

# Oracle Enterprise Manager for Flash Storage Systems

## User's Guide



FLASH STORAGE  
SYSTEMS

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# Preface

## Oracle Resources

**Important:** For the latest version of this document, visit the [SAN Storage – Oracle Flash Storage Systems](http://www.oracle.com/goto/fssystems/docs) section at the Oracle Help Center (<http://www.oracle.com/goto/fssystems/docs>).

**Table 1: Oracle resources**

For help with...	Contact...
Support	<a href="http://www.oracle.com/support">http://www.oracle.com/support</a> ( <a href="http://www.oracle.com/support">www.oracle.com/support</a> )
Training	<a href="https://education.oracle.com">https://education.oracle.com</a> ( <a href="https://education.oracle.com">https://education.oracle.com</a> )
Documentation	<ul style="list-style-type: none"><li>• <a href="http://www.oracle.com/goto/fssystems/docs">SAN Storage – Oracle Flash Storage Systems:</a> (<a href="http://www.oracle.com/goto/fssystems/docs">http://www.oracle.com/goto/fssystems/docs</a>)</li><li>• From Oracle FS System Manager (GUI): <b>Help &gt; Documentation</b></li><li>• From Oracle FS System HTTP access: (<a href="http://system-name-ip/documentation.php">system-name-ip/documentation.php</a> where <i>system-name-ip</i> is the name or the public IP address of your system)</li></ul>
Documentation feedback	<a href="http://www.oracle.com/goto/docfeedback">http://www.oracle.com/goto/docfeedback</a> ( <a href="http://www.oracle.com/goto/docfeedback">http://www.oracle.com/goto/docfeedback</a> )
Contact Oracle	<a href="http://www.oracle.com/us/corporate/contact/index.html">http://www.oracle.com/us/corporate/contact/index.html</a> ( <a href="http://www.oracle.com/us/corporate/contact/index.html">http://www.oracle.com/us/corporate/contact/index.html</a> )

## Typographical Conventions

Table 2: Typography to mark certain content

Convention	Meaning
<i>italics</i>	<p>Within normal text, words in italics indicate one of the following items:</p> <ul style="list-style-type: none"> <li>• Hypertext, as in a URL</li> <li>• A reference to a book title</li> <li>• New terms and emphasized words</li> <li>• Command variables</li> </ul>
monospace	<p>Indicates one of the following, depending on the context:</p> <ul style="list-style-type: none"> <li>• The name of a file or the path to the file</li> <li>• <i>Output</i> displayed by the system on the command line</li> </ul>
<b>monospace</b> (bold)	<i>Input</i> provided by an administrator on the command line.
>	Indicates a menu item or a navigation path in Oracle FS System Manager (GUI). For example, “Click <b>SAN &gt; Storage &gt; LUNS &gt; Action &gt; Clone</b> ” means to click the <b>Clone</b> link on the <b>SAN</b> page in the GUI.
...	Indicates that one or more steps have been omitted from the path or menu structure. The ellipsis is used within an expression of a navigation path or within a cascading menu structure. For example, in the <b>SAN &gt; Storage &gt; LUNS &gt; ... &gt; Clone</b> menu structure, the ... implies that one or more menu items have been omitted.

## Command Syntax Conventions

Table 3: Typography to mark command syntax

Typographic symbol	Meaning
[ ]	Square brackets. Delimits an optional command parameter or a set of optional command parameters.
{ }	Braces. Delimits a set of command parameters, one of which must be selected.
	Vertical bar. Separates mutually exclusive parameters.
...	Ellipsis. Indicates that the immediately preceding parameter or group of parameters can be repeated.
monospace	Indicates the name of a command or the name of a command option (sometimes called a <i>flag</i> or <i>switch</i> ).
<i>italic</i>	Indicates a variable for which you need to supply a value.



Command parameters that are not enclosed within square brackets ( [ ] ) are required.

**Important:** The above symbols (and font styling) are based on the POSIX.1-2008 specification. These symbols are used in the command syntax only to clarify how to use the command parameters. *Do not enter these symbols on the command line.*

# Introduction

## Oracle EM for FS Systems Overview

Oracle Enterprise Manager for Flash Storage Systems enables you to monitor an Oracle FS System from the Oracle Enterprise Manager for Flash Storage Systems version 12c and 13c .

**Note:** Within this documentation, the Oracle Enterprise Manager for Flash Storage Systems is referred to as the plug-in. The information in this document describes how to use the plug-in but does not provide detailed information on the Oracle FS System components. For detailed information on the Oracle FS System, review the *Oracle Flash Storage System Administrator's Guide*.

When you deploy the plug-in to Oracle Enterprise Manager, you can monitor the organization and components of your Oracle FS System. You can also view statistical metrics and generate reports.

**Note:** Make sure you use the plug-in designed to support the Oracle Flash Storage System, which is the Oracle Enterprise Manager for Flash Storage Systems. The Oracle Enterprise Manager for Pillar Axiom plug-in cannot be used to manage an Oracle Flash Storage System.

## System Requirements

Make sure your system meets the requirements for Oracle Enterprise Manager for Flash Storage Systems version 12c and 13c .

Oracle Enterprise Manager for Flash Storage Systems require the software versions listed in the following table to function correctly:

**Table 4: System requirements**

Requirement	Version
Oracle FS System software	Release 6.0 or higher
Operating systems	Refer to the <a href="http://www.oracle.com/technetwork/oem/grid-control/downloads/index.html">Oracle Enterprise Manager Downloads</a> page ( <a href="http://www.oracle.com/technetwork/oem/grid-control/downloads/index.html">http://www.oracle.com/technetwork/oem/grid-control/downloads/index.html</a> ).

## Monitoring Oracle FS Systems Overview

The Oracle Enterprise Manager for Flash Storage Systems enables you to view the organizational features and system components on your Oracle FS System. You can also view pre-defined reports and metrics to monitor system configuration and performance.

The plug-in allows you to view Oracle FS System LUN and Clone LUN details. You can also view regularly collected statistical metrics to monitor Oracle FS Systems, Pilots, Controllers, Drive Enclosures, and LUNs.

The plug-in also provides hardware reports, I/O reports, and storage usage reports that you can generate to monitor Oracle FS System configuration and performance. You can also create custom reports to supplement the available pre-defined reports.

## Generating Oracle FS System Reports Overview

The Oracle Enterprise Manager for Flash Storage Systems provides pre-defined hardware, I/O, and storage usage reports that you can generate for the Oracle FS System.

Hardware reports include an Oracle FS System summary report, a report of the disk drives in the Drive Enclosures associated with the Oracle FS System, and a hardware status report.

The I/O Access for LUNs report charts input and output statistics for the 10 most active LUNs on the Oracle FS System.

The Storage Usage reports show storage use per LUN associated with the Oracle FS System, and how much storage is used for the different priority, data access, and I/O bias Quality of Service categories.

### Related Links

[Hardware Reports](#)

[Oracle FS System I/O Reports](#)

[Oracle FS System Storage Usage Reports](#)

[#unique\\_13](#)

## Managing Oracle FS System Overview

The Oracle Enterprise Manager for Flash Storage Systems allows you to manage the organizational features and components of your Oracle FS System

The plug-in allows you to create, modify, and delete host group, volume group, and Storage Domain Oracle FS System organizational features. You can also modify the membership of these organizational features with the plug-in.

The plug-in allows you to create, modify, and delete Oracle FS System LUNs and Clone LUNs, and to make copies and clones of these LUNs and Clone LUNs.

The plug-in also allows you to create, modify, and delete data protection schedules that replicate LUNs and Clone LUNs at regular intervals to protect them from data loss.

# Installation

## Deploying the Plug-In Overview

You can download the archive package from the Oracle Technology Network (OTN) and import the archive package into Oracle Enterprise Manager. You can also import the plug-in using the `EMCLI` interface. Using `EMCLI` commands, you first import the plug-in, and then you deploy the plug-in.

For information on the plug-in deployment process, review the *Workflow of Plug-In Deployment* topic in either the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

Make sure you download and install the plug-in designed to support the Oracle Flash Storage System, which is the Oracle Enterprise Manager for Flash Storage Systems. The Oracle Enterprise Manager for Pillar Axiom plug-in cannot be used to manage an Oracle Flash Storage System.

**Note:** The Oracle Enterprise Manager 12c and 13c plug-ins are compatible with the Oracle Enterprise Manager 12c platform. The Oracle Enterprise Manager 12c plug-in is supported on Oracle Enterprise Manager 12c platform version 12.1.0.5.0 or higher.

Download the plug-in from the OTN and manually install the plug-in.

The plug-in is packaged in the `oracle_flash_storage_system_1.0.2.jar` file. You need to import the archive package to Oracle Enterprise Manager (OEM) to make the plug-in visible in the OEM GUI. When the plug-in is available in the GUI, you can deploy the plug-in to the management server and management agent.

**Note:** Make sure the plug-in can communicate with the Oracle Flash Storage System as described in this document.

## Port Assignments

The Oracle Enterprise Manager for Flash Storage Systems plug-in communicates with the Oracle FS System through port 8083.

Ensure that port 8083 is available (not blocked by a firewall or security software) and that the port is enabled on the Management Agent before you activate the plug-in. The following table provides information for the WebCLI HTTPS port type.

**Table 5: Required port**

Port type	Port number	Description
WebCLI HTTPS	8083	The port on which the plug-in communicates with the Oracle FS System WebCLI service.

**Note:** For information on the firewalls, review information in either the Oracle Enterprise Manager online help or the *.Oracle Enterprise Manager Cloud Control Administrator's Guide 12c and 13c*

## Install and Deploy Plug-In Using EMCLI

You can also import the EM plug-in using the EMCLI interface. Using EMCLI commands, you first import the plug-in, and then you deploy the plug-in.

Add the plug-in to the Oracle Enterprise Manager repository from the Oracle Management Server command line. Then deploy the plug-in to the management server and the management agent from the Plug-Ins page.

- 1 Make an SSH connection to the Oracle Management Server (OMS) within the Enterprise Manager environment.

Run the following command from the Oracle Management Server command line:

```
emcli import update -file=<path to plug-in archive>
12.1.0.2.0_oracle.ofs.ofss_2000_0.opar -omslocal
```

Where *path to plug-in archive* is the path to the \*.opar file you downloaded from OTN.

Following the import, you must deploy the plug-in to at least one management server and to at least one Agent.

- 2 In the Oracle Enterprise Manager client, select **Setup > Extensibility > Plug-ins**.
- 3 Expand the **Servers, Storage and Network** folder.
- 4 Select the **Oracle Enterprise Manager for Oracle Flash Storage Systems** plug-in.
- 5 From the tabs at the top of the Plug-Ins page, select **Deploy On > Management Servers**. Plug-ins must be deployed first on the Management Server, then on any Management Agents.  
Enter the credentials required to deploy the plug-in on the management server.
- 6 Follow the steps listed on the remaining dialog boxes to finish the deployment process.  
You can verify the status by selecting **Show Status** from the dialog box.
- 7 After the plug-in is successfully installed on the Management Server, select **Deploy On > Management Agent**.

If necessary, enter the credentials required to deploy the plug-in on the management agent.

- 8 Select **Add** to choose the **Management Agent** for the plug-in.
- 9 Follow the steps listed on the remaining dialog boxes to finish the deployment process.

You can verify the status by selecting **Show Status** from the dialog box.

After importing the plug-in, log out of the Oracle Enterprise Manager User Interface, and then log back in. Otherwise, **Oracle Flash Storage Systems** does not appear in the list to deploy to OEM.

## Deploy the Plug-In Using Self Update Console

You can use the Oracle Enterprise Manager Self Update Console to install the plug-in. Below is a description of the Self Update Console procedure to install the plug-in.

### Prerequisites:

- My Oracle Support credentials have been set up. This is required to enable plug-ins to be downloaded from the My Oracle Support site. Refer to the Oracle Enterprise Manager online help for further information.
- The Software Library (also known as the local store) has been configured. Updates are downloaded to this local store before being deployed. Refer to the Oracle Enterprise Manager online help for further information.
- Login credentials for the management server.
- Login credentials for the management agent running on the management server.
- The Oracle Enterprise Manager must have access to the Oracle Enterprise Manager Store through the Internet.

You can manage updates for the Oracle Enterprise Manager for Flash Storage Systems plug-in using the Self Update Console.

The process to deploy a plug-in is:

- Check availability of the plug-in for deployment.
- Download the plug-in.
- Deploy the plug-in.
- Verify the plug-in deployment.

For detailed information on this process, review the *Managing Plug-Ins* topic in the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

- 1 Log in to the Oracle Enterprise Manager Cloud Control 12c or 13c console.
- 2 Check if the plug-in, which is the Oracle Flash Storage System plug-in, is available for deployment. Follow the instructions provided in *Check the Availability of Plug-Ins* topic in the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

- 3 Download the plug-in from the Oracle Enterprise Manager Store. Follow the instructions provided in *Downloading Plug-Ins* topic in the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.
- 4 Deploy the plug-in to the management server and management agent. Follow the instructions provided in *Deploying Plug-Ins to Oracle Management Service* and *Deploying Plug-Ins on Oracle Management Agent* topics in the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

Verify the installation by following procedures provided in this document.

## Download the Plug-In Archive

The Oracle Enterprise Manager for Flash Storage Systems plug-in and documentation are distributed as a single zip archive that is available for download from the Oracle Technology Network (OTN).

### Prerequisite:

To gain access to software and documentation downloads, join the [Oracle Technology Network](http://www.oracle.com/technetwork/community/join/why-join/index.html) (<http://www.oracle.com/technetwork/community/join/why-join/index.html>).

- 1 On the OTN, open the [Oracle Flash Storage and Pillar Axiom Downloads](http://www.oracle.com/technetwork/server-storage/san-storage/downloads/index.html) page (<http://www.oracle.com/technetwork/server-storage/san-storage/downloads/index.html>) in a web browser.
- 2 From Oracle FS System and Pillar Axiom Downloads, select **Accept License Agreement**.
- 3 Locate and select the name of the software package to download.
- 4 Open the software archive and extract the contents to your workstation. The software archive contains a `readme.txt` file listing the contents of the archive, the installation executable file, and documentation.

After you download the software, you can install the software.

## (Optional) Import the Plug-In Manually

To activate the Oracle Enterprise Manager for Flash Storage Systems plug-in on your client, add the plug-in to the Oracle Enterprise Manager repository and then deploy the plug-in to your management server and management agent.

### Prerequisites:

- Login credentials for the management server.
- Login credentials for the management agent running on the management server.
- The path to the `oracle_flash_storage_system_1.0.2.jar` file you downloaded from OTN.



- 1 Import the plug-in to the Oracle Enterprise Manager.
- 2 Deploy the plug-in to the management server and the management agent from the Plug-Ins page.
- 3 Import the plug-in archive to the Oracle Software Library.  
Refer to *Importing Plug-In Archives* topic in the Oracle Enterprise Manager online help or the Oracle Enterprise Manager Cloud Control Administrator's Guide 12c and 13c.

## Verify Installation of the Plug-In

After you install the Oracle Enterprise Manager for Flash Storage Systems plug-in, verify that the plug-in was installed correctly.

- 1 Verify the installation of the plug-in after deploying the plug-in.
- 2 Follow the steps listed in *Verify Deployed Plug-Ins* topic in the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide 12c and 13c*

The plug-in appears in the Name column and the number one (1) or the number of agents appears in the Management Agent with Plug-in column. You can also verify the version under the Version column.

## (Optional) Undeploy the Plug-In

You can remove the Oracle Enterprise Manager for Flash Storage Systems from Oracle Enterprise Manager when the plug-in is no longer needed.

### Prerequisites:

- Login credentials for the management server.
- Login credentials for the management agent running on the management server.

To remove the plug-in, follow the steps to undeploy from the Oracle management agent.

- 1 Follow the instructions in either the *Undeploying Plug-Ins from Oracle Management Agent* topic in the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide 12c and 13c* to undeploy the Oracle Flash Storage System plug-in.
- 2 Verify that you removed the plug-in by following the instructions in the *Verifying Deployed Plug-Ins* topic in either the Oracle Enterprise Manager online help or the *Oracle Enterprise Manager Cloud Control Administrator's Guide 12c and 13c*.

---

## Log In to Oracle Enterprise Manager

Oracle Enterprise Manager version Oracle Enterprise Manager Cloud Control 12c and 13c is a web application that you launch from your browser. You must log in to Oracle Enterprise Manager to use the plug-in to access the Oracle FS System.

### Prerequisites:

- Server name and port for your Oracle Enterprise Manager installation
- Login credentials for Oracle Enterprise Manager.

Both can be obtained from your Oracle Enterprise Manager administrator

- 1 Start your web browser.
- 2 In the URL field, enter the server name and port for your Oracle Enterprise Manager installation.
- 3 Enter your Oracle Enterprise Manager user name and password, and click **Login**.

## Add Oracle FS System Targets

Before you can monitor or manage an Oracle FS System in Oracle Enterprise Manager, you must add the system as a target. When you add an Oracle FS System as a target, you also create a Monitoring Credential account. The Monitoring Credential account is used to monitor the Oracle FS System and generate reports.

### Prerequisites:

- Host name for the Oracle FS System target
- Login credentials for the Oracle FS System target

These credentials are for an administrator account on the Oracle FS System.

Your Oracle FS System administrator can provide this information.

You add targets from the **Targets** tab at the top of the Oracle Enterprise Manager page.

- 1 Select **Targets > All Targets**.  
All available targets are listed.
- 2 Locate **Agents** in the **Type** column and click the corresponding fully qualified domain name link in the **Name** column.  
The list of existing Oracle Flash Storage Systems displays.
- 3 From the **Add** drop-down list, select **Oracle Flash Storage System**.
- 4 Click **Go**.
- 5 Enter a name for the target in the **Name** field.
- 6 Enter the fully qualified domain name (for example: **coaxm013.us.oracle.com**) of the Oracle Flash Storage System in the **Host** field.

- 7 Provide login credentials for the Oracle FS System administrator account in the **Login** and **Password** fields. This creates a Monitoring Credential for the target.

**Important:** Take extra care when providing login credentials because the plug-in does not verify the credentials. If you enter an incorrect name or password, the system locks you out without the opportunity to re-enter the credentials and a login failure event is generated every two seconds in the Oracle FS System. The plug-in has no management capabilities; therefore, it is best practice to always use Administrator 2 privileges when performing plug-in tasks.

- 8 Click **OK**.

A target is added as well as a Monitoring Credential for that target. You can monitor and run reports for that target.

## Administrator Accounts Overview

Oracle recommends creating a unique administrator account or accounts for the plug-in Monitoring Credential accounts for the Oracle Enterprise Manager for Flash Storage Systems. You use these accounts to monitor the Oracle FS System from the plug-in.

You can create multiple administrator accounts in an Oracle FS System. Additional accounts are not necessary but Oracle recommends you create at least one Administrator 2 account on each Oracle FS System for the plug-in.

An administrator with Administrator 1 privileges needs to create the plug-in account on the Oracle FS System. The administrator who creates the account provides the name and password for the account to the plug-in administrator. Oracle does not recommend using the Oracle FS System Primary Administrator account for the plug-in account.

Oracle recommends assigning Administrator 2 privileges for these accounts based on the administrator's role. For example, you must be logged in with an Administrator 1 account to create or modify storage resources or perform tasks other than monitor and generate reports on the Oracle FS System.

Refer to the *Oracle Flash Storage System Administrator's Guide* for details about administrator accounts and assigned privileges on the Oracle FS System.

**Note:** When you add a target, you create a monitoring credential account. This account uses an administrator account on the Oracle FS System to monitor and run reports about the Oracle FS System target.

Refer to the *Oracle Flash Storage System Administrator's Guide* for details about creating administrator accounts on the Oracle FS System.

---

## Set Up Blackout Period

Before changing your password on the Oracle FS System account you use with the Oracle Enterprise Manager, you must create a blackout period to prevent Oracle Enterprise Manager from trying to log in to the Oracle FS System while the password is being updated.

### Prerequisites:

- Host name for the Oracle FS System target.
- Login credentials for the Oracle FS System target.

Your Oracle FS System system administrator can provide this information.

You create a blackout period from the **Enterprise** pull-down at the Oracle Enterprise Manager page.

- 1 Select **Enterprise** > **Monitoring** > **Blackouts**.
- 2 Select **Create**.
- 3 Enter a **Name** for the blackout period. For example, Oracle FS System password change.
- 4 From the **Reason** pull-down, select **Apps: Application Password Change**.
- 5 Uncheck the **Run jobs during the blackout...** box to disable jobs from being run from OEM. You do not want any jobs running during the blackout period as any job running from OEM to the Oracle FS System can cause login issues during a password change.
- 6 Under **Targets** select **Add**. Locate the Oracle Flash Storage System you are creating the blackout period for to change the administrator password.
- 7 Select the **Select** box next to the Oracle Flash Storage System you selected.
- 8 Select **Next** and enter the schedule information.
- 9 Select **Finish** to create the blackout schedule.

A blackout is created and begins based on the schedule you created. For more information on blackout periods, review the Oracle Enterprise Manager online help for additional information.

After the blackout schedule is created, go to the Oracle FS System and change the administrator password during the blackout period.

## Create Named Credential

As part of the management process, you must create a named credential to enable management activities for the Oracle FS System target within Oracle Enterprise Manager.

### Prerequisites:

- Host name for the Oracle FS System target.

- Login credentials for the Oracle FS System target.

Your Oracle FS System system administrator can provide this information.

You create a Named Credential from the **Setup** menu at the top of the Oracle Enterprise Manager page. When a target is added, the user name and password given during the 'Add a Target' process is used for monitoring and is called the Monitoring Credential. The Named Credential is used for management actions within the plug-in; this management account is not required for metric collection or reporting. You use the Monitoring Credential account for that activity. .

You can use the same Oracle FS System account for both the Named Credential and Monitoring Credential. You may want to use one Oracle FS System account for monitoring and running reports and another Oracle FS System account for configuring the Oracle FS System

- 1 Select **Setup > Security > Named Credentials**.
- 2 Enter **Credential name**.
- 3 Enter **Credential description**.
- 4 Select **Oracle Flash Storage System** from the **Authenticating Target Type**.
- 5 Select **Host Credentials** for the **Credential type**.
- 6 Select **Global** for the **Scope**. **Global** is the default value. The global value make the credential usable beyond a single target.
- 7 Select **Host** for the **Target type**.
- 8 Select a **Target name** by clicking the search icon. The **Target name** is the name of the Oracle FS System you are managing with the plug-in.
- 9 Enter the **UserName** which is the same user id you use on the host to log in to the system.
- 10 Enter the **Password** which is the same password you use to log in to the host.
- 11 Reenter the password in the **Confirm password** field.
- 12 Select **None** for **Run Privilege**.
- 13 Click **Test and Save**.

The plug-in logs into the Oracle FS System.

## Change Monitoring Configuration

When you add a target, you create a monitoring configuration. After you add the target, you can change the monitoring configuration including the user ID and password. You can also delete the monitoring configuration.

### Prerequisites:

- Host name for the Oracle FS System target.

- 
- Login credentials for the Oracle FS System target.

Your Oracle FS System system administrator can provide this information.

You access Monitoring Credentials the from the Setup menu at the top of the Oracle Enterprise Manager page.

- 1 Select **Setup > Security > Monitoring Credentials**.
- 2 Under **Target Type**, select **Oracle Flash Storage System**.
- 3 Select **Manage Monitoring Credentials**.
- 4 From the **Target Types** drop-down list, select **Oracle Flash Storage System**.
- 5 Under **Target Name**, select the target and then select **Set Credentials**.
- 6 Change the login credentials for the Oracle FS System in the **User ID** and **Password** and **Confirm Password** fields
- 7 Click **Save**.

The credentials are changed. Make sure the changes you make to this account are made to the account on the Oracle FS System.

# Monitor Oracle FS Systems

## Oracle FS System Configuration and Metrics

Oracle Enterprise Manager collects configuration and metric data for the Oracle FS System and SAN Hosts added as targets. A pre-defined set of configuration and metrics is collected for each Oracle FS System target.

Oracle Enterprise Manager collects configuration and metric data for these components of an Oracle FS System:

- Controllers
- Disk Drives
- Drive Enclosures
- LUNs
- Oracle FS System (overall system)
- Pilots
- SAN Hosts.

You can view Oracle FS System configuration data and metrics in Oracle Enterprise Manager. You can change the collection schedule and edit thresholds and collection settings for the configuration data and metrics. The majority of the metrics are accessed from **Monitoring > All Metrics** and configuration data is accessed from **Configuration > Latest Configuration**.

**Note:** Some metrics displayed under **Monitoring > All Metrics** may not contain data as the metric is not implemented in this product release.

## Oracle FS System Configuration Data and Metrics

Oracle Enterprise Manager collects a pre-defined set of configuration data and metrics for each Oracle FS System added as a target.

The following table identifies the categories of metrics collected. You can modify the values associated with these metrics by navigating either **Oracle Flash Storage System > Monitoring > Metric and Collection Settings** or **Oracle Flash Storage System > Monitoring > All Metrics**.

**Note:** For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

**Table 6: Metrics collected for Oracle FS Systems**

Category	Collected metrics
Controller Details	<ul style="list-style-type: none"> <li>• Serial Number</li> <li>• Name</li> <li>• Operational Status</li> <li>• Type</li> </ul>
Disk Drives	<ul style="list-style-type: none"> <li>• Serial Number</li> <li>• Capacity (GB)</li> <li>• Drive Enclosure Name</li> <li>• Drive Number</li> <li>• Operational Status</li> </ul>
Drive Enclosure Details	<ul style="list-style-type: none"> <li>• FQN</li> <li>• Model</li> <li>• Name</li> <li>• Operational Status</li> <li>• Serial Number</li> <li>• Temperature Status</li> <li>• WWN</li> </ul>
Event Details	<ul style="list-style-type: none"> <li>• Timestamp</li> <li>• Category</li> <li>• Component Name</li> <li>• Component GUID</li> <li>• Contact Name</li> <li>• Contact Phone Number</li> <li>• Description</li> <li>• Name</li> <li>• Severity</li> <li>• Type</li> </ul>



**Table 6: Metrics collected for Oracle FS Systems (continued)**

Category	Collected metrics
LUN Details	<ul style="list-style-type: none"> <li>• LUID (LUN unique identifier)</li> <li>• Access Bias</li> <li>• Active</li> <li>• Addressable Capacity (Bytes)</li> <li>• Addressable Capacity (GB)</li> <li>• Allocated Capacity (Bytes)</li> <li>• Allocated Capacity (GB)</li> <li>• Allocated Clone Capacity (Bytes)</li> <li>• Allocated Clone Capacity (GB)</li> <li>• Assigned Controller FQN</li> <li>• Clone</li> <li>• Current Controller FQN</li> <li>• AutoTier</li> <li>• IO Bias</li> <li>• ID</li> <li>• Logical Maximum Clone Capacity (Bytes)</li> <li>• Logical Maximum Clone Capacity (GB)</li> <li>• Management State</li> <li>• Name</li> <li>• Priority</li> <li>• Redundancy</li> <li>• Remaining Capacity</li> <li>• Remaining Clone Capacity (%)</li> <li>• Remaining Clone Capacity (GB)</li> <li>• Source LUN FQN</li> <li>• Source LUN Name</li> <li>• Status</li> <li>• Storage Class</li> <li>• Storage Domain FQN</li> <li>• TierReallocationEnabled</li> <li>• Used Clone Capacity (Bytes)</li> </ul>

**Table 6: Metrics collected for Oracle FS Systems (continued)**

Category	Collected metrics
	<ul style="list-style-type: none"> <li>• Used Clone Capacity (GB)</li> <li>• Volume Group</li> </ul>
LUN Statistics	<ul style="list-style-type: none"> <li>• Serial Number</li> <li>• Cache Flushes each Second</li> <li>• Cache Hit Ratio</li> <li>• LUN FQN</li> <li>• LUN ID</li> <li>• LUN Name</li> <li>• Non-Optimized I/O each Second</li> <li>• Read Block Size</li> <li>• Read Bytes Per Second</li> <li>• Read I/Os Per Second</li> <li>• Read Latency</li> <li>• Read Queue Depth</li> <li>• Total Block Size</li> <li>• Total Bytes Each Second</li> <li>• Total I/Os Each Second</li> <li>• Total Latency</li> <li>• Total Queue Depth</li> <li>• Write Block Size</li> <li>• Write Bytes Each Second</li> <li>• Write I/Os Each Second</li> <li>• Write Latency</li> <li>• Write Queue Depth</li> </ul>
Pilot Details	<ul style="list-style-type: none"> <li>• Name</li> <li>• Mode</li> <li>• Operational Status</li> <li>• Serial Number</li> <li>• Version String</li> <li>• Build Version</li> <li>• Release Version</li> </ul>

**Table 6: Metrics collected for Oracle FS Systems (continued)**

Category	Collected metrics
<p>Response</p> <p><b>Note:</b> The Response category represents the communication between Oracle Enterprise Manager and the Oracle FS System. It does not necessarily relate to the system's status or the system's health.</p>	<ul style="list-style-type: none"> <li>• Status</li> </ul>
SAN Host Details	<ul style="list-style-type: none"> <li>• Status</li> <li>• SAN Host Name</li> <li>• SAN Host FQN</li> <li>• SAN Host ID</li> <li>• FSPM Version</li> <li>• IP Address</li> <li>• SAN Host Operating System</li> </ul>
System Details	<ul style="list-style-type: none"> <li>• Serial Number</li> <li>• Allocated Space (%)</li> <li>• Allocated Space (GB)</li> <li>• Contact Name</li> <li>• Contact Phone Number</li> <li>• IP Address</li> <li>• Model Name</li> <li>• Operational Status</li> <li>• Remaining Space (%)</li> <li>• Remaining Space (GB)</li> <li>• System Name</li> <li>• Total Space (GB)</li> </ul>
Other Collected Items	<ul style="list-style-type: none"> <li>• System Details_Config</li> <li>• Drive Enclosures Software_Config</li> <li>• Pilot Software_Config</li> <li>• Controller Software_Config</li> </ul>

---

## View Oracle FS Configuration Data and Metrics

One or more Oracle FS Systems added as an Oracle Enterprise Manager target

The Oracle FS System for which you want to view configuration data or metrics must be selected as the target.

- 1 Select **Oracle Flash Storage System > Monitoring > All Metrics** for metrics.  
A list of the categories of all configuration data or metrics collected for the target Oracle Flash Storage System displays in the navigation pane.
- 2 Select a category of configuration data or metrics.  
A table of specific configuration data or metrics available for that category displays in the content pane.

## Update Metrics Collection Schedule

You can change the collection schedule for metrics. The collection schedule defines how often data, such as LUN statistics is collected.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to view metrics must be selected as the target.

- 1 Select **Oracle Flash Storage System > Monitoring > All Metrics** for metrics.  
A list of the categories of all configuration data or metrics collected for the target Oracle Flash Storage System displays in the navigation pane.
- 2 Select a category of configuration data or metrics.  
A table of specific configuration data or metrics available for that category displays in the content pane.
- 3 To change the collection schedule for this category of configuration data, click **Actions > History**.
- 4 To change the collection schedule for this category of configuration data, click **Schedule and Notify**.
- 5 To change the collection schedule for this category of metrics, click **Modify**.  
In the **Modify Collection Schedule** dialog, you can change the collection frequency, upload interval, and typical usage of the metric data for this category of metrics.
- 6 Follow the instructions on the screen and when you finish modifying the collection schedule, select **OK**.
- 7 Select **OK** to save your changes.  
The updated collection schedule is implemented.

## Oracle FS System Target Menu

The Oracle Enterprise Manager for Flash Storage Systems enables you to monitor host groups, volume groups, Storage Domains, LUNs, and data protection schedules on an Oracle Flash Storage System from within the Oracle Enterprise Manager.

When you select an Oracle Flash Storage System target in Oracle Enterprise Manager, you have access to menus from which you can view the host and volume groups, Storage Domains, LUNs, LUN Clone Schedules, events, and other features defined on the target system. To access the menu, select the pull-down next to **Oracle Flash Storage System**.

### Related Links

[View Host Groups](#)

[View Volume Groups](#)

[View LUNs or Clone LUNs](#)

[View Storage Domains](#)

[View LUN Clone Schedules](#)

## View Status

View status of the Oracle FS System with the Oracle Enterprise Manager for Flash Storage Systems.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to view status must be selected as the target.

- 1 Select **Oracle Flash Storage Systems > Status**.

Status is displayed for these items:

<b>System Summary</b>	Provide information on the system including serial number, model, management IP, and status. The status indicators are normal, warning, and critical.
<b>Storage Summary</b>	Provides information on total storage space, allocated space, and remaining space.
<b>Software Summary</b>	Provides the software versions for system components.
<b>Job Activity</b>	Status of background jobs run by Oracle Enterprise Manager
<b>Pilot Status</b>	Indicates the Pilot status and if the Pilot is the active or standby. The status indicators are normal, warning, and critical. The active Pilot performs configuration tasks. The standby Pilot is available if the active Pilot failover to the standby Pilot.

<b>Controller Status</b>	Provides the Controller type and status. The status indicators are normal, warning, and critical. Controller type is SAN Only.
<b>Enclosure Status</b>	Provides the enclosure name, model, and status.
<b>Incidents and Problems</b>	Displays information about issues with the Oracle FS System, the host server where the plug-in is installed, and the Oracle Enterprise Manager application.

- 2 Select the refresh icon to update the page.

The displayed fields for Oracle FS System are updated.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## View SAN Hosts

You can display a list of all host groups previously defined for an Oracle FS System system with the Oracle Enterprise Manager for Flash Storage Systems.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to view SAN Hosts must be selected as the target.

- 1 Select **Oracle Flash Storage Systems > Hosts**.
- 2 Select **SAN Hosts** from the View drop-down list.

All SAN host groups defined for the current Oracle FS System system are listed.

<b>Host Name</b>	Identifies the name of the SAN host
<b>Host Group Name</b>	Name of a collection of SAN hosts.
<b>Number of LUNs Mapped</b>	Identifies the number of LUNs that are mapped to the SAN host either because of a specific mapping or because the LUN is available to all SAN hosts.
<b>Status</b>	Identifies whether the Oracle FS Path Manager (FSPM) driver is communicating or registered. If the driver is not registered, install the FSPM software.
<b>FSPM Version</b>	Identifies the FSPM version.
<b>Host IP Address</b>	Identifies the IP address of the SAN host. If FSPM is not installed, the field displays N/A.
<b>Host Operating System</b>	Identifies the host operating system on which the FSPM software is installed.

All SAN host groups defined for the current Oracle FS System are listed.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

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## View Host Groups

Host groups associate registered SAN hosts into logical organizational units so you can assign attributes to the entire group rather than to individual hosts. You can display a list of all host groups previously defined for an Oracle FS System with the Oracle Enterprise Manager for Flash Storage Systems.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to view host groups must be selected as the target.

- 1 Select **Oracle Flash Storage System > Hosts**.
- 2 Select **Host Groups** from the **View** drop-down list.

All host groups defined for the current Oracle FS System are listed.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## View Volume Groups

Volume groups allow you to organize logical volumes (LUNs) into organizational units. You can display a list of all volume groups previously defined for a Oracle FS System system with the Oracle Enterprise Manager for Flash Storage Systems.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to view volume groups must be selected as the target.

- 1 Select **Oracle Flash Storage System > Volume Groups**.
- 2 Select **Volume Groups** from the **View** drop-down list.
- 3 You can search or filter to look for a volume group in the **Filter/Search...** field.

All volume groups and any parent volume groups that are defined for the current Oracle FS System are listed.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## View Storage Domains

Storage Domains assign LUNs to a specific collection of Drive Enclosures in an Oracle FS System. You can display a list of all the Storage Domains previously

defined for an Oracle FS System with the Oracle Enterprise Manager for Flash Storage Systems.

**Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to view Storage Domains must be selected as the target.

- 1 Select **Oracle Flash Storage System > Storage Domains**.
- 2 Select **Storage Domains** from the View drop-down list.

The following information is available:

**Tier Reallocation**

Indicates whether tier reallocation is enabled or disabled.

**Allocated Capacity**

Amount, in GB, of the capacity of this Storage Domain that has already been allocated for storage.

**Free Capacity**

Amount, in GB, of the capacity of this Storage Domain that has not yet been allocated for storage, and is available for use.

**Unavailable Capacity**

Amount, in GB, of the capacity of this Storage Domain that cannot be allocated for storage because it is in use.

**Total Capacity**

Total capacity of this Storage Domain in GB, including both available and unavailable capacity.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## View LUNs or Clone LUNs

You can display a list of all the LUNs or Clone LUNs defined for an Oracle FS System with the Oracle Enterprise Manager for Flash Storage Systems.

**Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to view LUNs or Clone LUNs must be selected as the target.

**Note:** LUNs do not always display and this is a known plug-in limitation. The plug-in framework limits the amount of data from the plug-in to the Oracle Enterprise Manager. Based on the size limitation, the plug-in can accommodate a system with approximately 1000 LUNs.

- 1 Select **Oracle Flash Storage System > LUNs**.



- 2 Select **LUNs** or **Clone LUNs** from the **View** drop-down list.
- 3 Select a LUN to display information about that LUN.

Available information includes:

**Basic Information**

LUN name, LUID, status, and Storage Domain and volume group membership.

**Capacity Information**

Used, maximum, and available capacity of the selected LUN, in GB.

**LUN Statistics**

A summary graph of the read I/O, write I/O, and total I/O each second for the selected LUN over the last 24 hours.

**Quality of Service**

Redundancy, I/O bias, access bias, and priority Quality of Service (QoS) attributes assigned to the selected LUN.

**Clone Capacity Information**

Used, maximum, and available capacity for clones of the selected LUN (if any), in GB.

**Access Information**

Protocol (FC) and type of mapping (to specific hosts or to all hosts) used to access the selected LUN.

**Clone LUNs**

Clone LUNs that are children of the select LUN, if any.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

**Related Links**

[Delete a LUN](#)

[Copy a LUN](#)

[Clone a LUN](#)

## View LUN Clone Schedules

You can display a list of all the LUN clone schedules defined for a Oracle FS System with the Oracle Enterprise Manager for Flash Storage Systems.

**Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to view protection schedules must be selected as the target and you must select the source LUN or Clone LUN for which the schedule was created to display the schedule.

- 1 Select **Oracle Flash Storage System > LUN Clone Schedules**.
- 2 Select **LUNs** or **Clone LUNs** from the **View** drop-down list.

- 3 You can search or filter for LUNs using the **Filter/Search...** field.
- 4 Select the name of a LUN or Clone LUN from the list.  
If a clone schedule is associated with the LUN or Clone LUN, the following information about the schedule displays:

**Schedule Name**

Name given to the schedule when it was created.

**Start Time**

Scheduled time and date to start creating clones of the LUN.

**Frequency**

How often clones are scheduled to be created.

**Protected Volume**

Name of the source volume (LUN) from which clones are scheduled to be created.

**Enabled**

Identifies whether the data protection schedule is enabled.

- Yes indicates that the schedule is actively cloning the protected volume.
- No indicates that the schedule is not cloning the protected volume.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## View Events

View events from the Oracle FS System with the Oracle Enterprise Manager for Flash Storage Systems.

**Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to view events must be selected as the target.

- 1 Select **Oracle Flash Storage Systems > Events**.

Status is displayed for these items:

<b>Event</b>	Displays the name of the event generated by the Oracle FS System.
<b>Severity</b>	Displays either informational, warning, or critical. Informational severity requires no action. A warning does not require immediate action and should be resolved. A critical status requires immediate action to prevent system failures or offline conditions.
<b>Category</b>	Displays either security, audit, or system. A security event could be a security problem such as an unauthorized request. An audit event tracks tasks performed such as a

	login. A system event can include problems with the system as well as tasks completed.
<b>Time Occurred</b>	Indicates the date and time the event occurred.
<b>Affected Item</b>	Identifies the name of the system object that caused the event.
<b>Description</b>	Provides a brief description of the event.

- 2 Select the refresh icon to update the page.

The displayed fields for Oracle FS System system are updated.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

# Manage Oracle FS System Reports

## Generating Oracle FS System Reports Overview

The Oracle Enterprise Manager for Flash Storage Systems provides pre-defined hardware, I/O, and storage usage reports that you can generate for the Oracle FS System.

Hardware reports include an Oracle FS System summary report, a report of the disk drives in the Drive Enclosures associated with the Oracle FS System, and a hardware status report.

The I/O Access for LUNs report charts input and output statistics for the 10 most active LUNs on the Oracle FS System.

The Storage Usage reports show storage use per LUN associated with the Oracle FS System, and how much storage is used for the different priority, data access, and I/O bias Quality of Service categories.

### Related Links

[Hardware Reports](#)

[Oracle FS System I/O Reports](#)

[Oracle FS System Storage Usage Reports](#)

[#unique\\_13](#)

## Generate Reports

You can generate pre-defined reports for any Oracle FS System system previously added as a target.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

If the Oracle FS System for which you want to generate the report is not already selected as the target, you can specify the Oracle FS System to serve as the target for the report.

- 1 Select **Enterprise > Reports > Information Publisher Reports**.
- 2 If not expanded, expand the reports in the Information Publisher Reports list by selecting **Expand All**.
- 3 Locate the **Oracle Flash Storage Reports** or enter information in the search fields.

- 4 Click the name report you want to view.  
The **Specify Target for Report** dialog displays.
- 5 Verify the name of the target in the **Target** field.  
If no target is specified, click the magnifying glass icon to search for a target Oracle Flash Storage System to include in the report.
- 6 Select the **Select** button to chose the host target.
- 7 Click the **Save** button to save your choice.
- 8 Click **Continue**.  
The selected report displays in a new window.
- 9 (Optional) To capture the output of the report, do either of the following:
  - Click **Printable Page** and use the web browser print function to print the report.
  - Click the comma icon in the top right corner of a report to open the report or save it as a comma-separated value (CSV) file.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

# Manage Oracle FS System

## Managing Host Groups Overview

You can create, modify, or delete host groups in Oracle Enterprise Manager with the Oracle Enterprise Manager for Flash Storage Systems. You can also assign a new host to a previously created host group.

You can organize SAN hosts into logical units by creating host groups. Creating host groups enables you to manage related hosts without specifying each individual host. As the system changes, you can modify the names of your host groups, and you can delete host groups that you no longer need.

When you first create a host group, you specify only a host group name. Once you create the host group name, you can assign hosts to the group.

### Related Links

[View Host Groups](#)

[Create a Host Group](#)

[Modify a Host Group](#)

[Delete a Host Group](#)

[Assign a Host to a Host Group](#)

## Create a Host Group

Creating a host group allows you to associate registered SAN hosts into logical organizational units.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to create a host group must be selected as the target.

- 1 Select **Oracle Flash Storage System > Hosts**.
- 2 Select **Host Groups** from the **View** drop-down list.
- 3 Select **Actions > Create**.
- 4 In the **Create Host Group** dialog, enter a name for your host group in the **Host Group Name** field and click **OK**.
- 5 Click **OK** in the **Create Host Group Succeeded** dialog.  
The new host group displays in the host groups page.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Modify a Host Group

You can modify a host group only by changing its name.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to modify a host group must be selected as the target.

- 1 Select **Oracle Flash Storage System > Hosts**.
- 2 Select **Host Groups** from the **View** drop-down list.
- 3 Select the host group you want to modify.
- 4 Select **Actions > Modify**.
- 5 Enter a new name in the **Modify Host Group** dialog and click **OK**.
- 6 Click **OK** in the confirmation dialog.  
The new host group name displays in the host groups page.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Delete a Host Group

You can delete a host group when the group is no longer needed because of changes to the hosts that comprise the group.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system from which you want to delete a host group must be selected as the target.

**Important:** When you delete a host group, you must replace any mappings to the host group with mappings to a different host group, or with mappings to individual hosts within the deleted host group.

- 1 Select **Oracle Flash Storage System > Hosts**.
- 2 Select **Host Groups** from the View drop-down list.
- 3 Select the host group you want to delete.
- 4 Select **Actions > Delete**.
- 5 Click **OK** to confirm that you want to delete the host group.
- 6 Click **OK** in the confirmation dialog.  
The host group no longer displays in the list on the host groups page.

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For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Assign a Host to a Host Group

Once you have created a host group, you can assign hosts to the host group.

### Prerequisites:

- One or more Oracle FS Systems added as an Oracle Enterprise Manager target.
- The host group must be created before you assign hosts to it.

The Oracle FS System system for which you want to assign a host to a host group must be selected as the target.

**Note:** In the Oracle FS System Manager (GUI), the Associate Hosts command associates ungrouped initiators with a new host that is created or an existing host. The Assign operation associates (drops into the group) an existing host entity with an existing or newly created host group.

- 1 Select **Oracle Flash Storage System > Hosts**.
- 2 Select **SAN Hosts** from the **View** drop-down list.
- 3 Select the host you want to assign to the host group.
- 4 Select **Actions > Assign**.
- 5 In the **Assign SAN Host** dialog, select the host group to which you want to assign this host from the **Assign to Host Group Name** drop-down list.
- 6 Click **OK** in the **Assign SAN Host** dialog.  
A confirmation dialog informs you when you have successfully assigned the host to the host group.
- 7 Click **OK** in the confirmation dialog.  
The host group name displays in the **Host Group Name** column beside the host name in the SAN Hosts page.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Managing Volume Groups Overview

You can create, modify, or delete Oracle FS System volume groups in Oracle Enterprise Manager with the Oracle Enterprise Manager for Flash Storage Systems.

Volume groups enable you to organize related logical volumes (LUNs) into groups to manage the volume groups together rather than individually. You can also specify parent-child relationships between volume groups to create group hierarchies.

When you create a volume group, you specify a name and a capacity for the group. Once you create a volume group, you can add LUNs to the group by



specifying the volume group name in the Quality of Service (QoS) settings for each LUN.

As your needs change, you can change the name or capacity of an existing volume group, or you can change which LUNs belong to the group by modifying the LUN QoS settings. You can also delete a volume group that is no longer needed, but you need to reassign the LUNs to a different volume group before you delete it.

### Related Links

[View Volume Groups](#)

[Create a Volume Group](#)

[Modify a Volume Group](#)

[Delete a Volume Group](#)

[Create a Volume Group](#)

[Modify a Volume Group](#)

[Delete a Volume Group](#)

[Create LUN: Quality of Service](#)

## Create a Volume Group

Volume groups allow you to organize logical volumes (LUNs) into organizational units.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to create the volume group must be selected as the target.

- 1 Select **Oracle Flash Storage System > Volume Groups**.
- 2 Select **Actions > Create**.
- 3 In the **Create Volume Group** dialog, specify the parameters for the volume group.  
Required parameters:
  - **Volume Group Name**.
  - **Parent Volume Group** or **<none>**. The default value is **<none>**.
- 4 Click **OK**.
- 5 Click **OK** in the **Create Volume Group Succeeded** dialog.  
The new volume group displays in the volume groups page.

Add LUNs to the volume group by specifying the volume group name in the Quality of Service (QoS) settings for each LUN.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

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## Modify a Volume Group

You can modify the name or parent of a volume group to meet changing needs for those attributes of the group.

**Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to modify a volume group must be selected as the target.

- 1 Select **Oracle Flash Storage System > Volume Groups**.
- 2 Select the volume group you want to modify.
- 3 Click **Actions > Modify**.
- 4 In the **Modify Volume Group** dialog, modify parameters for the volume group.

Parameters you can change:

- **Volume Group Name.**
  - **Parent Volume Group** or **<none>**. The default value is **<none>**, so if you do not choose a parent volume group, the volume group is not assigned a parent volume group.
- 5 Click **OK**.
  - 6 Click **OK** in the confirmation dialog.  
Changes to the volume group display in the volume groups page.

Modify LUN membership in the volume group by changing the volume group name in the Quality of Service (QoS) settings for each LUN.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Delete a Volume Group

You can delete a volume group after you have reassigned all its logical volumes (LUNs) to different volume groups.

**Prerequisites:**

- One or more Oracle FS Systems added as an Oracle Enterprise Manager target.
- All LUNs in the volume group reassigned to other volume groups before you delete the volume group.

**Caution:** Before you delete a volume group, reassign its LUNs to other volume groups by changing the volume group name in the Quality of Service (QoS) settings for the LUNs. Deleting a volume group that still has LUNs assigned to it can disrupt operations on the target Oracle FS System.

The Oracle FS System system from which you want to delete a volume group must be selected as the target.

- 1 Select **Oracle Flash Storage System > Volume Group**.
- 2 Select the volume group you want to delete.
- 3 Click **Actions > Delete**.
- 4 Click **OK**.
- 5 Click **OK** in the confirmation dialog.  
The volume group is removed from the list on the volume groups page.

## Managing Storage Domains Overview

You can create, modify, or delete Storage Domain in Oracle Enterprise Manager with the Oracle Enterprise Manager for Flash Storage Systems. You can also associate Drive Enclosures with an existing Storage Domain on the target Oracle FS System.

Storage Domains are logical units that allow you to assign LUNs to a specific collection of Drive Enclosures on a Oracle FS System. All LUNs belong to a Storage Domain. When you create a LUN, it is automatically assigned to the default Storage Domain, or you can specify a different Storage Domain in the Quality of Service (QoS) settings for the LUN.

When you create a Storage Domain, you specify a name for the Storage Domain. Once you create a Storage Domain, you can associate Drive Enclosures with the Storage Domain, and you can assign LUNs to the Storage Domain by specifying the Storage Domain name in the QoS settings for the LUN. You can also make the new Storage Domain the primary Storage Domain.

You can change the name of a Storage Domain or you can change the Drive Enclosures that are associated with the Storage Domain. You can also change whether the Storage Domain is the primary domain, and you can delete a Storage Domain that is no longer needed. To change which LUNs are assigned to the Storage Domain, you must change the specified Storage Domain name in the QoS settings for the LUNs.

### Related Links

[View Storage Domains](#)

[#unique\\_57](#)

[Modify a Storage Domain Name](#)

[Delete a Storage Domain](#)

[Change Drive Group to Primary Drive Group](#)

[Create a Volume Group](#)

[Modify a Volume Group](#)

[Delete a Volume Group](#)

[Create LUN: Quality of Service](#)

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## Creating Storage Domains

When creating a storage domain using the Oracle Enterprise Manager for Flash Storage Systems, you can name the new storage domain, select the background process priority, enable tier reallocation, and enable tier reallocation statistics collection.

The Oracle FS System Manager provides the same capabilities as the Oracle Enterprise Manager for Flash Storage Systems. In addition, you can use the Oracle FS System Manager to perform the following tasks:

- Assign LUNs to a specific collection of Drive Enclosures in an Oracle FS System
- Enable automatic QoS rebalancing
- Configure auto-tier scan options
- Specify LUN storage capacity

Based on the advanced storage domain capabilities that are available with the Oracle FS System Manager, Oracle recommends you create a storage domain using the Oracle FS System Manager.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Modify a Storage Domain Name

You can change the name or the Primary Storage Domain attribute of a Storage Domain.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to modify a Storage Domain must be selected as the target.

- 1 Select **Oracle Flash Storage System > Storage Domains**.
- 2 Select **Storage Domains** from the **View** drop-down list.
- 3 Select the Storage Domain you want to modify.
- 4 Click **Actions > Modify** and enter a new name for the Storage Domain.
- 5 Click **OK**.
- 6 Click **OK** in the confirmation dialog.  
The new Storage Domain name displays in the Storage Domain page.

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## Delete a Storage Domain

You can delete a Storage Domain when it is no longer needed.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system from which you want to delete the Storage Domain must be selected as the target.

- 1 Select **Oracle Flash Storage System > Storage Domains** from the target drop-down list.
- 2 Select **Storage Domains** from the **View** drop-down list.
- 3 Select the Storage Domain you want to delete.
- 4 Click **Actions > Delete**.
- 5 Click **OK** to confirm that you want to delete the Storage Domain.
- 6 Click **OK** in the confirmation dialog.  
The Storage Domain no longer displays in the list on the Storage Domain page.

## Change Drive Group to Primary Drive Group

You can change a drive group to be the primary drive group.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to associate a Drive Enclosure with a Storage Domain must be selected as the target.

- 1 Select **Oracle Flash Storage System > Storage Domains**.
- 2 Select **Drive Groups** from the **View** drop-down list.
- 3 Select the Drive Group you want to change to the primary drive group.
- 4 Click **Actions > Modify**.
- 5 Click **Make this the primary drive group**. The primary drive group contains system configuration information.  
A confirmation dialog informs you when you have successfully changed this drive group to the primary drive group.
- 6 Click **OK** in the confirmation dialog.

## Managing LUNs

You can create, modify, or delete Oracle FS System LUNs or Clone LUNs in Oracle Enterprise Manager with the Oracle Enterprise Manager for Flash Storage Systems. You can also copy or clone LUNs on the target Oracle FS System.

The Oracle Enterprise Manager for Flash Storage Systems provides a wizard to guide you through the process of creating or modifying an Oracle FS System

LUN. The plug-in also provides a **Delete** button you can use to remove a LUN you no longer need, a **Copy** button you can use to copy a LUN for use as a template to create a new LUN, and a **Clone** button you can use to create a point-in-time back-up copy of a LUN.

#### **Related Links**

[Delete a LUN](#)

[Copy a LUN](#)

[Clone a LUN](#)

## **Creating LUNs Overview**

The Oracle Enterprise Manager for Flash Storage Systems provides a wizard to guide you through the process of creating a LUN.

The plug-in Create LUN wizard is similar to the Create SAN LUN wizard in the Oracle FS System Manager (GUI).

The wizard starts when you click **Actions > Create**.

The wizard contains two tabs for Single Tier and Auto-Tier. Whether you choose Single Tier or Auto Tier, there are three tabs for LUN information: quality of service, mapping, and data protection. Each tab contains fields for selecting LUN properties. These fields are automatically filled in with default values.

Clicking **OK** at the bottom of any tab saves the LUN with the default values, or with any new values you have added, in each of the tabs.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

#### **Related Links**

[Delete a LUN](#)

[Copy a LUN](#)

[Clone a LUN](#)

[Create LUN: Data Protection](#)

[Create LUN: Mapping to All Hosts](#)

[Create LUN: Mapping to Selected Hosts](#)

[Create LUN: Quality of Service](#)

## **Create a LUN**

You can create a LUN with the Oracle Enterprise Manager for Flash Storage Systems.

#### **Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

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The Oracle FS System on which you want to create the LUN must be selected as the target.

- 1 Select **Oracle Flash Storage System > LUNs**.
- 2 Select **LUNs** or **Clone LUNs** from the View/Manage drop-down menu.
- 3 Click **Actions > Create**.

The Create LUN wizard displays.

Choose single tier or auto tier and then add LUN properties in the quality of service, mapping, and data protection tabs in the Create LUN wizard, or use the default properties. Click **OK** when you are finished.

The plug-in Create LUN wizard is nearly identical to the Create SAN LUN wizard in the Oracle FS System Manager (GUI).

The wizard starts when you click **Actions > Create**.

The wizard contains two tabs for Single Tier and Auto-Tier. Whether you choose Single Tier or Auto Tier, there are three tabs for LUN information: quality of service, mapping, and data protection. Each tab contains fields for selecting LUN properties. These fields are automatically filled in with default values.

Clicking **OK** at the bottom of any tab saves the LUN with the default values, or with any new values you have added, in each of the tabs.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Create LUN: Quality of Service

Specify Quality of Service (QoS) attributes to allocate the storage resources necessary to create the LUN.

You can specify a name, Storage Domain, volume group, Storage Profile, and Storage Class attributes for the LUN, as well as priority level, redundancy, capacity, and other QoS attributes, in the **Quality of Service** tab.

- 1 Select **Single Tier** or **Auto Tier**.  
Only select the Auto Tier option if the Storage Domain has more than one storage class.
- 2 Click the Quality of Service tab.
- 3 Select a Storage Domain for the LUN.  
Click the ellipsis button [...] to review the available storage capacity and storage classes for each Storage Domain.
- 4 Enter the **LUN Name**.
- 5 (Optional) Select the volume group to which you want the new LUN to belong.
- 6 From the **Storage Profile** drop-down list, select an existing profile or select **Custom** to create Storage Profile.

- If you select an existing Storage Profile, the system updates the QoS attributes as defined by the selected profile. Some fields are grayed out (unavailable) which indicates you cannot change those fields as the fields were defined by the storage profile.
- If you select **Custom**, select a **Storage Class** and then select either **Basic** or **Advanced**:

#### **Basic**

Complete these fields: Typical Access, I/O Bias, Redundancy, and Priority Level.

#### **Advanced**

Complete these fields: RAID Level, Read Ahead, and Priority Level.

- 7 Select a value for **Background Copy Priority**.
- 8 Adjust the values in the **Capacity** and **Allocated Logical Capacity** fields as necessary.
- 9 Click **OK** to create the LUN.
- 10 Select or deselect **Deselect Disable Reference Tag Checking** .  
Reference Tag Checking Indicates that the HBA bypasses the reference tag check as part of the process for ensuring data protection integrity for the LUN
- 11 Check or clear **Use as a Boot LUN**.  
Use as a Boot LUN specifies that the LUN is used as a boot drive in the SAN.

Clicking **OK** saves the LUN with the QoS settings and any attributes you set in the **Mapping** and **Data Protection** tabs.

After you have defined the QoS attributes for the LUN, you define mappings to the LUN, to either specific hosts or all hosts, in the **Mapping** tab.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Create LUN: Mapping to Selected Hosts

Map the LUN to one or more SAN hosts to allow only those specific hosts to access the LUN.

When you need to restrict access to a LUN, such as when the LUN contains sensitive data, map access to the LUN to a specific host or group of hosts.

- 1 Click the **Mapping** tab.
- 2 Select the **FC Access Protocol**.
- 3 Click the **Only selected hosts** option.
- 4 Select a Controller in the LUN Controller Assignment section.



Two storage Controller fields appear. For new LUNs, the **Current Controller** field is not available. From the **Assigned Controller** drop-down list, select a Controller or select **auto assign**.

If you select **auto assign**, the system determines the Controller. You can modify the value or select a new value after the LUN has been created.

- 5 To create a new host mapping, click **Create** and select values for the LUN mapping fields:
  - **Host Name:** Select the host to associate to the LUN.
  - **LUN Number:** Select the number to assign to the LUN for the selected host and click **OK**. This number must be unique for that particular host. It does not need to be unique across all hosts.
- 6 (Optional) Click **OK and Continue** to select additional hosts to map to the LUN.
- 7 In the Ports Masked for this LUN table, indicate which ports you want masked by selecting **Yes** or **No** in the Masked column.
- 8 (Optional) Click **OK** to create the LUN now.

Clicking **OK** saves the LUN with the LUN-to-host mapping and any attributes you set in the Quality of Service and Data Protection tabs.

After you have defined the host mappings for a LUN, you must next define Data Protection settings for the LUN.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide* .

## Create LUN: Mapping to All Hosts

Map the LUN to a unique LUN number to allow all SAN hosts to access the LUN.

- 1 Click the **Mapping** tab.
- 2 Select the **FC Access Protocol**.
- 3 Select **All hosts may access this LUN using LUN number**.
- 4 Select a number for the LUN from the drop-down list to the right of the previous option.
- 5 Select a Controller in the LUN Controller Assignment section.

Two storage Controller fields appear. For new LUNs, the **Current Controller** field is not available. From the **Assigned Controller** drop-down list, select a Controller or select **auto assign**.

If you select **auto assign**, the system determines the Controller. You can modify the value or select a new value after the LUN has been created.

- 6 In the Ports Masked for this LUN table, indicate which ports you want masked by selecting **Yes** or **No** in the Masked column.
- 7 (Optional) Click **OK** to create the LUN now.  
Clicking **OK** saves the LUN with the LUN number mapping and any attributes you set in the Quality of Service and Data Protection tabs.  
After you have defined the LUN number mapping for a LUN, you must next define Data Protection settings for the LUN.

## Create LUN: Data Protection

Allocate capacity for clones of the LUN to ensure protection of the LUN data.

To make sure that enough storage space exists for clones of a LUN, you must allocate a repository for clones when you create the LUN.

To set sufficient capacity, use a value equal to the source LUN capacity multiplied times the number of Clone LUNs multiplied times the maximum rate of change.

- 1 Click the Data Protection tab.
- 2 Select **Single Tier** or **Auto Tier**.
- 3 Click **Enable Clones**.
- 4 Adjust the value in the **Maximum Capacity** field by clicking the **Increment** or **Decrement** arrow or entering a new value in the field.  
The default value is the available capacity for Clone LUNs, which corresponds to the LUN capacity you set as the Addressable Logical Capacity for the LUN in the Quality of Service tab.
- 5 If you want to use the same QoS settings for the clone LUN, click the **Match Repository QoS to Tier QoS**. If you do not want to use the same QoS settings for the clone LUN, then complete the following fields:
  - a) Select the Storage Domain.
  - b) Select the Storage Class.
  - c) Select **Basic** or **Advanced**.
 

**Basic**  
Complete these fields: Typical Access, I/O Bias, Redundancy, and Priority Level.

**Advanced**  
Complete these fields: RAID Level and Priority Level.
- 6 Click **OK** to save the LUN.

Clicking **OK** saves the LUN with the new capacity allocation and the attributes you set in the Quality of Service and Mapping tabs.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

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## Modifying LUNs Overview

The Oracle Enterprise Manager for Flash Storage Systems provides a wizard to guide you through the process of modifying a LUN.

The Modify LUN wizard is nearly identical to the wizard you use to create LUNs.

The wizard starts when you select a LUN and click **Modify** at the bottom of the LUNs or Clone LUNs page.

The wizard contains three tabs: quality of service, mapping, and data protection. Each tab contains fields for selecting LUN properties. These fields are automatically filled in with default values. Clicking the **OK** button at the bottom of a tab saves the LUN with any changes you make to the values in any of the tabs.

### Related Links

[Delete a LUN](#)

[Copy a LUN](#)

[Clone a LUN](#)

[Modify LUN: Data Protection](#)

[Modify LUN: Mapped to All Hosts](#)

[Modify LUN: Mapped to Specific Hosts](#)

[Modify LUN: Quality of Service](#)

## Modify a LUN

You can change the properties of an existing LUN with the Oracle Enterprise Manager for Flash Storage Systems.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System in which the LUN you want to modify resides must be selected as the target.

- 1 Select **Oracle Flash Storage System** > **LUNs**.
- 2 Select **LUNs** or **Clone LUNs** from the **View/Manage** drop-down menu.
- 3 Click **Actions** > **Modify**.  
The Modify LUN wizard displays.

Modify LUN properties in the quality of service, mapping, and data protection tabs in the Modify LUN wizard, or keep the existing properties. Click **OK** when you are finished.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

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## Modify LUN: Quality of Service

Modify the current Quality of Service (QoS) attributes to change the QoS settings for the LUN.

As requirements for a LUN change, you can modify the name, Storage Domain, volume group, Storage Profile, Storage Class, and other attributes of the LUN in the Quality of Service tab.

- 1 Click the **Quality of Service** tab.
- 2 Click **Single Tier** or **Auto Tier**.
- 3 Modify the necessary volume group, Storage Domain membership settings, and QoS attributes.

Click the ellipsis button [...] beside the Storage Domain, Volume Group, or Storage Profile field for more information about choices for those fields.

Refer to the Capacity by Storage Class table for more information about storage classes.

- 4 Select **Basic** or **Advanced**.

### **Basic**

Modify these fields: Typical Access, I/O Bias, Redundancy, and Priority Level.

### **Advanced**

Modify these fields: RAID Level, Read Ahead, and Priority Level.

- 5 Click **OK** to save all of your updates, or continue on to the **Mapping** and **Data Protection** tabs to make additional updates to the LUN.

## Modify LUN: Mapped to Specific Hosts

- 1 Click **Create** to create a new host mapping.

Select values for the LUN mapping fields:

- **Host Name:** Select the host to associate with the LUN.
- **LUN Number:** Select the number to assign to the LUN for the selected host, and click **OK**. This number must be unique for that particular host but does not need to be unique across all hosts.

- 2 (Optional) Click **Create** to create more host mappings.

## Modify LUN: Mapped to All Hosts

Remap the LUN to a LUN number to make it available to all SAN hosts, or you can change a previously assigned LUN number.

To provide unrestricted access to a LUN, remap the LUN to a unique LUN number that all SAN hosts can use.

- 1 Click the Mapping tab.
- 2 Select the **FC Access Protocol**.
- 3 Click the **All hosts may access this LUN using LUN number** option.
- 4 Modify the number for the LUN from the drop-down list to the right of the previous option.
- 5 In the LUN Controller Assignment section, from the two settings that appear (**Current Controller** and **Assigned Controller**), select a Controller or select **auto assign**.
- 6 Click **OK** to save all of your updates, or continue on to the Data Protection tab to make additional updates to the LUN.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Modify LUN: Data Protection

Reallocate capacity for clones of the LUN to ensure adequate protection of the LUN data.

- 1 Click the Data Protection tab.
- 2 Select **Single Tier** or **Auto Tier**.
- 3 Click **Enable Clones**.
- 4 Adjust the value in the **Maximum Capacity** field by clicking the **Increment** or **Decrement** arrow or entering a new value in the field.  
The default value is the available capacity for Clone LUNs, which corresponds to the LUN capacity you set as the Addressable Logical Capacity for the LUN in the Quality of Service tab.
- 5 If you want to use the same QoS settings for the clone LUN, click the **Match Repository QoS to Tier QoS**. If you do not want to use the same QoS settings for the clone LUN, then complete the following fields:
  - a) Select the Storage Domain.
  - b) Select the Storage Class.
  - c) Select **Basic** or **Advanced**.  
**Basic**  
Complete these fields: Typical Access, I/O Bias, Redundancy, and Priority Level.  
**Advanced**  
Complete these fields: RAID Level and Priority Level.
- 6 Click **OK** to save the LUN.

## Enable Data Path for LUN

Enabling the data path to a LUN restores the communication between the mapped SAN host entry and the volume. When the data path to a LUN has been

disabled, you can provide the ability of a SAN host entry to access that LUN using the host mappings already established.

**Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to delete the LUN must be selected as the target.

- 1 Select **Oracle Flash Storage System > LUNs**.
- 2 Select one of the following from the **View/Manage** drop-down list:
  - **LUNs** if you want to enable a data path to a LUN.
  - **Clone LUNs** if you want to enable a data path to a Clone LUN.
- 3 Select the LUN or Clone LUN you want to enable the data path to access the LUN.
- 4 Click **Actions > Enable Data Path for LUN**.  
A confirmation dialog asks if you are sure you want to enable data path to the LUN or Clone LUN.
- 5 Click **OK** in the confirmation dialog.  
The data path is enabled to the LUN or Clone LUN. You can verify this by reviewing the LUNs information page under **Access Information** where **Data Path** is displayed as **Enabled**.

## Disable Data Path for LUN

You can remove the ability of a SAN host entry to access a LUN or Clone LUN but not remove the host mappings to the logical volume. This enables you to restore the SAN host entry access when necessary

**Prerequisite:**

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to delete the LUN must be selected as the target.

- 1 Select **Oracle Flash Storage System > LUNs**.
- 2 Select one of the following from the **View/Manage** drop-down list:
  - **LUNs** if you want to disable a data path to a LUN.
  - **Clone LUNs** if you want to disable a data path to a Clone LUN.
- 3 Select the LUN or Clone LUN you want to disable the data path to access the LUN.
- 4 Click **Actions > Disable Data Path for LUN**.

A confirmation dialog asks if you are sure you want to disable data path to the LUN or Clone LUN.

- 5 Click **OK** in the confirmation dialog.  
The data path is disabled to the LUN or Clone LUN. You can verify this by reviewing the LUNs information page under **Access Information** where **Data Path** is displayed as **Disabled**.

## Delete a LUN

You can delete a LUN or a Clone LUN when the LUN is no longer needed.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to delete the LUN must be selected as the target.

- 1 Select **Oracle Flash Storage System > LUNs**.
- 2 Select one of the following from the View/Manage drop-down list:
  - **LUNs** if you want to delete a LUN
  - **Clone LUNs** if you want to delete a Clone LUN.
- 3 Select the LUN or Clone LUN you want to delete.
- 4 Click **Actions > Delete**.  
A confirmation dialog asks if you are sure you want to delete the LUN, and if you also want to delete any data protection schedules associated with the LUN or Clone LUN.
- 5 (Optional) Select **Also Delete Protection Schedules** if there are data protection schedules associated with the LUN that you want to delete when you delete the LUN.
- 6 Click **OK** in the confirmation dialog.  
The LUN no longer appears in the list on the LUNs or Clone LUNs page. If you selected **Also Delete Protection Schedules**, any data protection schedules associated with the LUN are removed.

## Copy a LUN

You can copy a LUN when you want to create a new LUN with different Quality of Service (QoS), mapping, and data protection properties from those of the source LUN.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to copy the LUN must be selected as the target.

- 1 Select **Oracle Flash Storage System** > **LUNs**.
- 2 Select **LUNs** from the **View/Manage** drop-down list.
- 3 Select the LUN that you want to copy.
- 4 Click **Copy** at the bottom of the LUNs page.
- 5 Make any necessary changes in the Quality of Service, Mapping, and Data Protection tabs of the Copy LUN page.
- 6 Click **OK** in the Copy LUN page.  
A confirmation dialog informs you when the copy has been created successfully.
- 7 Click **OK** in the confirmation dialog.  
The LUN copy appears in the list of LUNs on the LUNs page with “Copy of” prepended to the source LUN name.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.

## Clone a LUN

You can clone a LUN when you want to create a point-in-time copy of a LUN with the same Quality of Service (QoS) properties as the original.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to clone the LUN must be selected as the target.

- 1 Select **Oracle Flash Storage System** > **LUNs**.
- 2 Select **LUNs** from the **View/Manage** drop-down list.
- 3 Select the LUN that you want to clone.
- 4 Click **Actions** > **Clone**.
- 5 Make any available changes in the Quality of Service and Mapping tabs of the Clone LUN page.
- 6 Click **OK** in the Clone LUN page.  
A confirmation dialog informs you when the Clone Volume (LUN) has been successfully created.
- 7 Click **OK** in the confirmation dialog.  
The Clone LUN appears in the list of clones on the Clone LUNs page with “Clone of” prepended to the source LUN name.

For detailed information or definitions about the displayed data, review the *Oracle Flash Storage System Administrator's Guide*.



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## Managing Protection Schedules Overview

You can create, modify, or delete schedules for protecting the data in a LUN or Clone LUN by making clones of the source LUN at regular intervals in Oracle Enterprise Manager with the Oracle Enterprise Manager for Flash Storage Systems.

Data protection schedules create clones of a source LUN or Clone LUN at regularly scheduled intervals. When you create a protection schedule, you can enable it to run at the scheduled time as soon as you save the schedule, or you can create a schedule and enable it later. You can modify the schedule to as needed, and delete a schedule when the schedule is no longer needed.

### Related Links

[Create a Protection Schedule](#)

[Modify a Protection Schedule](#)

[Delete a Protection Schedule](#)

## Create a Protection Schedule

You can create a replication schedule to create a clone of a protected LUN or Clone LUN at regular intervals

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System system for which you want to create a protection schedule must be selected as the target.

- 1 Select **Oracle Flash Storage System** > **Protection Schedules**.
- 2 Select **LUNs** or **Clone LUNs** from the **View/Manage** drop-down menu. Choose **LUNs** if you want to schedule protection for a LUN, or choose **Clone LUNs** if you want to schedule protection for a Clone LUN.
- 3 Select the LUN or Clone LUN for which you want to create a protection schedule.
- 4 Click **Actions** > **Create**.
- 5 In the **Create LUN Clone Schedule** dialog, enter a name for the schedule in the **Schedule Name** field.

**Tip:** Use a meaningful name that includes the type of protection and frequency to help you identify the schedule if you want to modify the schedule later.

- 6 (Optional) From the **Volume Group** drop-down list, choose the name of the volume group to which the clone volume is assigned.
- 7 Select **Enabled** if you would like your schedule to start as soon as it is created.

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If you do not enable your schedule now, you can do so at a later time by modifying the schedule.

- 8 Verify that the **Protected Volume** is the LUN or Clone LUN that you selected.
- 9 Use the controls in the Schedule panel to select the date and time.
- 10 Choose a frequency for your schedule:
  - Run Once
  - Hourly
  - Daily
  - Weekly
  - Monthly
- 11 In the Recurrence panel, choose a recurrence value for your schedule. If you chose a frequency of **Weekly**, choose the day of the week as well.
- 12 To save the schedule, click **OK**.  
Your schedule is listed in the Selected LUN Protection Schedules panel.

## Modify a Protection Schedule

You can modify a protection schedule to suit your needs.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System for which you want to modify protection schedule must be selected as the target and you must select the source LUN or Clone LUN that is the protected volume for the schedule in the LUNs or Clone LUNs list.

- 1 Select **Oracle Flash Storage System > LUN Clone Schedules**.
- 2 Select **LUNs** or **Clone LUNs** from the **View/Manage** drop-down menu. Choose **LUNs** if the schedule you want to modify protects a LUN, or choose **Clone LUNs** if the schedule protects a Clone LUN.
- 3 Select the LUN or Clone LUN for which you created the protection schedule.  
The schedule you want to modify displays in the Selected LUN Protection Schedules panel.
- 4 Click **Actions > Modify**.
- 5 In the **Create Data Protection Schedule** dialog, enter a name for the schedule in the **Schedule Name** field.  
**Tip:** Use a meaningful name that includes the type of protection and frequency to help you identify the schedule to modify the schedule later.
- 6 Verify that **Clone** is selected as the data protection type.

- 7 (Optional) From the **Volume Group** drop-down list, choose the name of a different volume group to which the clone volume are assigned.
- 8 Select **Enabled** if you would like your schedule to start as soon as you save your changes.
- 9 Verify that the **Protected Volume** is the LUN or Clone LUN that you selected.
- 10 Use the controls in the Schedule panel to select the date and time.
- 11 Choose a frequency for your schedule:
  - Run Once
  - Hourly
  - Daily
  - Weekly
- 12 In the Recurrence panel, choose a recurrence value for your schedule. If you chose a frequency of **Weekly**, choose the day of the week you would like your report to be generated.
- 13 To save changes to the schedule, click **OK**. Your modified schedule displays in the **Selected LUN Protection Schedules** panel.

## Delete a Protection Schedule

You can delete a protection schedule when you no longer need it.

### Prerequisite:

One or more Oracle FS Systems added as an Oracle Enterprise Manager target.

The Oracle FS System from which you want to delete a protection schedule must be selected as the target.

- 1 Select **Oracle Flash Storage System > Protection Schedules**.
- 2 Select **LUNs** or **Clone LUNs** from the **View/Manage** drop-down menu. Choose **LUNs** if the schedule you want to delete protects a LUN, or choose **Clone LUNs** if the schedule protects a Clone LUN.
- 3 Select the LUN or Clone LUN for which you created the protection schedule. The schedule you want to delete displays in the Selected LUN Protection Schedules panel.
- 4 Click **Delete** at the bottom of the screen.
- 5 Click **OK** to confirm that you want to delete the protection schedule.
- 6 Click **OK** to dismiss the confirmation dialog.

The schedule no longer appears in the Selected LUN Protection Schedules panel.

# Oracle FS System Configuration Data and Metrics

Oracle FS System Configuration Data and Metrics

# Oracle FS System Reports

## Hardware Reports

Hardware reports provide an overview of the system, and details about the drives, and status of all hardware components.

### Oracle FS System Summary

The Oracle FS System Summary report provides an overview of the system properties, storage usage, and software installed on the components of the selected Oracle FS System.

### Disk Drives

The Oracle FS System Disk Drives report lists the properties and status of all drives on each Drive Enclosure associated with the selected Oracle FS System.

### Hardware Status

The Hardware Status report provides the status of each component of the selected Oracle FS System.

## Oracle FS System I/O Reports

The Oracle Enterprise Manager for Flash Storage Systems provides one I/O report: the I/O Access for LUNs report.

The I/O Access for LUNs report charts input and output statistics for the ten most active LUNs on the Oracle FS System.

The top portion of the report is a pie chart that shows the percentage of I/O that has occurred on each LUN during the collection period.

The bottom portion of the report is a bar graph that shows the amount of I/O that has occurred on each of the ten most active LUNs on the selected Oracle FS System.

## Oracle FS System Storage Usage Reports

The Oracle Enterprise Manager for Flash Storage Systems provides two storage usage reports: a Storage Usage by LUN report, and a Storage Usage for LUN by QoS report.

A graph of the top 10 LUNs show the percentage of total space and the percentage of allocated space on the selected Oracle FS System.

The Storage Usage for LUN by QoS report consists of three pie charts that show the percentage of storage usage by LUNs that have priority, data access, or I/O bias Quality of Service (QoS) attributes.

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