

Oracle VM Storage Connect Plug-In 2.0

User's Guide

for Oracle Flash Storage Systems



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 System](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	http://www.oracle.com/support (www.oracle.com/support)
Training	https://education.oracle.com (https://education.oracle.com)
Documentation	<ul style="list-style-type: none">• Oracle Help Center: (http://www.oracle.com/goto/fssystems/docs)• From Oracle FS System Manager (GUI): Help > Documentation• From Oracle FS System HTTP access: (http://system-name-ip/documentation.php where system-name-ip is the name or the public IP address of your system)
Documentation feedback	http://www.oracle.com/goto/docfeedback (http://www.oracle.com/goto/docfeedback)
Contact Oracle	http://www.oracle.com/us/corporate/contact/index.html (http://www.oracle.com/us/corporate/contact/index.html)

Related Documentation

Familiarize yourself with the following related documents:

- *Oracle Flash Storage System Glossary*
- *Oracle Flash Storage System Administrator’s Guide*
- *Oracle FS1-2 Flash Storage System Release Notes*

Introduction

Virtualization Plug-In Integration Overview

Virtualization plug-in integration permits you to integrate various components into the virtualization environment. The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems permits you to integrate access to your Oracle FS System with Oracle VM and Oracle Storage Connect software. You can access the provisioning and management capabilities of your Oracle FS System in the Oracle VM (GUI).

Virtualization technology permits you to easily create and deploy many virtual machines (VMs) in your datacenter infrastructure. However, managing those VMs and the storage environment to which they connect can be difficult.

Using the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems makes it easy to view and manage your storage through an Oracle VM (GUI). Through the context menus, you can view and manage certain features of your Oracle FS System and other storage.

Note: This release supports both the Oracle Axiom and Oracle FS System storage systems. Throughout this document, references to the Oracle FS System also apply to the Oracle Axiom unless specifically noted.

In this document, the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems is also referred to as *the plug-in*.

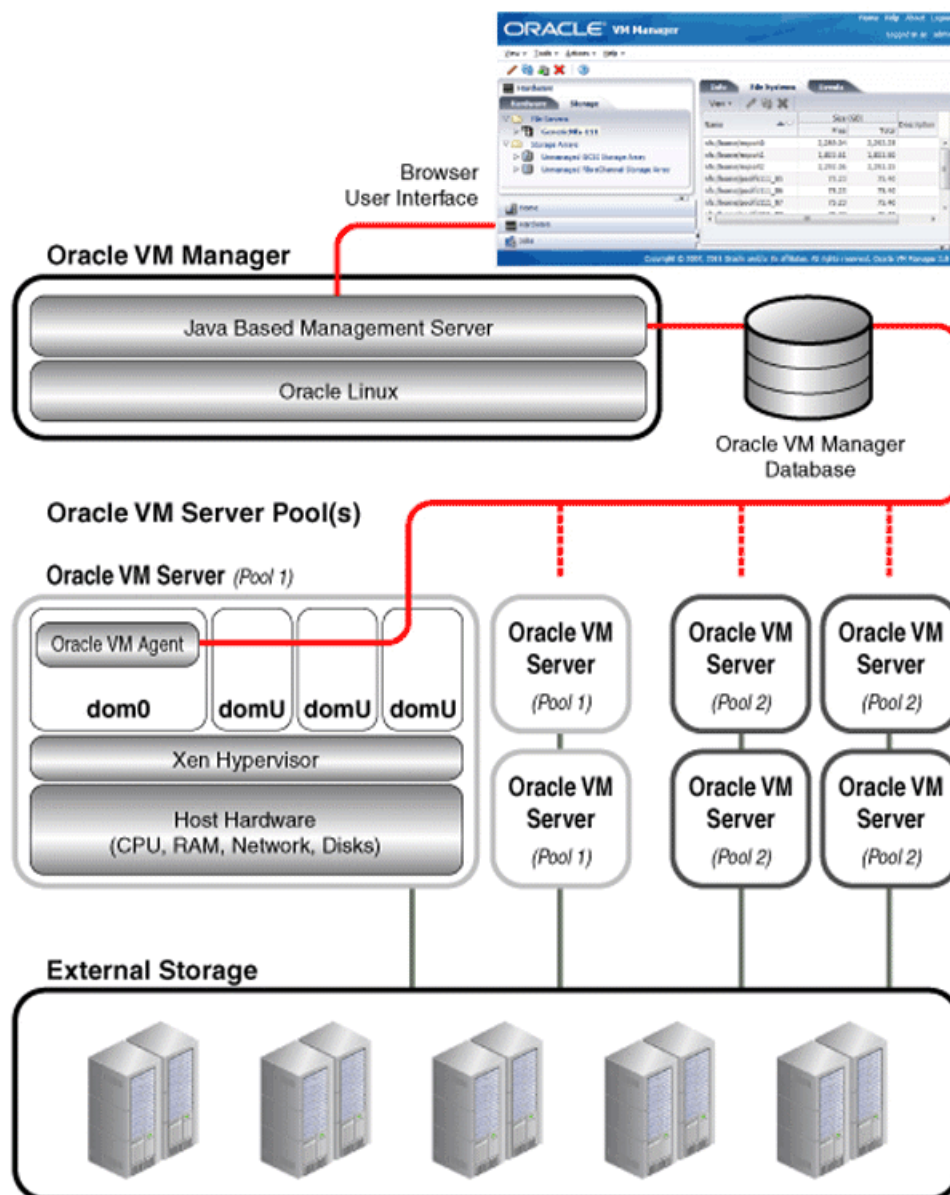
Oracle VM Environment Description

The Oracle Virtual Machine (VM) environment makes it possible to manage disparate physical infrastructures in a datacenter as virtual pools of resources (processors, memory, storage, and networking). The Oracle VM environment is made up of a number of software component layers and Oracle applications. Oracle VM supports both Oracle and non-Oracle applications.

Each physical host in an Oracle VM environment runs the Oracle hypervisor software to execute a number of VMs. The hypervisor provides a layer in the physical host upon which the VMs are created. Each VM can run a different operating system and can contain one or more applications. The resources from the physical hardware in the Oracle VM environment are aggregated into pools of functional resources. These functional resources can be allocated (or assigned) to specific VMs and applications as needed.

The following figure shows the Oracle VM architecture in a typical deployment scenario:

Figure 1: Oracle VM architecture



For more information, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Oracle VM Components Description

The Oracle VM environment is composed of numerous components. The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems integrates Oracle FS Systems with the following components:

Oracle VM Storage Connect	The framework by which storage vendors can integrate the provisioning and management of their storage platforms through the Oracle VM environment. This framework
---------------------------	---

	provides the interface between Oracle FS Systems and the Oracle VM environment.
Oracle VM	A cloud operating system environment that can be used as a platform for running applications, in addition to using it as a platform for running virtual machines (VMs).
Hypervisor	A virtualization layer, based on the Xen hypervisor, that runs on physical servers and abstracts processor, memory, storage, and resources into multiple VMs. The physical machine becomes the host for VMs, and is referred to as a <i>hypervisor host</i> .
Oracle VM Server	<p>The Oracle VM Server directs the actions on the VMs and the VM hosts. The Oracle VM Server contains the hypervisor, which has a stripped-down Linux kernel installed in <code>dom0</code>. The kernel handles administrative functions of the host server and communicates with the Oracle VM Manager through the Oracle VM agent service.</p> <p>The Oracle VM Server is installed to run automatically, and runs continuously in the background. The Oracle VM Server performs its monitoring and managing activities even when no Oracle VM Managers are connected, and even if no users are logged on to the computer where the Oracle VM Server resides. The Oracle VM Server must be available for network access from any machine used to run the Oracle VM Manager.</p> <p>You can join multiple Oracle VM Server systems together using server pools so that you can manage them using a single Oracle VM Manager connection. A single Oracle VM Server can only manage the physical hardware and resources of the host upon which the Oracle VM Server is installed.</p>
Oracle VM Manager	<p>The Oracle VM Manager is the GUI to the Oracle VM Server, the hypervisor hosts, and the VMs. Oracle VM Manager is installed on a host with network access to the Oracle VM Server system installation. While all Oracle VM Server activities are performed by an Oracle VM Server system, the administrator uses the Oracle VM Manager GUI to monitor, manage, and control the server.</p> <p>A single Oracle VM Manager can manage multiple Oracle VM Servers.</p>

For more information, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Plug-In Description

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems software permits you to access your Oracle FS System using the Oracle VM Manager.

The plug-in adds access to Oracle FS System functionality through the context menus in the Oracle VM Manager. When the plug-in is installed and configured, you can manage storage objects from that Oracle VM Manager.

While storage from other vendors is visible in the Oracle VM Manager, actions against that storage are not possible using the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems software.

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems gives you access to the following functionality using the Oracle VM Manager:

- Ability to view storage elements including Oracle FS Systems, physical disks (LUNs), clone physical disks (Clone LUNs), volume groups, and access groups (SAN hosts)
- Ability to create, modify, and delete physical disks and clone physical disks

Plug-In System Requirements

The following sections describe the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems requirements.

Hardware and Software

The installer for the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems includes all software dependencies. No other software is required besides the Oracle VM Server and the Oracle VM Manager.

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems can work with the operating systems required by Oracle VM Server software.

The following table summarizes the hardware and software requirements.

Table 2: Hardware and software requirements

Product	Version	Notes
Oracle Axiom System	5.4 or later	The system in which components, such as physical volumes (LUNs) and clones, reside.
Oracle FS System	6.1 or later	The system in which components, such as physical volumes (LUNs) and clones, reside.

Table 2: Hardware and software requirements (continued)

Product	Version	Notes
Oracle VM Manager	3.3.2 or later	The system in which the Oracle VM Manager is installed. The VM Manager provides a web interface that lets you see the Oracle VM Manager on your local system in a Web browser.
Oracle VM Server	3.3.2 or later	The physical system in which the Oracle VM Server is installed.

For more details about Oracle VM hardware and software requirements, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Licenses

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems requires no licenses.

All features on the Oracle FS System are enabled out of the factory. Administrators should ensure that they comply with their Service Level Agreements.

Oracle VM requires no licenses. The Oracle VM software is freely downloadable from the Oracle website at [Oracle Software Delivery Cloud](https://edelivery.oracle.com/linux) (<https://edelivery.oracle.com/linux>). You also receive that software when you purchase other Oracle software products.

Supported Protocols and Interfaces

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems supports the following protocols and interfaces:

- HTTPS using TCP port 8083 for communications from the plug-in to the Pilot on either the Oracle FS System or the Oracle Axiom System
- Configuration of FC SAN physical volume (LUN) resources for client host access
- UTF-8 character encoding

Management Networking Requirements

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems software communicates over a secure port with the Oracle FS System Pilot (the system's management controller). The host on which the Oracle VM Server is installed requires a TCP/IP connection for communication with the Pilot.

For either the Oracle FS System or the Oracle Axiom System: To connect the control path, the network configuration must allow the host to connect to TCP port 8083 on the Pilot. Port 8083 on the Pilot is open by default. The plug-in communicates over HTTPS on this port with the Pilot.

All other necessary ports to any other resources are opened by the installer.

Install the Plug-In

Installation Process Overview

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems comes from Oracle as a single, Resource Package Manager (RPM) file. The plug-in is installed with this RPM file.

Install the plug-in onto the same host on which the Oracle VM Server is installed.

Before you install the plug-in on an Oracle VM Server, you must log in to that Oracle VM Server. Being logged into the Oracle VM Manager has no effect on the installation.

After the plug-in is installed, you can log in and manage Oracle FS System using the Oracle VM Manager.

Related Links

[TCP Port Assignments](#)

[Download the Plug-In Installer](#)

[Install the Plug-In](#)

[Update the Plug-In](#)

[Verify the Plug-In Version](#)

[\(Optional\) Remove the Plug-In](#)

Download the Plug-In Installer

Download the software for the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems so you can install it.

Prerequisites:

- All hosts in the environment meet the system requirements.
- 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>) to gain access to software and documentation downloads.

You download the plug-in software from the Oracle Technical Network.

- 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 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 text file listing the contents of the archive, the installation executable file, and documentation.

Related Links

[Installation Process Overview](#)

[TCP Port Assignments](#)

TCP Port Assignments

During the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems installation, you can change the default server port assignment. The server port permits the Oracle VM Server to communicate with the plug-in.

The ports shown in the following table are used for all communications between the Oracle VM Server and the plug-in, and between the Oracle FS System and the plug-in.

Table 3: Oracle VM Server port communication

Port type	Value	Description
Server	8006	The port on which the Oracle VM Server listens. You can change the server port, if needed, to match the port number specified during the Oracle VM Server installation.
TCP	8083	<p>The port used by the plug-in to communicate over HTTPS with the Oracle FS System Pilot. This port is open by default on the Pilot. It must be open between the server upon which the plug-in is installed and the Pilot IP addresses to avoid firewall issues.</p> <p>For an Oracle FS System, use the following CLI command to verify that the service to open this port is enabled: <code>fscli webcli -list</code></p> <p>If necessary, use the following CLI command to enable the service: <code>fscli webcli -enable</code></p> <p>For an Axiom system, use the following CLI command to verify that the service to open this port is enabled: <code>axiom webcli -list</code></p> <p>If necessary, use the following CLI command to enable the service: <code>axiom webcli -enable</code></p> <p>Note: If port 8083 is not open, contact Oracle Customer Support (http://www.oracle.com/support).</p>

Install the Plug-In

After you have downloaded the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems, you can install the plug-in on the intended Oracle VM Server host.

Prerequisite: Red Hat Package Manager (RPM) installer file is already present on the Oracle VM Server.

The installation RPM package is `osc-oracle-oraclefs-n.n.n.el6.noarch.rpm`, where `n.n.n` is the version number.

- 1 From the Oracle VM Server host, issue the following command to install the RPM file:
`rpm -ivh osc-oracle-oraclefs-n.n.n.el6.noarch.rpm`
- 2 Issue the following command to verify installation of the RPM file:
`rpm -qa | grep osc-oracle-oraclefs`
The system returns the file name if the installation was successful.
- 3 Rediscover the Oracle VM Server upon which you performed the software update. To rediscover the Oracle VM Server, in Oracle VM Manager, on the Servers and VMs tab, right-click the Oracle VM Server, and then select Rediscover Server.

Refer to the Oracle VM documentation available on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>) for instructions.

Note: Only restart the Oracle VM through the Management Interface to avoid disrupting any Virtual Machines.

You can create an administrator account on the Oracle FS System for the sole purpose of Oracle VM administration. The account role you choose determines the privileges granted to this account. Create an Administrator 1 account for the sole purpose of Oracle VM administration at the earliest opportunity.

Related Links

[Installation Process Overview](#)

[TCP Port Assignments](#)

Install the Plug-In on Earlier OVM Versions

After you have downloaded the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems, you can install the plug-in on the Oracle VM Server (OVM) 3.2 or earlier following this process.

- Prerequisites:
- Using the Oracle Axiom Storage Connect Plug-In, version 1.x. on OVM 3.2 or earlier
 - Upgrading to OVM 3.3

The installation RPM package is called `osc-oracle-oraclefs-n.n.n.el6.noarch.rpm` where `n.n.n` is the version number.

- 1 Review the instructions in the [Oracle VM Installation and Upgrade Guide for Release 3.0.3](https://docs.oracle.com/cd/E26996_01/E18548/E18548.pdf) (https://docs.oracle.com/cd/E26996_01/E18548/E18548.pdf) for information on upgrading Oracle VM servers from release 3.2 or earlier.
- 2 Follow the instructions to add the package, `osc-oracle-oraclefs-n.n.n.el6.noarch.rpm`, to the Yum repository.
- 3 Issue the following command to verify installation of the RPM file:

```
rpm -qa | grep osc-oracle-oraclefs
```

The system returns the file name if the installation was successful.
- 4 Rediscover the Oracle VM Server upon which you performed the software update. To rediscover the Oracle VM Server, in Oracle VM Manager, on the Servers and VMs tab, right-click the Oracle VM Server, and then select Rediscover Server.

Refer to the Oracle VM documentation available on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>) for instructions.

Note: Avoid restarting the host running the Oracle VM Server because there may be other VMs already running on it.

You can create an administrator account on the Oracle FS System for the sole purpose of Oracle VM administration. The account role you choose determines

the privileges granted to this account. Create an Administrator 1 account for the sole purpose of Oracle VM administration at the earliest opportunity.

Log In to the Oracle VM Manager

When you launch the Oracle VM Manager and log in, you are using the Oracle VM Manager to manage the Oracle VM Server. The Oracle VM Manager is the interface to the Oracle VM Server and the virtual machines (VMs). You can use the Oracle VM Manager to access the Oracle FS System. The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems itself has no specific login operation.

The Oracle VM Manager software package must already be installed on your client workstation.

After you log in to the Oracle VM Manager, you can perform storage management tasks on your Oracle FS System, such as provisioning and tuning your storage.

- 1 Point your browser to the following location: `http://<IP_address>:7001/ovm/console/faces/login.jspx`, where `<IP_address>` is the IP address of the host upon which the Oracle VM Manager is installed. The Oracle VM Manager Welcome page appears.
- 2 Enter the login credentials for the Oracle VM Manager.
- 3 Click Login.
The Oracle VM Manager opens to the Oracle VM Manager Home page, or the last page you visited when you last logged off.

Log Out of the Oracle VM Manager

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems has no specific logout operation. When you have completed working with Oracle FS System in Oracle VM Manager, you log out from the Oracle VM Manager to exit the application.

If you do not log out, an unauthorized user might gain access to the Oracle FS System from your workstation.

At the top right corner of the Oracle VM Manager page, click Logout.
The Oracle VM Manager closes.

Update the Plug-In

When a new version of the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems software is available, you can update your version of the plug-in software.

- Prerequisites:
- The server name and IP address for the server upon which the Oracle VM Server and plug-in are installed.

- Credentials to log in to the Oracle VM Server to install the plug-in software.
- TCP port assignments for the plug-in to register and communicate with the Oracle VM Server.

- 1 Download the installation package from the Oracle Technical Network (OTN).
- 2 Extract the Red Hat Package Manager (RPM) package to the host containing the Oracle VM Server.
- 3 Issue the following command to search for any previous versions of the plug-in:

```
rpm -qa | grep osc-oracle-oraclefs
```
- 4 Issue the following command to remove any previous versions of the plug-in:

```
rpm -e osc-oracle-oraclefs-n.n.n.el6.noarch
```
- 5 Launch the Oracle VM Manager and log in.
- 6 Rediscover the Oracle VM Server upon which you performed the software update. To rediscover the Oracle VM Server, in Oracle VM Manager, on the Servers and VMs tab, right-click the Oracle VM Server, and then select Rediscover Server.

Refer to the Oracle VM documentation available on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>) for instructions.

- 7 Issue the command `rpm -Uvh osc-oracle-oraclefs-n.n.n.el6.noarch.rpm`, where `n.n.n` is the number of the updated software.
The RPM performs the upgrade process automatically.
- 8 Launch the Oracle VM Manager and log in, if necessary.
- 9 Rediscover the Oracle VM Server upon which you performed the software update. To rediscover the Oracle VM Server, in Oracle VM Manager, on the Servers and VMs tab, right-click the Oracle VM Server, and then select Rediscover Server.

Refer to the Oracle VM documentation available on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>) for instructions.

Verify the Plug-In Version

Use the Oracle VM Server console to verify the version of the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems software.

You might need to determine what version of the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems is installed before deciding if you need to update the plug-in. You can verify the plug-in version from the console of the Oracle VM Server on which the plug-in is installed.

- 1 From the Oracle VM Server console, issue the following command to query information about the plug-in:

```
rpm -qa | grep osc-oracle-oraclefs
```

The file name of the currently installed plug-in RPM is listed, for example, `osc-oracle-oraclefs-2.0-3.el6.noarch.rpm`.

- 2 Check the version displayed in the file name.

(Optional) Remove the Plug-In

You can uninstall the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems from the host running Oracle VM if you no longer need it.

When you uninstall the software, all traces of the software are removed.

- 1 Issue the following command to search for any previous versions of the plug-in:

```
rpm -qa | grep osc-oracle-oraclefs
```

- 2 Issue the following command to remove the plug-in:

```
rpm -e osc-oracle-oraclefs-n.n.n.el6.noarch.rpm
```

where `n.n.n` is the version of the software.

- 3 Issue the following command to verify that you have removed the software:

```
rpm -qa | grep osc-oracle-oraclefs
```

- 4 Launch the Oracle VM Manager and log in.
- 5 Rediscover the Oracle VM Server upon which you performed the software update. To rediscover the Oracle VM Server, in Oracle VM Manager, on the Servers and VMs tab, right-click the Oracle VM Server, and then select Rediscover Server.

Refer to the Oracle VM documentation available on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>) for instructions.

Manage Storage Objects

Administrator Account Overview

You can use the Oracle FS System Manager or the Oracle FS CLI to create multiple administrator accounts in an Oracle FS System. Additional accounts are not required, but these accounts are useful. Oracle recommends creating a dedicated administrator account that is assigned the Administrator 1 role for use with the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems.

Oracle does not recommend using the primary system administrator account for the plug-in operator account. Create a dedicated account to prevent the primary administrator account from being overloaded.

An administrator with administrator level 1 privileges needs to create the plug-in operator account. The administrator who creates the operator account provides the name and password for the account to the operator account holder.

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

Adding Storage Systems to Oracle VM Overview

You must add and register Oracle FS Systems with the Oracle VM environment before you can view and manage them. When you add an Oracle FS System, the system is registered with Oracle VM automatically. Registering the Oracle FS System enables Oracle VM to manage it. Oracle VM supports some, but not all, of the Oracle FS System storage management capabilities.

Before you add an Oracle FS System, it is helpful to gather the following information about the storage system and understand how Oracle VM supports the storage system:

- Credentials used to log in to the Oracle FS System.
- IP address of the Oracle FS System, or the fully qualified name (FQN) of the Pilot. (The Pilot is the storage system management controller.) Oracle recommends that you use the FQN to avoid the need to reconfigure the clients if the IP address changes.
- Port 8083 on the Pilot open between the server on which the plug-in is installed and the Oracle FS System.

It is helpful to know the following characteristics of Extra Information field entries for an Oracle FS System controller:

- All FQN entries are case sensitive.
- The FQN of a resource on an Oracle FS System is a user-configurable name. For example, a Controller on one Oracle FS System might have a name of /Controller01 while a Controller on another system might have a name of /Controller-01. Either ask the Oracle FS System storage administrator for the names in use or run one of the following Oracle FS CLI commands:

For an Oracle FS System `fscli controller -list`

For an Axiom System `axiomcli slammer -list`

Refer to the *Oracle Flash Storage System CLI Reference* for more information on the `controller` syntax for the Oracle FS System.

It is also helpful to understand what happens in the Oracle VM Manager after a system is added.

- When you register a SAN server with a specific protocol type (for example, FC), only the access groups that contain one or more of that type of storage initiator will appear in the Access Group list for that physical disk. However, all Physical Disks appear in the Physical Disks perspective under the Storage tab regardless of which protocol access the physical disk has enabled.
- The Info tab displays the initial configuration information known about the system. You need to synchronize the information between Oracle VM and the Oracle FS System to see the actual values. Synchronizing also refreshes the information for the access groups and volume groups. You can manually refresh as needed to view the latest information.

Refer to the *Oracle Flash Storage System Administrator's Guide* for information about Oracle FS System and physical disks (LUNs).

For information about access groups and refreshing information, refer to the [Oracle VM Documentation](http://docs.oracle.com/cd/E50245_01/index.html) (http://docs.oracle.com/cd/E50245_01/index.html).

Related Links

[Add a Storage System to Oracle VM](#)
[Access Storage Systems in Oracle VM](#)

Add a Storage System to Oracle VM

Before you can manage an Oracle FS System through Oracle VM Manager, you must register it in the Oracle VM environment.

- Prerequisites:
- Storage system login credentials with Administrator 1 privileges.
 - Port 8083 open between the Pilot, the Oracle FS System management controller, and the server on which the plug-in is installed.
 - Fully qualified host name or IP address of the Pilot.

When you register an Oracle FS System, you must authenticate credentials with the Oracle FS System.

- 1 Log in to the Oracle VM Manager.
- 2 Select the Storage tab.
- 3 Click the Discover SAN Server button on the toolbar at the top of the navigation pane.
- 4 In the Discover SAN Server dialog, enter the following:

Discover SAN Server section:

Name	Enter the name of the Oracle FS System you are registering with the Oracle VM Manager.
Description	Enter a description you want to use for the Oracle FS System, such as the location. If you do not enter a description, Oracle VM displays the description that was used when the Oracle FS System was first created.
Storage Type	From the drop-down list, select the type of storage server being registered.
Storage Plug-In	Select the Oracle VM Oracle FS Plug-In from the various plug-ins listed.
Plugin Private Data	Not used.

Administrative Information section:

Admin Host	The fully qualified domain name or IP address of the Oracle FS System.
Admin Username	The user name for the Oracle FS System operator account.
Admin Password	The password for the Oracle FS System operator account.

- 5 Click Next.

- 6 In the Add Admin Servers dialog, in the Available Servers section, select the Oracle VM Server upon which the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems is installed.
You are designating this server as the administrative server for the Oracle FS System you are adding.
- 7 Click the arrow icon to move the Oracle FS System entry from the Available Servers section to the Selected Servers section.
- 8 Click Finish.
The Oracle FS System registers with Oracle VM. The Oracle FS System appears under SAN Servers in the navigation tree.
- 9 In the navigation tree, select the Oracle FS System you just added.
- 10 Right-click the Oracle FS System, select Refresh, and click OK.

Related Links

[Adding Storage Systems to Oracle VM Overview](#)

Access Storage Systems in Oracle VM

After you have installed the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems and successfully logged in, you can add and register an Oracle FS System. The Oracle FS System is displayed in the Oracle VM Manager. You can view the utilization of storage in your Oracle FS System storage objects, as well as storage from other vendors from within the Oracle VM Manager.

- Prerequisites:
- The Oracle FS System to be accessed has been added and has been registered with Oracle VM.
 - The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems has been installed in Oracle VM Manager.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System you want to access.
- 3 To see information about or manage different aspects of your storage, select one of the following from the Perspective: drop-down list at the top of the content pane:

Info Shows configuration information for the Oracle FS System.

Physical Disks Shows information about the physical disks on the system, and provides a toolbar from which you can select to view, add, edit, remove, or clone a physical disk.

Access Groups

- Lists the access groups (Oracle FS System SAN hosts) from which you can select.

- Provides a toolbar from which you can select to view, add, edit, present, or unpresent a disk to or from an access group, or remove an access group.

Note: For information about configuring storage array access through access groups, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Volume Groups	Shows information about the volume groups on the system, and provides a toolbar from which you can select to view a volume group.
Events	Shows information about the Oracle VM and Oracle Storage Connect events on the system, and provides a toolbar from which you can select to view or acknowledge events.

Note: These are Oracle VM events, not Oracle FS System events.

For more information, refer to the *Oracle Flash Storage System Administrator's Guide* and the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Managing Storage System Physical Disks

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems provides options that allow you to create, modify, and otherwise manage physical disks.

In an Oracle FS System, physical disks are referred to as LUNs.

A LUN is defined as: A logical volume that is defined over a collection of drive groups and is addressed using SCSI protocol in a SAN. An administrator defines the QoS attributes of the LUN.

Using the Oracle VM Manager, you can perform the following actions on physical disks:

- Create a physical disk
- Modify the properties of a physical disk
- Delete a physical disk
- Present or unpresent (map or unmap) a physical disk to specific access groups
- Perform clone operations on a physical disk for various purposes, including data protection

You assign the storage resources, QoS attributes, and other attributes when you create the physical disk. As needs change, you can modify the storage capacity that is assigned to the physical disk.

Related Links

[View Physical Disks](#)

[View a Clone Physical Disk](#)

[Create a Physical Disk](#)

[Create a Clone Physical Disk](#)

[Modify a Physical Disk](#)

[Modify a Clone Physical Disk](#)

[Delete a Physical Disk](#)

[Delete a Clone Physical Disk](#)

View Physical Disks

You can view detailed information about a particular Oracle FS System physical disk in the Oracle VM Manager.

When you add an Oracle FS System and register it with Oracle VM, the Oracle VM Manager automatically lists its volume groups under the Oracle FS System in the navigation tree. All volume groups within the Oracle FS System display in the navigation tree. When you select a volume group, physical disks within each volume group are visible in the content area of the page. When you expand a physical disk, details about the physical disk display in a table below the physical disk listing.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System that contains the physical disk you want to view.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.

The existing physical disks and clone physical disks display in the table. You can sort the columns in the display table to suit your needs.

- 4 Expand the physical disk you want to view.
Details about the physical disk display in the table.
- 5 Highlight a volume group to view LUNs that are not in the default (/) volume group.

Creating Physical Disks

When you use the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems in the Oracle VM environment, you can create Oracle FS System physical disks using the Oracle VM Manager.

After you add an Oracle FS System, you can create a physical disk. When you create the physical disk, you associate it with an Oracle FS System. The disk

automatically has its protocol type enabled based on the storage array type you selected when the Oracle FS System was added and registered with Oracle VM.

You cannot specify a number for a physical disk. When you are presenting (mapping) an Oracle FS System physical disk to an access group, the plug-in automatically assigns the physical disk the next available physical disk number.

You can choose to make a physical disk shareable between virtual machines. When the physical disk is shareable, multiple virtual machines (VMs) can use it as storage. For more information about sharing disks, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>)

Thin provisioning allows an administrator to create a logical volume of any size without committing that capacity at that time. Each application has what appears to be all the storage needed for ongoing operations, but without the physical capacity locked to a particular volume. If you select to thin provision a physical disk, the Oracle FS System plug-in sets the allocated capacity to 0 and sets the addressable capacity to the value you provide. Refer to the *Oracle Flash Storage System Administrator's Guide* for more information about thin provisioning.

Refer to the *Oracle Flash Storage System Administrator's Guide* for information about Oracle FS System and physical disks (LUNs).

For information about Oracle VM and access groups, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Related Links

[Create a Physical Disk](#)

Create a Physical Disk

Define the attributes to allocate the storage resources necessary to create the physical disk.

- Prerequisites:
- Oracle FS System login credentials with Administrator 1 privileges.
 - The Oracle FS System where the physical disk is created has been added and has been registered with the Oracle VM environment.

Note: The Oracle FS System refers to physical disks as LUNs.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System upon which you want to create the physical disk.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
- 4 In the toolbar at the top of the content area of the page, click the Create Physical Disk plus sign (+) icon.
- 5 In the Create Physical Disk dialog, enter the following:

Volume Group	<p>Choose a volume group to which the physical disk is associated, if needed.</p> <p>Important: The volume group attribute cannot be modified at a later time.</p>						
Name	<p>Identifies the name that is assigned to a physical disk for administrative purposes. Physical disk names must be unique across the Oracle FS System and must be 82 or fewer UTF characters (255 or fewer ASCII characters).</p>						
Size	<p>Specifies the capacity of the physical disk in GB.</p>						
Extra Information	<p>Specifies the priority level of the physical disk. The field is a free-form text area that accepts one <option>:<value> pair on each line in the following format:</p> <pre><option>:<value> . . . <option>:<value></pre> <p>Example:</p> <pre>accessBias:random ioBias:write storageclass:stathd StorageDomain:/SD1</pre> <p>Important: Use line endings to separate <option>:<value> pairs from each other. If the option has no <value> argument associated with it, provide only the option name.</p> <p>The following options can be specified:</p> <table> <tr> <td>accessBias</td> <td>Identifies the expected access pattern to the LUN: sequential, random, or mixed.</td> </tr> <tr> <td>addressableCapacity or capacity</td> <td>Defines the actual amount of storage that is assigned to a logical volume. An allocated capacity can grow to and possibly exceed by a small amount the addressable logical capacity.</td> </tr> <tr> <td>allocatedCapacity</td> <td>Specifies the amount of space, in gigabytes, that the Oracle FS System sets aside for a LUN. This number can be less than the amount that you specify for the addressable logical capacity for the LUN using the</td> </tr> </table>	accessBias	Identifies the expected access pattern to the LUN: sequential, random, or mixed.	addressableCapacity or capacity	Defines the actual amount of storage that is assigned to a logical volume. An allocated capacity can grow to and possibly exceed by a small amount the addressable logical capacity.	allocatedCapacity	Specifies the amount of space, in gigabytes, that the Oracle FS System sets aside for a LUN. This number can be less than the amount that you specify for the addressable logical capacity for the LUN using the
accessBias	Identifies the expected access pattern to the LUN: sequential, random, or mixed.						
addressableCapacity or capacity	Defines the actual amount of storage that is assigned to a logical volume. An allocated capacity can grow to and possibly exceed by a small amount the addressable logical capacity.						
allocatedCapacity	Specifies the amount of space, in gigabytes, that the Oracle FS System sets aside for a LUN. This number can be less than the amount that you specify for the addressable logical capacity for the LUN using the						

	-capacity option. When the allocated capacity is less than the space that is requested for -capacity, the system creates what is called a <i>thinly provisioned</i> LUN.
<code>cloneCapacity</code>	Identifies the capacity that is allocated for Clone LUNs.
<code>copyPriority</code>	Identifies which of the following settings to use to control the impact on performance when you copy or migrate data from one location to another: auto, low, or high.
<code>maskedSlammerPorts</code> (Axiom)	Prevents LUN access through specific Slammer ports. Identify the ports to mask by specifying port-name values. The port-name is the fully qualified name (FQN) of a port that you can obtain by running the <code>slammer -list</code> or <code>controller -list</code> CLI command. The format of the FQN is <code>/<Slammer name>/CU<x>/Port<y></code> , where <code><Slammer name></code> is the name of the Slammer or Controller, <code><x></code> is either 0 or 1, and <code><y></code> can be 0 through 15. If you do not specify this option, the LUN becomes accessible on all Slammer or Controller ports on the assigned CU by default. The <code>maskedSlammerPorts</code> or <code>maskedControllerPorts</code> option can only be specified along with the <code>slammerNode</code> or <code>controller</code> option.
<code>maskedControllerPorts</code> (Oracle FS System)	
<code>ioBias</code>	Identifies the typical read-write ratio: read, write, or mixed.
<code>matchTierQos</code>	If this is specified, none of the repository QoS values are allowed.

<code>profile</code>	Identifies the ID or fully qualified name (FQN) of the QoS performance profile that should be applied when creating the LUN. When creating a LUN, do not specify the profile option if you are specifying the <code>redundancy</code> , <code>accessBias</code> , or <code>ioBias</code> options.
<code>raidLevel</code>	Cannot be used along with the <code>redundancy</code> , <code>accessBias</code> , <code>ioBias</code> , or <code>profile</code> options. Specify <code>raid5</code> , <code>raid10</code> , <code>raid6</code> , or <code>default</code> .
<code>readAhead</code>	Cannot be used along with the <code>redundancy</code> , <code>accessBias</code> , <code>ioBias</code> , or <code>profile</code> options. Specify <code>normal</code> , <code>aggressive</code> , <code>conservative</code> , or <code>default</code> .
<code>redundancy</code>	Identifies how many mirror copies of the original data are stored online. The default is 1.
<code>repositoryAccessBias</code>	Cannot be used with the <code>redundancyRaidLevel</code> option. Specify <code>sequential</code> , <code>random</code> , or <code>mixed</code> and can use mixed case values.
<code>repositoryIOBias</code>	Cannot be used with the <code>redundancyRaidLevel</code> option. Specify <code>read</code> , <code>write</code> , or <code>mixed</code> and can use mixed case values.
<code>repositoryPriority</code>	Specify <code>premium</code> , <code>high</code> , <code>medium</code> , <code>low</code> , or <code>archive</code> .
<code>repositoryRaidLevel</code>	Cannot be used with the <code>repositoryRedundancy</code> , <code>repositoryAccessBias</code> , or <code>redundancyioBias</code> options. Specify <code>raid5</code> , <code>raid10</code> , <code>raid6</code> , or <code>default</code> .
<code>repositoryRedundancy</code>	Cannot be used with the <code>redundancyRaidLevel</code> option. Specify 1 or 2.

<code>slammerNode (Axiom)</code>	Identifies the CU to which the LUN is assigned. If you do not specify this option, the storage system selects the CU automatically.
<code>controller (Oracle FS System)</code>	
<code>storageClass</code>	Identifies the type of physical storage to use for the LUN. If the storage system has two or more Storage Classes, you must specify the Storage Class for the storage system to use.
<code>storageDomain</code>	Identifies the Storage Domain in which the LUN should be created. If this option is not provided, the system uses the default Storage Domain. A storage domain is required when working with an Oracle FS System.
<code>suppressConservativeMode (Axiom)</code>	Prevents the storage system from entering conservative mode for the specified LUN.
<code>conservativeMode (Oracle FS System)</code>	
	<p>CAUTION:</p> <p>In conservative mode, data is written to disk before the write operation completes (write through). If conservative mode is suppressed, the system does not enable write through when a CU fails. If the remaining CU fails, any data that has not been written to the drives is lost. Because data could be lost, using the <code>-noConservativeMode</code> option or the <code>-suppressConservativeMode</code> option is not recommended.</p>

Note: A Storage Class must be specified if the storage system has more than one Storage Class.

For detailed information about each of these options, refer to the *Oracle Flash Storage System CLI Reference*.

	For a full list of only the <code>fscli -lun</code> options, enter <code>fscli -lun -add -help</code> on a command line.
Description	Enter up to 4096 characters to describe the Oracle FS System physical disk. This option is an Oracle VM Manager option.
Shareable	Select to make the physical disk available to share across virtual machines. This option is an Oracle VM Manager option. For more information about sharing disks, refer to the Oracle VM documentation on the Oracle Technical Network (http://docs.oracle.com).
Thin Provision	Select to create the physical disk as a thin-provisioned LUN. The default value is selected. This option is an Oracle VM Manager option. Refer to the <i>Oracle FS System Oracle Flash Storage System Administrator's Guide</i> for more information about thin provisioning.

6 Click OK.

The newly created physical disk appears in the Physical Disks table in the content area of the page.

Before the physical disk can be used, you must present it as a Physical Disk to an access group.

For more information about creating a physical disk, refer to the information about creating LUNs in the *Oracle Flash Storage System Administrator's Guide*.

Modify a Physical Disk

You might need to modify the current Quality of Service (QoS) attributes for a physical disk, such as increase the capacity or allocate space for clone physical disks. You can modify an existing physical disk from the Oracle VM Manager.

Prerequisite: Oracle FS System login credentials with Administrator 1 privileges.

When you modify a physical disk, you can keep the default values or use the values of the last selected physical disk.

Note: The Oracle FS System refers to physical disks as LUNs.

Refer to the *Oracle FS System Oracle Flash Storage System Administrator's Guide* for information about modifying physical disks (LUNs).

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System upon which the physical disk you want to modify resides.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.

- 4 Select the physical disk you want to modify.
- 5 In the toolbar at the top of the content area of the page, click the Edit Physical Disk pencil icon.
- 6 In the Edit Physical Disk dialog, modify any of the following:

Name Identifies the name that is assigned to a physical disk for administrative purposes. Physical disk names must be unique across the Oracle FS System and must be 82 or fewer UTF characters (255 or fewer ASCII characters).

Note: Changing the physical disk name in Oracle VM Manager does not change the LUN name on the Oracle FS System. To change the Oracle FS System LUN name, use the Oracle FS System or Oracle FS CLI.

New Size Specify the size to which you want to increase the physical disk.

Note: When you modify a physical disk, you cannot decrease the physical disk size.

Extra Information You cannot modify Extra Information field to change the priority level of an existing physical disk (LUN) in Oracle VM Manager. You need to use the Oracle FS System or CLI to modify these options on an existing LUN.

Description Edit the description of the Oracle FS System physical disk. Maximum 4096 characters.

Shareable Select to make the physical disk available to share across virtual machines. This option is an Oracle VM Manager option.

For more information about sharing disks, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Thin Provision You cannot modify this field.

- 7 Click OK.
The changes are applied to the physical disk and display in the Physical Disks table in the content area of the page.

Delete a Physical Disk

When a physical disk is no longer needed in an Oracle FS System, you can delete it in the Oracle VM Manager. Be sure the volume to be deleted is not being accessed.

Prerequisites:

- Oracle FS System login credentials with Administrator 1 privileges.

- If the source physical disk has clones, remove the clones before you delete the physical disk.

Note: If you try to delete a source physical disk that has clones, the plug-in will issue an error stating that you must remove these clones before you can delete the source physical disk.

CAUTION: Deleting a physical disk through the Oracle VM Manager permanently removes all data that reside on that physical disk. Once the disk has been deleted, the data is no longer available.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System upon which the physical disk you want to delete resides.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
- 4 Select the physical disk to be deleted from those listed in the Physical Disks table.
- 5 In the toolbar at the top of the content area of the page, click the Delete Physical Disk “X” icon.
- 6 In the Delete Confirmation dialog, click OK.
The physical disk no longer appears in the table.

Note: When you delete a physical disk, the Oracle FS System must recondition the storage for that disk before it will be made available for creation of new physical disks (LUNs). This reconditioning may take some time on very large physical disks. Refer to the *Oracle Flash Storage System Administrator’s Guide* for instructions regarding viewing the *Unavailable Storage* that is being reconditioned.

Managing Clone Physical Disks

Clone physical disks can be managed just as you manage source physical disks. You can create an immediate clone physical disk at any time.

In the Oracle FS System, physical disks are referred to as LUNs, and clone physical disks are referred to as Clone LUNs.

A Clone LUN is defined as: A point-in-time, read-write, partial-block snapshot of a LUN that can be accessed immediately.

Related Links

[View a Clone Physical Disk](#)

[Create a Clone Physical Disk](#)

[Modify a Clone Physical Disk](#)

[Delete a Clone Physical Disk](#)

View a Clone Physical Disk

You can view detailed information about a particular clone physical disk in an Oracle FS System in the Oracle VM Manager.

When you add an Oracle FS System and register it with Oracle VM, the Oracle VM Manager automatically adds a volume groups folder under the Oracle FS System. All volume groups within the Oracle FS System display in the volume groups folder. Clone physical disks within each volume group are visible nested under the volume group. When you select a clone physical disk, details about the clone display in a table on the Physical Disks tab page.

Note: There is no visible difference between physical disks and clone physical disks in the Oracle VM Manager.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System that contains the clone physical disk you want to view.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
The existing physical disks and clone physical disks display in the table. You can sort the columns in the display table to suit your needs.
- 4 Expand the clone physical disk you want to view.
Details about the clone physical disk display in the table.

Creating Clone Physical Disks

After you add an Oracle FS System, you can create physical disks and clone physical disks using the Oracle VM Manager. Cloning a physical disk provides data protection for the cloned volume.

When you create a clone physical disk, the clone physical disk takes on all the characteristics of the source physical disk. The clone physical disk has read-write capabilities just like the source physical disk.

In an Oracle FS System, physical disks are referred to as LUNs, and clone physical disks are referred to as Clone LUNs.

If no clone name is specified, the name of the created clone physical disk automatically defaults to the format `clone_<source_LUN_name>_<timestamp>`, where the `<timestamp>` is the time the clone physical disk was created.

Refer to the *Oracle Flash Storage System Administrator's Guide* for information about Oracle FS System, physical disks (LUNs), and clone physical disks (Clone LUNs).

For information about Oracle VM, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Related Links

[Create a Clone Physical Disk](#)

Create a Clone Physical Disk

You can provide data protection for a physical disk by cloning the volume. You can clone a physical disk manually in the Oracle VM Manager.

Note: There is no visible difference between physical disks and clone physical disks in the Oracle VM Manager.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System that contains the source physical disk you want to clone.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
- 4 In the toolbar at the top of the content area of the page, click the Clone Physical Disk icon.
- 5 In the Clone Physical Disk dialog, select or enter the following:

Clone Target Type Storage Array. This is the Oracle FS System.

Clone Target Indicate the Oracle FS System upon which you want the clone physical disk to reside. If needed, you can click the Search icon to look through the available SAN servers in the Search Clone Target dialog.

Clone Type Sparse Copy or Non-Sparse Copy.

- 6 Click OK.

The name of the created clone physical disk automatically defaults to the format `clone_<source_LUN_name>_<timestamp>`, where `<timestamp>` is the time the clone physical disk was created.

The clone physical disk displays in the Physical Disks table in the content area of the page.

Related Links

[Creating Clone Physical Disks](#)

Modify a Clone Physical Disk

You assign the storage resources and Quality of Service (QoS) attributes when you create a clone physical disk. As needs change, you can modify the current configuration for the clone physical disk. You can modify an existing clone physical disk from the Oracle VM Manager.

Prerequisite: Oracle FS System login credentials with dedicated account privileges

In an Oracle FS System, physical disks are referred to as LUNs, and clone physical disks are referred to as Clone LUNs.

Refer to the *Oracle Flash Storage System Administrator's Guide* for information about modifying clone physical disks (Clone LUNs).

Note: There is no visible difference between physical disks and clone physical disks in the Oracle VM Manager.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System upon which the clone physical disk you want to modify resides.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
- 4 Select the clone physical disk you want to modify.
- 5 In the toolbar at the top of the content area of the page, click the Edit Physical Disk pencil icon.
- 6 In the Edit Physical Disk dialog, edit any of the following:

Name	Identifies the name that is assigned to a clone physical disk for administrative purposes. Clone physical disk names must be unique across the Oracle FS System and must be 82 or fewer UTF characters (255 or fewer ASCII characters).
------	---

Note: Changing the clone physical disk name in Oracle VM Manager does not change the Clone LUN name on the Oracle FS System. To change the Oracle FS System Clone LUN name, use the Oracle FS System or Oracle FS CLI.

New Size	Specify the size to which you want to increase the clone physical disk.
----------	---

Note: When you modify a clone physical disk, you cannot decrease the clone physical disk size.

Extra Information	You cannot use the Extra Information field to change the priority level of an existing clone physical disk (Clone LUN) in Oracle VM Manager. You need to use the Oracle FS System or Oracle FS CLI to modify these options on an existing Clone LUN.
-------------------	--

Description	Indicates the description of the Oracle FS System clone physical disk.
-------------	--

Shareable	Determines whether the clone physical disk will be available to share across storage arrays.
-----------	--

Thin Provision	This option is not available to modify.
----------------	---

- 7 Click OK.
The changes are applied to the clone physical disk and display in the Physical Disks table in the content area of the page.

Delete a Clone Physical Disk

When a clone physical disk is no longer needed in an Oracle FS System, you can delete it in the Oracle VM Manager. Be sure the volume to be deleted is not being accessed.

Prerequisite: Oracle FS System login credentials with Administrator 1 privileges.

Note: When a physical disk that is a parent or source for clone physical disks is deleted, all child clones are deleted as well.

CAUTION: Deleting a clone physical disk in the Oracle VM Manager permanently removes all data that reside on that clone physical disk. Data will be lost.

Note: There is no visible difference between physical disks and clone physical disks in the Oracle VM Manager.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System upon which the clone physical disk you want to delete resides.
- 3 Select Physical Disks from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
- 4 Select the clone physical disk to be deleted from those listed in the Physical Disks table.
- 5 In the toolbar at the top of the content area of the page, click the Delete Physical Disk “X” icon.
- 6 On the Delete Confirmation dialog, click OK.
The clone physical disk no longer appears in the table.

Related Links

[Creating Clone Physical Disks](#)

[Modifying Physical Disks Outside of Oracle VM](#)

Access Groups

In the Oracle VM environment, access groups are SAN hosts or Host Groups when an Access Group has initiators from two or more Oracle VM Manager Servers, which can be considered collections of one or more storage initiators. A physical disk can only be accessed by a SAN host, and the access group enables access to the physical disk by that SAN host. The initiators in an access group are the initiators on an Oracle VM Server. Access groups enable you to expose a physical disk to a specific Oracle VM Server. You create the access groups through the Oracle VM Manager.

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems automatically creates an access group for each SAN host on an Oracle FS System.

A single access group represents a single host.

Before presenting (mapping) an access group to an Oracle FS System physical disk, add the initiators to the access group.

When you present an Oracle FS System physical disk to an access group, Oracle VM automatically assigns the physical disk the next available physical disk number.

After adding a new access group, you need to refresh the Oracle FS System SAN server for it to recognize the new access group.

For information about creating and deleting access groups, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

Related Links

[View Access Groups](#)

[Present/Unpresent a Physical Disk to an Access Group](#)

View Access Groups

You can view detailed information about a particular access group in the Oracle VM Manager.

When you add an Oracle FS System and register it with Oracle VM, the Oracle FS System appears in the list of SAN servers in the navigation area of the Oracle VM Manager. When you select the Oracle FS System in the navigation area and select Access Groups from the Perspective drop-down list, the Oracle VM Manager displays all known access groups associated with that Oracle FS System in the content area of the page, along with details about the access groups. The details that appear can be modified or filtered according to your needs.

For information about configuring SAN server access through access groups, refer to the Oracle VM documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System that contains the access group you want to view.
- 3 Select Access Groups from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
A table listing existing access groups displays in the content area of the page.
- 4 (Optional) To modify the appearance of the displayed columns in the table, select the View drop-down list on the toolbar at the top of the content area of the page and select one of the following:

Columns	Select Show All or select a specific column to show or hide.
---------	--

Reorder Columns	Select a column name, move up or down in the list, and click OK.
-----------------	--

The changes persist when you log out and log back in to the Oracle VM Manager.

Present/Unpresent a Physical Disk to an Access Group

Before a SAN host can use the provisioned storage, you must make the storage accessible to the Oracle VM Server. You make the storage accessible by mapping, or presenting, the physical disk to an access group in the Oracle VM Manager. Conversely, the physical disk is removed from the access group by unpresenting the physical disk from the access group.

For information about configuring SAN server access through access groups, refer to the Oracle VM Manager documentation on the [Oracle Technical Network](http://docs.oracle.com) (<http://docs.oracle.com>).

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System that contains the access group to which you want to present a physical disk.
- 3 Select Access Groups from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
A table listing existing access groups displays in the content area of the page.
- 4 Select the access group to which you want to present a physical disk.
- 5 Click the Edit Access Group pencil icon
The Edit Access Group dialog box displays.
- 6 Click the Physical Disks tab.
- 7 Select a physical disk from the Available Physical Disks section.
- 8 Click the arrow to move the physical disk to the Selected Physical Disks section.
- 9 Repeat as needed to present additional physical disks.
- 10 (Optional) To unpresent a physical disk to an access group, move the physical disk from the Selected Physical Disks section to the Available Physical Disks section.
- 11 Click OK.
The access groups to which a physical disk is presented display when you expand the physical disk in the content area of the page after selecting the Physical Disks perspective.

Volume Groups

Volume groups are organizational units that can contain any grouping of logical volumes and nested volume groups. When you add an Oracle FS System and register it with Oracle VM, any volume groups associated with the Oracle FS System are automatically added under the Oracle FS System in the navigation

area. If a LUN is moved to a different Volume Group than it was created in it will never be reflected in the Oracle VM Manager.

To create or delete a volume group, you must use the Oracle FS System or Oracle FS CLI. You cannot make modifications to volume groups through the Oracle VM Manager.

For information about creating or deleting volume groups, refer to the *Oracle Flash Storage System Administrator's Guide* or the *Oracle Flash Storage System CLI Reference*.

Note: After adding a new volume group, you need to refresh the Oracle FS System SAN server for it to recognize the new volume group. See the instructions for adding an Oracle FS System to Oracle VM for information about refreshing the Oracle FS System SAN server.

Related Links

[View Volume Groups](#)

View Volume Groups

You can view detailed information about a particular volume group in the Oracle VM Manager.

When you select a volume group, the details about the volume group display in the content area of the page. The display of details that appear can be modified or filtered according to your needs.

- 1 In the Oracle VM Manager, select the Storage tab.
- 2 From the available SAN servers in the navigation tree, select the Oracle FS System that contains the volume group you want to view.
- 3 Select Volume Groups from the Perspective: drop-down list in the toolbar at the top of the content area of the page.
A table listing existing volume group details displays in the content area of the page.
- 4 (Optional) To modify the appearance of the displayed columns, select the View drop-down list and select one of the following:

Columns	Select Show All or select a specific column to show or hide.
Reorder Columns	Select a column name, move it up or down in the list, and click OK.

The changes persist when you log out and log back in to the Oracle VM Manager.

Related Links

[Volume Groups](#)

Event Logs

The Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems logs events, storage system Oracle FS CLI calls, and exceptions. Reviewing the event logs can help you troubleshoot problems that arise with the plug-in. The log might also need to be sent to Oracle Customer Support to help debug the problem.

The log is located on the Oracle VM Server at `/var/log/ovs-agent.log`.

For detailed information about storage system Oracle FS CLI calls, refer to the *Oracle Flash Storage System CLI Reference*.

Best Practices

Administrator Account Recommendations

You can create multiple administrator accounts of different types in an Oracle FS System. Additional accounts are not necessary, but they are useful. Oracle recommends creating a dedicated operator account that is assigned the Administrator 1 role for use with the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems. Oracle does not recommend using the primary system administrator account for the plug-in operator account.

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

Modifying Physical Disks Outside of Oracle VM

When you make changes to Oracle FS System physical disks and clone physical disks that were created through the Oracle VM Manager, you must make the changes through the Oracle VM Manager. The only exception to this rule is the creation of volume groups. Be aware that a particular Oracle FS System registered with Oracle VM can be used with other applications outside of the Oracle VM environment. Although the non-Oracle VM-related storage associated with that Oracle FS System is visible in the Oracle VM Manager, it should be modified using the Oracle FS CLI or Oracle FS System, not the Oracle VM Manager.

You can specify many physical disk properties for greater control of physical disks. These properties can be specified in the Extra Information field in both the Creation of Physical Disks and Edit Physical Disk dialogs in the Oracle VM Manager.

For detailed information about the available property options, refer to the *Oracle Flash Storage System CLI Reference*.

Terminology Differences

Mapping Oracle VM Terms to Oracle FS System Terms

Ensure you are familiar with the terminology differences between the Oracle VM and the Oracle FS System interfaces

This following table describes the differences in terminology used between the Oracle VM and Oracle FS System interfaces.

Table 4: Mapping Oracle VM terms to Oracle FS System terms

Oracle VM terms	Oracle FS System terms	Notes
Access group	SAN hosts	
Clone	Active Clone LUN	These are read and write clones that can be mapped to SAN hosts (access groups). These clones remain active throughout their lives.
Physical disk	LUN	
Present and unpresent	Map and unmap	
Snap clone*	Active Clone LUN of an inactive Clone LUN (Snapshot)	Snap clones are always created from inactive clones. They are read and writable versions of the inactive clone (snapshot). As such, they look like normal clones.
Snapshot*	Inactive Clone LUN whose name is prefixed with OSCSNAP-	Making the clone inactive makes the clone read-only. These clones remain inactive throughout their lives. The plug-in automatically prefixes the name with OSCSNAP- to identify the clone physical disk as an Oracle Storage Connect snapshot. The prefix is not visible in the Oracle VM GUI because the Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems removes the prefix before returning the name to Oracle VM.
Split clone	None	Oracle FS System clones cannot be separated from their parent and still retain the same ID. Split clones are not supported.

Table 4: Mapping Oracle VM terms to Oracle FS System terms (continued)

Oracle VM terms	Oracle FS System terms	Notes
Storage array	Oracle FS System SAN systems	Oracle VM Manager version 3.1 and later refers to storage arrays as SAN servers.
Storage element	Storage objects such as LUN, Clone LUN, or filesystems	

Note: *Snapshots and snap clones are not currently supported in Oracle VM and Oracle VM Storage Connect Plug-In for Oracle Flash Storage Systems.

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