

Precise for Oracle Storage Device entities

This section includes the following topics:

- [About the Storage Device entities](#)
- [How the Objects tab can help you identify performance problems](#)

About the Storage Device entities

Storage Device entities can be monitored in the Objects tab, if you have installed Precise for Database & Storage. If you want to see the Storage Device entities that are monitored, select EMC Units in the Association area of the Objects tab. The information shown will give the DBA answers on whether there is a contention on a device due to re-tiering by performing the following actions:

Table 1 Actions

Action	Indicator	Possible Solution
Examine the device's response time overtime.	Marker on the Response Time graph.	Consider moving heavy files to other devices to split the I/O load or moving the data to a faster storage device.
Examine the device tier distribution and review other devices that share the same policy.	Marker on Tier Distribution graph.	Consider using a policy that secures more space on the high-end storage for the device. Verify if the policy is adequate for the type of activity.
Examine the device tier distribution and review other devices that share the same policy.	Marker on the Association table.	Consider moving other devices that use the fast (EFD) storage to another policy.

Other information related to the Storage Device entities that can be read from the Objects tab are:

- The type of storage the application is using (Thin/Thick).
- The type of policy that is associated to each device.
- The pools the application is using.
- How full the pools are.
- Who else is using the pools.
- How much of each storage Tier is being used by each device.

About the Association area

In the Association area, you can select the entities from the dropdown menu. When choosing EMC Units to see all of the EMC units (storage arrays) that are connected to the monitored server (either physically or via a remote gatekeeper), two tabs are shown at the right side of the table, Statistics - statistical data about the storage units, and Configuration - data regarding the unit's configuration. Each tab has its own columns in the table. The following tables describe the different column headings.

Table 2 Statistics

Column Name	Description
Type	Type of the device: Symmetrix or Clariion.
Unit ID	The ID of the unit.
Used By Instance	Shows whether the Oracle database instance is using the storage unit (the database has files on at least one storage device that belongs to that unit).
Read/Write req.	The number of read and write requests.
Load	The amount of data that the unit handled within the timeframe.
Throughput	The amount of data per second (MB/Sec.).
I/O Rate	The amount of requests to the unit per second.
Seq. Reads	The amount of sequential requests.
Cache Hit Ratio	The amount of requests that were answered by the cache in relation to the total amount (only for Symmetrix).
Read Hit Ratio	The percentage of read hits in relation to the total cache hit ratio (only for Symmetrix).
Write Hit Ratio	The percentage of write hits in relation to the total cache hit ratio (only for Symmetrix).

Table 3 Configuration

Column Name	Description
Type	Type of the device: Symmetrix or Clariion.
Unit ID	The ID of the unit.
Used By Instance	Shows whether the Oracle database instance is using the storage unit (the database has files on at least one storage device that belongs to that unit).
Unit Physical Disks	The amount of physical disks in the storage array.
Devices	The amount of storage devices.
Model	The unit's model.
Microcode Version	The microcode version of the unit.
Cache Size	The size of the cache.
Max. Write Slots	The maximum amount of pending write slots allowed before starting delayed fast writes (only for Symmetrix).
Max. DA Write Slots	The maximum amount of pending write slots allowed for one DA (front director) before starting delayed fast writes (only for Symmetrix).
Max. Device Write Slots	The maximum amount of pending write slots allowed for one device before starting delayed fast writes (only for Symmetrix).

The following sections handle the different Storage Device entities:

- [About the EMC Device entity](#)
- [About the Devices on the same RAID Group entity \(only for Clariion\)](#)
- [About the Front End Director entity](#)
- [About the Remote Director entity](#)
- [About the Disk Director entity](#)
- [About the Port entity \(for Symmetrix devices only\)](#)
- [About the Hyper entity \(for Symmetrix devices only\)](#)
- [About the Pools entity](#)

About the EMC Device entity

This entity is only available, in the Objects tab, if you have installed Precise for Database & Storage. For more information on the supported platforms, see the *Precise Installation Guide*.

An EMC Device is a logical entity that defines the combination of ports, front-end directors, disk directors and hypers (disk partitions) that are presented to the host operating system as a single device. A device may be configured to store data for other applications (including other Oracle instances) in addition to the selected Oracle instance. The EMC Device entity displays configuration details and performance counters for the device.

To determine if the device is used by the selected Oracle instance, check the **Used by Instance** check box in the Association area. If the device is not used by Oracle but the physical name is present (and the number of ports is greater than zero), the selected device is used by another application on the server.

The following views are available:

- Overview
- Performance
- Load
- Throughput
- Tiering (only for Thin devices with FAST auto-tiering)
- Scalability (only when choosing a specific device)(only relevant for Symmetrix)

About the overview of an EMC device

The Overview, in the Objects tab, displays general details of the Symmetrix storage device, such as the device's logical name and unit ID.

About the performance of an EMC device

The Performance view, in the Objects tab, displays two overtime graphs that illustrate the following information:

- The number of sequential reads and the total number of read and write requests during the selected time period.
- The read, write and overall cache hit ratios over the selected time period.

About the load of an EMC device

The Load view, in the Objects tab, displays an overtime graph that illustrates the megabytes of data read and written during the selected time period.

About the throughput of an EMC device

The Throughput view, in the Objects tab, displays an overtime graph that illustrates the I/O rate (requests per second) and throughput (megabytes per second) during the selected time period.

About the tiering of an EMC device

The Tiering view, in the Objects tab (only for Thin devices with FAST auto-tiering), shows how the device's content is distributed over the different Tiers (Sata, Flash, Fiber Channel) over time, other devices which share the same policy and pool, and which devices (if there are any) "stole" the current device's Tier allocation.

About the scalability of an EMC device

The Scalability view, in the Objects tab (only when choosing a specific device), shows the device's response time in relation to the requests on that device. (Only relevant for Symmetrix)

Associating an EMC device with other entities

You can associate an EMC device in the Main area of the Objects tab with disk directors, front end directors, RAID groups, hypervisors, ports, and oracle files to find out which files have extents on the selected device. You can display additional entities by using the **More** option.

About the Devices on the same RAID Group entity (only for Clariion)

This entity is only available, in the Objects tab, if you have installed Precise for Database & Storage. For more information on the supported platforms, see the [Precise Support Matrix](#).

When viewing a Thick Clariion Device (in the configuration tab), use the **Devices on the same Raid Group** option in the dropdown menu to view a list of all devices that share the same Raid group as the selected device.



The graphs in the upper part of the screen (Overview, Performance, Load, and Throughput) are the same graphs of that particular selected device with no connection to the **Devices on the same Raid Group** option.

About the Front End Director entity

The Front End Director entity is only available, in the Objects tab, if you have installed Precise for Database & Storage. For more information on the supported platforms, see the [Precise Support Matrix](#).

A Front End Director controls the I/O to and from the operating system devices using the connected ports. The following views are available:

- Overview
- Performance
- Load
- Throughput

About the overview of a front end director

The Overview, in the Objects tab, displays general details of the front-end director, such as director ID and director type.

About the performance of a front end director

The Performance view, in the Objects tab, displays two overtime graphs that illustrate the following information:

- The number of deferred writes, read requests, and write requests during the selected time period.
- The read, write, and overall cache hit ratios over the selected time period.

About the Load of a front end director

The Load view, in the Objects tab, displays an overtime graph that illustrates the megabytes of data read and written during the selected time period.

About the Throughput of a front end director

The Throughput view, in the Objects tab, displays an overtime graph that illustrates the I/O rate (requests per second) and throughput (megabytes per second) during the selected time period.

Associating a front end director with other entities

You can associate a front end director in the Main area of the Objects tab with devices. You can display additional entities by using the **More** option.

About the Remote Director entity

The Remote Director entity, in the Objects tab, is only available if you have installed Precise for Database & Storage. For more information on the supported platforms, see the [Precise Support Matrix](#).

A Remote Director is a specially configured front-end director that controls I/O to a remote front-end director on another unit. This setup is used for SRDF or disaster recovery.

The following views are available:

- Overview
- Performance
- Load
- Throughput

About the overview of a remote director

The Overview, in the Objects tab, displays general details of the remote director, such as director ID and director type.

About the performance of a remote director

The Performance view, in the Objects tab, displays two overtime graphs that illustrate the following information:

- The number of deferred writes, read requests, and write requests during the selected time period.
- The read, write, and overall cache hit ratios over the selected time period.

About the Load of a remote director

The Load view, in the Objects tab, displays an overtime graph that illustrates the megabytes of data read and written during the selected time period.

About the Throughput of a remote director

The Throughput view, in the Objects tab, displays an overtime graph that illustrates the I/O rate (requests per second) and throughput (megabytes per second) during the selected time period.

Associating a remote director with other entities

You can associate a remote director in the Main area of the Objects tab with devices. You can display additional entities by using the More... option.

About the Disk Director entity

The Disk Director entity is only available, in the Objects tab, if you have installed Precise for Database & Storage. For more information on the supported platforms, see the [Precise Support Matrix](#).

A Disk Director controls the I/O to a set of physical disks. The following views are available:

- Overview
- Performance
- Load
- Throughput

About the overview of a disk director

The Overview, in the Objects tab, displays general details of the disk director, such as director ID and director type.

About the performance of a disk director

The Performance view, in the Objects tab, displays two overtime graphs that illustrate the following information:

- The number of sequential reads and the total number of read and write requests during the selected time period.
- The read, write, and combined cache hit ratios over the selected time period.

About the load of a disk director

The Load view, in the Objects tab, displays an overtime graph of the megabytes of data read and written during the selected time period.

About the throughput of a disk director

The Throughput view, in the Objects tab, displays an overtime graph that illustrates the I/O rate (requests per second) and the throughput (megabytes per second) during the selected time period.

Associating a disk director with other entities

You can associate a disk director in the Main area of the Objects tab with devices. You can display additional entities by using the **More** option.

About the Port entity (for Symmetrix devices only)

The Port entity, in the Objects tab, is only available if you have installed Precise for Database & Storage. For more information on the supported platforms, see the [Precise Support Matrix](#). A Port describes a device's connection from a front-end director to an OS device. If a port is selected in the Main area, the Overview displays configuration information for the port.

Associating a port with other entities

You can associate a port in the Main area of the Objects tab with devices. You can display additional entities by using the **More** option.

About the Hyper entity (for Symmetrix devices only)

The Hyper entity, in the Objects tab, is only available if you have installed Precise for Database & Storage. For more information on the supported platforms, see the [Precise Support Matrix](#). A hyper is a disk partition on a physical disk where data for a device is stored. Data is usually striped or mirrored over a set of hypers. It is the lowest-level Symmetrix storage entity. If a hyper is selected in the Main area, the Overview displays configuration information for the hyper.

Associating a hyper with other entities

You can associate a hyper in the Main area of the Objects tab with all the devices that are on the same disk as the hyper itself. You can display additional entities by using the **More** option.

About the Pools entity

The Pools entity, in the Objects tab, is only available if you have installed Precise for Database & Storage. For more information on the supported platforms, see the [Precise Support Matrix](#).

The following views are available:

- Overview
- Performance
- Load
- Throughput

About the overview of a pool

The Overview, in the Objects tab, displays general details of the pool.

About the performance of a pool

The Performance view, in the Objects tab, displays two overtime graphs that illustrate the following information:

- The number of deferred writes, read requests, and write requests during the selected time period.
- The read, write, and overall cache hit ratios over the selected time period.

About the load of a pool

The Load view, in the Objects tab, displays an overtime graph that illustrates the megabytes of data read and written during the selected time period.

About the throughput of a pool

The Throughput view, in the Objects tab, displays an overtime graph that illustrates the I/O rate (requests per second) and throughput (megabytes per second) during the selected time period.

Associating a pool with other entities

You can associate a pool in the Main area of the Objects tab with all the devices that are on the same disk as the hyper itself. You can display additional entities by using the **More** option.

How the Objects tab can help you identify performance problems

The Objects tab helps you understand the relationship between database objects and statements. You can identify a performance problem by doing the following:

- [Filtering Symmetrix device entries and criteria](#)

Filtering Symmetrix device entries and criteria

For our example, the Objects tab reveals details for EMC Unit 000282503660. This unit has 48 physical disks, 17 of which are used by the sun4 server. 434 devices are configured for the unit. All of the devices listed in the Association area are used by Oracle instance ora920 (indicated by the column Used by Instance).

If there are many devices associated with this unit, you can limit your search by using the **More** option in the Association area.

To filter device entries from a **More** option

1. In the Association area, click **More** and the Associate with dialog box opens.
2. Click the **Entries** tab to define device entries to filter.
3. In the Populate with list, select the appropriate device entry.
4. In the Sort entries by list, select how you want to sort the entries.
5. Use the **A** (ascending) or **D** (descending) button to sort all selections.
6. In the Display top entries only list, select the number of entries to view for each search. After defining the device entries, you can define criteria for each device search.

To filter device criteria from a **More** option

1. In the Association area, click **More** and the Associate with dialog box opens.
2. Click the **Criteria** tab to define device criteria for a filter.
3. From the lists on the left, select the rows to filter.
4. In the middle lists, select the appropriate variable.
5. In the lists on the right, type in the appropriate filter or filters.
6. Click **OK** to approve your selections, or **Cancel** to cancel your selections.