Oracle® Enterprise Manager

Oracle Engineered Systems Metric Reference Manual

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Oracle Enterprise Manager Oracle Engineered Systems Metric Reference Manual, 24ai Release 1 (24.1)

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Contents

Preface

How to Use This Manual

1   Oracle Exadata

2   Recovery Appliance

Preface

This manual is a compilation of the Oracle Engineered Systems metrics provided in Oracle Enterprise Manager.

In addition to this manual, information on the Oracle Database and database-related target metrics is available in the following manuals:

- *Oracle Database Metric Reference Manual*
- *Oracle Grid Infrastructure Metric Reference Manual*
- *Systems Infrastructure Plug-in Metric Reference Manual*
- *Virtual Infrastructure Plug-in Metric Reference Manual*

Audience

This document is intended for Oracle Enterprise Manager users interested in Oracle Engineered Systems 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 Resources

For more information, see the documents and other resources in Oracle Enterprise Manager Documentation Sets and Other Resources.

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.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Convention	Meaning
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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How to Use This Manual

The *Oracle Enterprise Manager Oracle Engineered Systems Metric Reference Manual* (hereafter referred to as the *Oracle Engineered Systems Metric Reference Manual*) lists the Oracle Engineered Systems metrics that Enterprise Manager monitors.
To collect and monitor Oracle Engineered Systems metrics, the Systems Infrastructure plug-in must be deployed to an agent. The System Infrastructure plug-in depends on the EM Platform plug-in.

If you are managing **Oracle Exadata** systems, you will need the Oracle Exadata plug-in, which is installed with its dependencies: the EM Platform plug-in, Oracle Database plug-in, the Systems Infrastructure plug-in (including the EM Platform plug-in), and the Oracle Virtual Infrastructure plug-in.

If you are managing a **Recovery Appliance**, you will need the Zero Data Loss Recovery Appliance plug-in, with its dependency, the Oracle Exadata plug-in and its dependencies.

For information on metrics for CISCO switch, Integrated Light Out Manager, Infiniband Network, and Infiniband switch, see *Systems Infrastructure Plug-in Metric Reference Manual*.

For information on plug-ins, see Plug-ins Included In This Release in *Enterprise Manager Release Notes*.

This preface describes:

- Structure of the Metric Reference Manual
- About Metrics, Thresholds, and Alerts

Structure of the Metric Reference Manual

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 Engineered Systems 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
All versions	Every 10 minutes

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, 18c. Note that if "**All versions**" is mentioned, then the metric is available for target version 11gR2 and later.
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.

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.

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.

Accessing Metrics

To access metrics from the Enterprise Manager Console, use the All Metrics page:

1. From the Enterprise Manager 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:

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1. From the Enterprise Manager 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, and what benefit will be realized by defining a more stringent or lax threshold for that particular device, mount point, and so on.

1
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

Oracle Exadata Storage Server

The Oracle Exadata target monitors the software and hardware performance of an individual Oracle Exadata Storage Server in the database.

Aggregated Exadata Capacity

This metric category contains the aggregated metrics of the Exadata Capacity metric category and it collects every 60 minutes.

Target Version: All Versions

Collection Frequency: Every 60 Minutes

Metric	Description
Disk Size (GB)	This metric gives an indication of the size of the status in GB.
Disk Type	This metric reports the metrics are for hard disk, flash disk, flash cache, and grid disk.
Allocated (%)	This metric gives an indication of the percentage allocation of the total number of bytes for the hard disk, flash disk, flash cache, and grid disk.

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.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average CellDisk IO Load	This metric gives an indication of the average input/output load to the cell disk.
Average CellDisk Read IOPS	This metric gives an indication of the average number of read input/output operations per second.
Average CellDisk Read Response Time	This metric gives an indication of the average read response time to the cell disk.
Average CellDisk Read Throughput	This metric gives an indication of the average number of bytes read from the cell disk.
Average CellDisk Write IOPS	This metric gives an indication of the average number of write input/output operations to the cell disk.
Average CellDisk Write Response Time	This metric gives an indication of the average write response time to the cell disk.
Average CellDisk Write Throughput	This metric gives an indication for the average number of bytes written to the cell disk.
Maximum CellDisk IO Load	This metric gives an indication of the maximum input/output load to the cell disk.
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.
Total CellDisk Read IOPS	This metric gives an indication of the total number of read input/output operations per second to the cell disk.
Total CellDisk Read Throughput	This metric gives an indication for the total number of bytes read from the cell disk.
Total CellDisk Write IOPS	This metric gives an indication of the total number of write input/output operations per second to the cell disk.
Total CellDisk Write Throughput	This metric gives an indication of the total number of bytes written to the cell disk.

Aggregated Exadata Diskgroup Capacity

This metric category contains the aggregated capacity metrics for ASM instances and disk groups.

Target Version: All Versions

Collection Frequency: Every 60 Minutes

Metric	Description
ASM Instance	This metric reports the ASM instance name for the aggregated exadata diskgroup.
Diskgroup Name	This metric reports the name of the aggregated exadata diskgroup.
Count	This metric reports the total grid disk number for the specific diskgroup.
Size (GB)	This metric reports the diskgroup size in GB of the aggregated exadata diskgroup.

Aggregated Exadata FlashDisk and HardDisk

This metric category contains metrics that are aggregated over either the hard disks or flash disks in a cell.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average CellDisk IO Load	This metric reports the average input and output load to the cell disk.
Average CellDisk IO Utilization	This metric indicates the average utilization for I/O requests from the cell disk.
Average CellDisk Large Read IOPS	This metric indicates the average number of read input and output operations from large blocks in a cell disk.
Average CellDisk Large Read Response Time	This metric reports the average response time to read large blocks from the cell disk.
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.
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.
Average CellDisk Large Write Response Time	This gives an indication of the average response time when writing large blocks to the cell disk.
Average CellDisk Large Write Throughput	This gives an indication of the total number of bytes when writing large blocks to the cell disk.
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.
Average CellDisk Read Response Time	This metric reports the average read response time to the cell disk.
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.
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.
Average CellDisk Small Read Response Time	This metric reports the average response time when reading small blocks from the cell disk.
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.
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.
Average CellDisk Small Write Response Time	This metric reports the average response time when writing small blocks to the cell disk.
Average CellDisk Small Write Throughput	This gives an indication of the total number of bytes when writing small blocks to the cell disk.
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.
Average CellDisk Write Response Time	This metric reports the average response time when writing to the cell disk.
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.
CellDisk Type	This metric reports the type of Cell disk, either hard disk or flash disk.

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Metric	Description
Maximum CellDisk Small Read Response Time	This metric reports the maximum response time when reading small blocks from the cell disk.
Maximum CellDisk Small Write Response Time	This metric reports the maximum response time when writing small blocks to the cell disk.
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.
Total CellDisk IO Utilization	This metric reports the total utilization for I/O requests to the celldisk.
Total CellDisk Read IOPS	This metric reports the total number of bytes read from the hard disks or flash disks in a cell.
Total CellDisk Read Throughput	This metric reports the total number of bytes read from the hard disks or flash disks in a cell.
Total CellDisk Write IOPS	This metric reports the total number of bytes written to the hard disks or flash disks in a cell.
Total CellDisk Write Throughput	This metric reports the total number of bytes written to the hard disks or flash disks in a cell.

Aggregated Exadata Sparse Diskgroup Capacity

This metric category contains the sparse aggregated capacity metrics for ASM instances and disk groups.

Target Version: All Versions

Collection Frequency: Every 60 Minutes

Metric	Description
Count	This metric reports the total grid disk number for the specific diskgroup.
Size (GB)	This metric reports the diskgroup size in GB of the aggregated exadata sparse diskgroup.
Virtual Size (GB)	This metric reports the virtual diskgroup size in GB of the aggregated exadata sparse diskgroup.

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.

Target Version: 11*g*, 12*c*

Collection Frequency: N/A

Metric	Description
ADR Incident ID	This metric shows the alert Automatic Diagnostic Repository (ADR) unique identifier for Enterprise Manager Incident Manager.
ADR Problem Key	This metric shows the alert ADR problem key.
ADR Trace File Name	This metric shows the Alert ADR Trace file.
Action	This metric shows the recommended action to perform for this alert.
Alert Begin Time	This metric shows the time stamp when an alert changes its state.
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.
Alert Type	This metric shows the type of the alert. Values are stateful or stateless. Default Warning Threshold: Warning Default Critical Threshold: Critical Alert Text: Alert from %target% is cleared: %msg%
Alert Name	This metric shows the name of the alert.
Alert Sequence	This metric shows the alert sequence.
ECID	This metric shows the Alert ADR Execution Context Id.
Examined By	This metric shows the administrator who reviewed the alert.
Msg	This metric shows a brief explanation of the alert.
Notification	This metric shows the number indicating progress in notifying subscribers to alert messages.
Sequence Begin Time	This metric shows the time stamp when an alert sequence ID is first created.
Severity	This metric shows the Severity level. Possible values are clear, info, warning, or critical.

Cell ILOM Generated Alert

This metric category contains the cell ILOM generated alert metrics. This is shown whenever the Exadata Storage server (cell) ILOM generates alert and the Enterprise Manager subscribes to the cell's SNMP alert.

Target Version: 11*g*, 12*c*

Collection Frequency: N/A

Metric	Description
Chassis Id	This metric shows the Chassis Id of the cell ILOM.
Fault Class	This metric shows the fault class of the cell ILOM alert.
Fault Message Id	This metric shows the fault message Id of the cell ILOM alert.
Fault Status	This metric shows the fault status of the cell ILOM alert.
Fault Unique Id (UUID)	This metric shows the fault unique Id (UUID) of the cell ILOM alert.
Product Name	This metric shows the product name.

Exadata Services Status

This metric category contains the Exadata services status metric.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Metric	Description
CellSrv Status	This metric shows the status of the service *Cell Services*.
MS Status	This metric shows the status of the Management Server service.
RS Status	This metric shows the status of the Restart Server service.

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.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
CPU Utilization	This metric provides information about the CPU utilization. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: CPU Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
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.
Exadata Run Queue Length	This metric provides information about the Exadata run queue length. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Exadata Run Queue Length for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Exadata Temperature Lower Threshold	This metric shows the administrator who reviewed the alert. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Exadata Temperature Lower Threshold for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Exadata Temperature Reading	This metric reports the ambient operating temperature for the Exadata machine.
Exadata Temperature Upper Threshold	This metric reports the upper or maximum temperature threshold for the ambient operating temperature for the Exadata machine. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Exadata Temperature Upper Threshold for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
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.
LED Status	This metric provides the status of the locator LED (on or off).
Memory Utilization	This metric provides information about the memory utilization. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Memory Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Metric	Description
Network Received	This metric reports the total number of I/O packets received by interconnections per second.
Network Sent	This metric reports the total number of I/O packets transmitted by interconnections per second.
Offload Efficiency	This metric provides information about the offload efficiency. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Offload Efficiency for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Exadata CellDisk Metric

This metric category contains performance metrics for each cell disk. The metric values are collected for each cell disk.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average Large Read Response Time	This metric reports the average response time to read large blocks from the cell disk.
Average Large Write Response Time	This metric reports the average response time when writing large blocks to the cell disk.
Average Read Response Time	This metric reports the average read response time to the cell disk.
Average Response Time	This metric reports the average response time to the cell disk.
Average Small Read Response Time	This metric reports the average response time when reading small blocks from the cell disk.
Average Small Write Response Time	This metric reports the average response time when writing small blocks to the cell disk.
Average Write Response Time	This metric reports the average response time when writing to the cell disk.
CellDisk Type	This metric reports the celldisk type, either hard disk or flash disk.
IO Load	This metric reports the average input/output load to the cell disk.
IO Utilization	This metric reports the percentage utilization for I/O requests.
Large Read Bytes	This metric reports the number of MB read in large blocks from a cell disk. Default Critical Threshold: Not Defined Default Warning Threshold: Not Defined Alert Text: Large Read Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Large Read Requests	This metric reports the number of requests to read large blocks from a cell disk. Default Critical Threshold: Not Defined Default Warning Threshold: Not Defined Alert Text: Large Read Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Metric	Description
Large Write Bytes	This metric reports the number of MB written in large blocks to a cell disk.
	Default Critical Threshold: Not Defined
	Default Warning Threshold: Not Defined
	Alert Text: Large Write Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Large Write Requests	This metric reports the number of requests to write large blocks to a cell disk.
	Default Critical Threshold: Not Defined
	Default Warning Threshold: Not Defined
	Alert Text: Large Write Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Object Name	This metric reports the cell disk name.
Read IOPS	This metric reports the number of read input/outputs per second to a cell disk.
Read Throughput (MBPS)	This metric reports the number of bytes in MB per second read from a cell disk.
Small Read Bytes	This metric reports the number of MB read in small blocks from a cell disk.
	Default Critical Threshold: Not Defined
	Default Warning Threshold: Not Defined
	Alert Text: Small Read Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Small Read Requests	This metric reports the number of requests to read small blocks from a cell disk.
	Default Critical Threshold: Not Defined
	Default Warning Threshold: Not Defined
	Alert Text: Small Read Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Small Write Bytes	This metric reports the number of MB written in small blocks to a cell disk.
	Default Critical Threshold: Not Defined
	Default Warning Threshold: Not Defined
	Alert Text: Small Write Bytes for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Small Write Requests	This metric reports the number of requests to write small blocks to a cell disk.
	Default Critical Threshold: Not Defined
	Default Warning Threshold: Not Defined
	Alert Text: Small Write Requests for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Write IOPS	This metric reports number of write input/outputs operations per second to a cell disk.
Write Throughput (MBPS)	This metric reports the number of bytes in MB per second written to a cell disk.

Exadata CellDisk Load Imbalance

This metric category contains the Exadata CellDisk Load Imbalance metrics.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
IO Load Imbalance	This metric gives an indication of the percentage of maximum average I/O load from the cell disk. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: CellDisk %object_name% is %cd_io_load_imbalance%% load imbalance, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Object Name	This metric gives an indication of the object, such as hard disk or flash disk name.

Exadata Disk Status Metric

This metric category contains the status of the physical Exadata disk.

Target Version: All Versions

Collection Frequency: Every 1 Hour

Metric	Description
Disk Status	This metric reports the status of the physical disk. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Physical Disk Status %target%:%object_name% is %value%, equaled to warning (%warning_threshold%) or critical (%critical_threshold%) value.

Exadata Flash Cache IORM Database Metric

This metric category contains the IO statistics for the flash cache by database.

Metric	Description
Cell Name	This is the short name of the Exadata Storage Server without domain suffix. Target Version: All Versions
	Collection Frequency: Every 15 Minutes
Size (MB)	This metric shows the disk size in MB of the Flash Cache IORM Database. Target Version: 10*g*, 11*g*, 12cR1
	Collection Frequency: Every 24 hours

Exadata Flash Cache IORM Pluggable Database Metric

This metric category contains the IO statistics for the flash cache by pluggable database.

Metric	Description
Cell Name	This is the short name of the Exadata Storage Server without domain suffix. Target Version: All Versions
	Collection Frequency: Every 15 Minutes
Size (MB)	This metric shows the disk size in MB of the Flash Cache IORM Pluggable Database. Target Version: 13*c*
	Collection Frequency: Every 15 Minutes

Exadata Flash Cache Metric

This metric category contains the performance metrics for the flash cache in a cell.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
All I/O Requests	This metric reports the cumulative number of read requests to flash cache since the metric was created.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
Default Hits	This metric reports the number of read requests satisfied from flash cache non-keep objects since the last metric collection.
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. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Default hits rate for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
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.
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. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Default misses rate for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Default Read IOPS	This metric reports the number of read requests per second which were satisfied from flash cache non-keep objects.
Default Read Throughput (MBPS)	This metric reports the size of data read per second from flash cache non-keep objects.
Default Used (GB)	This metric reports the space used for non-keep objects on flash cache.
Destage Write To Disk Per Second	This metric reports the cumulative number of requests per second to write to flash cache since the metric was created.
First Writes	The metric reports the cumulative number of requests to write new data to flash cache since the metric was created.
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.
Flash Cache Population Writes Per Second	The metric reports the number of requests that are population writes into the flash cache due to read miss.
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.
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.
I/O Requests for keep	This metric reports the cumulative number of read requests to keep objects since the metric was created.

Metric	Description
Keep Hits	This metric shows the number of read requests satisfied from Flash Cache keep objects since the last metric collection.
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. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Keep hits rate for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
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.
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. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Keep misses rate for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Keep Overwrites Per Second	This metric reports the number of megabytes per second pushed out of the flash cache because of space limits for keep objects.
Keep Pool Read IOPS	This metric reports the number of read requests per second which were satisfied from Flash Cache keep objects.
Keep Pool Read Throughput (MBPS)	This metric reports the size of data read per second from Flash Cache keep objects.
Keep Pool Used (GB)	This metric reports the space used for keep objects on Flash Cache.
Overwrites	This metric reports the cumulative number of requests to overwrite existing data in flash cache.
Overwrites Per Second	This metric reports the cumulative number of requests per second to overwrite existing data in flash cache.
Read Hit Ratio for Random I/O	This metric reports the read hit ratio which is caculated by dividing Read IOPS by the sum of Read IOPS and disk reads per second.
Read IOPS for Random I/O	This metric reports the number of read requests per second from flash cache, for random I/O.
Read IOPS for Scan	This metric reports the number of IO read per second from flash cache, for scan data.
Read Misses (MB)	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.
Read Throughput Redirected to Disk for Scan (MBPS)	This metric reports the size of data read per second from disk, for scan data.
Read Throughput for Random I/O (MBPS)	This metric reports the throughput of data read from flash cache for random I/O.
Read Throughput for Scan (MBPS)	This metric reports the number of megabytes read per second from flash cache, for scan data.
Reads (MB)	This metric reports the cumulative size of data read from Flash Cache since the metric was created.
Reads for Keep (MB)	This metric reports the cumulative size of data read from Flash Cache keep objects since the metric was created.
Used (GB)	This metric reports the size of used space on flash cache.
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.

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Exadata Flash IORM Consumer Group Metric

This metric category contains the IO statistics of flash by consumer group.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average I/O Throughput (MB/Sec)	This metric reports the number of megabytes of I/O per second for this consumer group to flash.
Average Wait Time for I/O (ms/req)	This metric reports the average IORM wait time per request issued by a consumer group.
Average IORM Wait Time for Large I/O (ms/req)	This metric reports the average IORM wait time per request issued by a consumer group for large I/O.
Average IORM Wait Time for Small I/O (ms/req)	This metric reports the average IORM wait time per request issued by a consumer group for small I/O.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
I/O Requests per Second (IO/sec)	This metric reports the number of IO requests issued by a consumer group to flash per second.
I/O Requests per Second - Large (IO/Sec)	This metric reports the number of large IO requests issued by a consumer group to flash per second.
I/O Requests per Second - Small (IO/Sec)	This metric reports the number of small IO requests issued by a consumer group to flash per second.
I/O Utilization (%)	This metric reports the percentage of flash resources utilized by requests from this Consumer Group.

Exadata Flash IORM Database Metric

This metric category contains the IO statistics of flash by database.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average I/O Throughput (MB/Sec)	This metric reports the average number of megabytes of I/O per second for this database to flash.
Average Wait Time for I/O (ms/req)	This metric reports the average IORM wait time per request issued to the flash by a database.
Average IORM Wait Time for Large I/O (ms/req)	This metric reports the average IORM wait time per request issued to the flash by a database for large I/O.
Average IORM Wait Time for Small I/O (ms/req)	This metric reports the average IORM wait time per request issued for the flash by a database for small I/O.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
I/O Requests per Second (IO/sec)	This metric reports the number of IO requests issued by a database to the flash per second.

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Metric	Description
I/O Requests per Second - Large (IO/Sec)	This metric reports the number of large IO requests issued by a database to the flash per second.
I/O Requests per Second - Small (IO/Sec)	This metric reports the number of small IO requests issued by a database to the flash per second.
I/O Utilization (%)	This metric reports the percentage of flash resources utilized by requests from this database.

Exadata Flash IORM Pluggable Database Metric

This metric category contains the IO statistics of flash by pluggable database.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average I/O Throughput (MB/Sec)	This metric reports the average number of megabytes of I/O per second for this pluggable database to flash disks.
Average IORM Wait Time for I/O (ms/req)	This metric reports the average IORM wait time per request issued by a pluggable database to the flash disks.
Average IORM Wait Time for Large I/O (ms/req)	This metric reports the average IORM wait time per request issued by a pluggable database to the flash disks for large I/O.
Average IORM Wait Time for Small I/O (ms/req)	This metric reports the average IORM wait time per request issued by a pluggable database to the flash disks for small I/O.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
I/O Requests per Second (IO/sec)	This metric reports the number of IO requests issued by a pluggable database to the flash disk per second.
I/O Requests per Second - Large (IO/Sec)	This metric reports the number of large IO requests issued by a pluggable database to the flash disk per second.
I/O Requests per Second - Small (IO/Sec)	This metric reports the number of small IO requests issued by a pluggable database to the flash disk per second.
I/O Utilization (%)	This metric reports the percentage of flash resources utilized by requests from this pluggable database.

Exadata Flash Log Metric

This metric category contains the Exadata Flash Log metrics.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
Cumulative Disk Write Errors	This metric reports the cumulative number of write errors encountered while writing to hard disks.

Metric	Description
Cumulative Flash Write Errors	This metric reports the cumulative number of write errors encountered while writing to flash disks.
Efficiency of Smart Flash Log Over the Past Hour	This metric provides the efficiency of smart flash log over the past hour, that is, the ratio between the number of redo log writes completed by smart flash log in the past hour.
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.
Megabytes per second Written to Flash	This metric provides a number of megabytes per second written to flash disk.
Megabytes per second Written to Hard Disk	This metric provides a number of megabytes per second written to hard disk.
Redo Data Kept	This metric provides the number of bytes of redo data kept over time.
Redo Writes Exceeding Outlier Threshold	This metric provides the number of redo writes that exceed the outlier threshold over time.
Redo Writes Prevented from Exceeding Outlier Threshold	This metric provides the number of redo writes that were prevented from exceeding the outlier threshold over time.
Skipped Large Writes	This metric provides the number of write operations that were skipped for Large I/O.
Skipped Writes Due to Slow Disk	This metric provides the number of write operations that were skipped due to the reason that the hard disk was slow in responding.
Skipped Writes Due to Slow Disk During Last Minute	This metric provides the number of write operations that were skipped due to the reason that the hard disk was slow in responding in the last minute.
Skipped Writes Due to Unavailable Buffer	This metric provides the number of write operations that were skipped due to the unavailability of the buffer.
Writes Serviced	This metric provides the number of write operations that were serviced over the selected time range.

Exadata IORM Consumer Group Metric

This metric category contains the Exadata IORM Consumer Group metrics.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
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.
Average Wait Time for I/O (ms/req)	This metric reports the average IORM wait time per request issued by a consumer group.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
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.
I/O Utilization (%)	This metric reports the percentage of disk resources utilized by requests from this Consumer Group.

Exadata IORM DB

This metric category contains the metrics collected for the IORM databases.

Target Version: All Versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average I/O Load	This metric reports the average I/O load from this database for hard disks.
Average I/O Throughput (MB/Sec)	This metric reports the number of megabytes of I/O per second for this database to hard disks.
Average Wait Time for I/O (ms/req)	This metric reports the average wait time for I/O requests. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: 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.
Average Wait Time for Large I/O (ms/req)	This metric reports the average wait time for large I/O requests. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: 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.
Average Wait Time for Small I/O (ms/req)	This metric reports the average wait time for small I/O requests. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: 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.
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 or to flash disks.
Average latency of reading or writing blocks/request from hard disks	This metric reports the rate which is the average latency of reading or writing blocks per request by a database from or to hard disks.
Average latency of reading or writing large blocks/request from hard disks	This metric reports the rate which is the average latency of reading or writing large blocks per request by a database from or to hard disks.
Average latency of reading or writing small blocks/request from hard disks	This metric reports the rate which is the average latency of reading or writing small blocks per request by a database from or to hard disks.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
Cumulative latency of reading or writing blocks from flash disks	This metric reports the cumulative latency of reading or writing blocks by a database from or to flash disks.
Cumulative latency of reading or writing large blocks from hard disks	This metric reports the cumulative latency of reading or writing large blocks by a database from or to hard disks.
Cumulative latency of reading or writing small blocks from hard disks	This metric reports the cumulative latency of reading or writing small blocks by a database from or to hard disks.
I/O Requests per Second (IO/Sec)	This metric reports the number of IO requests issued by a database to hard disks per second.

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Metric	Description
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.
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.
IO Utilization (%)	This metric reports the percentage utilization for I/O requests.
Large I/O Utilization (%)	This metric reports the percentage utilization for large I/O requests. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Database IO Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Small IO Utilization (%)	This metric reports the percentage utilization for small I/O requests.
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 inter-database plan. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Wait Time of Large Requests for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
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 inter-database plan. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: Wait Time of Small Requests for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Exadata IORM Pluggable Database Metric

This metric category contains the metrics collected for the IORM pluggable databases.

Target Version: 12*c*

Collection Frequency: Every 15 Minutes

Metric	Description
Average I/O Load	This metric reports the average I/O load from this pluggable database for hard disks.
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.
Average Wait Time for I/O (ms/req)	This metric reports the average wait time for large I/O requests. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: 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.

Metric	Description
Average Wait Time for Small I/O (ms/req)	This metric reports the average wait time for small I/O requests. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: 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.
Average Wait Time for I/O (ms/req)	This metric reports the average wait time for I/O requests. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: 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.
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
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.
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.
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.
I/O Utilization (%)	This metric reports the percentage utilization for I/O requests. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: IO Utilization for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Large I/O Utilization (%)	This metric reports the percentage of disk resources utilized by large requests from this Pluggable Database.
Small I/O Utilization (%)	This metric reports the percentage of disk resources utilized by small requests from this Pluggable Database.
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 inter-database plan. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Wait Time of Large requests for %target%:%object_name%:%cell_name% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
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. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Wait Time of Small requests for %target%:%object_name%:%cell_name% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

Exadata Key Performance Indicators

The following key performance indicator metrics are displayed for the Exadata Storage Server:

Metric	Description	Alert Message	Clear Message
Exadata Key Performance Indicators	Key performance indicators for the Exadata Storage Server.	-	-
Total Flash Disk IOPS	Aggregated total read and write IOPS of all flash disks on the Exadata Storage Server.	Total flash disk IOPS for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total flash disk IOPS for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total Hard Disk IOPS	Aggregated total read and write IOPS of all hard disks on the Exadata Storage Server.	Total hard disk IOPS for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total hard disk IOPS for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total Flash Disk Throughput	Aggregated total read and write throughput of all flash disks on the Exadata Storage Server.	Total flash disk throughput for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total flash disk throughput for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total Hard Disk Throughput	Aggregated total read and write throughput of all hard disks on the Exadata Storage Server.	Total hard disk throughput for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total hard disk throughput for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Flash Disk IO Load	Average IO load across all flash disks on the Exadata Storage Server.	Average flash disk IO load for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Average flash disk IO load for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Hard Disk IO Load	Average IO load across all hard disks on the Exadata Storage Server.	Average hard disk IO load for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Average hard disk IO load for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Flash Disk Response Time	Average read and write latency across all flash disks on the Exadata Storage Server.	Average flash disk response time for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Average flash disk response time for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Hard Disk Response Time	Average read and write latency across all hard disks on the Exadata Storage Server.	Average hard disk response time for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total hard disk response time for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Flash Disk IO Health Exceptions	Number of flash disk Key Performance Indicators exceeding their critical thresholds for the Exadata Storage Server.	%target% has %value% flash disk Key Performance Indicators exceeding their critical thresholds.	%target% has %value% flash disk Key Performance Indicators exceeding their critical thresholds.

Metric	Description	Alert Message	Clear Message
Hard Disk IO Health Exceptions	Number of hard disk Key Performance Indicators exceeding their critical thresholds for the Exadata Storage Server.	%target% has %value% hard disk Key Performance Indicators exceeding their critical thresholds.	%target% has %value% hard disk Key Performance Indicators exceeding their critical thresholds.

Exadata Smart IO Metric

This metric category contains the Exadata smart IO metrics.

Target Version: 11*g*R2, 12*c*

Collection Frequency: Every 15 Minutes

Metric	Description
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
Megabytes per second of pass through IOs	This metric provides a number of megabytes per second saved by storage index.
Megabytes per second read from flash cache	This metric provides a number of megabytes per second read from flash cache by smart IO.
Megabytes per second read from hard disk	This metric provides a number of megabytes per second read from hard disk by smart IO.
Megabytes per second saved by storage index	This metric provides a number of megabytes per second saved by storage index.

Exadata Storage Type

This metric provides information on the available storage types.

Target Version: All versions

Collection Frequency: Every 24 Hours (1440 Minutes)

Metric	Description
Physical Disk Type	This metric column lists available storage types as physical disks on Exadata storage server, for example, HarDisk and FlashDisk.
Number of Physical Disks	This metric column provides the count of physical disks for each storage type on Exadata Storage Server, for example 12 for HardDisk, and 16 for FlashDisk.
Number of Cell Disks	This metric column provides count of physical disks that are configured as cell disks for each storage type on Exadata Storage Server, for example 12 for HardDisk, and 16 for FlashDisk.

Filesystem Utilization

This metric category contains the metrics relating to the filesystem utilization.

Target Version: All versions

Collection Frequency: Every 24 Hours

Metric	Description
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
Filesystem Utilization %	This metric provides the percentage of file system usage on the target. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: File system usage on %target%: %name%:%cell_name% is %value%, which has crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

HCA Port Configuration Monitor

This metric category contains the HCA port configuration monitor metrics.

HCA Port Errors

This metric category contains the HCA port error metrics.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Metric	Description
Excessive buffer overruns	This metric reports the number of "buffer overruns exceeding the threshold" since the last metric collection. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% excessive buffer overruns, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
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. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% incoming VL15 packets dropped, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Link integrity errors	This metric displays the number of link integrity errors, that is, errors on the local link. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% link integrity errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Link recovers	This metric reports the number of times the link error recovery process was completed successfully since the last metric collection. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% link recovers, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Packets not transmitted due to constraints	This metric reports the number of packets not transmitted due to constrains since the last metric collection. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% packets not transmitted due to constraints, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

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Metric	Description
Received packets discarded due to constraints	This metric reports the number of packets discarded due to constraints since the last metric collection. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% received packets discarded due to constraints, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Received packets marked with the EBP delimiter	This metric reports the number of packets marked with the EBP delimiter received on the port. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% received packets marked with the EBP delimiter, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Received packets with error	This metric reports the number of packets received with errors since the last metric collection. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% received packets containing an error, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Symbol errors	This metric reports the number of symbols errors detected since the last metric collection. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% symbol errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total errors	This metric reports the sum total of all errors listed in this section. Default Warning Threshold: Not Defined
	Default Critical Threshold: Not Defined
	Alert Text: Port %PortNumber% has %value% total errors, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

HCA Port State

This metric category contains the HCA port state metrics.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Metric	Description
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.
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. Default Warning Threshold: Not Defined
	Default Critical Threshold: 1
	Alert Text: Port %PortNumber%(%ca_disp_name%) is running in degraded mode.
Link state (0 = Down, 1 = Active)	This metric reports the link state. The link is down if the physical link state is 0.
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.

Metric	Description
The active link speed (Gbps)	The metric reports the speed of the active link.

HCA Port State (For Alerts)

The metrics in this category describe the host channel adapters (HCA) port state .

Target Version: All versions

Collection Frequency: Every 15 Minutes

Metric	Description
Is port disabled?	This metric indicates whether the HCA port is disabled. Default Warning Threshold: Not Defined
	Default Critical Threshold: 1
	Alert Text: Port %PortNumber%(%ca_disp_name%) is disabled.
Is port in 'polling' state?	This metric indicates whether the HCA port is checking or polling for a peer port. Default Warning Threshold: Not Defined
	Default Critical Threshold: 1
	Alert Text: 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.

Host Interconnect Statistics

This metric category contains the Host Interconnect Statistics metrics.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Metric	Description
Cell Name	This is the short name of the Exadata Storage Server without domain suffix.
Host MB Dropped Per Sec	This metric reports the number of megabytes dropped during transmission to a particular host in the interval.
Host MB Received Per Sec	This metric reports the number of megabytes received from a particular host in the interval.
Host MB Resent Per Sec	This metric reports the number of megabytes retransmitted to a particular host in the interval.
Host MB sent Per Sec	This metric reports the number of megabytes transmitted to a particular host in the interval.
Host RDMA MB Dropped Per Sec	This metric reports the number of megabytes dropped during RDMA transmission to a particular host in the interval.
Host RDMA Retry Latency (msec)	This metric reports the latency of the retry action during RDMA transmission to a particular host in the interval.

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.

Target Version: All versions

Collection Frequency: Every 5 Minutes

Metric	Description
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. Default Warning Threshold: Not Defined
	Default Critical Threshold: 0
	Alert Text: %target% is down. MS Status is %MSStatus% and Ping Status is %MgmtNetworkPingStatus%.

Top CPU Activity

This metric category contains the Top CPU metrics.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Metric	Description
Activity(%)	This metric reports the percentage of total samples from a specific database.
Begin Sequence	This metric reports the begin sequence number for collection.
Database Name	This metric reports the database unique name ("other" represents unnamed database requests).
End Sequence	-
Incarnation	This metric reports the cellsrv incarnation number.
SQL ID	This metric reports the SQL unique ID ("0000000000000" represents requests without a SQL ID).
Samples	This metric reports the total samples collected for a specific database in this interval.
Total Samples	This metric reports the total samples collected in this interval.

Network Port

This metric category contains the metrics used to monitor the performance, traffic statistics and the error statistics of the network ports.

Network Ports InfiniBand Error Statistics

This metric details the error statistics of the InfiniBand ports. The data is collected every 15 minutes.

Metric Summary

Each of the below metric columns have metric data such as Port ID, Average Value, Low Value, High Value, Last Known Value, Current Severity, Alert Triggered, and Last Collection Timestamp.

Metric Column	Description
Execution Buffer Overrun Errors	Number of buffer overruns since last collection
Link Downed	Number of failed link errors recovered and link down errors since the last collection
Link Integrity Errors	Number of link integrity errors since last collection

Metric Column	Description
Link Recovers	Number of link error recovers since last collection
Number of packets with the EBP delimiter received on the port since the last collection	Total number of packets with the EBP delimiter received on the port
Received Constraint Errors	Number of received constraint errors since last collection
Received Errors	Number of error packets received on the port since the last collection
Received Switch Relay Errors	Number of received switch relay errors since last collection
Sent Constraint Errors	Number of transmitted constraint errors since last collection
Sent Discards	Number of outbound packets discarded because of down/congested port since last collection
Symbol Errors	Number of minor link errors since the last collection. Usually an `8b/10b` error due to a bit error
Total Errors	Total number of errors
Virtual Lanne 15 Packets Dropped	Number of incoming Virtual Lane 15 packets dropped due to resource limitations

Network Ports InfiniBand Performance

This metric provides the performance statistics of the InfiniBand ports. The metric is collected every 15 minutes.

Metric Summary

Metric Column	Description	Metric Data
Active link width of port based on cable connectivity (e.g., 1X)	The active width of the InfiniBand port	Port ID, Average Value, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Cable State	The state of the cable connected to the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Enabled link speed (Gbps)	The enabled speed for the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Enabled link width (e.g., 1X or 4X)	The enabled width of the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Gateway Port Link Mode	The mode of the gateway port, if applicable	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Is port disabled?	Indicates that the cable is present but the port is disabled	Port ID, Average Value, Low Value, High Value, Last Known Value, Current Severity, Alert Triggered, Last Collection Timestamp
Is port in 'polling' state?	Indicates that the cable is present but the port is polling	Port ID, Average Value, Low Value, High Value, Last Known Value, Current Severity, Alert Triggered, Last Collection Timestamp

Metric Column	Description	Metric Data
Is the link degraded? (active speed or width less than enabled)	Indicates whether the link is degraded on the InfiniBand port	Port ID, Average Value, Low Value, High Value, Last Known Value, Current Severity, Alert Triggered, Last Collection Timestamp
Link state (0 = Down, 1 = Active)	The link state associated with the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Local Port LID	The LID (local identifier) associated with the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Physical link state (0 = Disabled/Polling, 1 = LinkUp)	The physical link state associated with the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Port State	The state of the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Remote Port LID	The LID (local identifier) associated with the remote InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Supported link speed (Gbps)	The supported speed for the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
Supported link width (e.g., 1X or 4X)	The supported width of the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp
The active lin kspeed (Gbps)	The active speed of the InfiniBand port	Port ID, Last Collected Value, Current Severity, Alert Triggered, Last Collection Timestamp

Network Ports InfiniBand Traffic Statistics

This metric provides the traffic statistics of the InfiniBand ports. The metric is collected every 15 minutes.

Metric Summary

Each metric column contains the metric data such as Port ID, Average Value, Last Known Value, Current Severity, Alert Triggered, and Last Collection Timestamp.

Metric Column	Description
Received Bytes	Total number of incoming octets
Received Multicast Packets	Total number of incoming multicast packets
Received Packets	Total number of incoming packets
Received Unicast Packets	Total number of incoming unicast packets
Sent Bytes	Total number of outgoing octets
Sent Multicast Packets	Total number of outgoing multicast packets
Sent Packets	Total number of outgoing packets
Sent Unicast Packets	Total number of outgoing unicast packets

Network Ports Performance

This metric provides the performance statistics of the network ports. The metric is collected every 15 minutes.

Metric Summary

In the following metrics columns, if the metric provides the status, then the metric data available are Name, Average Value, Last Collected Value, Current Severity, Alert Triggered, and Last Collection Timestamp. If the metric provides numerical values, then additionally, the metric data for Average Value, Low Value, High Value, and Last Known Value are available.

Metric Column	Description
Admin State	Administrative state. For example, UP, DOWN, TESTING.
Discarded Packets	Number of discarded packets
Duplex Mode	Actual mode of the port. Full or Half.
Inbound Errors	Number of incoming errors
Inbound Multicast Packets	Number of incoming non-unicast packets
Inbound Octets	Number of incoming octets
Inbound Octets Rate	Total incoming octets rate
Inbound Unicast Packets	Number of incoming unicast packets
Inbound Unknown Protocol	Number of incoming unknown protocol errors
MTU	Actual physical MTU
Operational Status	Operation status of the port. For example, UNKNOWN, UP, DOWN, TESTING, UNCONNECTED.
Outbound Discards	Number of outgoing discards
Outbound Errors	Number of outgoing errors
Outbound Multicast Packets	Number of outbound non-unicast packets
Outbound Octets	Number of outbound octets
Outbound Octets Rate	Total outgoing octets rate
Outbound Unicast Packets	Number of outbound unicast packets
Partition Keys	List of partition keys to which this port belongs
Port is down	Port status became down
Speed	Actual speed of the port
Speed Units	The unit of speed. For example, bytes per second, kilobytes per second, megabytes per second, gigabytes per second.
Total Octets Rate	Total octets rate for incoming and outgoing data
vLAN IDs	List of vLAN IDs to which this port belongs

Password Expiration

This metric category provides details on how long before the current monitoring password for Exadata Storage Server will expire. This is applicable for Exadata Storage Server targets using the monitoring mechanism ExaCLI or RESTAPI.

Target Version: Exadata Storage Server target *19.1.0.0.0*

Collection Frequency: Every 1 Hour

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Metric	Description
Days Until Password Expiration	This metric shows the number of days until the password expiration. Default Warning Threshold is `14 days` and Default Critical Threshold is `7 days`.

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.

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.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Metric	Description
Average Flash Disk IO Load	This metric indicates the average input/output load to the Flash disk.
Average Flash Disk Read IOPS	This metric indicates the average number of bytes read from the Flash disk.
Average Flash Disk Read Throughput	This metric indicates the average number of bytes read from the Flash disk.
Average Flash Disk Write IOPS	This metric indicates the average number of input/output operations written to the Flash disk
Average Flash Disk Write Throughput	This metric indicates the average number of bytes written to the Flash disk.
Average Hard Disk IO Load	This metric indicates the average I/O load to the hard disk.
Average Hard Disk Read IOPS	This metric indicates the average number of read input/output operations from the hard disk.
Average Hard Disk Read Throughput	This metric indicates the average number of bytes read from the hard disk.
Average Hard Disk Write IOPS	This metric indicates the average number of input/output operations written to the hard disk.
Average Hard Disk Write Throughput	This metric indicates the average number of bytes written to the hard disk.
Maximum Flash Disk IO Load	This metric indicates the maximum I/O load to the Flash disk.
Maximum Flash Disk Read IOPS	This metric indicates the maximum number of read input/output operations per second to the Flash disk.
Maximum Flash Disk Read Throughput	This metric indicates the maximum number of bytes read from the Flash disk.
Maximum Flash Disk Write IOPS	This metric indicates maximum number of input/output operations written to the Flash disk.
Maximum Flash Disk Write Throughput	This metric indicates maximum number of bytes written to the Flash disk.
Maximum Hard Disk IO Load	This metric indicates the maximum I/O load to the hard disk.

Metric	Description
Maximum Hard Disk Read IOPS	This metric indicates the maximum number of input/output operations read from the hard disk.
Maximum Hard Disk Read Throughput	This metric indicates the maximum number of bytes read from the hard disk.
Maximum Hard Disk Write IOPS	This metric indicates the maximum number of input/output operations written to the hard disk.
Maximum Hard Disk Write Throughput	This metric indicates the maximum number of bytes written to the hard disk.
Minimum Flash Disk IO Load	This metric indicates the minimum I/O load to the Flash disk.
Minimum Flash Disk Read IOPS	This metric indicates the minimum number of read input/output operations from the Flash disk.
Minimum Flash Disk Read Throughput	This metric indicates the minimum number of bytes read from the Flash disk.
Minimum Flash Disk Write IOPS	This metric indicates the minimum number of input/output operations written to the Flash disk.
Minimum Flash Disk Write Throughput	This metric indicates the minimum number of bytes written to the Flash disk.
Minimum Hard Disk IO Load	This metric indicates the minimum I/O load to the hard disk.
Minimum Hard Disk Read IOPS	This metric indicates the minimum number of read input/output operations per second to the hard disk.
Minimum Hard Disk Read Throughput	This metric indicates the minimum number of bytes read from the hard disk.
Minimum Hard Disk Write IOPS	This metric indicates the minimum number of input/output operations written to the hard disk.
Minimum Hard Disk Write Throughput	This metric indicates the minimum number of bytes written to the hard disk.

Response

This metric category contains the metric used to detect the response of the Oracle Database Exadata Storage Server System.

Target Version: All versions

Collection Frequency: Event-driven

Metric	Description
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.

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.

Exadata Key Performance Indicators

The following key performance indicator metrics are displayed for the Exadata Storage Server Grid:

Metric	Description	Alert Message	Clear Message
Exadata Key Performance Indicators	Key performance indicators for the Exadata Storage Server Grid.	-	-
Total Flash Disk IOPS	Aggregated total read and write IOPS of all flash disks on the Exadata Storage Server Grid.	Total flash disk IOPS for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total flash disk IOPS for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total Hard Disk IOPS	Aggregated total read and write IOPS of all hard disks on the Exadata Storage Server Grid.	Total hard disk IOPS for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total hard disk IOPS for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total Flash Disk Throughput	Aggregated total read and write throughput of all flash disks on the Exadata Storage Server Grid.	Total flash disk throughput for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total flash disk throughput for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Total Hard Disk Throughput	Aggregated total read and write throughput of all hard disks on the Exadata Storage Server Grid.	Total hard disk throughput for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total hard disk throughput for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Flash Disk IO Load	Average IO load across all flash disks on the Exadata Storage Server Grid.	Average flash disk IO load for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Average flash disk IO load for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Hard Disk IO Load	Average IO load across all hard disks on the Exadata Storage Server Grid.	Average hard disk IO load for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Average hard disk IO load for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Flash Disk Response Time	Average read and write latency across all flash disks on the Exadata Storage Server Grid.	Average flash disk response time for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Average flash disk response time for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.
Average Hard Disk Response Time	Average read and write latency across all hard disks on the Exadata Storage Server Grid.	Average hard disk response time for %target% is %value%, crossed warning (%warning_threshold%) or critical (%critical_threshold%) threshold.	Total hard disk response time for %target% is %value%, fallen below warning (%warning_threshold%) or critical (%critical_threshold%) threshold.

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Metric	Description	Alert Message	Clear Message
Flash Disk IO Health Exceptions	Number of members whose Exadata Key Performance Indicator Flash Disk IO Health Exceptions exceed their critical thresholds.	%target% has %value% member Exadata Storage Servers whose Key Performance Indicator Flash Disk IO Health Exceptions exceed their critical thresholds.	%target% has %value% member Exadata Storage Servers whose Key Performance Indicator Flash Disk IO Health Exceptions exceed their critical thresholds.
Hard Disk IO Health Exceptions	Number of members whose Exadata Key Performance Indicator Hard Disk IO Health Exceptions exceed their critical thresholds.	%target% has %value% member Exadata Storage Servers whose Key Performance Indicator Hard Disk IO Health Exceptions exceed their critical thresholds.	%target% has %value% member Exadata Storage Servers whose Key Performance Indicator Hard Disk IO Health Exceptions exceed their critical thresholds.

Response

This metric category contains the metric used to detect the response of the Oracle Exadata Storage Server Grid target.

Target Version: All versions

Collection Frequency: Event-driven

Metric	Description
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.

2

Recovery Appliance

This chapter provides information about the Recovery Appliance 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.

Data Sent/Received

These metrics collect information about the data that is backed up, copied to tape, and replicated for all protected databases.

Target Version: All versions

Collection Frequency: Every 5 Minutes

Data Source: RA_DATABASE view in the Recovery Appliance database

User Action: Not applicable

Metric	Description
Backup Data Rate (GB/s)	This metric provides the rate (GB/s) at which backup data is being ingested by the Recovery Appliance for all protected databases.
Cumulative Backup Data Delta (GB)	This metric provides the change in the cumulative amount of backup data received for all protected databases since the last collection of this metric.
Cumulative Backup Data Received (GB)	This metric provides the cumulative amount of backup data received by the Recovery Appliance for all protected databases.
Cumulative Copy-to-Tape Data Delta (GB)	This metric provides the change in the cumulative amount of data copied to tape for all protected databases since the last collection of this metric.
Cumulative Copy-to-Tape Data Sent (GB)	This metric provides the cumulative amount of data copied to tape for all protected databases.
Cumulative Replication Data Delta (GB)	This metric provides the change in the cumulative amount of data replicated for all protected databases since the last collection.
Cumulative Replication Data Sent (GB)	This metric provides the cumulative amount of data replicated for all protected databases.
Replication Data Rate (GB/s)	This metric provides the rate at which data is replicated for all protected databases.

Health

These metrics collect incident data for the Recovery Appliance.

The Health metric for a Zero Data Loss Recovery Appliance (ZDLRA) target lists all the incidents generated by the Recovery Appliance while monitoring the internal operations and

status of the databases protected by the appliance. This information is sourced from the RA_INCIDENT_LOG view in the Recovery Appliance.

For all Recovery Appliance incidents that have a severity of WARNING, ERROR, or INTERNAL, out-of-the-box alerts are raised in Oracle Enterprise Manager. This results in a relatively high volume of alerts, however, you have the option of setting the following metric collection properties to filter and be notified of only some of these alerts.

- `ignorePattern`: You can use this property to specify a regular expression pattern that can be used to filter out incidents. This pattern is applied to the **Error Text** column of the Health metric, and any rows matching the pattern are automatically filtered and not collected as part of the Health metric in Oracle Enterprise Manager. This greatly reduces the number of alerts generated for the Recovery Appliance. If you do not want to view ORA-45175 errors, you must add "ORA-45175" to the pattern: `.*ORA-*(45175)\D.*`. In addition, you can add other ORA errors that you want to ignore to the same pattern `.*ORA-*(-45160|45175|45168)\D.*`.

- `ignoreProtectionPolicies`: You can use this property on a Health metric to ignore the incidents generated against databases associated with a specific protection policy. If backups for certain databases are stopped deliberately, for example, with the intention of retiring the database, incidents are generated for these databases in the Recovery Appliance. You can create a new protection policy called "DECOMMISSIONED", add the databases for which you want to ignore alerts to this protection policy, and specify "DECOMMISSIONED" as the value for the `ignoreProtectionPolicies` property.

To set these properties:

1. Click **Monitoring** and then **Metric and Collection Settings** for the Recovery Appliance.

2. Click the pencil icon in the **Edit** column of any Health metric row to access **Edit Advanced Settings**.

Metrics Details

Target Version: All versions

Collection Frequency: Every 5 Minutes

Data Source: RA_INCIDENT_LOG view in the Recovery Appliance database.

Metric	Description
Component	This metric provides the component of the Recovery Appliance detecting this incident. Collection Frequency: Every 15 Minutes
Database Key	This metric provides the primary key of the protected database (if any) involved in this incident.
Database Unique Name	This metric provides the db_unique_name of the protected database (if any) involved in this incident.
Error Code	This metric provides the Oracle error code for the message describing the incident.
Error Text	This metric provides the text of the message describing the incident.
First Incident Time	This metric provides the timestamp when the Recovery Appliance first detected the incident.
Incident ID	This metric provides the unique ID for the incident.
Incident Status	This metric provides the status of this incident: ACTIVE, FIXED, or RESET.
Last Incident Time	This metric provides the timestamp when the Recovery Appliance most recently detected the incident.
Number of Incidents	This metric provides the number of times the Recovery Appliance detected the incident.
Parameter	This metric provides the parameter qualifying the scope of the error code.

Metric	Description
Severity	This metric provides the relative severity of the incident in the context of the operation of the Recovery Appliance. Default Warning Threshold: WARNING Default Critical Threshold: ERROR, INTERNAL Alert Text: %error_text%.
Storage Location Key	This metric provides the primary key of the storage location (if any) involved in this incident.
Storage Location Name	This metric provides the name of the storage location (if any) involved in this incident.
Task ID	This metric provides the ID of the task, if any, in which the incident was detected.
Task State	This metric provides the processing state of the task: EXECUTABLE, RUNNING, COMPLETED, TASK_WAIT, FAILED, and so on.
Task Type	This metric provides the type of processing performed by the task.

Protected Databases

These metrics collect information about the databases protected by this Recovery Appliance.

For protected databases, you can choose to set up thresholds and obtain alerts based on metrics such as recovery window goal or unprotected data window. If you stop sending backups to the Recovery Appliance for a protected database and you have previously set up thresholds and configured alerts, you will continue to receive the alerts even though your action was deliberate. In such a scenario, you have the option of setting the following metric collection property:

- **`ignoreProtectionPolicies`**: You can use this property on a Protected Databases metric to ignore the incidents generated against databases associated with a specific protection policy. If backups for certain databases are stopped deliberately, for example, with the intention of retiring the database, incidents are generated for these databases in the Recovery Appliance. You can create a new protection policy called "DECOMMISSIONED", add the databases for which you want to ignore alerts to this protection policy, and specify "DECOMMISSIONED" as the value for the `ignoreProtectionPolicies` property.

To set this property:

1. Click **Monitoring** and then **Metric and Collection Settings** for the Recovery Appliance.

2. Click the pencil icon in the **Edit** column of any Protected Databases metric row to access **Edit Advanced Settings**.

Metrics Details

Target Version: All versions

Collection Frequency: Every 15 Minutes

Data Source: RA_DATABASE, RA_DISK_RESTORE_RANGE and other views in the Recovery Appliance database.

Metric	Description
Backup Data Rate (GB/s)	This metric provides the rate (GB/s) at which backup data is being ingested by the Recovery Appliance for this protected database.
Copy-to-Tape Data Rate (GB/s)	This metric provides the rate (GB/s) at which the data has been copied to tape for this protected database.

Metric	Description
Copy-to-Tape Queued Data (GB)	This metric provides the amount of data (GB) that is in the queue to be copied to tape for this protected database.
Copy-to-Tape Queued Data Age (hours)	This metric provides information about how long the data has been in the queue to be copied to tape for this protected database.
Copy-to-Tape Total Data on Tape (GB)	This metric provides the total amount of data that has been copied to tape for this protected database.
Cumulative Backup Data (GB)	The metric provides the cumulative amount of backup data ingested by the Recovery Appliance for this protected database.
Cumulative Backup Data Delta (GB)	This metric provides the change in the cumulative amount of backup data ingested for this protected database since the last collection of this metric.
Cumulative Copy-to-Tape Data (GB)	This metric provides the cumulative amount of data copied to tape for this protected database.
Cumulative Copy-to-Tape Data Delta (GB)	This metric provides the change in the cumulative amount of data copied to tape for this protected database since the last collection of this metric.
Cumulative Replication Data Delta (GB)	This metric provides the change in the cumulative amount of data replicated for this protected database since the last collection of this metric.
Cumulative Replication Data (GB)	This metric provides the cumulative amount of data replicated for this protected database.
Current Recovery Window (interval)	This metric provides the current recovery window of this protected database (as an interval).
Current Recovery Window (sec)	This metric provides the current recovery window of this protected database (in seconds).
Database Key	This metric provides the primary key for this protected database in the Recovery Appliance metadata.
Database Unique Name	This metric provides the db_unique_name of this protected database.
Date Added as Protected Database	This metric provides the time when this protected database was enrolled with the Recovery Appliance.
Deduplication Ratio	This metric provides the ratio of the total size of received backups for this protected database to the space consumed for this database in Recovery Appliance storage.
Keep Backup Space (GB)	This metric provides the total amount of space used by backups that have a KEEP retention setting that overrides the retention policy used for this protected database.
Last Complete Backup	This metric provides the latest point in time for which a complete backup is available for all data files in this protected database.
Last Copy to Tape	This metric provides the last time that data was copied to tape for this protected database.
Last Replication	This metric provides the last time data was replicated for this protected database.
Most Recent Recovery Point	This metric provides the latest time to which the protected database can be recovered.
Near-Zero Data Loss Enabled	This metric indicates whether this protected database is shipping redo data to the Recovery Appliance. User Action: Check the Near-Zero Data Loss setting in Backup Settings for this protected database.
Number of Protected Databases	This metric provides the total number of protected databases enrolled with the Recovery Appliance.
Oldest Recovery Point	This metric provides the earliest time to which the protected database can be recovered.
Protection Policy	This metric provides the name of the protection policy used by this protected database.
Recovery Window Goal (interval)	This metric provides the recovery window goal (as an interval) for disk backups, as specified in the protection policy used by this protected database.
Recovery Window Goal (sec)	This metric provides the recovery window goal in seconds for disk backups, as specified in the protection policy used by this protected database.

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Metric	Description
Recovery Window Ratio (%)	This metric provides the ratio between the current recovery window and the recovery window goal for this protected database.
Recovery Window Space (GB)	This metric provides an estimation of the required space in Recovery Appliance storage to meet the recovery window goal specified in the protection policy used by this protected database.
Recovery Window Space as a Percentage of Reserved Space	This metric provides the ratio between the recovery window space and the reserved space for this protected database. Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: The space required to meet the recovery window for database %db_unique_name% is %value%% of the reserved space for the database.
Replication Data Rate (GB/s)	This metric provides the rate at which data is being replicated for this protected database.
Replication Queued Data (GB)	This metric provides the amount of data (GB) that is in the queue to be replicated for this protected database.
Reserved Space (GB)	This metric provides the minimum amount of disk space (GB) that will be reserved on the Recovery Appliance for this protected database.
Storage Location	This metric provides the name of the Recovery Appliance storage location used by this protected database.
Unprotected Data Window (sec)	This metric provides the current actual amount of potential data loss for this protected database.
Unprotected Data Window Threshold (sec)	This metric provides the maximum amount of acceptable potential data loss exposure specified in the protected policy used by this protected database.
Used Space (GB)	This metric provides the amount of disk space currently used for this protected database in the Recovery Appliance.

Protected Databases Recovery

This metric provides the recovery information for databases protected by the specific Recovery Appliance.

Metric	Description
Database Unique Name	The unique name of this protected database.
Tenant Identifier	The customer tenant identifier for this database in the Recovery Appliance.
Protection Policy	The name of the protection policy used by this database.
State	The protected database current state in the Recovery Appliance.
Near-zero Data Loss Enabled	YES if real-time redo transport is active. NO if redo has not recently been received.
Minimum Recovery Needed (seconds)	The minimum interval needed (in seconds) to restore any part of the protected database.
Recovery Window Goal (seconds)	The recovery window goal (in seconds) for restoring backups stored on disk, as specified in the protection policy.
Current Recovery Window (seconds)	The current value (in seconds) of the recovery window for this database.
Recovery Window Ratio (%)	The ratio between the current recovery window and the recovery window goal for this protected database.

Metric	Description
Unprotected Data Window Threshold (seconds)	The user-specified maximum amount of data loss (in seconds) specified in the protection policy used by this database.
Unprotected Data Window (seconds)	The point (in seconds) beyond which recovery is impossible unless additional redo is available.
Estimated Time To Recover (seconds)	The estimated recovery duration (in seconds), to the most current possible time.
Recoverability	Protected database current recoverability.

Queued Data

These metrics provide an overview of the amount of data and number of tasks queued on the Recovery Appliance for backup, copy-to-tape, and replication operations.

Target Version: All versions

Collection Frequency: Every Hour

Data Source: RA_SBT_TASK and RA_TASK views in the Recovery Appliance database

User Action: Not applicable

Metric	Description
Backup Tasks Queued Since Last Collection	This metric provides the number of backup tasks queued on the Recovery Appliance since the last collection of this metric.
Copy-to-Tape Tasks Queued Since Last Collection	This metric provides the number of copy-to-tape tasks queued on the Recovery Appliance since the last collection of this metric.
Replication Tasks Queued Since Last Collection	This metric provides the number of replication tasks queued on the Recovery Appliance since the last collection of this metric.
Total Backup Tasks Queued	This metric provides the total number of backup tasks queued on the Recovery Appliance.
Total Copy-to-Tape Data Queued (bytes)	This metric provides the cumulative amount of data in the queued copy-to-tape tasks.
Total Copy-to-Tape Tasks Queued	This metric provides the total number of copy-to-tape tasks queued on the Recovery Appliance.
Total Replication Data Queued (bytes)	This metric provides the cumulative amount of data in the queued replication tasks.
Total Replication Tasks Queued	This metric provides the total number of replication tasks queued on the Recovery Appliance.

Replication Status

These metrics collect information about the replication servers configured on the Recovery Appliance.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Data Source: RA_REPLICATION_SERVER and RA_SBT_LIBRARY views in the Recovery Appliance database

User Action: Not applicable

Metric	Description
Replication Server Name	This metric provides the name of the replication server, as specified when the replication server was created.
Replication Status	This metric provides the tape library status (READY, PAUSE, ERROR, or null).
SBT Library Name	This metric provides the name of the tape library that the replication server is associated with.

Response

The metrics in this category show the status of the Recovery Appliance instance.

Target Version: All versions

Collection Frequency: Every 5 Minutes

Data Source: RA_SERVER view in the Recovery Appliance database

User Action: Not applicable

Metric	Description
Status	This metric shows the status of the Recovery Appliance processes. Valid values: • 1: Recovery Appliance processes are running • 0: Recovery Appliance processes are not running Default Warning Threshold: Not Defined Default Critical Threshold: 0 Alert Text: Recovery Appliance is down. %oraerr%

Storage Locations

These metric collect information about the storage locations configured for this Recovery Appliance.

Target Version: All versions

Collection Frequency: Every 15 Minutes

Data Source: RA_DATABASE and RA_STORAGE_LOCATION views in the Recovery Appliance database.

User Action: Not applicable

Metric	Description
Incoming Backup Data Rate (GB/s)	This metric provides the rate at which backup data is being ingested, aggregated across all databases using this storage location.
Key	This metric provides the primary key for this storage location in the Recovery Appliance metadata.
Name	This metric provides the Recovery Appliance storage location name.
Number of Storage Locations	This metric provides the total number of storage locations for this Recovery Appliance.

Metric	Description
Recovery Window Space (GB)	This metric provides the estimated space that is needed to meet the recovery window goal for all databases using this storage location.
Recovery Window Space as a Percentage of Reserved Space	This metric provides the ratio between the total space required to meet the recovery window for all databases using this storage location and the total reserved space for all databases using the storage location. Evaluation and Collection Frequency: Every 15 Minutes Default Warning Threshold: Not Defined Default Critical Threshold: Not Defined Alert Text: The total space required to meet the recovery window for all databases using storage location %sl_name% is %value%% of the total reserved space for all databases using the storage location.
Recovery Window Space as a Percentage of Storage Location Size	This metric provides the ratio between the total space required to meet the recovery window for all databases using storage location and the size of the storage location. Evaluation and Collection Frequency: Every 15 Minutes Default Warning Threshold: 85 Default Critical Threshold: 97 Alert Text: The total space required to meet the recovery window for all databases using storage location %sl_name% is %value%% of the size of the storage location.
Reserved Space (GB)	This metric provides the amount of disk space reserved for all databases using this storage location.
Size (GB)	This metric provides the maximum amount of storage (in GB) that the Recovery Appliance storage location can use for the backup data.
Unreserved Space (GB)	This metric provides the difference between the maximum amount of storage that the storage location can use for backup data and the amount of disk space reserved for all databases using this storage location.
Unused Space (GB)	This metric provides the amount of unused space in this storage.
Used Space (GB)	This metric provides the total amount of disk space used in this storage location.