLogFileSyncTime: difference of 'sum of time waited for sessions of foreground processes on the 'log file sync' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

There are 3 main things you can do to help reduce waits on log file sync:

- Tune LGWR to get good throughput to disk.
 - Do not put redo logs on RAID 5.
 - Place log files on dedicated disks.
 - Consider putting log files on striped disks.
- If there are lots of short duration transactions, see if it is possible to BATCH transactions together so there are fewer distinct COMMIT operations. Each commit has to have it confirmed that the relevant REDO is on disk. Although commits can be piggybacked by Oracle, reducing the overall number of commits by batching transactions can have a very beneficial effect.
- Determine whether any activity can safely be done with NOLOGGING / UNRECOVERABLE options.

5.92.34 Log switch/archive (%)

Used as part of the 'alter system archive log change *scn*' command. Oracle is basically waiting for the current log from an open thread other than our own to be archived.

Table 5–52 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'log switch/archive' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaLogSwitchArchTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaLogSwitchArchTime: difference of 'sum of time waited for sessions of foreground processes on the 'log switch/archive' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

No user action is necessary.

5.92.35 Pipe put (%)

The session is waiting for the pipe send timer to expire or for space to be made available in the pipe.

Table 5–53 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'pipe put' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaPipePutTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaPipePutTime: difference of 'sum of time waited for sessions of foreground processes on the 'pipe put' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

You are dependent on space being freed up on the pipe, so you are not actually dependent on any one session. You can query X\$KGLB to find the pipe name. There is virtually no way of finding the pipe name other than via SQL, as there are no useful addresses.

5.92.36 Row cache lock (%)

This metric is used to wait for a lock on a data dictionary cache specified by cache id. If one is running in shared mode (Parallel Server), the LCK0 is signaled to get the row cache lock for the foreground waiting on this event. The LCK0 process will get the lock asynchronously. In exclusive mode, the foreground process will try to get the lock.

Table 5–54 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'row cache lock' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaRowCacheLockTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaRowCacheLockTime: difference of 'sum of time waited for sessions of foreground processes on the 'row cache lock' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

If this event shows up a lot, consider increasing the shared pool so that more data dictionary can be cached.

5.92.37 SQL*Net break/reset to client (%)

The server is sending a break or reset message to the client. The session running on the server is waiting for a reply from the client.

These waits are caused by an application attempting to:

- Select from a closed cursor
- Select on a cursor after the last row has already been fetched and no data has been returned
- Select on a non-existent table
- Insert a duplicate row into a uniquely indexed table
- Issuing a query with invalid syntax

If the value, v\$session_wait.p2, for this parameter equals 0, it means a reset was sent to the client. A non-zero value means that the break was sent to the client.

Table 5–55 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net break/reset to client' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetResetToClientTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaNetResetToClientTime: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net break/reset to client' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

Wait time: Up to one second, then loop back and check that buffer is clean.

Parameters:

P1: Absolute file number

P2: Block number

User Action

If these waits are significant, track down the application logic producing these errors to reduce these waits. If you are using Oracle9i or higher, check in v\$sysstat "parse count (failures)" to see that statements have been parsed where columns or tables are unknown. The statistic "parse count (failures)" does not increase if you send SQL with invalid syntax.

The clearest method to track down the root cause of the error is to run tracing on the users experiencing the wait. Their trace files will contain the SQL statements failing and generating the break/reset wait.

5.92.38 SQL*Net break/reset to dblink (%)

The server is sending a break or reset message to the client. The session running on the server is waiting for a reply from the client.

These waits are caused by an application attempting to:

- Select from a closed cursor
- Select on a cursor after the last row has already been fetched and no data has been returned
- Select on a non-existent table
- Insert a duplicate row into a uniquely indexed table
- Issuing a query with invalid syntax

If the value, v\$session_wait.p2, for this parameter equals 0, it means a reset was sent to the client. A non-zero value means that the break was sent to the client.

Table 5–56 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net break/reset to dblink' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetResetToDblinkTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaNetResetToDblinkTime: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net break/reset to dblink' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

If these waits are significant, track down the application logic producing these errors to reduce these waits. If you are using Oracle9i or higher, check in v\$sysstat "parse count (failures)" to see that statements have been parsed where columns or tables are

unknown. The statistic "parse count (failures)" does not increase if you send SQL with invalid syntax.

5.92.39 SQL*Net message to client (%)

The shadow process is waiting for confirmation of a send to the client process.

Table 5–57 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net message to client' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetMsgToClientTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaNetMsgToClientTime: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net message to client' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

This event could indicate network latency problems.

5.92.40 SQL*Net message to dblink (%)

The shadow process is waiting for confirmation of a send to the client process.

Table 5–58 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net message to dblink' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetMsgToDblinkTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaNetMsgToDblinkTime: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net message to dblink' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

See the Idle Events section in this chapter for more information.

User Action

This event could indicate network latency problems.

5.92.41 SQL*Net more data from client (%)

The shadow process has received part of a call from the client process (for example, SQL*Plus, Pro*C, and JDBC) in the first network package and is waiting for more data for the call to be complete. Examples are large SQL or PL/SQL block and insert statements with large amounts of data.

Table 5–59 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net more data from client' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetMoreFromClientTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaNetMoreFromClientTime: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net more data from client' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

See the Idle Events section in this chapter for more information.

User Action

This event could indicate:

- Network latency problems
- tcp_no_delay configuration issues
- Large array insert
- Soft parsing, shipping SQL and PL/SQL text. Using stored procedures and packages will help alleviate this problem.

5.92.42 SQL*Net more data from dblink (%)

The shadow process has received part of a call from the client process (for example, SQL*Plus, Pro*C, and JDBC) in the first network package and is waiting for more data for the call to be complete. Examples are large SQL or PL/SQL block and insert statements with large amounts of data.

Table 5–60 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net more data from dblink' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetMoreFromDblinkTime} / \text{DeltaServiceTime}) * 100$ where:

- **DeltaNetMoreFromDblinkTime**: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net more data from dblink' event' between sample end and start
- **DeltaServiceTime**: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

This event could indicate:

- Network latency problems
- tcp_no_delay configuration issues
- Large array insert
- Large number of columns or wide column data

5.92.43 SQL*Net more data to client (%)

The shadow process has completed a database call and is returning data to the client process (for example SQL*Plus). The amount of data being sent requires more than one send to the client. The shadow process waits for the client to receive the last send. This happens, for example, in a SQL statement that returns a large amount of data.

Table 5–61 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net more data to client' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetMoreToClientTime} / \text{DeltaServiceTime}) * 100$ where:

- **DeltaNetMoreToClientTime**: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net more data to client' event' between sample end and start
- **DeltaServiceTime**: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

This event could indicate:

- Network latency problems
- tcp_no_delay configuration issues
- Large array insert

- Large number of columns or wide column data

5.92.44 SQL*Net more data to dblink (%)

The shadow process has completed a database call and is returning data to the client process (for example SQL*Plus). The amount of data being sent requires more than one send to the client. The shadow process waits for the client to receive the last send. This happens, for example, in a SQL statement that returns a large amount of data.

Table 5–62 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'SQL*Net more data to dblink' event.

Data Source

The data is derived using the following formula:

$(\text{DeltaNetMoreToDblinkTime} / \text{DeltaServiceTime}) * 100$ where:

- DeltaNetMoreToDblinkTime: difference of 'sum of time waited for sessions of foreground processes on the 'SQL*Net more data to dblink' event' between sample end and start
- DeltaServiceTime: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

This event could indicate:

- Network latency problems
- tcp_no_delay configuration issues
- Large array insert
- Large number of columns or wide column data

5.92.45 Wait Time (%)

This metric represents the percentage of time spent waiting, instance-wide, for resources or objects during this sample period.

This test checks the percentage time spent waiting, instance-wide, for resources or objects during this sample period. If the % Wait Time is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Table 5–63 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of database service time is spent waiting.

Table 5–64 Metric Summary Table

Target Version	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Data Source

The data is derived using the following formula:

$\Delta\text{TotalWait} / (\Delta\text{TotalWait} + \Delta\text{CpuTime})$ where:

- $\Delta\text{TotalWait}$: difference of 'sum of time waited for all wait events in v\$system_event' between sample end and start
- $\Delta\text{CpuTime}$: difference of 'select value from v\$sysstat where name='CPU used by this session' between sample end and start

User Action

Investigate further into which specific wait events are responsible for the bulk of the wait time. Individual wait events may identify unique problems within the database. Diagnosis will be tailored where appropriate through drilldowns specific to individual wait events.

5.92.46 Write complete waits (%)

The session is waiting for a buffer to be written. The write is caused by normal aging or a cross instance call.

A user wants to modify a block that is part of DBWRs current write batch. When DBWR grabs buffers to write, it marks them as 'being written'. All the collected buffers are then written to disk. The wait 'write complete waits' implies a buffer is wanted while this flag was set. The flags are cleared as each buffer is written.

Table 5–65 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 10 Minutes	Not Defined	Not Defined	%value%% of service time is spent waiting on the 'write complete waits' event.

Data Source

The data is derived using the following formula:

$(\Delta\text{WriteCompleteWaitsTime} / \Delta\text{ServiceTime}) * 100$ where:

- $\Delta\text{WriteCompleteWaitsTime}$: difference of 'sum of time waited for sessions of foreground processes on the 'write complete waits' event' between sample end and start
- $\Delta\text{ServiceTime}$: difference of 'sum of time waited for sessions of foreground processes on events not in IdleEvents + sum of 'CPU used when call started' for sessions of foreground processes' between sample end and start

User Action

Multiple DBWRs, ASYNC_IO and/or increasing the size of the buffer cache may help reduce waits.

5.93 Wait by Session Count

This metric category contains the metrics that represent the number of sessions waiting on each non-idle wait event. High waiting levels are caused by excessive contention.

5.93.1 Session Waiting for Event Count

This metric represents the number of sessions waiting on a given wait event at the sample time.

Table 5–66 Metric Summary Table

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 5 Minutes	Not Defined	Not Defined	%value% sessions are waiting for event %event%.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Wait Event object.

If warning or critical threshold values are currently set for any Wait Event object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Wait Event object, use the Edit Thresholds page.

Data Source

The following formula is the data source for each metric index:

```
select count (1)
```

User Action

Evaluate the various types of wait activity using the real-time and historical performance monitoring capabilities of Enterprise Manager.

5.94 Waits by Wait Class

This metric category contains the waits by wait class metrics.

5.94.1 Average Users Waiting Count

This metric represents the average number of users that have made a call to the database and that are waiting for an event, such as an I/O or a lock request, to complete. If the number of users waiting on events increases, it indicates that either more users are running, increasing workload, or that waits are taking longer, for example when maximum I/O capacity is reached and I/O times increase.

Table 5–67 Metric Summary Table

Target Version	Key	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	class: "Administrative"	Every 10 Minutes	Not Defined	Not Defined	Not Defined
10g, 11g, 12c	class: "Application"	Every 10 Minutes	Not Defined	Not Defined	Not Defined
10g, 11g, 12c	class: "Cluster"	Every 10 Minutes	Not Defined	Not Defined	Not Defined
10g, 11g, 12c	class: "Commit"	Every 10 Minutes	Not Defined	Not Defined	Not Defined
10g, 11g, 12c	class: "Concurrency"	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Configuration"	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Network"	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Other"	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Scheduler"	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "System I/O"	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "User I/O"	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Wait Class object.

If warning or critical threshold values are currently set for any Wait Class object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Wait Class object, use the Edit Thresholds page.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

5.94.2 Database Time Spent Waiting (%)

This metric represents the percentage of time that database calls spent waiting for an event. Although there is no correct value for this metric, it can be used to detect a change in the operation of a system, for example, an increase in Database Time Spent Waiting from 50% to 75%. ('No correct value' means that there is no single value that

can be applied to any database. The value is a characteristic of the system and the applications running on the system.)

Table 5–68 Metric Summary Table

Target Version	Key	Server Evaluation Frequency	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	class: "Administrative"	Every Minute	Every 10 Minutes	30	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Application"	Every Minute	Every 10 Minutes	30	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Cluster"	Every Minute	Every 10 Minutes	50	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Commit"	Every Minute	Every 10 Minutes	50	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Concurrency"	Every Minute	Every 10 Minutes	30	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Configuration"	Every Minute	Every 10 Minutes	30	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Network"	Every Minute	Every 10 Minutes	30	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Other"	Every Minute	Every 10 Minutes	30	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "Scheduler"	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "System I/O"	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹
10g, 11g, 12c	class: "User I/O"	Every Minute	Every 10 Minutes	Not Defined	Not Defined	The Management Agent generates the alert text. ¹

¹ For releases earlier than Oracle Database plug-in release 12.1.0.6, the Database Server generates this alert text.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Wait Class object.

If warning or critical threshold values are currently set for any Wait Class object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Wait Class object, use the Edit Thresholds page.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page. ADDM will highlight the source of increased time spent in wait events.

Cluster Database

This chapter provides information about the Cluster Database (Oracle Real Application Clusters (RAC) database) metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

6.1 Archive Area

This metric category contains the metrics representing the use of the archive areas.

If the database is running in ARCHIVELOG mode, these metrics check for available redo log destinations. If the database is not running in ARCHIVELOG mode, these metrics fail to register. For each destination, this metric category returns the total, used, and free space.

6.1.1 Archive Area Used (%)

The Archive Full (%) metric returns the percentage of space used on the archive area destination. If the space used is more than the threshold value given in the threshold arguments, then a warning or critical alert is generated.

If the database is not running in ARCHIVELOG mode or all archive destinations are standby databases for Oracle8i, this metric fails to register.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage. For more information, see [Section 6.31.1, "Recovery Area Free Space \(%\)"](#).

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 15 Minutes	80	Not Defined	%value%% of archive area %archDir% is used.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Archive Area Destination object.

If warning or critical threshold values are currently set for any Archive Area Destination object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Archive Area Destination object, use the Edit Thresholds page.

Data Source

If no quota is set for archive area, the percentage is calculated using the UNIX `df -k` command.

If quota is set:

```
archive area used (%) = (total area used / total archive area) * 100
```

User Action

Verify the device specified in the initialization parameter `LOG_ARCHIVE_DEST` is set up properly for archiving.

There are two methods you can use to specify archive destinations. These destinations can be setup using Enterprise Manager. For each database target, you can drill-down to the database **Availability** tab, and access the **Recovery Settings** page.

- The first method is to use the `LOG_ARCHIVE_DEST_n` parameter (where n is an integer from 1 to 10) to specify from one to ten different destinations for archival. Each numerically-suffixed parameter uniquely identifies an individual destination, for example, `LOG_ARCHIVE_DEST_1`, `LOG_ARCHIVE_DEST_2`, and so on.
- The second method, which allows you to specify a maximum of two locations, is to use the `LOG_ARCHIVE_DEST` parameter to specify a primary archive destination and the `LOG_ARCHIVE_DUPLEX_DEST` parameter to determine an optional secondary location.

If the `LOG_ARCHIVE_DEST` initialization parameter is set up correctly and this metric triggers, then free up more space in the destination specified by the archive destination parameters.

6.1.2 Archive Area Used (KB)

This metric represents the total space used (in KB) on the device containing the archive destination directory.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage. For more information, see [Section 6.31.1, "Recovery Area Free Space \(%\)"](#).

Target Version	Collection Frequency
Not Available	Every 15 Minutes

Data Source

If no quota is set for archive area, this is calculated through the UNIX `df -k` command.

`total area used = quota_used * db_block_size (in KB)`

User Action

Verify the device specified in the initialization parameter `LOG_ARCHIVE_DEST` is set up properly for archiving.

There are two methods you can use to specify archive destinations. These destinations can be setup using Enterprise Manager. For each database target, you can drill-down to the database **Availability** tab, and access the **Recovery Settings** page.

- The first method is to use the `LOG_ARCHIVE_DEST_n` parameter (where n is an integer from 1 to 10) to specify from one to ten different destinations for archival. Each numerically-suffixed parameter uniquely identifies an individual destination, for example, `LOG_ARCHIVE_DEST_1`, `LOG_ARCHIVE_DEST_2`, and so on.
- The second method, which allows you to specify a maximum of two locations, is to use the `LOG_ARCHIVE_DEST` parameter to specify a primary archive destination and the `LOG_ARCHIVE_DUPLEX_DEST` parameter to determine an optional secondary location.

If the `LOG_ARCHIVE_DEST` initialization parameter is set up correctly and this metric triggers, then free up more space in the destination specified by the archive destination parameters.

6.1.3 Free Archive Area (KB)

When running a database in ARCHIVELOG mode, the archiving of the online redo log is enabled. Filled groups of the online redo log are archived, by default, to the destination specified by the `LOG_ARCHIVE_DEST` initialization parameter. If this destination device becomes full, the database operation is temporarily suspended until disk space is available.

If the database is running in ARCHIVELOG mode, this metric checks for available redo log destination devices.

If the database is not running in ARCHIVELOG mode, this metric fails to register.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage. For more information, see [Section 6.31.1, "Recovery Area Free Space \(%\)"](#).

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 15 Minutes	Not Defined	Not Defined	Archive area %archDir% has %value% free KB remaining.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Archive Area Destination object.

If warning or critical threshold values are currently set for any Archive Area Destination object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Archive Area Destination object, use the Edit Thresholds page.

Data Source

If the database is in NOARCHIVELOG mode, then nothing is collected.

If the database is in ARCHIVELOG mode, log_archive_destination from v\$parameter is queried to obtain the current list of archivelog destinations. The results are obtained by directly checking the disk usage (df -kl).

User Action

Verify the device specified in the initialization parameter LOG_ARCHIVE_DEST is set up properly for archiving.

There are two methods you can use to specify archive destinations. These destinations can be setup using Enterprise Manager. For each database target, you can drill-down to the database **Availability** tab, and access the **Recovery Settings** page.

- The first method is to use the LOG_ARCHIVE_DEST_n parameter (where n is an integer from 1 to 10) to specify from one to ten different destinations for archival. Each numerically-suffixed parameter uniquely identifies an individual destination, for example, LOG_ARCHIVE_DEST_1, LOG_ARCHIVE_DEST_2, and so on.
- The second method, which allows you to specify a maximum of two locations, is to use the LOG_ARCHIVE_DEST parameter to specify a primary archive destination and the LOG_ARCHIVE_DUPLEX_DEST parameter to determine an optional secondary location.

If the LOG_ARCHIVE_DEST initialization parameter is set up correctly and this metric triggers, then free up more space in the destination specified by the archive destination parameters.

6.1.4 Total Archive Area (KB)

This metric represents the total space (in KB) on the device containing the archive destination directory.

Note: For databases that are configured to archive to the Fast Recovery Area, the Archive Area metrics (Archive Area Used(%), Archive Area Used (KB), Free Archive Area (KB), and Total Archive Area (KB)) are not applicable. Instead, use the Recovery Area Free Space(%) metric to monitor Fast Recovery Area usage. For more information, see [Section 6.31.1, "Recovery Area Free Space \(%\)"](#).

Target Version	Collection Frequency
Not Available	Every 15 Minutes

Data Source

If no quota is set for archive area, this is calculated through the UNIX `df -k` command.

If quota is set:

`total archive area = quota_size * db_block_size (in KB)`

User Action

Oracle recommends that multiple archivelog destinations across different disks be configured. When at least one archivelog destination gets full, Oracle recommends the following:

- If tape is being used, back up archive logs to tape and delete the archive logs.
- If tape is not being used, back up the database and remove obsolete files. This also removes archive logs that are no longer needed based on the database retention policy.
- If archivelog destination `quota_size` is being used, raise the `quota_size`.

6.2 Cluster Managed Database Services

The metrics in the Cluster Managed Database Services metric category provide information about the CPU load for the managed database services.

6.2.1 % CPU Time Load (in last 5 min)

This metric provides the CPU load percentage for any cluster managed database service that exceeds the defined threshold in the last 5 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 5 Minutes	Not Defined	Not Defined	CPU Load Percent %value% for service %name% exceeds the thresholds set.

6.3 Data Guard - 10.1 Database

The metrics in the Data Guard metrics category check the status, data not received, and data not applied for the databases in the Data Guard configuration. The metric runs on the primary database and covers conditions for all databases in the Data Guard configuration, including the primary and all physical and logical standby databases. It is applicable to both broker and non-broker Data Guard configurations.

For non-broker configurations, the metric is limited to monitoring primary database redo transport destination errors (as reflected in the `ERRORS` column of `v$archive_dest`).

For broker configurations, the metric is based on the Data Guard broker health check, which covers a much broader range of issues.

6.3.1 Data Guard Status - 10.1 Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Use the Data Guard Status metric to check the status of each database in the Data Guard configuration.

By default, a critical and warning threshold value was set for this metric column. Alerts will be generated when threshold values are reached. You can edit the value for a threshold as required.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	Warning	Error	The Data Guard status of %dg_name% is %value%.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

User Action

1. Check the Edit Properties General page for the primary and standby databases for detailed information.
2. Examine the database alert logs and the Data Guard broker logs for additional information.

6.3.2 Data Not Applied (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log that was successfully archived to the standby database. Redo data in all subsequent log files are counted as logs not applied. If the primary database goes down at this point, the redo data from these log files can be applied on the standby database. If there is a gap in the log files received on the standby database, any log files received after the gap cannot be applied.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database and log apply services is currently applying log 1, log apply services can continue to apply up to log 3. Log apply services cannot apply any more log files because log 4 is missing. Even though log files 6, 7, and 9 are received, they cannot be applied and they will not be counted as data not applied.

If all the archived log files on the standby database are continuous, and standby redo logs are used, the standby redo logs are also counted as data not applied, unless real-time apply is turned on and log apply services is already working on the standby redo log files.

If the standby redo logs are multithreaded, the broker computes the highest applied SCN for every thread and totals the numbers. If there are multiple incarnations and the standby database is in a different incarnation from the primary database, each incarnation is computed separately and the results are then totaled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	1	3	Standby database %dg_name% has not applied the last %value% received logs.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

6.3.3 Data Not Applied (MB)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log that was archived to the standby database. The size of redo data in all subsequent log files are counted as data not applied. If the primary database goes down at this point, redo from these log files can be applied on the standby database. If there is a gap in the log files received on the standby database, any log files received after the gap cannot be applied.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database and log apply services is currently applying log 1, log apply services can continue to apply up to log 3. Log apply services cannot apply any more log files because log 4 is missing. Even though log files 6, 7, and 9 are received, they cannot be applied and they will not be counted as data not applied. In this case, the total size of log files 1, 2, and 3 is the size of Data Not Applied.

If all the archived log files on the standby database are continuous, and standby redo log files are used, the standby redo log files are also counted as data not applied, unless real-time apply is turned on and log apply services is already working on the standby redo log files. The size of an archived log file is its file size. However, the size of a standby redo log is the size of the actual redo in the log and not the file size.

If the standby redo log files are multithreaded, the broker computes the highest applied SCN for every thread and totals the numbers. If there are multiple incarnations and the standby database is in a different incarnation from the primary database, each incarnation is computed separately and the results are then totaled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	Not Defined	Not Defined	Standby database %dg_name% has not applied the last %value% megabytes of data received.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

6.3.4 Data Not Received (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log file that was successfully archived to the standby database. Redo data in all subsequent log files, including the current online redo log file, are counted as log files for potential data loss and will be unrecoverable if the primary database goes down at this point.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database, and if log 10 is the current online log file, and if log apply services are currently applying log 1, the last continuous log after the highest applied SCN is log 3. All log files after log 3, that is log files 4 through 10, are counted as data not received. If the primary database goes down at this point, all redo data in log files 4 through 10 are lost on the standby database.

If the primary database is multithreaded (in a RAC database), the broker computes the highest applied SCN for every thread and totals the numbers. If the primary database has multiple incarnations (for example, due to a flashback operation) and the standby database is in a different incarnation from the primary database, the computation is done on each incarnation and the results are then totaled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	1	3	Standby database %dg_name% has not received the last %value% logs from the primary database.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

6.3.5 Data Not Received (MB)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log file that was successfully archived to the standby database. The size of redo data in all subsequent log files, including the current online redo log file, are counted as data for potential data loss and will be unrecoverable if the primary database goes down at this point. The size of an archived log file is its file size, and the size of the online redo log file is the size of the actual redo in the online log file, not the file size of the online redo log file.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database, and if log 10 is the current online log file, and if log apply services is currently applying log 1, the last continuous log after the highest applied SCN is log 3. All log files after log 3, that is log files 4 through 10, are counted as data not received and the total size of redo data in these log files is the size of Data Not Received.

If the primary database is multithreaded (in a RAC database), the broker computes the highest applied SCN for every thread and totals the numbers. If the primary database has multiple incarnations (for example, due to a flashback operation) and the standby database is in a different incarnation from the primary database, the computation is done on each incarnation and the results are then totaled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR1	Every 5 Minutes	Not Defined	Not Defined	Standby database %dg_name% has not received the last %value% megabytes of data from the primary database.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

6.4 Data Guard - 9.2 Database

The metrics in the Data Guard metrics category check the status, data not received, and data not applied for the databases in the Data Guard configuration. The metric runs on the primary database and covers conditions for all databases in the Data Guard configuration, including the primary and all physical and logical standby databases. It is applicable to both broker and non-broker Data Guard configurations.

For non-broker configurations, the metric is limited to monitoring primary database redo transport destination errors (as reflected in the ERRORS column of v\$archive_dest).

For broker configurations, the metric is based on the Data Guard broker health check, which covers a much broader range of issues.

6.4.1 Data Guard Status - 9.2 Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Use the Data Guard Status metric to check the status of each database in the Data Guard configuration.

By default, a critical and warning threshold value was set for this metric column. Alerts will be generated when threshold values are reached. You can edit the value for a threshold as required.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2	Every 5 Minutes	Warning	Error	The Data Guard status of %dg_name% is %value%.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

User Action

1. Check the Edit Properties General page for the primary and standby databases for detailed information.
2. Examine the database alert logs and the Data Guard broker logs for additional information.

6.4.2 Data Not Applied (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log that was successfully archived to the standby database. Redo data in all

subsequent log files are counted as logs not applied. If the primary database goes down at this point, the redo data from these log files can be applied on the standby database. If there is a gap in the log files received on the standby database, any log files received after the gap cannot be applied.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database and log apply services is currently applying log 1, log apply services can continue to apply up to log 3. Log apply services cannot apply any more log files because log 4 is missing. Even though log files 6, 7, and 9 are received, they cannot be applied and they will not be counted as data not applied.

If all the archived log files on the standby database are continuous, and standby redo logs are used, the standby redo logs are also counted as data not applied, unless real-time apply is turned on and log apply services is already working on the standby redo log files.

If the standby redo logs are multithreaded, the broker computes the highest applied SCN for every thread and totals the numbers. If there are multiple incarnations and the standby database is in a different incarnation from the primary database, each incarnation is computed separately and the results are then totaled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2	Every 5 Minutes	1	3	Standby database %dg_name% has not applied the last %value% received logs.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

6.4.3 Data Not Received (logs)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The broker computes the highest applied SCN and uses its value to find the last continuous log file that was successfully archived to the standby database. Redo data in all subsequent log files, including the current online redo log file, are counted as log files for potential data loss and will be unrecoverable if the primary database goes down at this point.

For example, if log files 1, 2, 3, 6, 7, and 9 are received on the standby database, and if log 10 is the current online log file, and if log apply services are currently applying log 1, the last continuous log after the highest applied SCN is log 3. All log files after log 3, that is log files 4 through 10, are counted as data not received. If the primary database goes down at this point, all redo data in log files 4 through 10 are lost on the standby database.

If the primary database is multithreaded (in a RAC database), the broker computes the highest applied SCN for every thread and totals the numbers. If the primary database has multiple incarnations (for example, due to a flashback operation) and the standby database is in a different incarnation from the primary database, the computation is done on each incarnation and the results are then totaled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2	Every 5 Minutes	1	3	Standby database %dg_name% has not received the last %value% logs from the primary database.

Data Source

The following commands are the data sources for this metric:

Non-broker: v\$archive_dest on primary database

Broker: Data Guard broker on primary database

6.5 Data Guard Fast-Start Failover

The metrics in this category are database-level metrics. For cluster databases, these metrics are monitored at the cluster database target level and not by member instances.

6.5.1 Fast-Start Failover Occurred

This metric provides the time at which a fast-start failover occurred.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2	Every 5 Minutes	Not Defined	1	A fast-start failover occurred at %dg_fs_time%.

6.6 Data Guard Fast-Start Failover Observer Status

The metrics in the Data Guard Fast-Start Failover Observer Status metric category provide information about the status of the observer process.

The observer process continuously monitors the primary and target standby databases and evaluates whether failover is necessary, and then initiates a fast-start failover when conditions warrant.

6.6.1 Observer Status

This metric displays the status of the observer process.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	Every Minute	Not Defined	Error	The Data Guard fast-start failover observer status is %value%.

6.7 Data Guard Fast-Start Failover Observer Status - 10.2 Database

The metrics in the Data Guard Fast-Start Failover Observer Status - 10.2 Database metric category provide information about the status of the observer process for Oracle Database 10gR2 only.

The observer process continuously monitors the primary and target standby databases and evaluates whether failover is necessary, and then initiates a fast-start failover when conditions warrant.

6.7.1 Observer Status - 10.2 Database

This metric displays the status of the observer process for Oracle Database 10gR2.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2	Every 5 Minutes	Not Defined	Error	The Data Guard fast-start failover observer status is %value%.

6.8 Data Guard Performance

This metric category provides the Data Guard Performance metric.

6.8.1 Apply Lag (seconds)

This metric displays (in seconds) how far the standby is behind the primary.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	The standby database is approximately %value% seconds behind the primary database.

Data Source

The data source for this metric is the following command:

```
v$dataguard_stats('apply lag')
```

6.8.2 Estimated Failover Time (seconds)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric shows the approximate number of seconds required to failover to this standby database. This accounts for the startup time, if necessary, plus the remaining time required to apply all the available redo on the standby. If a bounce is not required, it is only the remaining apply time.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	The estimated time to failover is approximately %value% seconds.

Data Source

The data source for this metric is the following command:

```
v$dataguard_stats('estimated startup time','apply finish time','standby has been open')
```

6.8.3 Redo Apply Rate (KB/second)

Displays the Redo Apply Rate in KB/second on this standby.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	The estimated time to failover is approximately %value% seconds.

6.8.4 Redo Generation Rate (KB/second)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 5 Minutes	Not Defined	Not Defined	The redo generation rate is %value% KB/sec.

6.8.5 Transport Lag (seconds)

The approximate number of seconds of redo not yet available on this standby database. This may be because the redo has not yet been shipped or there may be a gap.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	There are approximately %value% seconds of redo not yet available on this standby database.

Data Source

The data source for this metric is the following command:

```
v$dataguard_stats('transport lag')
```

6.9 Data Guard Performance - 11.1 and Prior Database

This metric category includes the Data Guard Performance metrics for Oracle Database 11g and Oracle Database 10gR2.

6.9.1 Apply Lag (seconds) - 11.1 and Prior Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric displays (in seconds) how far the standby is behind the primary.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	The standby database is approximately %value% seconds behind the primary database.

Data Source

The data source for this metric is the following command:

```
v$dataguard_stats('apply lag')
```

6.9.2 Estimated Failover Time (seconds) - 11.1 and Prior Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric shows the approximate number of seconds required to failover to this standby database. This accounts for the startup time, if necessary, plus the remaining time required to apply all the available redo on the standby. If a bounce is not required, it is only the remaining apply time.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	The estimated time to failover is approximately %value% seconds.

Data Source

The data source for this metric is the following command:

```
v$dataguard_stats ('estimated startup time','apply finish time','standby has been open')
```

6.9.3 Transport Lag (seconds) - 11.1 and Prior Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The approximate number of seconds of redo not yet available on this standby database. This may be because the redo has not yet been shipped or there may be a gap.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	There are approximately %value% seconds of redo not yet available on this standby database.

Data Source

The data source for this metric is the following command:

```
v$dataguard_stats('transport lag')
```

6.9.4 Redo Apply Rate (KB/second) - 11.1 and Prior Database

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric displays the Redo Apply Rate in KB/second on this standby.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11gR1	Every 5 Minutes	Not Defined	Not Defined	The redo apply rate is %value% KB/sec

6.10 Data Guard Status

The metrics in the Data Guard metrics category check the status, data not received, and data not applied for the databases in the Data Guard configuration.

6.10.1 Data Guard Status

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Use the Data Guard Status metric to check the status of each database in the Data Guard configuration.

By default, a critical and warning threshold value was set for this metric column. Alerts will be generated when threshold values are reached. You can edit the value for a threshold as required.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 5 Minutes	Warning	Error	The Data Guard status of %dg_name% is %value%.

Data Source

1. Check the Edit Properties General page for the primary and standby databases for detailed information.
2. Examine the database alert logs and the Data Guard broker logs for additional information.

6.11 Database Cardinality

This metric category contains the metrics that monitor the number of active instances of a cluster database.

6.11.1 Open Instance Count

This metric monitors how many instances are in an open state.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 5 Minutes	Not Defined	Not Defined	%value% instance(s) out of %total_count% are up.

6.12 Database Job Status

This metric category contains the metrics that represent the health of database jobs registered through the DBMS_SCHEDULER interface.

6.12.1 Broken Job Count

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The Oracle Server job queue is a database table that stores information about local jobs such as the PL/SQL call to execute for a job such as when to run a job. Database replication is also managed by using the Oracle job queue mechanism using jobs to push deferred transactions to remote master sites, to purge applied transactions from the deferred transaction queue, or to refresh snapshot refresh groups.

A job can be broken in two ways:

Oracle has failed to successfully execute the job after sixteen attempts. The job has been explicitly marked as broken by using the procedure `DBMS_JOB.BROKEN`.

This metric checks for broken DBMS jobs. A critical alert is generated if the number of broken jobs exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 30 Minutes	0	Not Defined	%value% job(s) are broken.

Data Source

The data source for this metric is the following command:

```
SELECT COUNT(*)
  FROM dba_jobs
 WHERE broken < > 'N'
```

User Action

Check the ALERT log and trace files for error information. Correct the problem that is preventing the job from running. Force immediate re-execution of the job by calling `DBMS_SCHEDULER.RUN`.

6.12.2 Failed Job Count

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The Oracle Server job queue is a database table that stores information about local jobs such as the PL/SQL call to execute for a job such as when to run a job. Database replication is also managed by using the Oracle job queue mechanism using jobs to push deferred transactions to remote master sites, to purge applied transactions from the deferred transaction queue or to refresh snapshot refresh groups.

If a job returns an error while Oracle is attempting to execute it, the job fails. Oracle repeatedly tries to execute the job doubling the interval of each attempt. If the job fails sixteen times, Oracle automatically marks the job as broken and no longer tries to execute it.

This metric checks for failed DBMS jobs. An alert is generated if the number of failed job exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 30 Minutes	0	Not Defined	%value% job(s) have failed.

Data Source

The data source for this metric is the following command:

```
SELECT COUNT(*)
FROM dba_jobs
WHERE NVL(failures, 0) < > 0"
```

User Action

Check the ALERT log and trace files for error information. Correct the problem that is preventing the job from running.

6.13 Database Wait Bottlenecks

This metric category contains the metrics that approximate the percentage of time spent waiting by user sessions across instances for the cluster database. This approximation takes system-wide totals and discounts the effects of sessions belonging to background processes.

6.13.1 Active Sessions Using CPU

This metric represents the active sessions using CPU.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 Minutes

6.13.2 Active Sessions Waiting: I/O

This database-level metric represents the active sessions waiting for I/O. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 Minutes

6.13.3 Active Sessions Waiting: Other

This database-level metric represents all the waits that are neither idle nor user I/O. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 Minutes

6.13.4 Average Database CPU (%)

This metric represents the average database CPU across instances as a percentage.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

6.13.5 Host CPU Utilization (%)

This metric represents the percentage of CPU being used across hosts.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 Minutes

6.13.6 Load Average

This metric reports the sum of the current CPU load for all cluster database hosts.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

6.13.7 Maximum CPU

This metric represents the total CPU count across all the cluster database hosts.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Collection Frequency
10g, 11g, 12c	Every 15 Minutes

6.13.8 Wait Time (%)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric represents the percentage of time spent waiting, database-wide, for resources or objects during this sample period.

This test checks the percentage time spent waiting, database-wide, for resources or objects during this sample period. If the % Wait Time is greater than or equal to the threshold values specified by the threshold arguments, and the number of occurrences exceeds the value specified in the Number of Occurrences parameter, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 15 Minutes	Not Defined	Not Defined	Generated By Database Server

Data Source

The data source for this metric is the following formula where:

- DeltaTotalWait: Difference of 'sum of time waited for all wait events in v\$system_event' between sample end and start.
- DeltaCpuTime: Difference of 'select value from v\$sysstat where name='CPU used by this session' between sample end and start.

$\Delta\text{TotalWait} / (\Delta\text{TotalWait} + \Delta\text{CpuTime})$

User Action

Investigate further into which specific wait events are responsible for the bulk of the wait time. Individual wait events may identify unique problems within the database. Diagnosis will be tailored where appropriate through drilldowns specific to individual wait events.

6.14 Database Vault Attempted Violations - Command Rules

The metrics in the Database Vault Attempted Violations - Command Rules metric category provides information about the attempted Database Vault command rule violations.

6.14.1 Database Vault Attempted Violations Count - Command Rules

This metric raises an alert, which helps the Oracle Database Vault security analyst to monitor violation attempts on the Database Vault database. This user can select the command rules to be affected by the alert and filter these command rules based on the different types of attempts by using error codes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2,10g, 11g, 12c	Every Hour	Not Defined	Not Defined	%ACTION_OBJECT_NAME% got violated at %VIOLATIONTIMESTAMP%

6.15 Database Vault Attempted Violations - Realms

The metrics in the Database Vault Attempted Violations - Realms metric category provide information about realm violations (for example, when an unauthorized user tries to modify an object that is protected by the realm).

6.15.1 Database Vault Attempted Violations Count - Realms

This metric raises an alert, which helps the Oracle Database Vault security analyst to monitor violation attempts on the Database Vault database. This user can select the realms to be affected by the alert and filter these realms based on the different types of attempts by using error codes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2,10g, 11g, 12c	Every Hour	Not Defined	Not Defined	%ACTION_OBJECT_NAME% got violated at %VIOLATIONTIMESTAMP%.

6.16 Database Vault Configuration Issues - Realms

The metrics in the Database Vault Configuration Issues - Realms metric category provide information about configuration issues in the realm. The Oracle Database Vault realm protects configuration information in the Oracle Database Vault.

6.16.1 Database Vault Configuration Issues Count - Realms

This metric tracks and raises an alert if users misconfigure realms.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2,10g, 11g, 12c	Every Hour	Not Defined	0	%ACTION_OBJECT_NAME% has configuration issues.

6.17 Database Vault Configuration Issues - Command Rules

The metrics in the Database Vault Configuration Issues - Command Rules metric category provide information about configuration issues in the command rules. A command rule is a rule that you create to protect SELECT, ALTER SYSTEM, database definition language (DDL), and data manipulation language (DML) statements that affect one or more database objects

6.17.1 DV (Command Rule) - Configuration Issue Count

This metric tracks and raises an alert if users misconfigure command rules.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2,10g, 11g, 12c	Every Hour	Not Defined	0	%ACTION_OBJECT_NAME% has configuration issues.

6.18 Database Vault Policy Changes

The metrics in the Database Vault Policy Changes metric category provide information about any changes to a Database Vault Policy.

6.18.1 Database Vault Policy Changes Count

This metric raises an alert on any change to any Database Vault policy, such as policies for realms and command rules.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2,10g, 11g, 12c	Every Hour	Not Defined	0	%ACTION_OBJECT_NAME% has configuration issues.

6.19 Deferred Transactions

This metric category contains the metrics associated with this distributed database's deferred transactions.

6.19.1 Deferred Transaction Count

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Oracle uses deferred transactions to propagate data-level changes asynchronously among master sites in an advanced replication system as well as from an updatable snapshot to its master table.

This metric checks for the number of deferred transactions. An alert is generated if the number of deferred transactions exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 5 Minutes	100	Not Defined	Number of deferred transactions is %value%.

Data Source

The data source for this metric is the following command:

```
SELECT count(*)
FROM sys.deftran
```

User Action

When the advanced replication facility pushes a deferred transaction to a remote site, it uses a distributed transaction to ensure that the transaction has been properly committed at the remote site before the transaction is removed for the queue at the local site. If transactions are not being pushed to a given remote site, verify that the destination for the transaction was correctly specified. If you specify a destination database when calling DBMS_DEFER_SYS.SCHEDULE_EXECUTION using the DBLINK parameter, or DBMS_DEFER_SYS.EXECUTE using the DESTINATION parameter, make sure the full database link is provided.

Wrong view destinations can lead to erroneous deferred transaction behavior. Verify that the DEFCALLEST and DEFTRANDEST views are the definitions from the CATREPC.SQL and not those from CATDEFER.SQL.

6.19.2 Deferred Transaction Error Count

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Oracle uses deferred transactions to propagate data-level changes asynchronously among master sites in an advanced replication system as well as from an updatable snapshot to its master table. If a transaction is not successfully propagated to the remote site, Oracle rolls back the transaction, logs the transaction in the SYS.DEFERROR view in the remote destination database.

This metric checks for the number of transactions in SYS.DEFERROR view and raises an alert if it exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 5 Minutes	0	Not Defined	Number of deferred transactions with errors is %value%.

Data Source

The data source for this metric is the following command:

```
SELECT count(*)
FROM sys.deferror
```

User Action

An error in applying a deferred transaction may result from a database problem, such as a lack of available space in the table to be updated, or may be the result of an unresolved insert, update, or delete conflict. The SYS.DEFERROR view provides the ID of the transaction that could not be applied. Use this ID to locate the queued calls associated with the transaction. These calls are stored in the SYS.DEFCALL view. You can use the procedures in the DBMS_DEFER_QUERY package to determine the arguments to the procedures listed in the SYS.DEFCALL view.

6.20 Exadata Module Version Failure

This metric category provides information about any Exadata module version errors.

6.20.1 Error Count

This metric tracks and raises an alert when a defined number of Exadata module version errors occur.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 24 Hours	0	Not Defined	%errorCode% occurrences of %errorCount%.

6.21 Failed Logins

The metric in this metric category checks for the number of failed logins on the target database. This check is performed every ten minutes and returns the number of failed logins for that ten-minute interval. This metric will only work for databases where the audit_trail initialization parameter is set to DB or XML and the session is being audited.

6.21.1 Failed Login Count

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric checks for the number of failed logins on the target database. This check is performed every ten minutes and returns the number of failed logins for that ten-minute interval. This metric will only work for databases where the audit_trail initialization parameter is set to DB or XML and the session is being audited.

If the failed login count crosses the values specified in the threshold arguments, then a warning or critical alert is generated. Because it is important to know every time a significant number of failed logins occurs on a system, this metric will generate a new alert for any ten-minute interval where the thresholds are crossed. You can manually clear these alerts. They will not automatically clear after the next collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 30 Minutes	150	300	Number of failed login attempts exceeds threshold value.

Data Source

The database stores login information in different views based on the audit_trail setting. The database views used are:

- DB or DB_EXTENDED: DBA_AUDIT_SESSION

- XML (10g Release 2 only): DBA_COMMON_AUDIT_TRAIL

6.22 Fast Recovery

The metrics in the Fast Recovery metrics category relate to the fast recovery area.

6.22.1 Fast Recovery Area

Formerly referred to as flash recovery area, this metric returns an optional disk location that you can use to store recovery-related files such as control file and online redo log copies, archived redo log files, flashback logs, and RMAN backups.

Oracle Database and RMAN manage the files in the fast recovery area automatically. You can specify the disk quota, which is the maximum size of the fast recovery area.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is the following command:

```
SELECT value
  FROM v$parameter
 WHERE name='db_recovery_file_dest';
```

User Action

No user action is required.

6.22.2 Fast Recovery Area Size

This metric returns the Fast Recovery Area Size.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is the following command:

```
SELECT value
  INTO l_fast_recovery_size
  FROM v$parameter
 WHERE name='db_recovery_file_dest_size';
```

User Action

No user action is required.

6.22.3 Flashback On

This metric returns whether or not flashback logging is enabled - YES, NO, or RESTORE POINT ONLY. For the RESTORE POINT ONLY option, flashback is ON but you can only flashback to guaranteed restore points.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is the following command:

```
SELECT flashback_on
FROM v$database;
```

User Action

No user action is required.

6.22.4 Log Mode

This metric returns the log mode of the database - ARCHIVELOG or NOARCHIVELOG.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is the following command:

```
SELECT log_mode
FROM v$database;
```

User Action

No user action is required.

6.22.5 Non-Reclaimable Fast Recovery Area (%)

This metric represents the percentage of space non-reclaimable (space used minus space reclaimable) in the fast recovery area.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is one of the following commands:

Non-reclaimable = space used - space reclaimable

Space Used:

```
SELECT SUM(PERCENT_SPACE_USED)
FROM v$fast_recovery_area_usage;
```

Space Reclaimable:

```
SELECT SUM(PERCENT_SPACE_RECLAIMABLE)
FROM v$fast_recovery_area_usage;
```

User Action

No user action is required.

6.22.6 Oldest Flashback Time

This metric returns the oldest point-in-time to which you can flashback your database.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is the following command:

```
SELECT to_char(oldest_flashback_time, 'YYYY-MM-DD HH24:MI:SS')
FROM v$flashback_database_log;
```

User Action

No user action is required.

6.22.7 Reclaimable Fast Recovery Area (%)

This metric represents the percentage of space reclaimable in the fast recovery area.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is the following command:

```
Space Reclaimable:
SELECT SUM(PERCENT_SPACE_RECLAIMABLE)
FROM v$fast_recovery_area_usage;
```

User Action

No user action is required.

6.22.8 Usable Fast Recovery Area (%)

This metric represents the percentage of space usable in the fast recovery area. The space usable is composed of the space that is free in addition to the space that is reclaimable.

Target Version	Collection Frequency
10g, 11g	Every 15 Minutes

Data Source

The data source for this metric is the following command:

```
SELECT (CASE WHEN PERCENT_USED > 100 THEN 0 ELSE (100-PERCENT_USED) END)
PERCENT_FREE
FROM (SELECT (SUM(PERCENT_SPACE_USED)-SUM(PERCENT_SPACE_RECLAIMABLE))
PERCENT_USED
FROM V$FAST_RECOVERY_AREA_USAGE);
```

User Action

No user action is required.

6.23 Invalid Objects

This metric category contains the metrics associated with invalid objects.

6.23.1 Total Invalid Object Count

This metric represents the total invalid object count.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	%value% object(s) are invalid in the database.

6.24 Invalid Objects by Schema

This metric category contains the metrics that represent the number of invalid objects in each schema.

6.24.1 Owner's Invalid Object Count

This metric represents the invalid object count by owner.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined		%value% object(s) are invalid in the %owner% schema.

Data Source

The data source for each metric index is the following command:

```
SELECT count(1)
```

User Action

View the status of the database objects in the schema identified by the Invalid Object Owner metric. Recompile objects as necessary.

6.25 Messages Per Buffered Queue

The metrics in the Messages Per Buffered Queue metrics category monitor the age and state of the first (top of the queue) message for each buffered queue in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

6.25.1 Average age of messages per buffered queue (seconds)

This metric provides the average age (in seconds) of the messages in the buffered queue for all nonsystem queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages in %schema%.%queue_name% queue is %value% seconds.

6.25.2 First Message Age in Buffered Queue Per Queue (Seconds)

This metric gives the age (in seconds) of the first message in the buffered queue for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message in %schema%.%queue_name% buffered queue is %value% seconds.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

This metric is calculated by finding the age of the first message in all the subscribers of the queue and then the oldest amongst all is taken.

The following views and tables are used for the calculation:

1. <SCHEMA>.AQ\$<QUEUE_TABLE>
2. v\$buffered_queues

User Action

When using buffered queues for storing and propagating messages, monitor this metric to get the age of first message in the queue.

6.25.3 Messages processed per buffered queue (%)

This metric gives the messages processed percentage per minute per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for queue %schema%.%queue_name% is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

This is calculated as the percent of total number of messages processed per minute and total number of messages received per minute in the last collection interval per buffered queue.

User Action

When using queues for storing/propagating messages, monitor this metric to get the messages processed percent (or throughput) per minute in the last collection interval for the queue.

6.25.4 Messages processed per buffered queue (%) per minute

This metric gives the messages processed percentage per minute in the last interval per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for queue %schema%.%queue_name% is %value% .

6.25.5 Spilled Messages

This metric displays the current number of overflow messages spilled to disk from the buffered queue.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Current number of overflow messages spilled to disk from the buffered queue %schema%.%queue_name% is %value%

6.25.6 Total Messages Processed per Buffered Queue per Minute

This metric gives the total number of messages processed per minute per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages processed per minute in the last interval for queue %schema%.%queue_name% is %value% .

6.25.7 Total Messages Received per Buffered Queue per Minute

This metric gives the total number of messages received or enqueued into the buffered queue per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for queue %schema%.%queue_name% is %value% .

6.26 Messages Per Buffered Queue Per Subscriber

This metric category monitors the messages for buffered queues per subscriber in the database.

6.26.1 Average Age of Messages Per Buffered Queue Per Subscriber (Seconds)

This metric display's the average age of messages in the buffered queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

6.26.2 First Message Age in Buffered Queue per Subscriber (Seconds)

This metric displays the age of the first message in the buffered queue per queue per subscriber in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message for subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

6.26.3 Messages Processed Per Buffered Queue (%) Per Subscriber Per Minute

This metric gives the total number of messages processed per minute per buffered queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%

6.26.4 Messages Processed Per Buffered Queue Per Subscriber (%)

This metric gives the messages processed percentage for the buffered queue per subscriber. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% percent.

6.26.5 Total Messages Processed Per Buffered Queue Per Subscriber Per Minute

This metric gives the total number of messages processed per minute per buffered queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

6.26.6 Total Messages Received Per Buffered Queue Per Subscriber Per Minute

This metric gives the total number of messages received or enqueued into the queue per subscriber per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

6.27 Messages Per Persistent Queue

The metrics in the Messages Per Persistent Queue metrics category monitor the age and state of the first (top of the queue) message for each persistent queue in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

6.27.1 Average Age of Messages Per Persistent Queue (Seconds)

This metric displays the average age of messages in the persistent queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages in %schema%.%queue_name% queue is %value% seconds.

6.27.2 Age of The First Message in Persistent Queue Per Queue (Seconds)

This metric gives the age (in seconds) of the first message in the persistent queue for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message in %schema%.%queue_name% queue is %value% seconds.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

This metric is calculated by finding the age of the first message in all the subscribers of the queue and then the oldest amongst all is taken.

The following views/tables are used for the calculation:

1. <SCHEMA>.AQ\$_<QUEUE_TABLE>_S
2. <SCHEMA>.AQ\$_<QUEUE_TABLE>_I
3. <SCHEMA>.AQ\$<QUEUE_TABLE>

User Action

When using persistent queues for storing and propagating messages, monitor this metric to get the age of first message in the queue.

6.27.3 Messages Processed Per Persistent Queue (%)

This metric gives the messages processed percentage for the persistent queue. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for queue %schema%.%queue_name% is %value% percent.

6.27.4 Messages Processed Per Persistent Queue (%) Per Minute

This metric gives the messages processed percentage per minute per persistent queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for queue %schema%.%queue_name% is %value%

6.27.5 Total Messages Processed per Persistent Queue per Minute

This metric gives the total number of messages processed per minute per persistent queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages processed per minute in the last interval for queue %schema%.%queue_name% is %value% .

6.27.6 Total Messages Received per Persistent Queue per Minute

This metric gives the total number of messages received or enqueued into the queue per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for queue %schema%.%queue_name% is %value% .

6.28 Messages Per Persistent Queue Per Subscriber

The metrics in the Messages Per Persistent Queue Per Subscriber metrics category monitor the age and state of the first (top of the queue) message for each persistent queue per queue subscriber in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

6.28.1 Average Age of Messages Per Persistent Queue Per Subscriber (Seconds)

This metric display's the average age of messages in the persistent queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Average age of messages for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

6.28.2 First Message Age in Persistent Queue per Subscriber (Seconds)

This metric gives the age (in seconds) of the first message in the persistent queue per subscriber for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Age of first message for subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

6.28.3 Messages Processed Per Persistent Queue (%) Per Subscriber Per Minute

This metric gives the messages processed percentage per minute per persistent queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

6.28.4 Messages Processed Per Persistent Queue Per Subscriber (%)

This metric gives the messages processed percentage for the persistent queue per subscriber. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% percent.

6.28.5 Total Messages Processed Per Persistent Queue Per Subscriber Per Minute

This metric gives the messages processed percentage per minute per persistent queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

6.28.6 Total Messages Received Per Persistent Queue Per Subscriber Per Minute

This metric gives the total number of messages received or enqueued into the queue per subscriber per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Total messages received per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% .

6.29 QoS Management - Performance Satisfaction

Oracle Database Quality of Service (QoS) Management is an automated, policy-based product that monitors the workload requests for an entire system.

For more information, see *Oracle Database Quality of Service Management User's Guide*.

6.29.1 Negative PSM Duration (seconds)

This metric tracks the negative PSM duration and raises an alert when it exceeds its threshold.

Performance Satisfaction Metric (PSM) is a normalized numeric value that indicates how well a particular Performance Objective is being met, and which enables Oracle Database QoS Management to compare the performance of the system for widely differing Performance Objectives.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 5 Minutes	Not Defined	Not Defined	Negative PSM Duration value %value% for Performance Class %PC% has crossed the threshold.

6.30 Recovery

This metric category contains the metrics representing database recovery.

6.30.1 Corrupt Data Block Count

This metric represents the count of corrupt data blocks.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Metric Summary 9iR2 or higher Evaluated and Collected every 15 minutes Operator > Warning Threshold - 0 Critical Threshold - Not Defined Number of corrupt data blocks is %value%.

Data Source

The data source for this metric is the following command:

```
SELECT count(unique(file#))
FROM v$database_block_corruption;
```

User Action

Perform a database recovery.

6.30.2 Missing Media File Count

This metric represents the count of missing media files.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Metric Summary 8i or higher Evaluated and Collected every 15 minutes Operator > Warning Threshold - 0 Critical Threshold - Not Defined Number of missing media files is %value%.

Data Source

This metric is calculated with the following command:

```
SELECT count(file#)
FROM v$datafile_header
WHERE recover = 'YES' OR error is not null;
```

User Action

You should perform a database recovery.

6.31 Recovery Area

This metric category contains the recovery area metrics.

6.31.1 Recovery Area Free Space (%)

Use the Recovery Area Free Space (%) metric to monitor Fast Recovery Area usage. This metric represents the recovery area free space as a percentage. It is a database-level metric that is evaluated by the database server every 15 minutes or during a file creation, whichever occurs first.

The metric data is also printed in the alert log. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The Critical Threshold is set for < 3% and the Warning Threshold is set for < 15%. You cannot customize these thresholds. An alert is returned the first time the alert occurs, and the alert is not cleared until the available space rises above 15%.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 15 Minutes or during file creation, whichever occurs first	15% (Cannot be changed)	3% (Cannot be changed)	db_recovery_file_dest_size of N bytes is N% used, and has N remaining bytes available.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

6.32 SCN Growth Statistics

This metric category provides information about the Systems Change Number (SCN) in the database environment and reports on the health of the SCN growth in the database.

6.32.1 SCN Health

This metric displays the status of the SCN health.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Hour	62	10	The SCN health is %scn_health%.

6.33 SCN Max Statistics

This metric category provides information about the maximum value of the SCN.

6.33.1 Max SCN Jump in one second (last 24 hours)

This metric displays the maximum SCN jump in one second over the previous 24 hours.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every Hour	Not Defined	Not Defined	The maximum SCN jump in one second (last 24 hours) is %scn_max_jump%.

6.34 Segment Advisor Recommendations

This metric category contains metrics related to the Automatic Segment Advisor job.

Oracle uses the Automatic Segment Advisor job to detect segment issues regularly within maintenance windows. It determines whether the segments have unused space that can be released. The Number of recommendations is the number of segments that have Reclaimable Space. The recommendations come from all runs of the automatic segment advisor job and any user-scheduled segment advisor jobs.

6.34.1 Number of recommendations

Oracle uses the Automatic Segment Advisor job to detect segment issues regularly within maintenance windows. It determines whether the segments have unused space that can be released. The Number of recommendations is the number of segments that have Reclaimable Space. The recommendations come from all runs of the automatic segment advisor job and any user-scheduled segment advisor jobs.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

6.35 Session Suspended

This metric category contains the metrics that represent the number of resumable sessions that are suspended due to a correctable error.

6.35.1 Session Suspended by Data Object Limitation

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric represents the session suspended by a data object limitation.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

6.35.2 Session Suspended by Quota Limitation

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric represents the session suspended by a quota limitation.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

6.35.3 Session Suspended by Rollback Segment Limitation

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric represents the session suspended by a rollback segment limitation.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

6.35.4 Session Suspended by Tablespace Limitation

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric represents the session suspended by a tablespace limitation.

Target Version	Collection Frequency
10g, 11g, 12c	Every 5 Minutes

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

6.36 Snapshot Too Old

This metric category contains the snapshot too old metrics.

6.36.1 Snapshot Too Old due to Rollback Segment Limit

This database-level metric represents snapshots too old because of the rollback segment limit. This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

6.36.2 Snapshot Too Old due to Tablespace Limit

This database-level metric represents snapshots too old because of the tablespace limit. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

User Action

View the latest Automatic Database Diagnostic Monitor (ADDM) report. For a more detailed analysis, run ADDM from the Advisor Central link on the Database Home page.

6.37 Space Usage by Buffered Queues

This metric category monitors the space usage of buffered queues with respect to the streams pool size.

6.37.1 Queue Size (MB)

This metric display's the size of buffered queue, which is the total number of Mega bytes allocated for all messages and metadata.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Size of buffered queue %schema%.%queue_name% is %value% MB.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

The source of this metric is the INSTANCE_NAME column from GV\$INSTANCE view.

User Action

When using queues for storing or propagating messages, monitor this metric to get the instance in which the buffered queue is available.

6.37.2 Space Usage of Buffered Queue With Respect to Streams Pool Size (%)

This metric gives the space usage percentage of buffered queue with respect to streams pool size per buffered queue.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Buffered queue %schema%.%queue_name% has consumed %value% percent of streams pool size.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Schema Name and Queue Name objects.

If warning or critical threshold values are currently set for any unique combination of Schema Name and Queue Name objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Schema Name and Queue Name objects, use the Edit Thresholds page.

Data Source

The source of this metric is the QUEUE_SIZE AND CURRENT_SIZE columns from GV\$BUFFERED_QUEUES and GV\$SGA_DYNAMIC_COMPONENTS views.

User Action

When using buffered queues for storing or propagating messages, monitor this metric to get the space usage percentage of buffered queue with respect to the allocated streams pool size.

6.38 Streams Apply Queue - Buffered

The metrics in the Streams Apply Queue - Buffered metrics category show the current total number of messages in a buffered queue to be dequeued by each apply process and the total number of messages to be dequeued by each apply process that have spilled from memory into the persistent queue table.

6.38.1 Streams Apply - (%)Spilled Messages

This metric usually indicates that transactions are staying longer in memory.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11gR2, 12c	Every 30 Minutes	Not Defined	Not Defined	Spilled messages for Apply process [%APPLY_NAME%] queue is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Apply Name object.

If warning or critical threshold values are currently set for any Apply Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Apply Name object, use the Edit Thresholds page.

Data Source

The source for this metric is the target database in the gv\$buffered_queues and gv\$buffered_subscribers tables.

User Action

Either increase Streams Pool size and /or increase Apply Parallelism to speed up Apply processing.

6.39 Streams Apply Queue - Persistent

The metrics in the Streams Apply Queue - Persistent metrics category show the number of messages in a persistent queue in READY state and WAITING state for each apply process.

6.39.1 Streams Apply - (%)Messages in Waiting State

This metric shows the percentage of messages in a wait state.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Messages waiting for Apply process [%APPLY_NAME%] queue is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Apply Name and Messages Delivery Mode objects.

If warning or critical threshold values are currently set for any unique combination of Apply Name and Messages Delivery Mode objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Apply Name and Messages Delivery Mode objects, use the Edit Thresholds page.

Data Source

The data source for this metric is Target Database and Apply Queue.

User Action

No user action is required.

6.40 Streams Apply Reader Statistics

The reader server for an apply process dequeues messages from the queue. The reader server computes dependencies between LCRs and assembles messages into transactions. The reader server then returns the assembled transactions to the coordinator, which assigns them to idle apply servers.

The metrics in this metric category show the total number of messages dequeued by the reader server for the apply process since the last time the apply process was started.

6.40.1 Rate at Which Messages Are Getting Spilled (Per Sec)

The reader server for an apply process dequeues messages from the queue. The reader server computes dependencies between LCRs and assembles messages into

transactions. The reader server then returns the assembled transactions to the coordinator, which assigns them to idle apply servers.

This metric shows the rate at which message are getting spilled (per second) by the reader server for the apply process since the last time the apply process was started.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9iR2, 10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Total number of spilled messages for Apply Process [%APPLY_NAME%] is %value% .

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Apply Name object.

If warning or critical threshold values are currently set for any Apply Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Apply Name object, use the Edit Thresholds page.

Data Source

For this metric, the data source is Target database, gv\$streams_apply_reader view.

User Action

No user action is required.

6.41 Streams Capture Queue Statistics

The metrics in this metric category show the current total number of messages in a buffered queue that were enqueued by each capture process and the total number of messages enqueued by each capture process that have spilled from memory into the queue spill table.

If queue publishers other than the capture process enqueue messages into a buffered queue, then the values shown can include messages from these other queue publishers.

6.41.1 Streams Capture - (%)Spilled Messages

Queue spill indicates the messages are staying in memory longer. It can also indicate that the Propagation or Apply Process is slow to consume the enqueued messages.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Spilled messages for Capture process %CAPTURE_NAME% queue is %value% percent.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each Capture Name object.

If warning or critical threshold values are currently set for any Capture Name object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each Capture Name object, use the Edit Thresholds page.

Data Source

The source of this metric is the target database in the gv\$buffered_queues table view.

User Action

Increase Streams Pool Size to avoid queue spills.

6.42 Streams Latency and Throughput

The metrics in the Streams Latency and Throughput metrics category collect information about latency and throughput for each capture, propagation and apply component in the database. Latency and throughput are important indicators for the overall performance of the streams path.

6.42.1 Latency

High Latency indicates that the components are slow.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Latency for Streams %streams_process_type% Process %streams_process_name% is %value% seconds.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects.

If warning or critical threshold values are currently set for any unique combination of Streams Process Name and Streams Process Type objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects, use the Edit Thresholds page.

Data Source

The data source for this metric is the target database in the gv\$streams_capture, gv\$propagation_sender, and gv\$streams_apply_server views.

User Action

Identify and correct the least performing component in the streams configuration.

6.42.2 Throughput (per sec)

This metric collects information about throughput for each capture, propagation and apply component in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10gR2, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Throughput for Streams %streams_process_type% Process %streams_process_name% is %value% messages/sec.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects.

If warning or critical threshold values are currently set for any unique combination of Streams Process Name and Streams Process Type objects, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each unique combination of Streams Process Name and Streams Process Type objects, use the Edit Thresholds page.

Data Source

Not available.

User Action

The required actions are specific to your site.

6.43 Streams Processes Count

The metrics in this metric category show the total number of Streams capture processes, propagations, and apply processes at the local database. This metric also shows the number of capture processes, propagations, and apply processes that have encountered errors.

6.43.1 Apply Processes Having Errors

This metric shows the number of apply processes that have encountered errors at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 10 Minutes

Data Source

The information in this metric is in the DBA_APPLY data dictionary view.

User Action

If an apply process has encountered errors, then correct the conditions that caused the errors.

6.43.2 Capture Processes Having Errors

This metric shows the number of capture processes that have encountered errors at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 10 Minutes

Data Source

The information in this metric is in the DBA_CAPTURE data dictionary view.

User Action

If a capture process has encountered errors, then correct the conditions that caused the errors.

6.43.3 Number of Apply Processes

This metric shows the number of apply processes at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 10 Minutes

Data Source

The information in this metric is in the `DBA_APPLY` data dictionary view.

User Action

Use this metric to determine the total number of apply processes at the local database.

6.43.4 Number of Capture Processes

This metric shows the number of capture processes at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 10 Minutes

Data Source

The information in this metric is in the `DBA_CAPTURE` data dictionary view.

User Action

Use this metric to determine the total number of capture processes at the local database.

6.43.5 Number of Propagation Jobs

This metric shows the number of propagations at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 10 Minutes

Data Source

The information in this metric is in the `DBA_PROPAGATION` data dictionary view.

User Action

Use this metric to determine the total number of propagations at the local database.

6.43.6 Propagation Errors

This metric shows the number of propagations that have encountered errors at the local database.

Target Version	Collection Frequency
10g, 11g, 12c	Every 10 Minutes

Data Source

The information in this metric is in the DBA_PROPAGATION data dictionary view.

User Action

If a propagation has encountered errors, then correct the conditions that caused the errors.

6.44 Streams Propagation - Message State Stats

The metrics in this metric category collect the number of messages in Ready and Waiting state for each Propagation process.

6.44.1 Streams Prop - (%)Messages in Waiting State

This metric collects the number of messages in Ready state for each Propagation process.

Target Version	Collection Frequency
9iR2, 10g, 11g, 12c	Every 30 Minutes

Data Source

The source of the data for this metric is the target database in the source and destination queues.

User Action

No user action is required.

6.45 Suspended Session

The metrics in this metric category contain the metrics that represent the number of resumable sessions that are suspended due to a correctable error.

6.45.1 Suspended Session Count

This metric represents the number of resumable sessions currently suspended in the database.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i	Every 5 Minutes	0	Not Defined	%value% session(s) are suspended.

Data Source

This metric is calculated with the following command:

```
SELECT count (*)
```

```
FROM v$resumable
WHERE status = 'SUSPENDED' and enabled = 'YES'
```

User Action

Query the v\$resumable view to see what the correctable errors are that are causing the suspension. The method to correct each error depends on the nature of the error.

6.46 Tablespace Allocation

The metrics in this metric category check the amount of space used and the amount of space allocated to each tablespace. The used space can then be compared to the allocated space to determine how much space is unused in the tablespace. This metric is intended for reporting, rather than alerts. Historical views of unused allocated free space can help DBAs to correctly size their tablespaces, eliminating wasted space.

6.46.1 Tablespace Allocated Space (MB)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The allocated space of a tablespace is the sum of the current size of its data files. A portion of this allocated space is used to store data while some may be free space. If segments are added to a tablespace, or if existing segments grow, they will use the allocated free space. The allocated free space is only available to segments within the tablespace. If, over time, the segments within a tablespace are not using this free space, the allocated free space is not being used.

This metric calculates the space allocated for each tablespace. It is not intended to generate alerts. Rather it should be used in conjunction with the Allocated Space Used (MB) metric to produce a historical view of the amount of space being used and unused by each tablespace.

Data Source

Tablespace Allocated Space (MB) is calculated by looping through the tablespaces data files and totalling the size of the data files.

6.46.2 Tablespace Used Space (MB)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

The allocated space of a tablespace is the sum of the current size of its data files. Some of this allocated space is used to store data, and some of it may be free space. If segments are added to a tablespace, or if existing segments grow, they will use the allocated free space. The allocated free space is only available to segments within the tablespace. If, over time, the segments within a tablespace are not using this free space, then the allocated free space is being wasted.

This metric calculates the space used for each tablespace. It is not intended to generate alerts. Rather it should be used in conjunction with the Tablespace Allocated Space (MB) metric to produce a historical view of the amount of space being used and unused by each tablespace.

Data Source

Tablespace Used Space (MB) is derived from Tablespace Allocated Space (MB) Tablespace Allocated Free Space (MB) where:

Tablespace Allocated Space (MB) is calculated by looping through the tablespaces data files and totaling the size of the data files.

Tablespace Allocated Free Space (MB) is calculated by looping through the tablespaces data files and totaling the size of the free space in each data file.

6.47 Tablespaces Full

The metrics in this metric category check for the amount of space used by each tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space accounts for the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if data files can extend and there is enough disk space available for them to extend.

6.47.1 Tablespace Free Space (MB)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each tablespace. This metric is intended for larger tablespaces, where the Available Space Used (%) metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] has [%value% mbytes] free
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Generated By Database Server

Data Source

The source of the data for this metric is MaximumSize Total Used Space where:

- TotalUsedSpace: Total used space in MB of tablespace.
- MaximumSize: Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thereby increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

6.47.2 Tablespace Space Used (%)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files have reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks the Available Space Used (%) for each tablespace. If the percentage of used space is greater than the values specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
8i, 9i	Every 30 Minutes	85	97	Tablespace [%name%] is [%value% percent] full
10g, 11g, 12c	Every 30 Minutes	85	97	Generated By Database Server

Data Source

This metric is calculated with the following command where:

- TotalUsedSpace: total used space in MB of tablespace.
- MaximumSize: Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

$(\text{TotalUsedSpace} / \text{MaximumSize}) * 100$

For additional information about the data source, refer to the fullTbsp.pl Perl script located in the sysman/admin/scripts directory.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thus increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

6.48 Tablespaces Full (dictionary managed)

The metrics in this metric category check for the amount of space used by each tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space accounts for the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if data files can extend, and there is enough disk space available for them to extend.

6.48.1 Tablespace Free Space (MB) (dictionary managed)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files have reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each tablespace. This metric is intended for larger tablespaces, where the Available Space Used (%) metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] has [%value% mbytes] free.

Data Source

The source of the data for this metric is MaximumSize Total Used Space where:

- TotalUsedSpace: Total used space in MB of tablespace.
- MaximumSize: Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

6.48.2 Tablespace Space Used (%) (dictionary managed)

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files have reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks the Available Space Used (%) for each tablespace. If the percentage of used space is greater than the values specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
10g, 11g, 12c	Every 30 Minutes	85	97	Tablespace [%name%] is [%value% percent] full

Data Source

The source of the data for this metric is $(\text{TotalUsedSpace} / \text{MaximumSize}) * 100$ where:

- **TotalUsedSpace:** Total used space in MB of tablespace.
- **MaximumSize:** Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thereby increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

6.49 Tablespaces With Problem Segments

The metrics in this metric category check for the following:

- The largest chunk-free space in the tablespace. If any table, index, cluster, or rollback segment within the tablespace cannot allocate one additional extent, then an alert is generated.

- Whether any of the segments in the tablespace are approaching their maximum extents. If, for any segment, the maximum number of extents minus the number of existing extents is less than 2, an alert is generated.

Only the tablespaces with problem segments are returned as results.

6.49.1 Segments Approaching Maximum Extents Count

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric checks for segments nearing the upper limit of the number of maximum extents. If the number of segments is greater than the values specified in the threshold arguments, a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0	Not Defined	%value% segments in %name% tablespace approaching max extents.

Data Source

The source of the data for this metric is the number of segments for which the maximum number of extents minus the number of existing extents is less than 2.

For additional information about the data source, refer to the problemTbsp.pl Perl script located in the sysman/admin/scripts directory.

User Action

If possible, increase the value of the segments MAXEXTENTS storage parameter. Otherwise, rebuild the segment with a larger extent size ensuring the extents within a segment are the same size by using a locally managed tablespace. For a dictionary managed tablespace, specify STORAGE parameters where NEXT=INITIAL and PCTINCREASE = 0.

6.49.2 Segments Not Able to Extend Count

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric checks for segments that cannot allocate an additional extent. If the number of segments is greater than the values specified in the threshold arguments, a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0	Not Defined	%value% segments in %name% tablespace unable to extend.

Data Source

After checking for the largest chunk free space in the tablespace, this is the number of segments that cannot allocate an additional extent.

For additional information about the data source, refer to the problemTbsp.pl Perl script located in the sysman/admin/scripts directory.

User Action

Perform one of the following:

- Increase the size of the tablespace by enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thereby increasing the free space in this tablespace.

6.50 Temporary File Status

This metric category contains the Temporary File Status metric.

6.50.1 Temporary File Id

The absolute file number of the temporary file, used to join with other database tables and views to retrieve additional information.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i, 10g, 11g, 12c	Every 15 Minutes	OFFLINE	Not Defined	The temporary file %NAME% is %STATUS%.

6.51 Total Objects by Schema

The metrics in this metric category contain the metric that provides the number of database objects in a schema.

6.51.1 Total Object Count

This metric displays the total number of database objects in a schema.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 24 Hours	Not Defined	Not Defined	%value% object(s) exist in the %owner% schema.

6.52 Total Tables by Schema

The metrics in this metric category provide the number of tables in a schema.

6.52.1 Total Table Count

This metric displays the total number of tables in a schema.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 24 Hours	Not Defined	Not Defined	%value% table(s) exist in the %owner% schema.

6.53 User Block

The metrics in this metric category contain the metrics that tell to what extent, and how consistently, a given session is blocking multiple other sessions.

6.53.1 Blocking Session Count

For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

This metric signifies that a database user is blocking at least one other user from performing an action, such as updating a table. An alert is generated if the number of consecutive blocking occurrences reaches the specified value. The sessions being blocked can come from different instances.

Note: The catblock.sql script needs to be run on the managed database prior to using the User Blocks test. This script creates some additional tables, view, and public synonyms that are required by the User Blocks test.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 5 Minutes	0	Not Defined	Session %sid% blocking %value% other sessions for all instances.

Data Source

This metric is calculated using the following command:

```
SELECT blocking_sid, num_blocked
FROM ( SELECT blocking_sid, SUM(num_blocked) num_blocked
FROM ( SELECT l.id1, l.id2,
MAX(DECODE(l.block, 1, i.instance_name||'-'||l.sid,
2, i.instance_name||'-'||l.sid, 0 )) blocking_sid,
SUM(DECODE(l.request, 0, 0, 1 )) num_blocked
FROM gv$lock l, gv$instance i
WHERE ( l.block!= 0 OR l.request > 0 ) AND
l.inst_id = i.inst_id
GROUP BY l.id1, l.id2)
GROUP BY blocking_sid
ORDER BY num_blocked DESC)
WHERE num_blocked != 0
```

User Action

Either have the user who is blocking other users rollback the transaction, or wait until the blocking transaction has been committed.

6.54 User Locks

The metrics in this metric category provide information regarding user locks.

Enterprise Manager will issue the alert when the Maximum Blocked Session Count or maximum blocked DB time (seconds) of transactional locks: TM, TX, UL reach the threshold.

6.54.1 Maximum Blocked DB Time (seconds)

This metric represents the maximum time wasted in any given lock chain, not for the total time wasted by everyone in any lock chain.

Target Version	Key	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i, 10g, 11g, 12c	lockType= TM	Every 10 Minutes	Not Defined	Not Defined	%value% seconds in DB Time is spent waiting for %lockType% lock.
9i, 10g, 11g, 12g	lockType= TX	Every 10 Minutes	Not Defined	Not Defined	%value% seconds in DB Time is spent waiting for %lockType% lock.
9i, 10g, 11g, 12c	lockType = UL	Every 10 Minutes	Not Defined	Not Defined	%value% seconds in DB Time is spent waiting for %lockType% lock.

Multiple Thresholds

For this metric you can set different warning and critical threshold values for each User Lock Type object.

If warning or critical threshold values are currently set for any User Lock Type object, those thresholds can be viewed on the Metric Detail page for this metric.

To specify or change warning or critical threshold values for each User Lock Type object, use the Edit Thresholds page.

Data Source

The data for the metric is retrieved from database view gv\$session.

User Action

You can set the threshold for warning alert or critical alert for maximum Blocked DB Time (seconds). When maximum time wasted in any given lock chain reaches the threshold, Enterprise Manager will issue the alert.

6.54.2 Maximum Blocked Session Count

This metric represents the maximum length of any lock chain, not for the total number of people stuck in lock chains.

Target Version	Key	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
9i, 10g, 11g, 12c	lockType= TM	Every 10 Minutes	Not Defined	Not Defined	%value% sessions are blocked by %lockType% lock.
9i, 10g, 11g, 12c	lockType= TX	Every 10 Minutes	Not Defined	Not Defined	%value% sessions are blocked by %lockType% lock.
9i, 10g, 11g, 12c	lockType= UL	Every 10 Minutes	Not Defined	Not Defined	%value% sessions are blocked by %lockType% lock.

This chapter provides information about the listener metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

You can use Enterprise Manager to manage Oracle listener targets. From the Enterprise Manager Listener home page, you can monitor key metrics that can help determine the performance and availability of the listener and help you troubleshoot potential performance problems.

7.1 General Status

This metric category contains a set of metrics that provide general information about the listener target. For more information, see the section on Listener Administration in the *Oracle Database Net Services Administrator's Guide*.

7.1.1 Alias

This metric provides the alternative name for the listener. On the Metric Detail page, you can see the value of this metric only when you select one of the Real Time refresh options. The alias also appears on the Listener home page.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the STATUS command of the Listener Control Utility.

7.1.2 Security

This metric shows whether or not a password is required to run specific commands with the Listener Control Utility.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the STATUS command of the Listener Control Utility.

7.1.3 SID List

This metric lists the System Identifiers (SIDs) for the services monitored by the listener.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The list of SIDs for the listener is stored in the `listener.ora` configuration file.

7.1.4 SNMP Status

This metric indicates whether or not the listener can respond to queries from an SNMP-based network management system.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the STATUS command of the Listener Control Utility.

7.1.5 Start Date

This metric represents the date and time when the listener was last started. On the Metric Detail page, you can see the value of this metric only when you select one of the Real Time refresh options. This metric also appears on the Enterprise Manager Listener home page.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the STATUS command of the Listener Control Utility.

7.1.6 TNS Address

This metric displays the protocol, host, and port information for the listener. On the Metric Detail page, you can see the value of this metric only when you select one of the Real Time refresh options. The TNS address also appears on the Listener home page.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The TNS address of the Listener is defined in the `listener.ora` configuration file.

7.1.7 Trace Level

This metric represents the level of tracing currently enabled for the listener. Tracing can be used to troubleshoot problems with the listener by saving additional information to the trace file. For more information about the trace levels you can set for the listener, see the information about the Listener Control Utility in the *Oracle Database Net Services Reference Guide 10g Release 2 (10.2)*.

On the Metric Detail page, you can see the value of this metric only when you select one of the Real Time refresh options.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the STATUS command of the Listener Control Utility.

7.1.8 Version

This metric provides the version of the listener software. On the Metric Detail page, you can see the value of this metric only when you select one of the Real Time refresh options. This metric also appears on the Enterprise Manager Listener home page.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the STATUS command of the Listener Control Utility.

7.2 Listener Ports

This metric category collects configuration data for the listener such as ports, protocol, and host. It is calculated using the `lsnrctl status <listener Name>` command on all platforms.

7.3 Listener Services

This metric category collects configuration data for the services registered to the listener (for example, service name, SID, or service).

It is calculated using the `lsnrctl status <listener Name>` command on all platforms.

7.4 Load

This metric category contains a set of metrics that provide information about the number of connections supported by the listener over a period of time. For more information, see the section on Listener Administration in the *Oracle Database Net Services Administrator's Guide*.

7.4.1 Connections Established

This metric provides the number of connections established since the listener was last started.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the `SERVICES` command of the Listener Control Utility.

User Action

If you are experiencing performance issues with the database or other services supported by the listener, review the historical values of this metric to determine whether or not the performance problems are caused by excessive load on the listener or host.

7.4.2 Connections Established (per min)

This metric reports the average number of connections per minute that were established with the listener.

Data Source

The data is derived from the Listener Control Utility.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

User Action

If you are experiencing performance issues with the database or other services supported by the listener, review the historical values of this metric to determine whether or not the performance problems are caused by excessive load on the listener or host.

7.4.3 Connections Refused

This metric reports the number of connections to the listener that were refused. A connection can be refused for a variety of reasons, including situations where the database or other listener service is down, or if the connection timed out.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the `SERVICES` command of the Listener Control Utility.

User Action

If Enterprise Manager reports a high number of refused connections, check the availability and performance of the database or other services supported by the listener.

7.4.4 Connections Refused (per min)

This metric reports the average number of connections that were refused per minute.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The data is derived from the Listener Control Utility.

User Action

If Enterprise Manager reports a high number of refused connections, check the availability and performance of the database or other services supported by the listener.

7.5 Response

This metric category contains the response and status metrics that provide performance information about the Listener.

7.5.1 Response Time (msec)

This metric represents the time (in milliseconds) that it takes for the Listener to respond to a network request (ping).

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 5 Minutes	400	1000	Listener response to a TNS ping is %value% msec.

Data Source

The value of this metric is derived using the `TNSPING` command. For more information about the `TNSPING` command, see the *Oracle Database Net Services Administrator's Guide*.

User Action

If the listener response time consistently exceeds the threshold, then there can be a number of possible causes, such as slow DNS resolution, network congestion, or other network-specific factors. For more information about investigating these issues, see the My Oracle Support Note, *Oracle Net Performance Tuning* (Doc ID 67983.1):

<https://support.oracle.com/epmos/faces/DocumentDisplay?id=67983.1>

7.5.2 Status

This metric returns a value of 1 if the listener is up and running. It returns a 0 if the listener is unavailable.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every 5 Minutes	Not Defined	0	The listener is down: %oraerr%.

Data Source

The data is derived from the from the `STATUS` command in the Listener Control Utility. For more information, see the *Oracle Database Net Services Administrator's Guide*.

User Action

When the listener is down, users cannot access the database or other services on this host. Review the troubleshooting information in *Oracle Database Net Services Administrator's Guide*.

7.6 TNS Errors

This metric category contains metrics that perform incremental scanning of listener log files for security errors. For releases earlier than Oracle Database Plug-in Release 12.1.0.4, these error codes are predefined and can be any of the following:

- 1169
- 1189
- 1190
- 12508

7.6.1 TNSMsg

This metric reports the TNS error message.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
Not Available	Every Hour	Not Defined	TNS-[]*0*(1169 1189 12508 1190)	%tnserr% error occurred.Please check log for details.

Oracle Exadata

This chapter provides information about the Oracle Exadata metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

It includes the metrics collected for the following target types:

- [Oracle Exadata Storage Server](#)
- [Oracle Database Exadata Storage Server System](#)
- [Oracle Exadata Storage Server Grid](#)

8.1 Oracle Exadata Storage Server

The Oracle Exadata target monitors the software and hardware performance of an individual Oracle Exadata Storage Server in the database.

8.1.1 Aggregated Exadata Capacity

This metric category contains the aggregated metrics of the Exadata Capacity metric category and it collects every 60 minutes.

8.1.1.1 Disk Size (GB)

This metric gives an indication of the size of the status in GB.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

8.1.1.2 Disk Type

This metric reports the metrics are for hard disk, flash disk, flash cache, and grid disk.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

8.1.1.3 Usage (%)

This metric gives an indication of the percentage utilization total number of bytes written to the hard disk, flash disk, flash cache, and grid disk.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

8.1.2 Aggregated Exadata CellDisk

This metric category contains the aggregated cell disk performance metrics. The metric values are aggregated over all the cell disks in a cell. They are mainly aggregated via averaging and totaling.

8.1.2.1 Average CellDisk IO Load

This metric gives an indication of the average input/output load to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.2 Average CellDisk Read IOPS

This metric gives an indication of the average number of read input/output operations per second.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.3 Average CellDisk Read Response Time

This metric gives an indication of the average read response time to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.4 Average CellDisk Read Throughput

This metric gives an indication of the average number of bytes read from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.5 Average CellDisk Write IOPS

This metric gives an indication of the average number of write input/output operations to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.6 Average CellDisk Write Response Time

This metric gives an indication of the average write response time to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.7 Average CellDisk Write Throughput

This metric gives an indication for the average number of bytes written to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.8 Maximum CellDisk IO Load

This metric gives an indication of the maximum input/output load to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.9 Total CellDisk Read Throughput

This metric gives an indication for the total number of bytes read from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.10 Total CellDisk Write IOPS

This metric gives an indication of the total number of write input/output operations per second to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.11 Total CellDisk Write Throughput

This metric gives an indication of the total number of bytes written to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.12 Total CellDisk IO Load

This metric gives an indication of the total input/output load to the celldisk. The Total CellDisk IO load is the aggregated number of IO requests waiting to be serviced by the storage server disks at any given point in time. You can think of this as the length of the queue for I/O requests.

Because the type of requests can be either for small or large reads, there is not one number that would indicate a potential performance issue. Oracle cannot recommend a number as each customer environment is often unique. Monitor the value of the I/O load and a number that correlates with poor response time will be a good candidate

for a metric threshold. An Exadata system is underutilized if the I/O load is less than 20.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.2.13 Total CellDisk Read IOPS

This metric gives an indication of the total number of read input/output operations per second to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.3 Aggregated Exadata Diskgroup Capacity

This metric category contains the aggregated capacity metrics for ASM instances and disk groups.

8.1.3.1 ASM Instance

This metric reports the ASM instance name for the aggregated exadata diskgroup.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

8.1.3.2 Count

This metric reports the total grid disk number for the specific diskgroup.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

8.1.3.3 Diskgroup Name

This metric reports the name of the aggregated exadata diskgroup.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

8.1.3.4 Size (GB)

This metric reports the diskgroup size in GB of the aggregated exadata diskgroup.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

8.1.4 Aggregated Exadata FlashDisk and HardDisk

This metric category contains metrics that are aggregated over either the hard disks or flash disks in a cell.

8.1.4.1 Average CellDisk IO Load

This metric reports the average input and output load to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.2 Average CellDisk Large Read IOPS

This metric indicates the average number of read input and output operations from large blocks in a cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.3 Average CellDisk IO Utilization

This metric indicates the average utilization for I/O requests from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.4 Average CellDisk Large Read Response Time

This metric reports the average response time to read large blocks from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.5 Average CellDisk Large Read Throughput

This gives an indication of the average number of bytes read from the large blocks from the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.6 Average CellDisk Large Write IOPS

This gives an indication of the average number of input and output operations written to large blocks of the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.7 Average CellDisk Large Write Response Time

This gives an indication of the average response time when writing large blocks to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.8 Average CellDisk Large Write Throughput

This gives an indication of the total number of bytes when writing large blocks to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.9 Average CellDisk Read IOPS

This metric gives an indication of the average number of read input/output operations from the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.10 Average CellDisk Read Response Time

This metric reports the average read response time to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.11 Average CellDisk Read Throughput

This metric gives an indication of the average number of bytes read from the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.12 Average CellDisk Small Read IOPS

This gives an indication of the average number of read input and output operations from small blocks in a cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.13 Average CellDisk Small Read Response Time

This metric reports the average response time when reading small blocks from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.14 Average CellDisk Small Read Throughput

This gives an indication of the average number of bytes read from the small blocks from the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.15 Average CellDisk Small Write IOPS

This gives an indication of the average number of input and output operations written to small blocks of the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.16 Average CellDisk Small Write Response Time

This metric reports the average response time when writing small blocks to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.17 Average CellDisk Small Write Throughput

This gives an indication of the total number of bytes when writing small blocks to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.18 Average CellDisk Write IOPS

This metric gives an indication of the average number of input/output operations written to the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

8.1.4.19 Average CellDisk Write Response Time

This metric reports the average response time when writing to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.20 Average CellDisk Write Throughput

This metric gives an indication of the average number of bytes written to the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.21 CellDisk Type

This metric reports the type of Cell disk, either hard disk or flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.22 Maximum CellDisk Small Read Response Time

This metric reports the maximum response time when reading small blocks from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.23 Maximum CellDisk Small Write Response Time

This metric reports the maximum response time when writing small blocks to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.24 Total CellDisk IO Load

This metric reports the total input/output load to the celldisk. The Total CellDisk IO load is the aggregated number of IO requests waiting to be serviced by the storage server disks at any given point in time. You can think of this as the length of the queue for I/O requests.

Because the type of requests can be either for small or large reads, there is not one number that would indicate a potential performance issue. Oracle cannot recommend a number as each customer environment is often unique. Monitor the value of the I/O load and a number that correlates with poor response time will be a good candidate for a metric threshold. An Exadata system is underutilized if the I/O load is less than 20.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.25 Total CellDisk IO Utilization

This metric reports the total utilization for I/O requests to the celldisk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.26 Total CellDisk Read IOPS

This metric reports the total number of bytes read from the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.27 Total CellDisk Read Throughput

This metric reports the total number of bytes read from the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.28 Total CellDisk Write IOPS

This metric reports the total number of bytes written to the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.4.29 Total CellDisk Write Throughput

This metric reports the total number of bytes written to the hard disks or flash disks in a cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.5 Cell Generated Alert

This metric category contains the cell generated alert metrics. This is shown whenever the Exadata Storage server (cell) generates alert and the Enterprise Manager subscribes to the cell's SNMP alert.

8.1.5.1 Action

This metric shows the recommended action to perform for this alert.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.2 ADR Incident ID

This metric shows the alert Automatic Diagnostic Repository (ADR) unique identifier for Enterprise Manager Incident Manager.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.3 ADR Problem Key

This metric shows the alert ADR problem key.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.4 ADR Trace File Name

This metric shows the Alert ADR Trace file.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.5 Alert Begin Time

This metric shows the time stamp when an alert changes its state.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.6 Alert Object

This metric shows the Alert Object Name, such as cell disk or grid disk, for which a metric threshold has caused an alert.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.7 Alert Name

This metric shows the name of the alert.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.8 Alert Sequence

This metric shows the alert sequence.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.9 Alert Type

This metric shows the type of the alert. Values are stateful or stateless.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
11g, 12c	N/A	Warning	Critical	Alert from %target% is cleared: %msg%

8.1.5.10 ECID

This metric shows the Alert ADR Execution Context Id.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.11 Examined By

This metric shows the administrator who reviewed the alert.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.12 Msg

This metric shows a brief explanation of the alert.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.13 Notification

This metric shows the number indicating progress in notifying subscribers to alert messages.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.14 Sequence Begin Time

This metric shows the time stamp when an alert sequence ID is first created.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.5.15 Severity

This metric shows the Severity level. Possible values are clear, info, warning, or critical.

Target Version	Collection Frequency
11g, 12c	N/A

8.1.6 CellSrv Status

This metric category contains the cell server status metric.

8.1.6.1 CellSrv Status

This metric shows the status of the cell server.

Target Version	Collection Frequency
11g, 12c	Every 15 Minutes

8.1.7 Exadata Cell Metric

This metric category contains the performance metrics collected at the cell level for each cell, such as CPU utilization and memory utilization.

8.1.7.1 Cell Name

This metric reports the exadata cell name.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.7.2 CPU Utilization

This metric provides information about the CPU utilization.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	CPU Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.7.3 Disk I/O Objective

This metric provides the optimization objective which IORM is configured to achieve. For example, "Low Latency" or "Balanced" for OLTP-oriented databases, or "High Throughput" for data warehouses.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.7.4 Exadata Run Queue Length

This metric provides information about the Exadata run queue length.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Exadata Run Queue Length for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.7.5 Exadata Temperature Lower Threshold

This metric reports the lower or minimum temperature threshold for the ambient operating temperature for the Exadata machine.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Exadata Temperature Lower Threshold for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.7.6 Exadata Temperature Reading

This metric reports the ambient operating temperature for the Exadata machine.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.7.7 Exadata Temperature Upper Threshold

This metric reports the upper or maximum temperature threshold for the ambient operating temperature for the Exadata machine.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Exadata Temperature Upper Threshold for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.7.8 IORM Boost

This metric reports the ratio of the cumulative number of positions in the I/O queue that were skipped because of IORM scheduling to the number of I/Os that were scheduled.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.7.9 LED Status

This metric provides the status of the locator LED (on or off).

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.7.10 Memory Utilization

This metric provides information about the memory utilization.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Memory Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.7.11 Network Received

This metric reports the total number of I/O packets received by interconnections per second.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.7.12 Network Sent

This metric reports the total number of I/O packets transmitted by interconnections per second.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.7.13 Offload Efficiency

This metric provides information about the offload efficiency.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Offload Efficiency for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8 Exadata CellDisk Metric

This metric category contains performance metrics for each cell disk. The metric values are collected for each cell disk.

8.1.8.1 Average Large Read Response Time

This metric reports the average response time to read large blocks from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.2 Average Large Write Response Time

This metric reports the average response time when writing large blocks to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.3 Average Read Response Time

This metric reports the average read response time to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.4 Average Small Read Response Time

This metric reports the average response time when reading small blocks from the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.5 Average Small Write Response Time

This metric reports the average response time when writing small blocks to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.6 Average Write Response Time

This metric reports the average response time when writing to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.7 CellDisk Type

This metric reports the celldisk type, either hard disk or flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.8 IO Load

This metric reports the average input/output load to the cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.9 IO Utilization

This metric reports the percentage utilization for I/O requests.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.10 Large Read Bytes

This metric reports the number of MB read in large blocks from a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Large Read Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.11 Large Read Requests

This metric reports the number of requests to read large blocks from a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Large Read Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.12 Large Write Bytes

This metric reports the number of MB written in large blocks to a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Large Write Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.13 Large Write Requests

This metric reports the number of requests to write large blocks to a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Large Write Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.14 Object Name

This metric reports the cell disk name.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.15 Read IOPS

This metric reports the number of read input/outputs per second to a cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.16 Read Throughput (MBPS)

This metric reports the number of bytes in MB per second read from a cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.17 Small Read Bytes

This metric reports the number of MB read in small blocks from a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Small Read Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.18 Small Read Requests

This metric reports the number of requests to read small blocks from a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Small Read Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.19 Small Write Bytes

This metric reports the number of MB written in small blocks to a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Small Write Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.20 Small Write Requests

This metric reports the number of requests to write small blocks to a cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Small Write Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.8.21 Write IOPS

This metric reports number of write input/outputs operations per second to a cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.8.22 Write Throughput (MBPS)

This metric reports the number of bytes in MB per second written to a cell disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.9 Exadata CellDisk Load Imbalance

This metric category contains the Exadata CellDisk Load Imbalance metrics.

8.1.9.1 IO Load Imbalance

This metric gives an indication of the percentage of maximum average I/O load from the cell disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	CellDisk %object_name% is %cd_io_load_imbalance%% load imbalance, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.9.2 Object Name

This metric gives an indication of the object, such as hard disk or flash disk name.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.10 Exadata Disk Status Metric

This metric category contains the status of the physical Exadata disk.

8.1.10.1 Disk Status

This metric reports the status of the physical disk.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 1 Hour	Not Defined	Not Defined	Physical Disk Status %target%:%object_name% is %value%, equaled to warning (%warning_threshold%) or critical (%critical_threshold%) value.

8.1.11 Exadata Flash Cache Metric

This metric category contains the performance metrics for the flash cache in a cell.

8.1.11.1 Cell Name

This metric provides the name of the Exadata Storage Server on which the flash cache belongs to.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.2 Default Hits

This metric reports the number of read requests satisfied from flash cache non-keep objects since the last metric collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.3 Default Hits (%)

This metric reports the percentage of read requests to non-keep objects that are satisfied from flash cache since the last metric collection. Exadata Storage Server automatically decides which objects will be put in flash cache as non-keep objects. In general, the higher the hits rate, the better the performance.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Default hits rate for %target%:%object_name%:%cell_ name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.11.4 Default Misses

This metric reports the number of read requests to non-keep objects which did not find all data in flash cache since the last metric collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.5 Default Misses (%)

This metric reports the percentage of read requests to non-keep objects which did not find all data in flash cache since the last metric collection. In general, a low number of

read misses indicates better performance. However, in cases where it is not beneficial to put data object of large size into flash cache, a high number of read misses does not necessarily indicate performance issues.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Default misses rate for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.11.6 Default Read IOPS

This metric reports the number of read requests per second which were satisfied from flash cache non-keep objects.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.7 Default Read Throughput (MBPS)

This metric reports the size of data read per second from flash cache non-keep objects.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.8 Default Used (GB)

This metric reports the space used for non-keep objects on flash cache.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.9 Flash Cache All I/O Requests

This metric reports the cumulative number of read requests to flash cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.10 First Writes

The metric reports the cumulative number of requests to write new data to flash cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.11 First Writes Per Second

The metric reports the number of requests per second to write new data to flash cache since the last metric collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.12 Flash Cache I/O Requests Keep Pool Misses

This metric reports the cumulative number of read requests to keep objects which did not find all data in flash cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.13 Flash Cache I/O Requests Read Misses

This metric reports the cumulative number of read requests which did not find all data in flash cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.14 Flash Cache I/O Requests for keep

This metric reports the cumulative number of read requests to keep objects since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.15 Flash Cache Megabytes Read Misses

This metric reports the cumulative size of data read from disk which did not find all data from Flash Cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.16 Flash Cache Megabytes Reads

This metric reports the cumulative size of data read from Flash Cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.17 Flash Cache Megabytes Reads for Keep

This metric reports the cumulative size of data read from Flash Cache keep objects since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.18 Flash Cache Read IOPS

This metric reports the number of read requests per second from Flash Cache for small requests since the last metric collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.19 Keep Hits

This metric shows the number of read requests satisfied from Flash Cache keep objects since the last metric collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.20 Keep Hits (%)

This metric reports the percentage of read requests to keep objects that are satisfied from Flash Cache since the last metric collection. In general, the higher the keep hits rate, the better performance.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Keep hits rate for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.11.21 Keep Misses

This metric reports the number of read requests to keep objects which did not find all data in Flash Cache since the last metric collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.22 Keep Misses (%)

This metric reports the percentage of read requests to keep objects which did not find all data in Flash Cache since the last metric collection. In general, a low number of read misses indicates better performance. However, in cases where it is not beneficial to put data objects of a large size into flash cache, a high number of read misses does not necessarily indicate performance issues.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Keep misses rate for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.11.23 Keep Pool Read IOPS

This metric reports the number of read requests per second which were satisfied from Flash Cache keep objects.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.24 Keep Pool Read Throughput (MBPS)

This metric reports the size of data read per second from Flash Cache keep objects.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.25 Keep Pool Used (GB)

This metric reports the space used for keep objects on Flash Cache.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.26 Read Throughput (MBPS)

This metric reports the size of data read per second redirected from Flash Cache to disk due to the size of the requested object since the last metric collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.27 Requests that are first writes into flash cache

This metric reports the cumulative number of requests to write new data to Flash Cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.28 Requests that are overwrites into Flash Cache

This metric reports the cumulative number of requests to overwrite existing data on Flash Cache since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.29 Used (GB)

This metric reports the size of used space on flash cache.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.11.30 Write IO requests that bypass Flash Cache

This metric reports the cumulative number of writes that bypass flash cache due to the large size of requested objects since the metric was created.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.12 Exadata Flash Log Metric

This metric category contains the Exadata Flash Log metrics.

8.1.12.1 Cell Name

This metric provides the name of the storage server on which the Flash Log resides.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.12.2 Efficiency of Smart Flash Logging (%)

This metric provides the efficiency of Smart Flash Logging expressed as a percentage, that is, the ratio between the number of redo log writes completed by Smart Flash Log and the total number of redo log writes.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.13 Exadata IORM Consumer Group Metric

This metric category contains the Exadata IORM Consumer Group metrics.

8.1.13.1 Average I/O Throughput (MB/Sec)

This metric reports the number of megabytes of I/O per second for this consumer group to hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.13.2 Average Wait Time for I/O (ms/req)

This metric reports the average IORM wait time per request issued by a consumer group.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.13.3 Cell Name

This metric reports the name of Exadata Storage Server.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.13.4 I/O Requests per Second (IO/sec)

This metric reports the number of IO requests issued by a consumer group to hard disks per second.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.13.5 I/O Utilization (%)

This metric reports the percentage of disk resources utilized by requests from this Consumer Group.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14 Exadata IORM DB

This metric category contains the metrics collected for the IORM databases.

8.1.14.1 Average I/O Load

This metric reports the average I/O load from this database for hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.2 Average I/O Throughput (MB/Sec)

This metric reports the number of megabytes of I/O per second for this database to hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.3 Average Wait Time for I/O (ms/req)

This metric reports the average wait time for I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Average Throttle Time per Disk I/O by Database for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.14.4 Average Wait Time for Large I/O (ms/req)

This metric reports the average wait time for large I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Average IORM wait time of Large Request in seconds for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.14.5 Average Wait Time for Small I/O (ms/req)

This metric reports the average wait time for small I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Average IORM wait time of Small Request in seconds for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.14.6 Average latency of reading or writing blocks/request from flash disks

This metric reports the rate which is the average latency of reading or writing blocks per request by a database from flash disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.7 Average latency of reading blocks/request from hard disks

This metric reports the rate which is the average latency of reading blocks per request by a database from hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.8 Average latency of reading large blocks/request from hard disks

This metric reports the rate which is the average latency of reading large blocks per request by a database from hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.9 Average latency of reading small blocks/request from hard disks

This metric reports the rate which is the average latency of reading small blocks per request by a database from hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.10 Cell Name

This metric provides a character string (maximum 400) that specifies the IP addresses of the cell.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.11 Cumulative latency of reading blocks from flash disks

This metric reports the cumulative latency of reading blocks by a database from flash disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.12 Cumulative latency of reading large blocks from hard disks

This metric reports the cumulative latency of reading large blocks by a database from hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.13 Cumulative latency of reading small blocks from hard disks

This metric reports the cumulative latency of reading small blocks by a database from hard disks.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.14 I/O Requests per Second (IO/Sec)

This metric reports the number of IO requests issued by a database to hard disks per second.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.15 I/O Requests per Second - Large (IO/Sec)

This metric reports the number of large IO requests issued by a database to hard disks per second.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.16 I/O Requests per Second - Small (IO/Sec)

This metric reports the number of small IO requests issued by a database to hard disks per second.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.17 IO Utilization (%)

This metric reports the percentage utilization for I/O requests.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.18 Large I/O Utilization (%)

This metric reports the percentage utilization for large I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Database IO Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.14.19 Small IO Utilization (%)

This metric reports the percentage utilization for small I/O requests.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.14.20 Wait Time for Large I/O (ms)

This metric specifies the average number of milliseconds that large I/O requests issued by the database have waited to be scheduled by IORM in the past minute. A large value indicates that the I/O workload from this database is exceeding the allocation specified for it in the interdatabase plan.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Wait Time of Large Requests for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.14.21 Wait Time for Small I/O (ms)

This metric specifies the average number of milliseconds that small I/O requests issued by the database have waited to be scheduled by IORM in the past minute. A large value indicates that the I/O workload from this database is exceeding the allocation specified for it in the interdatabase plan.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Wait Time of Small Requests for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.15 Exadata IORM Pluggable Database Metric

This metric category contains the metrics collected for the IORM pluggable databases.

8.1.15.1 Average I/O Load

This metric reports the average I/O load from this pluggable database for hard disks.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.2 Average I/O Throughput (MB/Sec)

This metric reports the number of megabytes of I/O per second for this consumer group to hard disks.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.3 Average Wait Time for Large I/O (ms/req)

This metric reports the average wait time for large I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 15 Minutes	Not Defined	Not Defined	Average IORM Wait time per Large request in milliseconds for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.15.4 Average Wait Time for Small I/O (ms/req)

This metric reports the average wait time for small I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 15 Minutes	Not Defined	Not Defined	Average IORM Wait time per Small request in milliseconds for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.15.5 Average Wait Time for I/O (ms/req)

This metric reports the average wait time for I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 15 Minutes	Not Defined	Not Defined	Average IORM Wait time per I/O request in milliseconds for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.15.6 Cell Name

This metric provides a character string (maximum 400) that specifies the IP addresses of the cell.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.7 I/O Requests per Second (IO/Sec)

This metric reports the number of IO requests issued by a pluggable database to hard disks per second.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.8 I/O Requests per Second - Large (IO/Sec)

This metric reports the number of large IO requests issued by a pluggable database to hard disks per second.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.9 I/O Requests per Second - Small (IO/Sec)

This metric reports the number of small IO requests issued by a pluggable database to hard disks per second.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.10 I/O Utilization (%)

This metric reports the percentage utilization for I/O requests.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 15 Minutes	Not Defined	Not Defined	IO Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.15.11 Large I/O Utilization (%)

This metric reports the percentage of disk resources utilized by large requests from this Pluggable Database.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.12 Small I/O Utilization (%)

This metric reports the percentage of disk resources utilized by small requests from this Pluggable Database.

Target Version	Collection Frequency
12c	Every 15 Minutes

8.1.15.13 Wait Time for Large I/O (ms)

This metric specifies the average number of milliseconds that large I/O requests issued by the database have waited to be scheduled by IORM in the past minute. A large value indicates that the I/O workload from this database is exceeding the allocation specified for it in the interdatabase plan

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 15 Minutes	Not Defined	Not Defined	Wait Time of Large requests for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.15.14 Wait Time for Small I/O (ms)

This metric specifies the average number of milliseconds that small I/O requests issued by the database have waited to be scheduled by IORM in the past minute.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 15 Minutes	Not Defined	Not Defined	Wait Time of Small requests for %target%:%object_name%:%cell_name% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.16 Exadata Smart IO Metric

This metric category contains the Exadata smart IO metrics.

8.1.16.1 Cell Name

This metric provides a character string (maximum 400) that specifies the IP addresses of the cell.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

8.1.16.2 Megabytes per second of pass through IOs

This metric provides a number of megabytes per second saved by storage index.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

8.1.16.3 Megabytes per second read from flash cache

This metric provides a number of megabytes per second read from flash cache by smart IO.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

8.1.16.4 Megabytes per second read from hard disk

This metric provides a number of megabytes per second read from hard disk by smart IO.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

8.1.16.5 Megabytes per second saved by storage index

This metric provides a number of megabytes per second saved by storage index.

Target Version	Collection Frequency
11gR2, 12c	Every 15 Minutes

8.1.17 Filesystem Utilization

This metric category contains the metrics relating to the filesystem utilization.

8.1.17.1 Cell Name

This metric provides a character string (maximum 400) that specifies the IP addresses of the cell.

Target Version	Collection Frequency
All Versions	Every 24 Hours

8.1.17.2 Filesystem Utilization %

This metric provides the percentage of file system usage on the target.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	File system usage on %target%: %name%:%cell_name% is %value%, which has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.18 HCA Port Configuration Monitor

This metric category contains the HCA port configuration monitor metrics.

8.1.18.1 HCA Node GUID

This metric displays the node GUID.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.18.2 Is this port disconnected (yes/no)

This metric specifies whether the HCA port is disconnected.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	yes	Port %PortNumber%(%CA_Display_Name%) on %target% is disconnected from port %ConnectedToSwitchPortNumPrev% on %ConnectedToSwitchNamePrev%.

8.1.18.3 Port GUID

This metric provides the port GUID.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.18.4 Switch GUID on the other end of the link

This metric provides the GUID of the switch to which this port is connected.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.18.5 Switch Name to which this port is connected

This metric provides the name of the switch to which this port is connected.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.18.6 Switch Port number on the other end of the link

This metric provides the port number of the switch to which this port is connected.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.19 HCA Port Errors

This metric category contains the HCA port error metrics.

8.1.19.1 Excessive buffer overruns

This metric reports the number of “buffer overruns exceeding the threshold” since the last metric collection.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% excessive buffer overruns, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.2 Incoming VL15 packets dropped due to resource limitation

This metric reports the number of incoming VL 15 packets dropped due to lack of buffers since the last metric collection.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% incoming VL15 packets dropped, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.3 Link integrity errors

This metric displays the number of link integrity errors, that is, errors on the local link.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% link integrity errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.4 Link recovers

This metric reports the number of times the link error recovery process was completed successfully since the last metric collection.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% link recovers, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.5 Packets not transmitted due to constraints

This metric reports the number of packets not transmitted due to constraints since the last metric collection.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% packets not transmitted due to constraints, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.6 Received packets discarded due to constraints

This metric reports the number of packets discarded due to constraints since the last metric collection.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% received packets discarded due to constraints, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.7 Received packets marked with the EBP delimiter

This metric reports the number of packets marked with the EBP delimiter received on the port.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% received packets marked with the EBP delimiter, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.8 Received packets with error

This metric reports the number of packets received with errors since the last metric collection.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% received packets containing an error, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.9 Symbol errors

This metric reports the number of symbols errors detected since the last metric collection.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% symbol errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.19.10 Total errors

This metric reports the sum total of all errors listed in this section.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% total errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

8.1.20 HCA Port State

This metric category contains the HCA port state metrics.

8.1.20.1 Active link width of port based on cable connectivity (e.g., 1X)

This metric displays the active link width of the port based on the cable connectivity.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.20.2 Is the link degraded? (active speed or width less than enabled)

This metric reports whether or not the link is degraded. If the active speed of a link is less than the enabled speed, then it is considered to be degraded and this column value is set to 1.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	1	Port %PortNumber%(%ca_disp_name%) is running in degraded mode.

8.1.20.3 Link state (0 = Down, 1 = Active)

This metric reports the link state. The link is down if the physical link state is 0.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.20.4 Physical link state (0 = Disabled/Polling, 1 = LinkUp)

This metric reports the physical link state. The physical link state is 0 if the port is in polling or disabled state.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.20.5 The active link speed (Gbps)

The metric reports the speed of the active link.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.21 HCA Port State (For Alerts)

The metrics in this category describe the host channel adapters (HCA) port state .

8.1.21.1 Is port disabled?

This metric indicates whether the HCA port is disabled.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	1	Port %PortNumber%(%ca_disp_name%) is disabled.

8.1.21.2 Is port in 'polling' state?

This metric indicates whether the HCA port is checking or polling for a peer port.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	1	Port %PortNumber%(%ca_disp_name%) is polling for peer port. This could happen when the cable is unplugged from one of the ends or the other end port is disabled.

8.1.22 Host Interconnect Statistics

This metric category contains the Host Interconnect Statistics metrics.

8.1.22.1 Cell Name

This metric reports the name of Exadata Storage Server.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.22.2 Host MB Dropped Per Sec

This metric reports the number of megabytes dropped during transmission to a particular host in the interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.22.3 Host MB Received Per Sec

This metric reports the number of megabytes received from a particular host in the interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.22.4 Host MB Resent Per Sec

This metric reports the number of megabytes retransmitted to a particular host in the interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.22.5 Host MB sent Per Sec

This metric reports the number of megabytes transmitted to a particular host in the interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.22.6 Host RDMA MB Dropped Per Sec

This metric reports the number of megabytes dropped during RDMA transmission to a particular host in the interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.22.7 Host RDMA Retry Latency (msec)

This metric reports the latency of the retry action during RDMA transmission to a particular host in the interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.23 Response

This metric category contains the metric used to detect whether or not the Management server on the cell is running. This metric is checked at 5 minute intervals. A one in the status column indicates that the cell is up, otherwise the cell is down.

8.1.23.1 Response Status

This metric is checked at 5 minute intervals. A one in the status column indicates that the cell is up, otherwise the cell is down.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	0	%target% is down. MS Status is %MSStatus% and Ping Status is %MgmtNetworkPingStatus%.

8.1.24 Top CPU

This metric category contains the Top CPU metrics.

8.1.24.1 Activity(%)

This metric reports the percentage of total samples from a specific database.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.24.2 Begin Sequence

This metric reports the begin sequence number for collection.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.24.3 Database Name

This metric reports the database unique name ("other" represents unnamed database requests).

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.24.4 End Sequence

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.24.5 Incarnation

This metric reports the cellsrv incarnation number.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.24.6 Samples

This metric reports the total samples collected for a specific database in this interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.24.7 SQLID

This metric reports the SQL unique ID ("0000000000000" represents requests without a SQL ID).

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.1.24.8 Total Samples

This metric reports the total samples collected in this interval.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2 Oracle Database Exadata Storage Server System

The Oracle Database Exadata Storage Server System target type is a system target that contains all the Oracle Exadata targets that provide storage for one single database.

8.2.1 Agg_Exadata_System_Celldisk_Metric

This metric category provides the metrics collected for a group of Exadata targets that are the storage for one database.

8.2.1.1 Average Flash Disk IO Load

This metric indicates the average input/output load to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.2 Average Flash Disk Read IOPS

This metric indicates the average number of bytes read from the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.3 Average Flash Disk Read Throughput

This metric indicates the average number of bytes read from the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.4 Average Flash Disk Write IOPS

This metric indicates the average number of input/output operations written to the Flash disk

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.5 Average Flash Disk Write Throughput

This metric indicates the average number of bytes written to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.6 Average Hard Disk IO Load

This metric indicates the average I/O load to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.7 Average Hard Disk Read IOPS

This metric indicates the average number of read input/output operations from the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.8 Average Hard Disk Read Throughput

This metric indicates the average number of bytes read from the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.9 Average Hard Disk Write IOPS

This metric indicates the average number of input/output operations written to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.10 Average Hard Disk Write Throughput

This metric indicates the average number of bytes written to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.11 Maximum Flash Disk IO Load

This metric indicates the maximum I/O load to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.12 Maximum Flash Disk Read IOPS

This metric indicates the maximum number of read input/output operations per second to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.13 Maximum Flash Disk Read Throughput

This metric indicates the maximum number of bytes read from the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.14 Maximum Flash Disk Write IOPS

This metric indicates maximum number of input/output operations written to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.15 Maximum Flash Disk Write Throughput

This metric indicates maximum number of bytes written to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.16 Maximum Hard Disk IO Load

This metric indicates the maximum I/O load to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.17 Maximum Hard Disk Read IOPS

This metric indicates the maximum number of input/output operations read from the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.18 Maximum Hard Disk Read Throughput

This metric indicates the maximum number of bytes read from the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.19 Maximum Hard Disk Write IOPS

This metric indicates the maximum number of input/output operations written to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.20 Maximum Hard Disk Write Throughput

This metric indicates the maximum number of bytes written to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.21 Minimum Flash Disk IO Load

This metric indicates the minimum I/O load to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.22 Minimum Flash Disk Read IOPS

This metric indicates the minimum number of read input/output operations from the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.23 Minimum Flash Disk Read Throughput

This metric indicates the minimum number of bytes read from the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.24 Minimum Flash Disk Write IOPS

This metric indicates the minimum number of input/output operations written to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.25 Minimum Flash Disk Write Throughput

This metric indicates the minimum number of bytes written to the Flash disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.26 Minimum Hard Disk IO Load

This metric indicates the minimum I/O load to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.27 Minimum Hard Disk Read IOPS

This metric indicates the minimum number of read input/output operations per second to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.28 Minimum Hard Disk Read Throughput

This metric indicates the minimum number of bytes read from the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.29 Minimum Hard Disk Write IOPS

This metric indicates the minimum number of input/output operations written to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.1.30 Minimum Hard Disk Write Throughput

This metric indicates the minimum number of bytes written to the hard disk.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

8.2.2 Response

This metric category contains the metric used to detect the response of the Oracle Database Exadata Storage Server System.

8.2.2.1 Status

This metric's collection frequency is event-driven. A one in the status column indicates that the target is up, otherwise it is down.

Target Version	Collection Frequency
All Versions	Event-driven

8.3 Oracle Exadata Storage Server Grid

The Oracle Exadata Storage Server Grid target type is a system target that contains all the Oracle Exadata targets from the same Exadata Database Machine system.

8.3.1 Response

This metric category contains the metric used to detect the response of the Oracle Exadata Storage Server Grid target.

8.3.1.1 Status

This metric's collection frequency is event-driven. A one in the status column indicates that the target is up, otherwise it is down.

Target Version	Collection Frequency
All Versions	Event-driven

Pluggable Databases

This chapter provides information about the Pluggable Databases (PDB) metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

9.1 Database Feature Usage

This metric category provides details on database feature usage metrics.

9.1.1 Count

This column stores feature-specific usage data in number format.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The AUX_COUNT column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.2 Currently Used

Indicates whether usage was detected the last time the system checked (TRUE) or not (FALSE)

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The CURRENTLY_USED column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.3 DBID

Database identifier of the database being tracked

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The DBID column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.4 Detected Usages

Number of times the system has detected usage for the feature

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The DETECTED_USES column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.5 Feature Info

This column stores feature-specific usage data in character format.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The FEATURE_INFO column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.6 Feature Name

Name of the feature

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The NAME column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.7 First Usage Date

First sample time the system detected usage of the feature

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The FIRST_USAGE_DATE column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.8 Last Sample Date

Amount of time (in seconds) between the last two usage sample times

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The LAST_SAMPLE_DATE column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.9 Last Sample Period

Amount of time (in hours) between the last two usage sample times

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The LAST_SAMPLE_PERIOD column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.10 Last Usage Date

Last sample time the system detected usage of the feature

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The LAST_USAGE_DATE column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.11 Total Samples

Number of times the system has woken up and checked for feature usage

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The TOTAL_SAMPLES column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.1.12 Version

Database version in which the feature was tracked

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The VERSION column from the CDB_FEATURE_USAGE_STATISTICS view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information about which database features are being used.

9.2 Datafiles

This metric category provides details on the datafile metrics.

9.2.1 Autoextensible

Autoextensible indicator.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The AUTOEXTENSIBLE column of the CDB_DATA_FILES view if a permanent datafile or the AUTOEXTENSIBLE column of the CDB_TEMP_FILES view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.2 Datafile Name

Name of the database file or temporary file.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The FILE_NAME column of the CDB_DATA_FILES view if a permanent datafile. The FILE_NAME column of the CDB_TEMP_FILES view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.3 File Size

Size of the file in bytes.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The BYTES column of the CDB_DATA_FILES view if a permanent datafile or the BYTES column of the CDB_TEMP_FILES view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.4 Initial File Size

Creation size of the file (in bytes)

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The CREATE_BYTES column of the V\$DATAFILE view if a permanent datafile or the CREATE_BYTES column of the V\$TEMPFILE view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.5 Increment By

Number of tablespace blocks used as autoextension increment. Block size is contained in the BLOCK_SIZE column of the CDB_TABLESPACES view.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The INCREMENT_BY column of the CDB_DATA_FILES view if a permanent datafile or the INCREMENT_BY column of the CDB_TEMP_FILES view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.6 Max File Size

Maximum file size in bytes

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The MAXBYTES column of the CDB_DATA_FILES view if a permanent datafile or the MAXBYTES column of the CDB_TEMP_FILES view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.7 Status

The ONLINE status of the database file (one of SYSOFF, SYSTEM, OFFLINE, ONLINE, RECOVER) or the status of the temporary file (one of OFFLINE, ONLINE, UNKNOWN).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The ONLINE_STATUS column of the CDB_DATA_FILES view if a permanent datafile or the STATUS column of the CDB_TEMP_FILES view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.8 Storage Entity

The filesystem or the raw device used by this datafile or temporary file.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Perl script utility to retrieve the full file path.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.2.9 Tablespace

Name of the tablespace to which the file belongs

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The TABLESPACE column of the CDB_DATA_FILES view if a permanent datafile or the TABLESPACE column of the CDB_TEMP_FILES view if a temporary file.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.3 Database Job Status

The metrics in this category represent the health of database jobs registered through the DBMS_SCHEDULER interface.

9.3.1 Broken Job Count

The Oracle Server job queue is a database table that stores information about local jobs such as the PL/SQL call to execute for a job such as when to run a job. Database replication is also managed by using the Oracle job queue mechanism using jobs to

push deferred transactions to remote master sites, to purge applied transactions from the deferred transaction queue or to refresh snapshot refresh groups.

A job can be broken in two ways:

- Oracle failed to successfully execute the job after a specified number of attempts (defined in the job).
- The job is explicitly marked as broken by using the procedure DBMS_JOB.BROKEN.

This metric checks for broken DBMS jobs. A critical alert is generated if the number of broken jobs exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0	Not Defined	%value% job(s) are broken.

9.3.2 Failed Job Count

The Oracle Server job queue is a database table that stores information about local jobs such as the PL/SQL call to execute for a job such as when to run a job. Database replication is also managed by using the Oracle job queue mechanism using jobs to push deferred transactions to remote master sites, to purge applied transactions from the deferred transaction queue or to refresh snapshot refresh groups.

If a job returns an error while Oracle is attempting to execute it, the job fails. Oracle repeatedly tries to execute the job doubling the interval of each attempt. If the job fails after a specified number of times (specified in the job definition), Oracle automatically marks the job as broken and no longer tries to execute it.

This metric checks for failed DBMS jobs. An alert is generated if the number of failed job exceeds the value specified by the threshold argument.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0	Not Defined	%value% job(s) have failed.

9.4 Database Services

The metrics in this category include the service CPU time and service response time.

9.4.1 Service CPU Time (per user call) (microseconds)

This metric represents the average CPU time, in microseconds, for calls to a particular database service.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	CPU per call for service %keyValue% is %value% microseconds

9.4.2 Service Response Time (per user call) (microseconds)

This metric represents the average elapsed time, in microseconds, for calls to a particular database service.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Elapsed time per call for service %keyValue% is %value% microseconds

9.5 Failed Logins

The metrics in this category check for the number of failed logins on the target database. This check is performed every interval specified by the collection frequency and returns the number of failed logins for the last 30 minutes. These metrics will only work for databases where the audit_trail initialization parameter is set to DB or XML and the session is being audited.

9.5.1 Failed Login Count

This metric checks for the number of failed logins on the target database. This check is performed every interval specified by the collection frequency and returns the number of failed logins for the last 30 minutes. This metric will only work for databases where the audit_trail initialization parameter is set to DB or XML and the session is being audited.

If the failed login count crosses the values specified in the threshold arguments, then a warning or critical alert is generated. Because it is important to know every time a significant number of failed logins occurs on a system, on every collection, this metric determines the number of failed login attempts in the last 30 minutes and overrides the current alert instead of a new alert. You can manually clear these alerts. They will not automatically be cleared after the next collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	150	300	Number of failed login attempts exceeds threshold value.

9.6 Invalid Objects

This metric category contains the metrics associated with invalid objects.

9.6.1 Total Invalid Object Count

This metric represents the total invalid object count.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined*	%value% object(s) are invalid in the database.

9.7 Invalid Objects by Schema

This metric category contains the metrics that represent the number of invalid objects in each schema.

9.7.1 Owner's Invalid Object Count

This metric represents the invalid object count by owner.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	%value% object(s) are invalid in the %owner% schema in pluggable database %pdbName%

Data Source

For each metric index:

```
SELECT count(1)
```

User Action

View the status of the database objects in the schema identified by the Invalid Object Owner metric. Recompile objects as necessary.

9.8 Messages per buffered queue

The metrics in this category monitor the age and state of the first (top of the queue) message for each buffered queue in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

9.8.1 Average age of messages per buffered queue (seconds)

This metric provides the average age (in seconds) of the messages in the buffered queue for all nonsystem queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Average age of messages in %schema%.%queue_name% queue is %value% seconds.

9.8.2 Spilled Messages

This metric displays the current number of overflow messages spilled to disk from the buffered queue.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Current number of overflow messages spilled to disk from the buffered queue %schema%.%queue_name% is %value%

9.8.3 First message age in the buffered queue per queue (seconds)

This metric gives the age (in seconds) of the first message in the buffered queue for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Age of first message in %schema%.%queue_name% buffered queue is %value% seconds.

9.8.4 Messages processed per buffered queue (%)

This metric gives the messages processed percentage per minute per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Messages processed for queue %schema%.%queue_name% is %value% percent.

9.8.5 Total Messages Processed per Buffered Queue per Minute

This metric gives the total number of messages processed per minute per buffered queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages processed per minute in the last interval for queue %schema%.%queue_name% is %value%

9.8.6 Total messages received per buffered queue per minute

This metric gives the total number of messages received or enqueued into the buffered queue per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages processed per minute in the last interval for queue %schema%.%queue_name% is %value%

9.8.7 Total number of messages processed

This metric gives the total number of messages processed in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.8.8 Total number of messages received

This metric gives the total number of messages received in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.9 Messages per buffered queue per subscriber

This metric category monitors the messages for buffered queues per subscriber in the database.

9.9.1 Average age of messages/buffered queue/subscriber (seconds)

This metric display's the average age of messages in the buffered queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Average age of messages for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

9.9.2 First message age in buffered queue per subscriber (seconds)

This metric displays the age of the first message in the buffered queue per queue per subscriber in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Age of first message for subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

9.9.3 Messages processed/buffered queue/subscriber (%)

This metric gives the messages processed percentage for the buffered queue per subscriber. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Messages processed for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% percent.

9.9.4 Messages processed/buffered queue/subscriber per minute (%)

This metric gives the total number of messages processed per minute per buffered queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%.

9.9.5 Total messages processed/buffered queue/subscriber per minute

This metric gives the total number of messages processed per minute per buffered queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%

9.9.6 Total messages received/buffered queue/subscriber per minute

This metric gives the total number of messages received or enqueued into the queue per subscriber per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages received per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%

9.9.7 Total number of messages processed

This metric gives the total number of messages processed in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.9.8 Total number of messages received

This metric gives the total number of messages received in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.10 Messages per persistent queue

The metrics in this category monitor the age and state of the first (top of the queue) message for each persistent queue in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

9.10.1 Average age of messages per persistent queue (seconds)

This metric displays the average age of messages in the persistent queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Average age of messages in %schema%.%queue_name% queue is %value% seconds.

9.10.2 First message age in persistent queue/queue (seconds)

This metric gives the age (in seconds) of the first message in the persistent queue for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Age of first message in %schema%.%queue_name% queue is %value% seconds.

9.10.3 Global Database Name

This metric provides the unique global database name.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.10.4 Messages processed per persistent queue (%)

This metric gives the messages processed percentage for the persistent queue. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Messages processed for queue %schema%.%queue_name% is %value% percent.

9.10.5 Messages processed per persistent queue per minute (%)

This metric gives the messages processed percentage per minute per persistent queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Messages processed per minute in the last interval for queue %schema%.%queue_name% is %value%

9.10.6 Total messages processed per persistent queue per minute

This metric gives the total number of messages processed per minute per persistent queue in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages processed per minute in the last interval for queue %schema%.%queue_name% is %value%

9.10.7 Total messages received per persistent queue per minute

This metric gives the total number of messages received or enqueued into the queue per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages received per minute in the last interval for queue %schema%.%queue_name% is %value%

9.10.8 Total number of messages processed

This metric gives the total number of messages processed in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.10.9 Total number of messages received

This metric gives the total number of messages received in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.11 Messages per persistent queue per subscriber

The metrics in this category monitor the age and state of the first (top of the queue) message for each persistent queue per queue subscriber in the database except for the system queues. Queues that are in the schema of SYS, SYSTEM, DBSNMP, and SYSMAN are defined as system level queues.

9.11.1 Average age of messages/persistent queue/subscriber (seconds)

This metric display's the average age of messages in the persistent queue per queue in seconds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Average age of messages for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

9.11.2 First message age in persistent queue/subscriber (seconds)

This metric gives the age (in seconds) of the first message in the persistent queue per subscriber for all non-system queues in the database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Age of first message for subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% seconds.

9.11.3 Global Database Name

This metric provides the unique global database name.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.11.4 Messages processed/persistent queue/subscriber per minute (%)

This metric gives the messages processed percentage per minute per persistent queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%

9.11.5 Messages processed/persistent queue/subscriber (%)

This metric gives the messages processed percentage for the persistent queue per subscriber. Messages processed percent is calculated as the percent of the total number messages processed or dequeued to the total number of messages received or enqueued.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Messages processed for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value% percent.

9.11.6 Total messages processed/persistent queue/subscriber per minute (%)

This metric gives the messages processed percentage per minute per persistent queue subscriber in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages processed per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%.

9.11.7 Total messages received/persistent queue/subscriber per minute

This metric gives the total number of messages received or enqueued into the queue per subscriber per minute in the last collection interval of the metric.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	Not Defined	Not Defined	Total messages received per minute in the last interval for the subscriber %subs_name% %subs_address% in %schema%.%queue_name% queue is %value%.

9.11.8 Total number of messages processed

This metric gives the total number of messages processed in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.11.9 Total number of messages received

This metric gives the total number of messages received in the last collection interval of the metric.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.12 Response

This metric category represent the responsiveness of the Oracle Server, with respect to a client. For PDB, it is also indicative of the state of the PDB. For example, an Open state maps to Up and a Closed/Mounted state maps to Down. If the PDB target exists but the PDB has been dropped/unplugged from the CDB, the target will be in Metric Collection Error.

9.12.1 State

This metric represents the state of the pluggable database.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	MOUNTED	DOWN:UNKNOWN*	The database status is %value%..

User Action

Check the listener configured for the CDB to make sure it is running and serves the CDB. If listener is fine, check if the PDB is in the mount/closed state and open the PDB.

9.12.2 Status

This metric checks whether a new connection can be established to a database. If the maximum number of users is exceeded or the listener is down, this test is triggered.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	0	Failed to connect to database instance: %oraerr%.

User Action

Check the listener configured for the CDB to make sure it is running and serves the CDB. If listener is fine, check if the PDB is in the mount/closed state and open the PDB.

9.12.3 ORA- Error

This is a user-readable message, including any Ora-error, encountered during response evaluation.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

User Action

Check the listener configured for the CDB to make sure it is running and serves the CDB. If listener is fine, check if the PDB is in the mount/closed state and open the PDB.

9.13 Rollback Segments

This metric category provides the rollback metrics.

9.13.1 Name

Name of the rollback segment

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The SEGMENT_NAME column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.2 Aveactive

Current size of active extents, averaged over time.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The AVEACTIVE column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.3 Aveshrink

Average shrink size

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The AVESHRINK column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.4 Extents

Number of extents in the rollback segment

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The EXTENTS column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.5 Hwmsize

High watermark of the rollback segment size

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The HWMSIZE column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.6 Initial Size

Initial extent size in bytes

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The INITIAL_EXTENT column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.7 Maximum Size

Maximum number of extents

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The MAX_EXTENTS column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.8 Minimum Extents

Minimum number of extents

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The MIN_EXTENTS column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.9 Next Size

Secondary extent size in bytes

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The NEXT_EXTENT column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.10 Optsize

Optimal size of the rollback segment

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The OPTSIZE column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.11 Pct Increase

Percent increase for extent size

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The PCT_INCREASE column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.12 Size

Size (in bytes) of the rollback segment.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The RSSIZE column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.13 Shrinks

Number of times the size of a rollback segment decreases

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The SHRINKS column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.14 Status

The status of the rollback segment (one of OFFLINE, ONLINE, NEEDS RECOVERY, PARTLY AVAILABLE, UNDEFINED).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The STATUS column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.15 Tablespace Name

Name of the tablespace containing the rollback segment

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The TABLESPACE_NAME column from the CDB_ROLLBACK_SEGS view.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.13.16 Wraps

Number of times the rollback segment is wrapped

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The WRAPS column from the V\$ROLLSTAT view

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.14 Segment Advisor Recommendations

This metric category provides segment advisor recommendations. Oracle uses the Automatic Segment Advisor job to detect segment issues regularly within maintenance windows. It determines whether the segments have unused space that can be released. The Number of recommendations is the number of segments that have Reclaimable Space. The recommendations come from all runs of the automatic segment advisor job and any user-scheduled segment advisor jobs.

9.14.1 Number of recommendations

Oracle uses the Automatic Segment Advisor job to detect segment issues regularly within maintenance windows. It determines whether the segments have unused space that can be released. The Number of recommendations is the number of segments that have Reclaimable Space. The recommendations come from all runs of the automatic segment advisor job and any user-scheduled segment advisor jobs.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Collection Frequency
All Versions	Every 60 Minutes

9.15 Tablespaces

This metric category provides details on the tablespace metrics.

9.15.1 Allocation Type

Type of extent allocation in effect for the tablespace (one of SYSTEM, UNIFORM, USER).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The ALLOCATION_TYPE column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.2 Big File

Indicates whether the tablespace is a bigfile tablespace (YES) or a smallfile tablespace (NO).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The BIGFILE column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.3 Block Size

Tablespace block size.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The BLOCK_SIZE column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.4 Extent Management

Indicates whether the extents in the tablespace are dictionary managed (DICTIONARY) or locally managed (LOCAL).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The EXTENT_MANAGEMENT column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.5 Increment By

Default percent increase for extent size.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The PCT_INCREASE column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.6 Initial Ext Size

Default initial extent size.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The INITIAL_EXTENT column from CDB_TABLESPACES

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.7 Logging

Default logging (one of LOGGING, NOLOGGING).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The LOGGING column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.8 Max Extents

Default maximum number of extents

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The MAX_EXTENTS column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.9 Minimum Extent Size

Minimum extent size for this tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The MIN_EXTLEN column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.10 Minimum Extents

Default minimum number of extents.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The MIN_EXTENTS column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.11 Next Extent

Default incremental extent size.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The NEXT_EXTENT column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.12 Segment Space Management

Indicates whether the free and used segment space in the tablespace is managed using free lists (MANUAL) or bitmaps (AUTO).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The SEGMENT_SPACE_MANAGEMENT column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.13 Size

Allocated size in bytes of the tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Sum of BYTES column from CDB_DATA_FILES for permanent and undo tablespaces or the sum of BYTES column from CDB_TEMP_FILES for temporary tablespaces.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.14 Status

Tablespace status (one of ONLINE, OFFLINE, READ ONLY).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The STATUS column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.15 Tablespace Name

Name of the tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The TABLESPACE_NAME column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.16 Type

One of UNDO, PERMANENT or TEMPORARY.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The CONTENTS column from CDB_TABLESPACES.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.17 Used Size(B)

Size in bytes of the used space of the tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Sum of BYTES column from CDB_DATA_FILES minus the sum of BYTES from CDB_FREE_SPACE for permanent and undo tablespaces or the sum of USED_BLOCKS

FROM GV\$SORT_SEGMENT times BLOCK_SIZE from CDB_TABLESPACES for temporary tablespaces.

User Action

This is a configuration metric so this column is purely informative and collected to provide DBAs with information necessary to manage the current database.

9.15.18 Tablespace Used Space (MB)

This metric calculates the space used for each tablespace. It is not intended to generate alerts. Rather it should be used in conjunction with the Tablespace Allocated Space (MB) metric to produce a historical view of the amount of space being used and unused by each tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Tablespace Used Space (MB) is Tablespace Allocated Space (MB) Tablespace Allocated Free Space (MB) where:

Tablespace Allocated Space (MB) is calculated by looping through the tablespaces data files and totaling the size of the data files.

Tablespace Allocated Free Space (MB) is calculated by looping through the tablespaces data files and totaling the size of the free space in each data file.

9.16 Tablespace Allocation

The metrics in this metric category check the amount of space used and the amount of space allocated to each tablespace. The used space can then be compared to the allocated space to determine how much space is unused in the tablespace. This metric is intended for reporting, rather than alerts. Historical views of unused allocated free space can help DBAs to correctly size their tablespaces, eliminating wasted space.

9.16.1 Tablespace Allocated Space (MB)

The allocated space of a tablespace is the sum of the current size of its data files. A portion of this allocated space is used to store data while some may be free space. If segments are added to a tablespace, or if existing segments grow, they will use the allocated free space. The allocated free space is only available to segments within the tablespace. If, over time, the segments within a tablespace are not using this free space, the allocated free space is not being used.

This metric calculates the space allocated for each tablespace. It is not intended to generate alerts. Rather it should be used in conjunction with the Allocated Space Used (MB) metric to produce a historical view of the amount of space being used and unused by each tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Tablespace Allocated Space (MB) is calculated by looping through the tablespaces data files and totalling the size of the data files.

9.16.2 Tablespace Used Space (MB)

The allocated space of a tablespace is the sum of the current size of its datafiles. Some of this allocated space is used to store data and some of it may be free space. If segments are added to a tablespace, or if existing segments grow, they will use the allocated free space. The allocated free space is only available to segments within the tablespace. If, over time, the segments within a tablespace are not using this free space, then the allocated free space is being wasted.

This metric calculates the space used for each tablespace. It is not intended to generate alerts. Use in conjunction with the Tablespace Allocated Space (MB) metric to produce a historical view of the amount of space being used and unused by each tablespace.

Target Version	Collection Frequency
All Versions	Every 24 Hours

9.17 Tablespaces Full

The metrics in this metric category check for the amount of space used by each tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space accounts for the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if data files can extend and there is enough disk space available for them to extend.

9.17.1 Tablespace Free Space (MB)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each tablespace. This metric is intended for larger tablespaces, where the Available Space Used (%) metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] only has [%value% megabytes] free space

Data Source

MaximumSize Total Used Space where:

- **TotalUsedSpace:** Total used space in MB of tablespace
- **MaximumSize:** Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thereby increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

9.17.2 Tablespace Space Used (%)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files have reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks the Available Space Used (%) for each tablespace. If the percentage of used space is greater than the values specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	85	97	Tablespace [%name%] is [%value% percent] full

Data Source

$(\text{TotalUsedSpace} / \text{MaximumSize}) * 100$ where:

- **TotalUsedSpace:** total used space in MB of tablespace
- **MaximumSize:** Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

For additional information about the data source, refer to the fullTbsp.pl Perl script located in the sysman/admin/scripts directory.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thus increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

9.18 Tablespaces Full (Temp)

The metrics in this category check for the amount of space used by each locally managed temporary tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space takes into account the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if data files can extend and there is enough disk space available for them to extend.

9.18.1 Tablespace Free Space (MB) (Temp)

As segments within a tablespace grow, the available free space decreases. If there is no more free space available, that is, the data files have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each temporary tablespace. This metric is intended for larger temporary tablespaces, where the Available Space Used (%) metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] has [%value% mbytes] free

9.18.2 Tablespace Space Used (%) (Temp)

As segments within a tablespace grow, the available free space decreases. If there is no more free space available, that is, the data files have hit their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	Not Defined	Not Defined	Tablespace [%name%] is [%value% percent] full

9.19 Tablespaces Full (dictionary managed)

The metrics in this metric category check for the amount of space used by each tablespace. The used space is then compared to the available free space to determine tablespace fullness. The available free space accounts for the maximum data file size as well as available disk space. This means that a tablespace will not be flagged as full if data files can extend, and there is enough disk space available for them to extend.

9.19.1 Tablespace Free Space (MB) (dictionary managed)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files have reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks for the total available free space in each tablespace. This metric is intended for larger tablespaces, where the Available Space Used (%) metric is less meaningful. If the available free space falls below the size specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Data Source

MaximumSize Total Used Space where:

- TotalUsedSpace: Total used space in MB of tablespace
- MaximumSize: Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

9.19.2 Tablespace Space Used (%) (dictionary managed)

As segments within a tablespace grow, the available free space decreases. If there is no longer any available free space, meaning data files have reached their maximum size or there is no more disk space, then the creation of new segments or the extension of existing segments will fail.

This metric checks the Available Space Used (%) for each tablespace. If the percentage of used space is greater than the values specified in the threshold arguments, then a warning or critical alert is generated.

If the version of the monitored database target is Oracle Database 10g Release 1 or later and the tablespace uses Local Extent Management, then the Oracle Database Server evaluates this metric internally every 10 minutes. Alternatively, if the version of the monitored Database target is Oracle 9i or earlier, or the tablespace uses Dictionary Extent Management, then the Oracle Management Agent tests the value of this metric every 30 minutes.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 30 Minutes	85	97	Tablespace [%name%] in pluggable database [%pdbName%] is [%value% percent] full.

Data Source

$(\text{TotalUsedSpace} / \text{MaximumSize}) * 100$ where:

- TotalUsedSpace: Total used space in MB of tablespace
- MaximumSize: Maximum size (in MB) of the tablespace. The maximum size is determined by looping through the tablespaces data files, as well as additional free space on the disk that would be available for the tablespace should a data file autoextend.

User Action

Perform one of the following:

- Increase the size of the tablespace by: Enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thereby increasing the free space in this tablespace.
- Run the Segment Advisor on the tablespace.

9.20 Tablespaces With Problem Segments

The metrics in this metric category check for the following:

- The largest chunk-free space in the tablespace. If any table, index, cluster, or rollback segment within the tablespace cannot allocate one additional extent, then an alert is generated.
- Whether any of the segments in the tablespace are approaching their maximum extents. If, for any segment, the maximum number of extents minus the number of existing extents is less than 2, an alert is generated.

Only the tablespaces with problem segments are returned as results.

9.20.1 Segments Approaching Maximum Extents Count

This metric checks for segments nearing the upper limit of the number of maximum extents. If the number of segments is greater than the values specified in the threshold arguments, a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0		%value% segments in %name% tablespace pluggable database %pdbName% approaching max extents.

Data Source

Number of segments for which the maximum number of extents minus the number of existing extents is less than 2.

For additional information about the data source, refer to the `problemTbsp.pl` Perl script located in the `sysman/admin/scripts` directory.

User Action

If possible, increase the value of the segments `MAXEXTENTS` storage parameter. Otherwise, rebuild the segment with a larger extent size ensuring the extents within a segment are the same size by using a locally managed tablespace. For a dictionary managed tablespace, specify `STORAGE` parameters where `NEXT=INITIAL` and `PCTINCREASE = 0`.

9.20.2 Segments Approaching Maximum Extents

This metric reports segments which are nearing the upper limit of maximum extents.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

Number of segments for which the maximum number of extents minus the number of existing extents is less than 2.

For additional information about the data source, refer to the `problemTbsp.pl` Perl script located in the `sysman/admin/scripts` directory.

User Action

If possible, increase the value of the segments `MAXEXTENTS` storage parameter. Otherwise, rebuild the segment with a larger extent size ensuring the extents within a segment are the same size by using a locally managed tablespace. For a dictionary managed tablespace, specify `STORAGE` parameters where `NEXT=INITIAL` and `PCTINCREASE = 0`.

9.20.3 Segments Not Able to Extend

This metric checks for segments that cannot allocate an additional extent.

This is a database-level metric. For cluster databases, this metric is monitored at the cluster database target level and not by member instances.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The first 10 segment names that cannot allocate an additional extent in the tablespace.

User Action

Perform one of the following:

- Increase the size of the tablespace by enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.

9.20.4 Segments Not Able to Extend Count

This metric checks for segments that cannot allocate an additional extent. If the number of segments is greater than the values specified in the threshold arguments, a warning or critical alert is generated.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 24 Hours	0	Not Defined	%value% segments in %name% tablespace in pluggable database %pdbName% unable to extend.

Data Source

After checking for the largest chunk free space in the tablespace, this is the number of segments that cannot allocate an additional extent.

For additional information about the data source, refer to the problemTbsp.pl Perl script located in the sysman/admin/scripts directory.

User Action

Perform one of the following:

- Increase the size of the tablespace by enabling automatic extension for one of its existing data files, manually resizing one of its existing data files, or adding a new data file.
- If the tablespace is suffering from tablespace free space fragmentation problems, consider reorganizing the entire tablespace.
- Relocate segments to another tablespace, thereby increasing the free space in this tablespace.

9.21 Temporary File Status

This metric category provides the temporary file status metrics.

9.21.1 File Name

The name of the temporary file.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The NAME column of the V\$TEMPFILE view.

User Action

This information is purely Informative.

9.21.2 Status

The status of the temporary file, either ONLINE or OFFLINE.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	OFFLINE	Not Defined	The temporary file %NAME% in pluggable database %pdbName% is %STATUS%..

Data Source

The STATUS column of the V\$TEMPFILE view.

User Action

If the default settings are still in use, an offline temporary file will generate an incident (alert). Determine whether this file is expected to be offline and if not, switch it back online. Also, if this file is expected to be offline, ensure that the temporary tablespace it belongs to has other available online temporary files.

9.21.3 Temporary File Id

The absolute file number of the temporary file, used to join with other database tables and views to retrieve additional information.

Target Version	Collection Frequency
All Versions	Every 15 Minutes

Data Source

The FILE# column of the V\$TEMPFILE view.

User Action

This information is purely informative.

9.22 Total Objects by Schema

The metrics in this category contain the metric that provides the number of database objects in a schema.

9.22.1 Total Object Count

This metric displays the total number of database objects in a schema.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	%value% object(s) exist in the %owner% schema.

9.23 Total Tables by Schema

The metrics in this category contain the metric that provides the number of tables in a schema.

9.23.1 Total Table Count

This metric displays the total number of tables in a schema.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 15 Minutes	Not Defined	Not Defined	%value% table(s) exist in the %owner% schema.

CISCO Switch Metrics

This chapter provides information about the CISCO Switch metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

The Cisco Switch plug-in enables Enterprise Manager Cloud Control to monitor Cisco Switch targets. This plug-in is used to monitor the Cisco switch's CPU, memory, temperature, network interfaces, system information, fan, and power supply metrics. Each Cisco switch will have a plug-in instance added to its agent.

10.1 CPU

This metric category contains the CPU usage metrics.

10.1.1 CPU Usage in the Last 5 Minutes (%)

This metric displays the average CPU usage over the last 5 minutes, in percent.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	20	40	-

Data Source

The data is collected using simple network management protocol (SNMP).

User Action

No user action is required.

10.1.2 CPU Usage in the Last 1 Minute (%)

This metric shows the average CPU usage over the last minute, in percent.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 1 Minute	20	40	-

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.1.3 CPU Usage in the Last 5 Seconds (%)

This metric shows the CPU usage at last metric collection, in percent.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	20	40	-

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.2 Fan

This metric category contains the fan metrics.

10.2.1 Fan State

This metric shows the status indicator for the switch fan. 1 indicates Normal, 2 Warning, 3 Critical, 4 Shutdown, 5 Not Present, and 6 Not Functioning.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	20	3	State of the fan %KeyValue% is either warning or critical. Current state code is %fanState%. (state code values are mapped as 1=normal,2=warning,3=critical,4=shutdown, 5=notPresent,6=notFunctioning)

Data Source

The data is collected using SNMP push.

User Action

No user action is required.

10.3 Memory

This metric category contains the memory metrics.

10.3.1 Memory Pool Usage (%)

This metric shows the amount of the switch's memory in use, in percent.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	-

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4 Network Interfaces

This metric category contains the network interface metrics.

10.4.1 Admin Status

This metric shows the Admin status for the switch.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Network Interface %Name% (%Alias%) AdminStatus is %AdminStatus%.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.2 Incoming Discards(%)

This metric shows the inbound packets discarded, in percent. The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	1	3	Percentage of Inbound Packets discarded at Network Interface %Name% are %PercentDiscardsIn%%%. It has crossed warning (%warning_threshold%%%) or critical (%critical_threshold%%%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.3 Incoming Errors(%)

This metric shows the inbound packet errors, in percent.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	1	3	Percentage of Inbound Packet Errors at Network Interface %Name% are %PercentErrorsIn%%%. It has crossed warning (%warning_threshold%%%) or critical (%critical_threshold%%%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.4 Incoming Traffic(%)

This metric shows the incoming bandwidth in use, in percent.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	80	90	Network Interface %Name% has used %PercentBandwidthUsedIncoming%%% of its bandwidth. It has crossed warning (%warning_threshold%%%) or critical (%critical_threshold%%%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.5 Incoming Traffic (Kb/s)

This metric shows the incoming traffic, measured in Kb/s.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Incoming Traffic rate for network interface %Name% is %NetworkRecdRate%Kilobits/sec. It has crossed warning (%warning_threshold%%) or critical (%critical_threshold%%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.6 Interface Status

This metric shows the status of switch interface.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Failed	Network Interface %Name% (%Alias%) AdminStatus is %AdminStatus%.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.7 OperStatus

This metric shows the OperStatus of switch.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Network Interface %Name% (%Alias%) OperStatus is %OperStatus%.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.8 Outgoing Discards(%)

This metric shows the outbound packets discarded, in percent.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	1	3	Percentage of Outbound Packets discarded at Network Interface %Name% are %PercentDiscardsOut%%. It has crossed warning (%warning_threshold%%%) or critical (%critical_threshold%%%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.9 Outgoing Errors(%)

This metric shows the outbound packet errors, in percent.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	1	3	Percentage of Outbound Packet Errors at Network Interface %Name% are %PercentErrorsOut%%. It has crossed warning (%warning_threshold%%%) or critical (%critical_threshold%%%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.10 Outgoing Traffic(%)

This metric shows the outbound bandwidth in use, in percent.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Network Interface %Name% (%Alias%) AdminStatus is %AdminStatus%.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.4.11 Outgoing Traffic(Kb/s)

This metric shows the outbound traffic, measured in Kb/s.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Outgoing Traffic rate for network interface %Name% is %NetworkSentRate%Kilobits/sec It has crossed warning (%warning_threshold%%) or critical (%critical_threshold%%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.5 Power Supply

This metric category contains the power supply metrics.

10.5.1 Power Supply State

This metric shows the status indicator for switch's power supply. 1 indicates Good, 2 indicates Bad, 3 indicates Down.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	3	State of the power supply %KeyValue% is either warning or critical. Current state code is %powerSupplyState%. (state code values are mapped as 1=normal,2=warning,3=critical,4=shutdown, 5=notPresent,6=notFunctioning).

Data Source

The data is collected using SNMP push.

User Action

No user action is required.

10.5.2 TCP Ping, Milliseconds

This is the switch ping time, measured in ms.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP push.

User Action

No user action is required.

10.6 System Information

This section contains the system information metrics.

10.6.1 Contact

This metric shows the contact person for the switch and method of contacting them.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.6.2 Host Name

This metric shows the host name of the switch.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.6.3 Location

This metric shows the physical location of the switch.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.6.4 Up Since (Days)

This metric shows the number of days since switch has been down.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

10.7 Temperature

This metric category contains the temperature metrics.

10.7.1 Temperature, State

This metric shows the switch's temperature status.

The following table shows how often the metric's value is collected.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	warning	critical	State of the Temperature for %KeyValue% is either warning or critical. Current state is %TemperatureState% (state code values are mapped as 1=normal,2=warning,3=critical,4=shutdown, 5=notPresent,6=notFunctioning) and the current temperature status value is %TemperatureStatusValue% Celsius.

Data Source

The data is collected using both SNMP poll and push.

User Action

No user action is required.

10.7.2 Temperature, Value (Celsius)

This metric shows the temperature of the switch in degrees celsius.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	56	66	-

Data Source

The data is collected using both SNMP poll and push.

User Action

No user action is required.

KVM Target Metrics

This chapter provides information about the KVM Target metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

KVM Target metrics are used to monitor keyboard, video or visual display unit, and mouse (KVM) targets. The Avocent MergePoint Unity Switch plug-in enables Enterprise Manager Cloud Control to monitor KVM targets. The plug-in provides the status of the KVM and event occurrences, such as Factory Defaults Set, Fan Failure, Aggregated Target Device Status, Power Supply Failure, Power Supply Restored, Reboot Started, and Temperature Out of Range on the KVM target.

11.1 Aggregated Target Device Status Changed

The metrics in this metric category provide details of the aggregated target device status changed metrics.

11.1.1 Aggregated Target Device Status

This metric provides the aggregated target device status. A status 0 indicates that the aggregate server status has changed.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	0	Not Defined	Aggregate server status changed and its encoded value is %aggregatedTargetDeviceStatusChangedObject% .

Data Source

The data for this metric is collected through SNMP push.

User Action

No user action is required.

11.1.2 Aggregated Target Device Status Changed Object

This metric provides the encoded value of the aggregate server status upon change.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data for this metric is collected through SNMP push.

User Action

No user action is required.

11.2 Factory Defaults Set

The metrics in this metric category provide details of the factory defaults set metrics.

11.2.1 Factory Defaults Set Status

This metric provides the factory defaults set status. A status 0 indicates that the KVM was commanded to set itself to factory defaults.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	0	Not Defined	The appliance was commanded to set itself to factory.

Data Source

The data for this metric is collected through SNMP push (traps).

User Action

No user action is required.

11.3 Fan Failure

The metrics in this metric category provide details of the fan failure metrics.

11.3.1 Fan Failure Status

This metric provides the fan failure status. A status 0 indicates that the KVM's fan has failed.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	Not Defined	0	Fan failure has been detected.

Data Source

The data for this metric is collected through SNMP push.

User Action

No user action is required.

11.4 Ping Status

The metrics in this category provide details about the ping status metrics.

11.4.1 Status

This metric reports the status of the KVM target.

Target Version	Collection Frequency
All Versions	Every 30 Minutes

Data Source

The data for this metric is collected using OS line token fetchlet by running the agent provided script `osresp.pl`.

User Action

No user action is required.

11.4.2 TCP Ping, Milliseconds

This metric reports the KVM target's response to a ping time, in ms.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	400	1000	KVM target's response to a TCP ping is %value% msec

Data Source

The data for this metric is collected using OS line token fetchlet by running the agent provided script `osresp.pl`.

User Action

No user action is required.

11.5 Power Supply

The metrics in this metric category provide details of the power supply metrics.

11.5.1 Power Supply Status

This metric provides the power supply status. A status 0 indicates that the KVM's power supply has failed.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	0	Not Defined	Power Supply %keyValue% has failed.

Data Source

The data for this metric is collected through SNMP push.

User Action

No user action is required.

11.6 Reboot Started

This metric category contains the reboot started metrics.

11.6.1 Reboot Started Status

This metric provides the status of the reboot. A status 0 indicates that the KVM is rebooting.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	0	Not Defined	The appliance is rebooting. Command issued by user %userName% .

Data Source

The data for this metric is collected using OS line token fetchlet by running the agent provided script osresp.pl.

User Action

No user action is required.

11.6.2 User Name

This metric provides the name of the user that ordered the KVM to reboot.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data for this metric is collected using OS line token fetchlet by running the agent provided script osresp.pl.

User Action

No user action is required.

11.7 Response

This metric category contains the response metrics.

11.7.1 Status

This metric indicates whether OMS on the KVM is running. 1 indicates Up, and 0 indicates Down.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	Not Defined	0	%target% is down

Data Source

The data for this metric is collected using OS line token fetchlet by running the agent provided script osresp.pl.

User Action

No user action is required.

11.7.2 TCP Ping, Milliseconds

This metric reports the KVM ping time, in ms.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data for this metric is collected using OS line token fetchlet by running the agent provided script osresp.pl.

User Action

No user action is required.

11.8 Temperature Range

This metric category contains the metric that provides details on the temperature range metrics.

11.8.1 Temperature Out Of Range Status

This metric reports whether or not the temperature is out of range. A status 0 indicates that the KVM's temperature is outside operating range.

Target Version	Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All versions	Every 5 Minutes	Not Defined	0	Temperature is outside operating range.

Data Source

The data for this metric is collected through SNMP push.

User Action

No user action is required.

Integrated Lights Out Manager Metrics

This chapter provides information about the Integrated Lights Out Manager (ILOM) metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

The Oracle ILOM plug-in monitors the Oracle ILOM service processor in a compute node for hardware events and records sensor data to the Oracle Enterprise Manager Repository.

The ILOM plug-in is deployed to the Oracle Management Agent on the first compute node in an Oracle Database system, and only that Management Agent communicates with the Oracle Management Server and Repository for all ILOM database server service processors in the Oracle Database system.

12.1 Component Fault

This metric category describes component failure alerts.

12.1.1 Fault Status

This metric provides the component failure status.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	CRITICAL	Component %ComponentName% has a fault.

12.2 Fan Fault

This metric category describes fan failure alerts.

12.2.1 Fault Status

This metric provides the fan failure status.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	CRITICAL	The fan %FanName% has a fault.

12.3 Fan Sensors

This metric category describes the fan sensor metrics.

12.3.1 Sensor Speed (RPM)

This is the speed of the ILOM fan, in revolutions per minute (RPM).

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	-1	Fan %SensorName% encountered a fault: %SensorSpeed% (-1: Predictive Failure, -2: Fan Missing/Removed, -3: Fan Not Readable/Not Present, -4: General Fault, -5: Not Spinning/Obstructed).

Data Source

The data for this metric is collected using the operating system (OS) line token fetchlet by running the `FanSensorStatus.plscript`.

User Action

No user action is required.

12.3.2 Sensor State

This metric reports the status of the ILOM fan.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	FAULT_DIAGNOSED FAULT_SUSPECTED WARNING	CRITICAL ERROR FAILED FAULTED NOT_PRESENT NON_RECOVERABLE PREDICTIVE_FAILURE_ASSERTED LOWER_CRITICAL UPPER_CRITICAL LOWER_NON_RECOVERABLE UPPER_NON_RECOVERABLE	Fan %SensorName% rotating at %SensorSpeed%(rpm) encountered a fault: %SensorState%

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `FanSensorStatus.plscript`.

User Action

No user action is required.

12.4 Hard Disk Status

The metrics in this category provide information about the hard disk status.

12.4.1 Fault Status (0 - cleared, 1 - critical)

This metric reports the status of the hard disk. 0 indicates Cleared, 1 indicates Critical.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	1	The hard disk %HardDiskName% has a fault. Fault code is %FaultCode%.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `NodeStatusCheck.pl - ping` script.

User Action

No user action is required.

12.5 HCA Port State (For Alerts)

The metrics in this category describe the host channel adapters (HCA) port state .

12.5.1 Is Port Disabled?

This metric indicates whether the HCA port is disabled.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	1	Port %PortNumber%(%ca_disp_name%) is disabled.

12.5.2 Is Port in 'polling' state?

This metric indicates whether the HCA port is checking or polling for a peer port.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	1	Port %PortNumber%(%ca_disp_name%) is polling for peer port. This could happen when the cable is unplugged from one of the ends or the other end port is disabled.

12.6 ILOM Temperatures

This metric category contains the ILOM temperatures metrics.

12.6.1 Inlet Ambient Temperature

This metric shows the inlet ambient temperature for the ILOM target in degrees Celsius.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Current Inlet temperature for ILOM %target% is %value% degree Celcius.

12.6.2 Outlet Ambient Temperature

This metric shows the outlet ambient temperature for the ILOM target in degrees Celsius.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Current Outlet temperature for ILOM %target% is %value% degree Celcius.

12.6.3 System Ambient Temperature

This metric shows the system ambient temperature for the ILOM target in degrees Celsius.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	Not Defined	Current System temperature for ILOM %target% is %value% degree Celcius.

12.7 Memory Fault

This metric category contains the memory failure alert metric.

12.7.1 Fault Status

This metric provides the memory failure status.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	CRITICAL	Memory %MemoryName% has a fault.

12.8 Processor Fault

This metric category contains the CPU failure alert metric.

12.8.1 Fault Status

This metric provides the CPU failure status.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	Not Defined	CRITICAL	The processor %ProcessorName% has a fault.

12.9 Sensor Alerts

This metric category contains the sensor alert metrics.

12.9.1 Current Sensor Description

This metric provides a description of the current sensor status.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the GetSensorAlerts script .

User Action

No user action is required.

12.9.2 Current Sensor Status

This metric shows the current status of the ILOM sensor.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	WARNING - *	CRITICAL - *	Current sensor(s) at level - %CurrentStatusDesc%.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the GetSensorAlerts script.

User Action

No user action is required.

12.9.3 Fan Sensor Status

This metric shows the status of the sensor for the ILOM fan.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	WARNING - *	CRITICAL - *	Fan sensor(s) at level - %FanStatusDesc%.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSensorAlerts` script.

User Action

No user action is required.

12.9.4 Fan Sensor Status Description

This metric shows the description of the fan sensor status.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSensorAlerts` script.

User Action

No user action is required.

12.9.5 Power Supply Sensor Description

This metric shows the description of the power supply sensor status.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSensorAlerts` script.

User Action

No user action is required.

12.9.6 Power Supply Sensor Status

This metric shows the status of the sensor for the ILOM power supply.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	WARNING - *	CRITICAL - *	Power supply sensor(s) at level - %PowerSupplyStatusDesc%.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the GetSensorAlerts script.

User Action

No user action is required.

12.9.7 Temperature Sensor Description

This metric shows the description of the temperature sensor status.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the GetSensorAlerts script.

User Action

No user action is required.

12.9.8 Temperature Sensor Status

This metric shows the status of the sensor for the ILOM temperature.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	WARNING - *	CRITICAL - *	Temperature sensor(s) at level - %TemperatureStatusDesc%.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the GetSensorAlerts script.

User Action

No user action is required.

12.9.9 Voltage Sensor Description

This metric provides a description of the voltage sensor status.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSensorAlerts` script.

User Action

No user action is required.

12.9.10 Voltage Sensor Status

This metric shows the status of the sensor for ILOM voltage.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 5 Minutes	WARNING - *	CRITICAL - *	Voltage sensor(s) at level - %VoltageStatusDesc%.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSensorAlerts` script.

User Action

No user action is required.

12.10 Service Processor Information

This metric category contains the service processor information metrics.

12.10.1 Check Physical Presence

This metric provides a flag that indicates whether a user must press the **Locator** button on the physical system to recover the ILOM administrator password.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSpInformation` script.

User Action

No user action is required.

12.10.2 Host Name

This metric provides an ILOM host name as a method of network identification.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSpInformation` script.

User Action

No user action is required.

12.10.3 Reset to Defaults

This metric provides a flag that indicates whether the system has been told to reset to defaults.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSpInformation` script.

User Action

No user action is required.

12.10.4 System Contact

This metric provides a contact person and method of contact for the ILOM.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSpInformation` script.

User Action

No user action is required.

12.10.5 System Description

This metric provides a description of this ILOM.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSpInformation` script.

User Action

No user action is required.

12.10.6 System Identifier

This metric provides an ILOM system identifier property, which helps identify the managed device in the payload element of an SNMP trap.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSpInformation` script.

User Action

No user action is required.

12.10.7 System Location

This metric shows the physical location of the ILOM.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `GetSpInformation` script.

User Action

No user action is required.

12.11 Temperature Sensors

This metric category contains the temperature sensor metrics.

12.11.1 Sensor Reading (degree C)

This metric shows the ILOM temperature, in degrees Celsius.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 4 Minutes	Not Defined	Not Defined	The temperature sensor %SensorName% operating at %SensorReading%(degree C) has exceeded its threshold.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the TempSensorStatus.pl script.

User Action

No user action is required.

12.11.2 Sensor State

This metric shows the status of the ILOM temperature.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 4 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the TempSensorStatus.pl script.

User Action

No user action is required.

12.12 Voltage Sensors

This metric category contains the voltage sensor metrics.

12.12.1 Sensor Reading (Volts)

This metric reports the ILOM voltage reading, in volts.

The following table shows how often the metric's value is collected and compared against the default thresholds.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
12c	Every 4 Minutes	Not Defined	Not Defined	The voltage sensor %SensorName% operating at %SensorReading%(Volts) has exceeded its threshold.

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `VoltSensorStatus.pl` script.

User Action

No user action is required.

12.12.2 Sensor State

This metric shows the status of the ILOM voltage.

The following table shows how often the metric's value is collected.

Target Version	Collection Frequency
12c	Every 5 Minutes

Data Source

The data for this metric is collected using the OS line token fetchlet by running the `VoltSensorStatus.pl` script.

User Action

No user action is required.

Infiniband Network

This chapter provides information about the Infiniband Network metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

These metrics provide details on the throughput performance of each link (port-to-port connection) in the network, an aggregation of performance for Switch-to-Node and Switch-to-Switch link types, and total throughput performance of the network.

13.1 Link Type Performance

The metrics in this metric category describe the performance for Switch-to-Node and Switch-to-Switch link types.

13.1.1 Average Throughput

This metric reports the average throughput for all the links of this type (Gbps).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The data source is the perfquery command and the iblinkinfo.pl file.

User Action

No user action is required.

13.1.2 Highest Throughput

This metric reports the highest throughput amongst all the links of this type (Gbps).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The data source is the perfquery command and the niblinkinfo.pl file.

User Action

No user action is required.

13.1.3 Link Type

This metric reports the link type, either switch-to-switch or switch-to-node.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The data source is the perfquery command and the iblinkinfo.pl file.

User Action

No user action is required.

13.1.4 Lowest Throughput

This metric reports the lowest throughput amongst all of the links of this type (Gbps).

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The data source is the perfquery command and the iblinkinfo.pl file.

User Action

No user action is required.

13.2 Network Performance

This metric category contains the total throughput performance of the network.

13.2.1 Total Throughput (KBPS)

This metric reports the sum of all the bytes transmitted by each node in the last collection interval, divided by the duration of the last collection interval.

Target Version	Collection Frequency
All Versions	Every 24 Hours

Data Source

The data source is the perfquery command and the iblinkinfo.pl file.

User Action

No user action is required.

Infiniband Switch

This chapter provides information about the Infiniband Switch metrics.

For each metric, it provides the following information:

- Description
- Metric table

The metric table can include some or all of the following: target version, default collection frequency, default warning threshold, default critical threshold, and alert text.

These metrics describe the performance of each port of the switch and the aggregation of performance for Switch-to-Node and Switch-to-Switch link types. They also define whether a switch is a subnet manager for the network or not. Switch statistics are also covered.

14.1 Aggregate Sensors

This metric category is not initiated by the agent. The IB switch pushes information to the agent through SNMP trap mechanism. It works only when the agent subscribes for SNMP traps. Note that this metric is used only for generating alerts. No data is uploaded to repository. The All Metrics page will not show any data for this metric.

14.1.1 Alarm Status

This metric reports whether the severity is set or cleared (Major/Cleared).

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	major	The aggregate sensor %keyValue% has a fault.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.1.2 Sensor Value

This metric reports whether the aggregate sensor is de-asserted (1) or aggregate sensor state is asserted (2).

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.2 Fan Speed Sensors

Similar to Aggregate sensors, this metric category contains SNMP trap based metrics.

14.2.1 Alarm Status

This metric reports the alarm status. These values (Critical/Major/Warning) indicate fan speed has exceeded fatal, critical, and non-critical thresholds, respectively. The first two states are shown as Critical alert in Enterprise Manager and the last state is shown as Warning.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	warning FAULT_ DIAGNOSED FATAL_ SUSPECTED WARNING	critical major CRITICAL ERROR FAILED FAULTED NOT_PRESENT NON_RECOVERABLE PREDICTIVE_FAILURE_ ASSERTED LOWER_CRITICAL UPPER_CRITICAL LOWER_NON_RECOVERABLE UPPER_NON_RECOVERABLE	The speed of fan %keyValue% has exceeded its threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.2.2 Fan Speed (revolutions per minute)

This metric reports the speed of the fan in revolutions per minute.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.3 Fan Speed Sensor Alerts

Similar to Fan Speed Sensors, this metric category contains SNMP trap based metrics.

14.3.1 Alarm Status

This metric reports the alarm status. These values (Critical/Major/Warning) indicate that fan speed has exceeded fatal, critical, and non-critical thresholds, respectively. The first two states are shown as a Critical alert in Enterprise Manager and the last state is shown as Warning.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	warning WARNING	critical major CRITICAL ERROR FAILED	The speed of fan %keyValue% has exceeded its threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.3.2 Fan Speed (revolutions per minute)

This metric reports the speed of the fan in revolutions per minute.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.4 FRU Removal Alerts

This metric category provides information about field replaceable unit (FRU) removal alerts.

14.4.1 FRU Status

This metric displays an alert that is sent for all FRU removals.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	The FRU %keyValue% has been removed from the system.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.5 Response

The metric in this category is used to detect whether the management server on the cell is running.

14.5.1 Response Status

This metric is checked at 1 minute intervals. A one in the status column indicates that the cell is up, otherwise the cell is down.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 1 Minute	Not Defined	0	Failed to connect to Infiniband switch %target%.

Data Source

Not available.

User Action

No user action is required.

14.6 Switch Gateway Port State

This metric category provides information about the gateway metrics for gateway ports of an Infiniband switch.

14.6.1 10 Gb/s Ethernet Port

This metric displays the 10 Gb/s Ethernet port number.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.2 State

This metric displays the state of the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.3 Received Bytes

This metric displays the number of bytes received by the gateway

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.4 Received Packets

This metric displays the number of packets received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.5 Received Jumbo Packets

This metric displays the number of jumbo packets received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.6 Received Unicast Packets

This metric displays the number of unicast packets received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.7 Received Broadcast Packets

This metric displays the number of broadcast packets received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.8 Received Buffers

This metric displays the number of buffers received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.9 Received CRC Errors

This metric displays the number of Cyclic Redundancy Check (CRC) errors received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.10 Received Runtime Errors

This metric displays the number of runtime errors received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.11 Received Total Errors

This metric displays the total number of errors received by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.12 Transmitted Bytes

This metric displays the number of bytes transmitted by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.13 Transmitted Packets

This metric displays the number of packets transmitted by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.14 Transmitted Jumbo Packets

This metric displays the number of jumbo packets transmitted by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.15 Transmitted Unicast Packets

This metric displays the number of unicast packets transmitted by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.16 Transmitted Multicast Packets

This metric displays the number of multicast packets transmitted by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.17 Transmitted Broadcast Packets

This metric displays the number of broadcast packets transmitted by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.6.18 Transmitted Total Errors

This metric displays the total number of errors transmitted by the gateway.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.7 Switch Performance Summary

This metric category provides overall performance of the ibswitch across all ports.

14.7.1 Average link throughput (KBPS)

This metric reports the average number of bytes received and transmitted per second across all ports in the ibswitch (KBPS).

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.7.2 Highest link throughput (KBPS)

This metric reports the maximum number of bytes received and transmitted per second across all ports in ibswitch (KBPS).

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.7.3 Lowest link throughput (KBPS)

This metric reports the minimum number of bytes received and transmitted per second across all ports in ibswitch (KBPS).

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.8 Switch Port Configuration Monitor

This metric category is mainly used for monitoring the connectivity of ports and raising alerts when there is a disconnection.

14.8.1 GUID on the other end of the link

This metric reports the IB globally unique identifier (GUID). This is not an Enterprise Manager target GUID of the entity to which the port is connected. This can be switch GUID, if the other end is a switch port, or port GUID if it is an HCA port.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.8.2 Name of the entity to which this port is connected

This metric reports the name of the entity (Switch/Cell/Compute Node) to which this switch port is connected.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.8.3 Node GUID if the peer is a Switch port, Port GUID otherwise

This metric displays the node GUID if the peer port is a switch port. Otherwise, it displays the port GUID, indicating a HCA port.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.8.4 Port number of the peer port

This metric reports the port number of the peer port.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.8.5 Type of entity to which this disconnected port was connected

If this port is currently disconnected, then this field provides the type of the entity from which disconnection happened. It can take four possible values (Switch/Cell/Node/None). When the port is in connected state then the value for this metric is None.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	node cell switch	Port %PortNumber% on %target% is disconnected from port %ConnectedToPortNumberPrev% on %ConnectedToNamePrev%.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.8.6 Type of the entity to which this port is connected.

This metric can take any of the three values (Switch/Cell/Compute Node) depending on what entity this port is connected to.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9 Switch Port Errors

The metrics in this metric category provide statistics obtained from perfquery output on the switch. This metric values provide the delta change in error counters since last collection. Alerts are raised only if there are new errors since last metric collection.

14.9.1 Excessive buffer overruns

This metric reports the number of “buffer overruns exceeding the threshold” since last Collection (which is 5 minutes).

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% excessive buffer overruns, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.2 Incoming VL15 packets dropped due to resource limitation

This metric reports the number of incoming VL 15 packets dropped due to lack of buffers since last metric collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% incoming VL15 packets dropped, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.3 Link integrity errors

This metric displays the number of link integrity errors, that is errors on the local link.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% link integrity errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.4 Link recovers

This metric reports the number of times the link error recovery process was completed successfully since last collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% link recovers, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.5 Packets not transmitted due to constraints

This metric reports the number of packets not transmitted due to constraints since last collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% packets not transmitted due to constraints, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.6 Received packets discarded due to constraints

This metric reports the number of packets discarded due to constraints since last collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% received packets discarded due to constraints, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.7 Received packets marked with the EBP delimiter

This metric reports the number of packets marked with the EBP delimiter received on the port.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% received packets marked with the EBP delimiter, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.8 Received packets with error

This metric reports the number of packets received with errors since last collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% received packets containing an error, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.9 Symbol errors

This metric reports the number of symbols errors detected since last collection.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Port %PortNumber% has %value% symbol errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.9.10 Total errors

This metric reports the sum total of all errors mentioned above.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	10	Not Defined	Port %PortNumber% has %value% total errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.10 Switch Port Performance

This metrics category contains performance metrics at the switch port level.

14.10.1 Link Throughput: bytes transmitted and received per sec (KBPS)

This metric reports the number of bytes transmitted and received.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.10.2 Number of bytes received per sec (KBPS)

This metric reports the number of bytes received per second (KBPS).

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.10.3 Number of bytes transmitted per sec (KBPS)

This metric reports the number of bytes transmitted per second (KBPS).

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.10.4 Number of packets received per sec

This metric reports the number of packets received per second.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.10.5 Number of packets transmitted per sec

This metric reports the number of packets transmitted per second.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.11 Switch Port State

This metrics category contains Switch Port state metrics.

14.11.1 Active link width of port based on cable connectivity

This metric displays the active link width of the port based on the cable connectivity.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

14.11.2 Is the link degraded?

This metric reports whether or not the link is degraded. If the active speed of a link is less than the enabled speed, then it is considered to be degraded and this column value is set to 1. It is mainly used for raising alerts.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	1	Port %PortNumber% is running in degraded mode.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.11.3 Link state

This metric reports the link state. The link is down if the physical link state is 0.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.11.4 Physical link state

This metric reports the physical link state. The physical link state is 0 if the port is in polling or disabled state.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.11.5 The active link speed (Gbps)

The metric reports the speed of the active link.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.12 Switch Port State (For Alerts)

This metrics category contains Switch Port state metrics (for alerts).

14.12.1 Indicates that cable is present but port is disabled

This metric reports that the cable is present but that the port is disabled. This metric's collection frequency is event-driven.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Event-driven	Not Defined	1	Cable is present on Port %PortNumber% but the port is disabled.

14.12.2 Indicates that cable is present but port is polling for peer port

This metric reports that the cable is present but the port is checking for the peer port. This metric's collection frequency is event-driven.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Event-driven	Not Defined	1	Cable is present on Port %PortNumber% but it is polling for peer port. This could happen when the peer port is unplugged/disabled.

14.13 Switch State Summary

This metrics category contains metrics that report the overall state of switch ports.

14.13.1 Number of active ports

This metric reports the total number of active ports.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.13.2 Number of degraded ports

This metric reports the total number of degraded ports.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Number of degraded ports is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.13.3 Number of ports with errors

This metric reports the number of ports with errors. From 12.1.0.3 Exadata plug-in onwards, degraded ports are counted both in Degraded ports and Error ports categories.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Number of ports with errors is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.14 Switch Temperatures

This metrics category contains metrics that report the switch temperature.

14.14.1 Back of switch temperature

This metric reports the rear chassis temperature.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Switch back temperature is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.14.2 Front of switch temperature

This metric reports the front chassis temperature.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Switch front temperature is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.14.3 Switch I4 chip temperature

This metric reports the I4 chip temperature.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Switch I4 chip temperature is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.14.4 Switch Service Processor temperature

This metric reports the management controller temperature.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	Not Defined	Switch service processor temperature is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.15 Temperature Sensors

Similar to other SNMP trap based metrics, this metric category contains metrics that are also used only for generating alerts and are not uploaded to the repository.

14.15.1 Alarm Status

This metric reports the alarm status. These values (Critical/Major/Warning) indicate if the temperature has exceeded fatal, critical, and non-critical thresholds, respectively. The first two states are shown as Critical alert in Enterprise Manager and the last state is shown as Warning.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	critical major CRITICAL ERROR FAILED	The temperature sensor %keyValue% has exceeded its threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.15.2 Temperature (degrees Celsius)

This metric reports the temperature of rear chassis/front chassis/I4 chip/Management controller.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.16 Voltage Sensors

This metrics category contains metrics that report the voltage sensor.

14.16.1 Alarm Status

This metric reports the alarm status. These values (Critical/Major/Warning) indicate if the temperature has exceeded fatal, critical, and non-critical thresholds, respectively. The first two states are shown as Critical alert in Enterprise Manager and the last state is shown as Warning.

Target Version	Evaluation and Collection Frequency	Default Warning Threshold	Default Critical Threshold	Alert Text
All Versions	Every 5 Minutes	Not Defined	critical major CRITICAL ERROR FAILED	The voltage sensor %keyValue% has exceeded its threshold.

Data Source

The data is collected using SNMP.

User Action

No user action is required.

14.16.2 Voltage (mV)

This metric reports the voltage recorded by various voltage sensors on the ibswitch.

Target Version	Collection Frequency
All Versions	Every 5 Minutes

Data Source

The data is collected using SNMP.

User Action

No user action is required.

