Oracle Axiom Storage Connect

User's Guide

ORACLE

PILLAR AXIOM

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Preface

Related Documentation

- *Pillar Axiom Customer Release Notes*
- *Pillar Axiom Glossary*
- *Pillar Axiom Administrator's Guide*

For details about your Oracle VM environment, see the Oracle VM documentation available at Oracle Documentation (www.oracle.com).

Typographical Conventions

Table 1 Typography to mark certain content

Convention	Meaning
italics	Within normal text, words in italics indicate: • A reference to a book title. • New terms and emphasized words. • Command variables.
`monospace`	Indicates one of the following, depending on the context: • The name of a file or the path to the file. • *Output* displayed by the system on the command line.
`monospace` (bold)	*Input* provided by an administrator on the command line.
>	Indicates a menu item or a navigation path in a graphical user interface (GUI). For example, "Click **Storage** > **Clone LUNs**" means to click the **Clone LUNs** link on the **Storage** page in the graphical user interface (GUI).

Table 1 Typography to mark certain content (continued)

Convention	Meaning
...	Used within an expression of a navigation path or within a cascading menu structure. The ellipsis indicates that one or more steps have been omitted from the path or menu structure. For example, in the **Groups > Volume Groups > Actions > ... > Data Protection > Create** menu structure, the ... implies that one or more menu items have been omitted.

Oracle Contacts

Table 2 Oracle Resources

For help with...	Contact...
Support	https://support.oracle.com
Training	https://education.oracle.com
Documentation	• Oracle Technical Network: http://www.oracle.com/technetwork/indexes/documentation/index.html#storage • From the Pillar Axiom Storage Services Manager (GUI): **Support > Documentation** • From Pillar Axiom HTTP access: `http://`*`system-name-ip/`*`documentaton.php` where *system-name-ip* is the name or the public IP address of your system.
Documentation feedback	http://www.oracle.com/goto/docfeedback
Contact Oracle	http://www.oracle.com/us/corporate/contact/index.html

CHAPTER 1

Introduction to the Oracle Axiom Storage Connect Plug-In

About Virtualization Plug-In Integration

Virtualization plug-in integration permits you to integrate various components into the virtualization environment. The Oracle Axiom Storage Connect plug-in permits you to integrate access to your Pillar Axiom systems with Oracle VM and Oracle Storage Connect software. You can access the provisioning and management capabilities of your Pillar Axiom systems in the Oracle VM graphical user interface (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. To perform those tasks, you often must drill-down on objects and make note of values in multiple pages. Then, you have to switch back and forth between the virtualization application interface and the storage application interface to locate the associated storage objects. Many environments contain a number of different storage products so that means you could be switching between multiple storage application interfaces.

Using the Oracle Axiom Storage Connect plug-in makes it easy to view and manage your storage through a Oracle VM GUI. Through the context menus, you can view and manage certain features of your Pillar Axiom systems and other storage.

Related concepts

- *About the Oracle VM Environment*
- *About the Oracle VM Components*
- *About the Oracle Axiom Storage Connect Plug-In*

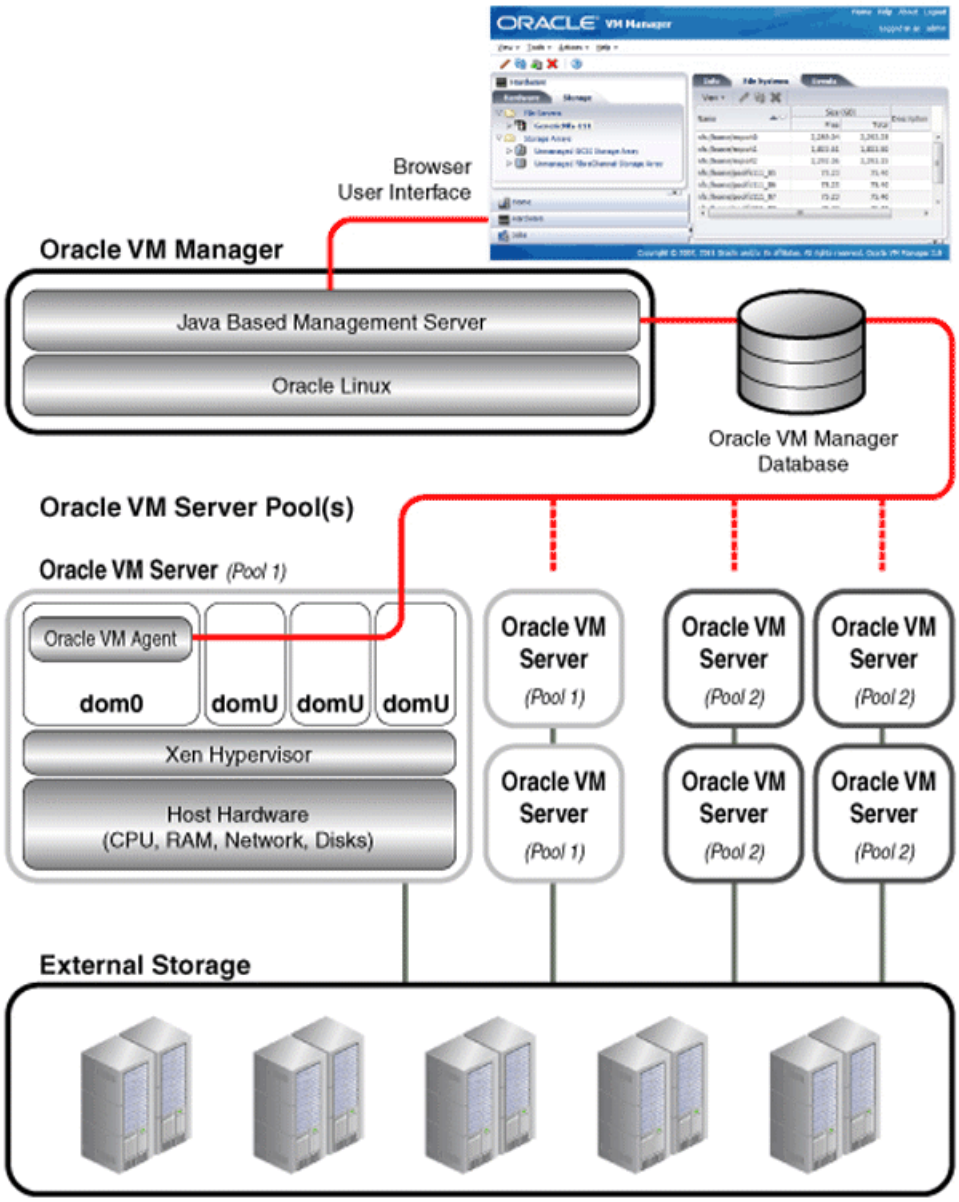
About the Oracle VM Environment

The Oracle Virtual Machine (VM) environment makes it possible to manage disparate physical infrastructure 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 a 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 Documentation (http://www.oracle.com).

Related concepts

- *About Virtualization Plug-In Integration*
- *About the Oracle VM Components*
- *About the Oracle Axiom Storage Connect Plug-In*

About the Oracle VM Components

The Oracle VM environment is composed of numerous components. The Oracle Axiom Storage Connect plug-in integrates Pillar Axiom 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 Pillar Axiom 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 hypervisor host.

Oracle VM Server

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 dom0. The kernel handles administrative functions of the host server and communicates with the Oracle VM Manager via the Oracle VM agent service.

The Oracle VM Server is installed to run automatically and runs continuously in the background. It 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.

You can join multiple Oracle VM Server systems together using server pools so 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 it is installed.

Oracle VM Manager

The graphical user interface (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.

A single Oracle VM Manager can manage multiple Oracle VM Servers.

For more information, refer to the Oracle Documentation (http://www.oracle.com).

Related concepts

- *About Virtualization Plug-In Integration*
- *About the Oracle VM Environment*
- *About the Oracle Axiom Storage Connect Plug-In*

About the Oracle Axiom Storage Connect Plug-In

The Oracle Axiom Storage Connect plug-in software permits you to access your Pillar Axiom storage using the Oracle VM Manager graphical user interface (GUI).

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

While storage from other vendors is visible in the GUI, actions against that storage are not possible through the use of the Oracle Axiom Storage Connect plug-in software.

The Oracle Axiom Storage Connect plug-in gives you access to the following functionality using the GUI:

- View storage elements including Pillar Axiom systems, physical disks (LUNs), clone physical disks (Clone LUNs), volume groups, and access groups (storage area network, or SAN, hosts)
- Create, modify, and delete physical disks and clone physical disks

Related concepts

- *About Virtualization Plug-In Integration*
- *About the Oracle VM Environment*
- *About the Oracle VM Components*

Oracle Axiom Storage Connect System Requirements

The following sections describe the Oracle Axiom Storage Connect requirements.

Hardware and Software

The installer for the Oracle Axiom Storage Connect plug-in includes all software dependencies. No other software is required besides the Oracle VM Server and the Oracle VM Manager.

The Oracle Axiom Storage Connect plug-in can work with the operating systems required by Oracle VM Server software.

Table 3 Hardware and software requirements

Product	Version	Notes
Pillar Axiom system	5.2 or later	The system in which the Pillar Axiom components, such as physical disks (LUNs) and clones, reside.
Oracle VM Manager	3.0.2 or later	The systems in which the graphical user interface (GUI) is installed. The VM Manager provides a web interface that lets you see the GUI on your local system via a Web browser.
Oracle VM Server	3.0.2 or later	The bare-metal system in which the Oracle VM Server is installed.

For more details about Oracle VM hardware and software requirements, refer to the Oracle Documentation (http://www.oracle.com).

Licenses

The Oracle Axiom Storage Connect plug-in does not require any additional license key beyond the standard Pillar Axiom system license terms.

All features on the Pillar Axiom system are enabled out of the factory. Administrators should ensure they are in compliance with their End User License Agreements and have purchased the necessary licenses for Optional Premium features. For details about the Optional Premium features, refer to the *Pillar Axiom Administrator's Guide*.

Oracle VM requires no licenses. The Oracle VM software is freely downloadable from Oracle's website at Oracle Downloads (http:// www.oracle.com). You also receive that software when you purchase other Oracle software products.

Related concepts

- *About the Installation Process*
- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related references

- *Supported Protocols and Interfaces*
- *Management Networking Requirements*
- *TCP Port Assignments*

Related tasks

- *Download the Oracle Axiom Storage Connect Plug-In Installer*
- *Install the Oracle Axiom Storage Connect Plug-In*
- *Update the Oracle Axiom Storage Connect Plug-In*
- *Remove Oracle Axiom Storage Connect Plug-In (Optional)*

Supported Protocols and Interfaces

The Oracle Axiom Storage Connect plug-in supports the following protocols and interfaces:

- HTTPS using TCP port 8083 for communications from the plug-in to the Pilot, the Pillar Axiom management controller.
- Configuration of Internet Small Computer Systems Interface (iSCSI) and Fibre Channel (FC) storage area network (SAN) physical disk resources for client host access.
- Management using SAN and iSCSI functionality.
- UTF-8 character encoding.

Related concepts

- *About the Installation Process*

Related references

- *Oracle Axiom Storage Connect System Requirements*
- *Management Networking Requirements*
- *TCP Port Assignments*

Management Networking Requirements

The Oracle Axiom Storage Connect plug-in software communicates over a secure port with the Pillar Axiom Pilot, the system's management controller. The host on which Oracle VM Server as installed requires a TCP/IP connection for communication with the Pilot.

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 are opened by the installer.

Related concepts

- *About the Installation Process*

Related references

- *Oracle Axiom Storage Connect System Requirements*
- *Supported Protocols and Interfaces*
- *TCP Port Assignments*

CHAPTER 2

Install the Oracle Axiom Storage Connect Plug-In

About the Installation Process

The Oracle Axiom Storage Connect plug-in 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 that 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 affect on the installation.

After the plug-in is installed, you can log in, begin to add and work with Pillar Axiom systems using the Oracle VM graphical user interface (GUI).

Related references

- *Oracle Axiom Storage Connect System Requirements*
- *Supported Protocols and Interfaces*
- *Management Networking Requirements*
- *TCP Port Assignments*

Related tasks

- *Download the Oracle Axiom Storage Connect Plug-In Installer*
- *Install the Oracle Axiom Storage Connect Plug-In*
- *Update the Oracle Axiom Storage Connect Plug-In*
- *Remove Oracle Axiom Storage Connect Plug-In (Optional)*
- *Verify the Plug-In Version*

Download the Oracle Axiom Storage Connect Plug-In Installer

Download the software for the Oracle Axiom Storage Connect plug-in so you can install it.

Prerequisite:

- All hosts in the environment meet the system requirements.

You download the plug-in software from the Pillar Support portal.

1. Direct your browser to the Pillar Support portal (https://support-portal.pillardata.com/csportal/login.seam).
2. Navigate to the download package.
3. To initiate the download, double-click the download package.
4. Download the package to the host containing the Oracle VM Server.

Related concepts

- *About the Installation Process*
- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related references

- *TCP Port Assignments*
- *Oracle Axiom Storage Connect System Requirements*

Related tasks

- *Install the Oracle Axiom Storage Connect Plug-In*
- *Update the Oracle Axiom Storage Connect Plug-In*
- *Remove Oracle Axiom Storage Connect Plug-In (Optional)*

TCP Port Assignments

During the Oracle Axiom Storage Connect plug-in installation, you can change the default port assignments. These ports permit the Oracle VM Server and Oracle VM Manager to connect to and communicate with the plug-in.

The ports shown in the following tables are used for all communications between the Oracle VM Server and the plug-in, and the Pillar Axiom system and the plug-in.

Table 4 Port communication between the Oracle VM Server and the plug-in

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.

Table 5 Port communication between the plug-in and the Pillar Axiom Pilot

Port type	Value	Description
TCP	8083	The port used by the plug-in to communicate over HTTPS with the Pillar Axiom Pilot, the system's management controller. 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 three IP addresses on the Pilot to avoid firewall issues. **Note:** If port 8083 is not open, contact Oracle Pillar Customer Support (http://support-portal.pillardata.com/csportal/login.seam) support@pillardata.com.

Related concepts

- *About the Installation Process*

Related references

- *Oracle Axiom Storage Connect System Requirements*
- *Supported Protocols and Interfaces*
- *Management Networking Requirements*

Install the Oracle Axiom Storage Connect Plug-In

After you have downloaded the Oracle Axiom Storage Connect plug-in, you can install the plug-in on the intended Oracle VM Server host.

Prerequisite:

- Resource Package Manager (RPM) installer file is already present on the Oracle VM Server.

The installation RPM package is called `osc-oracle-axiom-<1.0-x>.el5.noarch.rpm`, where `<1.0.x>` is the version number.

1. Issue the following command to install the RPM file:

   ```
   rpm -ivh osc-oracle-axiom-1.0-x.e15.noarch.rpm
   ```

2. Issue the following command to verify the file has installed:

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

   Result:
   The system returns the file name if the installation was successful.

After you have successfully installed the plug-in, you can log in to Oracle VM Manager. From Oracle VM Manager, you must rediscover the Oracle VM Server upon which you installed the plug-in.

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

For information about rediscovering the server, refer to the Oracle Documentation (http://www.oracle.com).

An administrative account can be created on the Axiom for the sole purpose of Oracle VM administration. Privileges will be granted based on the account role chosen. You should create the recommended administrative account at the earliest opportunity.

Related concepts

- *About the Installation Process*
- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related references

- *TCP Port Assignments*
- *Oracle Axiom Storage Connect System Requirements*

Related tasks

- *Download the Oracle Axiom Storage Connect Plug-In Installer*
- *Update the Oracle Axiom Storage Connect Plug-In*
- *Remove Oracle Axiom Storage Connect Plug-In (Optional)*

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. Using the Oracle VM Manager graphical user interface (GUI), you can access Pillar Axiom systems. The Oracle Axiom Storage Connect plug-in itself has no specific log in operation.

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

After you log in to the Oracle VM Manager GUI, you can perform storage management tasks on your Pillar Axiom systems, 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 Oracle VM Manager is installed.

   Result:
   The **Oracle VM Manager** Welcome page appears.

2. Enter the login credentials for the Oracle VM Manager:
   - **Username**
   - **Password**
3. Click **Login**.

   Result:
   The Oracle VM Manager GUI opens to the **Oracle VM Manager Home** page, or the last page you visited when you last logged off.

Related concepts

- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related tasks

- *Log Out of the Oracle VM Manager*
- *Access Storage in Oracle VM*

Log Out of the Oracle VM Manager

The Oracle Axiom Storage Connect plug-in has no specific log off operation. When you have completed working with Pillar Axiom systems in Oracle VM Manager graphical user interface (GUI), you log out from the Oracle VM Manager GUI to exit the application.

If you do not log out, an unauthorized user may gain access to the Pillar Axiom system from your workstation.

1. At the top right corner of the Oracle VM Manager GUI page, click **Logout**.

   Result:
   The Oracle VM Manager GUI closes.

Related concepts

- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related tasks

- *Log In to the Oracle VM Manager*
- *Access Storage in Oracle VM*

Access Storage in Oracle VM

After you have installed the Oracle Axiom Storage Connect plug-in and successfully logged in, you can add and register a Pillar Axiom system. The Pillar Axiom system will then be displayed in the Oracle VM Manager graphical user interface (GUI). You can view the utilization of storage from your Pillar Axiom storage objects as well as storage from other vendors from within the Oracle VM Manager GUI.

Prerequisites:

- The Pillar Axiom system to be accessed has been added and registered with Oracle VM.
- The Pillar Axiom plug-in has been selected in Oracle VM Manager.

1. In the Oracle VM Manager navigation tree, in the Hardware area, select the **Storage** tab and then **Storage Arrays** folder.

   Result:
   The connected Pillar Axiom system appears in the **Storage Arrays** tab in the content area at the right.

2. Select the Pillar Axiom system you want to access.
3. To see information about or manage different aspects of your storage, select a tab from those available in the content area of the page:

Info	Shows configuration information for the Storage Server and the Admin Host used for the Pillar Axiom system.
Physical Disks	Shows information about the physical disks on the system, and provides a menu bar from which you can select to view, add, edit, remove, or clone a physical disk.
Access Groups	Lists the access groups (Pillar Axiom SAN hosts) from which you can select. It also provides a menu bar 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 Documentation (http://www.oracle.com).

Volume Groups	Shows information about the volume groups on the system, and provides a menu bar 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 menu bar from which you can select to view or acknowledge events.

For more information, refer to the *Pillar Axiom Administrator's Guide* and the Oracle Documentation (http://www.oracle.com).

Related concepts

- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related tasks

- *Log In to the Oracle VM Manager*
- *Log Out of the Oracle VM Manager*

Update the Oracle Axiom Storage Connect Plug-In

When a new version of the Oracle Axiom Storage Connect plug-in software is available, you can update your version of the plug-in software.

You must obtain the server name and IP address for the server upon which the Oracle VM Server and plug-in is installed. Your company's IT department provides you with this information.

Prerequisites:

- Privileges required to install the plug-in software.
- Information available for the plug-in to register and communicate with the Oracle VM Server.

1. Direct your browser to the Pillar Support portal (http://support-portal.pillardata.com/csportal/login.seam).
2. Navigate to the update download package.
3. To initiate the download, double-click the download Resource Package Manager (RPM) package.
4. Download the package to the host containing the Oracle VM Server.
5. Issue the command `rpm -Uvh osc-oracle-axiom-<version_number>.el5.noarch.rpm`, where `<version_number>` is the number of the updated software.

   Result:
   The RPM performs the upgrade process automatically.
6. When the installation completes, click **Finish**.
7. Launch the Oracle VM Manager and log in.
8. Rediscover the Oracle VM Server upon which you performed the software update.

   Result:
   You can begin to work with the **Pillar Axiom** storage objects in the Oracle VM Manager graphical user interface (GUI).

Related concepts

- *About the Installation Process*
- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related references

- *TCP Port Assignments*
- *Oracle Axiom Storage Connect System Requirements*

Related tasks

- *Download the Oracle Axiom Storage Connect Plug-In Installer*
- *Install the Oracle Axiom Storage Connect Plug-In*
- *Remove Oracle Axiom Storage Connect Plug-In (Optional)*
- *Verify the Plug-In Version*

Verify the Plug-In Version

You cannot verify the version of the Oracle Axiom Storage Connect plug-in software in the Oracle VM Manager graphical user interface (GUI), but you can verify the version from within the Oracle VM Server.

You can view information about each plug-in, including the plug-in name, vendor, and version. You can check errors on the Oracle VM Server via the log file. Checking the status and errors information is helpful when you encounter connection problems.

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

   ```
   rpm –qa | grep osc-oracle-axiom
   ```

   Result:
   The currently installed plug-in RPM is listed.

2. Check the version displayed.

Related concepts

- *About the Installation Process*

Related tasks

- *Update the Oracle Axiom Storage Connect Plug-In*

Remove Oracle Axiom Storage Connect Plug-In (Optional)

You can uninstall the Oracle Axiom Storage Connect plug-in software 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 command to uninstall the RPM file:

   ```
   rpm -e osc-oracle-axiom-<version_number>.e15.noarch.rpm
   ```

   , where `<version_number>` is the version of the software.

2. Issue the following command to verify the file has uninstalled:

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

   Result:
   The system responds with `No plug-in` if the uninstall was successful.

Related concepts

- *About the Installation Process*
- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related references

- *TCP Port Assignments*
- *Oracle Axiom Storage Connect System Requirements*

Related tasks

- *Download the Oracle Axiom Storage Connect Plug-In Installer*
- *Install the Oracle Axiom Storage Connect Plug-In*
- *Update the Oracle Axiom Storage Connect Plug-In*

CHAPTER 3

Manage Pillar Axiom Storage Objects

About Pillar Axiom Administrator Accounts

You can create multiple administrator accounts in a Pillar Axiom system. Additional accounts are not necessary, but they are useful. We recommend creating a dedicated administrator account that is assigned the Administrator 1 role for use with the Oracle Axiom Storage Connect plug-in.

The use of the primary system administrator account for the plug-in is not recommended. Creating a dedicated account prevents the primary administrator account from being overloaded.

The plug-in operator account is created by someone with administrator level 1 privileges. The administrator who creates the operator account provides the name and password for the account to the operator account holder.

Refer to the *Pillar Axiom Administrator's Guide* for details about administrator accounts.

Related concepts

- *Administrator Account Recommendations*
- *About Adding Pillar Axiom Systems to Oracle VM*
- *Administrator Account Recommendations*

Related references

- *TCP Port Assignments*
- *Oracle Axiom Storage Connect System Requirements*

Related tasks

- *Download the Oracle Axiom Storage Connect Plug-In Installer*
- *Install the Oracle Axiom Storage Connect Plug-In*
- *Update the Oracle Axiom Storage Connect Plug-In*
- *Remove Oracle Axiom Storage Connect Plug-In (Optional)*
- *Add a Pillar Axiom System to Oracle VM*
- *Log In to the Oracle VM Manager*
- *Log Out of the Oracle VM Manager*
- *Access Storage in Oracle VM*

About Adding Pillar Axiom Systems to Oracle VM

Pillar Axiom systems must be added and registered with the Oracle VM environment for you to be able to view and manage them. When you add a Pillar Axiom system, you are registering it with Oracle VM. Registering the plug-in enables Oracle VM to manage it. Oracle VM supports some but not all of the Pillar Axiom system's storage management capabilities.

Before you add a Pillar Axiom system, it is helpful to gather information about the system and understand how Oracle VM supports it.

- Have ready the Pillar Axiom system's login credentials and IP address (or the fully qualified host name of the Pilot, the Pillar Axiom management controller). We recommend use of DNS to avoid the need to reconfigure the clients if the IP changes.
- Have open port 8083 on the Pilot between the server upon which the plug-in is installed and the three IP addresses of the Pillar Axiom system.
- You can add both iSCSI and SAN (FC) Pillar Axiom systems to the environment; however, you can add only one type of system at a time. A Pillar Axiom storage array can be designated as a FC or iSCSI array, but not both. Oracle VM does not support Pillar Axiom systems with both FC and iSCSI enabled.
- Extra Information field entries for a Pillar Axiom Slammer control unit have certain characteristics. The characteristics are:
    - All fully qualified name (FQN) entries are case sensitive.
    - The syntax of the FQN can vary on Pillar Axiom models. For example, one Pillar Axiom system can have a syntax of `/Slammer1/1` while another can have a syntax of `/SLAMMER-01/1`.

      Refer to the *Pillar Axiom CLI Reference Guide* to gather the correct `slammerNode` syntax.

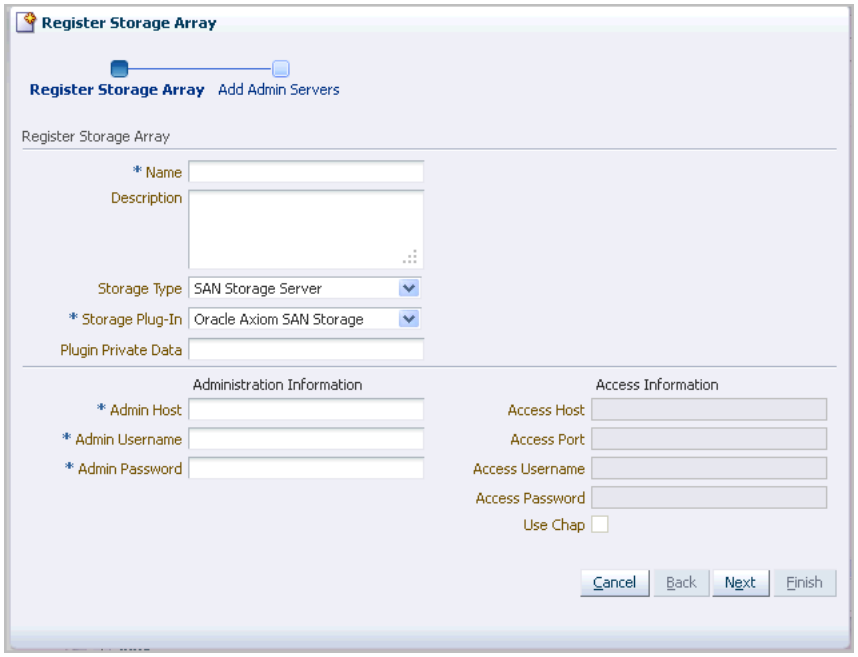
It is also helpful to understand what happens in the Oracle VM Manager graphical user interface (GUI) after a system is added.

- The Oracle VM software automatically creates access groups and volume groups folders nested under the Pillar Axiom system in the navigation area.
- When you register a storage array with a specific protocol type (FC or iSCSI), 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 will appear 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 sync the information between Oracle VM and the Pillar Axiom system to see the actual values. This step also refreshes the information for the access groups and volume groups. You can manually refresh as needed to view the latest information.

To add a Pillar Axiom system, you use the Register Storage Array dialog. The following image shows the dialog.

Figure 2 Register Storage Array dialog



Refer to the *Pillar Axiom Administrator's Guide* for information about Pillar Axiom systems and physical disks.

For information about access groups and refreshing information, refer to the Oracle Documentation (http://www.oracle.com).

Related concepts

- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*

Related tasks

- *Add a Pillar Axiom System to Oracle VM*

Add a Pillar Axiom System to Oracle VM

If no Pillar Axiom systems are connected to the Oracle VM environment, you can manually add one.

Prerequisites:

- Pillar Axiom dedicated account privileges required to add a Pillar Axiom system.
- Pillar Axiom login credentials available.
- Port 8083 open between the Pilot, the Pillar Axiom management controller, and the server on which the plug-in is installed.
- Fully qualified host name of the Pilot. Your company's IT department provides you with this information.

When you are adding and registering a Pillar Axiom system, you must authenticate credentials with the Pillar Axiom system.

1. Log in to the Oracle VM Manager.
2. In the Oracle VM Manager inventory tree, on the menu bar, select **View > Hardware**.
3. Select the **Storage** tab and then the **Storage Arrays** folder.
4. From the menu bar, select **Actions > Register Storage Array**.
5. In the Register Storage Array dialog, enter the following:
   - Register Storage Array section:

Name	Enter the name of the Pillar Axiom system you are registering with the Oracle VM Manager.
Description	Enter a description you want to use for the Pillar Axiom system, such as the location. If you do not enter a description, Oracle VM displays the description that was used when the Pillar Axiom system was first created.

Storage Type	From the drop-down list, select the type of storage server being registered, SAN or iSCSI.
Storage Plug-In	Select the **Oracle Axiom SAN Storage** plug-in from the various plug-ins listed. This is the Oracle Axiom Storage Connect plug-in.
Plugin Private Data	Not used.

- Administrative Information section:

Admin Host	The fully qualified domain name or IP address of the Pillar Axiom system.
Admin Username	The Pillar Axiom system's dedicated account username.
Admin Password	The Pillar Axiom system's dedicated account password.

- Access Information section:

  Note: Fields in the Access Information section are only required for iSCSI Pillar Axiom systems.

Access Host	The Pillar Axiom system's discovered iSCSI target IP address.
Access Port	The port number for iSCSI on a target. The standard port is 3260 and is open by default on the Pillar Axiom system.
Access Username	The Pillar Axiom system's dedicated account username.

Access Password	The Pillar Axiom system's dedicated account username.
Use Chap	Select if Challenge Handshake Authentication Protocol (CHAP) will be used.

6 Click **Next**.

7 In the **Add Admin Servers** dialog, in the **Available Servers** section, select the host upon which the Oracle VM Server and the Oracle Axiom Storage Connect plug-in are installed.

You are designating this server as the administrative server for the Pillar Axiom system you are adding.

8 Click the arrow icon to move the Pillar Axiom system entry from the Available Servers section to the Selected Servers section.

9 Click **Finish**.

Result:
The Pillar Axiom system registers with Oracle VM. The Pillar Axiom system appears listed in the Storage Arrays tab in the content area of the page and also under Storage Arrays in the Hardware tab of the inventory tree. The automatically created access groups and volume groups folders appear under the Pillar Axiom system in the navigation area.

10 In the inventory tree, select the Pillar Axiom system you just added.

11 Right-click the Pillar Axiom system, select **Refresh Storage Array**, and click **OK**.

Related concepts

- *About Adding Pillar Axiom Systems to Oracle VM*
- *About Pillar Axiom Administrator Accounts*
- *Administrator Account Recommendations*
- *About Creating Clone Physical Disks*
- *About Creating Pillar Axiom Physical Disks*

About Managing Pillar Axiom Physical Disks

The Oracle Axiom Storage Connect plug-in functionality provides options that allow you to create, modify, and otherwise manage physical disks.

In a Pillar Axiom system, physical disks are referred to as LUNs.

A LUN is defined as:

> A logical volume within a storage area network (SAN). Administrators assign storage resources and Quality of Service (QoS) attributes to each logical unit (LUN).

For example, using the graphical user interface (GUI), you can perform the following actions:

- Create a physical disk.
- Modify the properties of a physical disk.
- Online or offline a physical disk to affect its accessibility on the data path.
- Present or unpresent (map or unmap) a physical disk to specific access groups.
- Provide 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 at a later time modify the attributes of the physical disk, the storage capacity that is assigned to the physical disk, or both.

Related concepts

- *About Managing Pillar Axiom Clone Physical Disks*
- *About Access Groups*
- *About Volume Groups*

Related references

- *Review Event Logs*
- *Mapping Oracle Terms to Pillar Axiom Terms*

About Viewing Physical Disks

You can view detailed information about the physical disks in the Oracle VM environment using the Oracle VM Manager graphical user interface (GUI).

When you add a Pillar Axiom system and register it with Oracle VM, a volume groups folder is automatically added. The volume groups that are created display in the volume groups folder. When physical disks are created in that volume group, the physical disks are visible nested under the volume group.

Related tasks

- *View Physical Disks*

View Physical Disks

You can view detailed information about a particular Pillar Axiom physical disk in the Oracle VM Manager graphical user interface (GUI).

When you select a physical disk, details about the physical disk display in a table on the Physical Disks tab page.

1. From the Oracle VM Manager menu bar, select the **View** drop-down list, and select **Hardware**.
2. In Hardware view of the navigation pane, select the **Storage** tab and then the **Storage Arrays** folder.
3. Select the Pillar Axiom storage array that contains the physical disk you want to view.
4. Select the **Physical Disks** tab in the content area of the page.

   The existing physical disks and clone physical disks display in the table.
5. Locate the physical disk you want to view.

   You can sort the columns in the display table to suit your needs. If a physical disk is part of an access group or volume group, you can also view information about the physical disk from the access groups and volume groups tabs.

Related concepts

- *About Viewing Physical Disks*

Related tasks

- *Create a Pillar Axiom Physical Disk*
- *Modify a Pillar Axiom Physical Disk*
- *Delete a Pillar Axiom Physical Disk*

About Creating Pillar Axiom Physical Disks

When you use the Oracle Axiom Storage Connect plug-in in the Oracle VM environment, you have access to your Pillar Axiom systems through the Oracle VM Manager graphical user interface (GUI). You can create Pillar Axiom physical disks using the Oracle VM Manager GUI.

After you add a Pillar Axiom system, you can create a physical disk. When you create the physical disk, you associate it with a Pillar Axiom system. The disk automatically has its protocol type enabled based on the storage array type selected when the Pillar Axiom system was added and registered with Oracle VM. For example, if creating a physical disk on a Fibre Channel (FC) array, then that physical disk will have FC enabled and Internet Small Computer Systems Interface (iSCSI) disabled.

Oracle VM does not support creating Pillar Axiom physical disks with both FC and iSCSI enabled. However, the Oracle VM Manager will display these physical disks if they already exist on the Pillar Axiom system or are created by using the Pillar Axiom GUI or Pillar Axiom CLI.

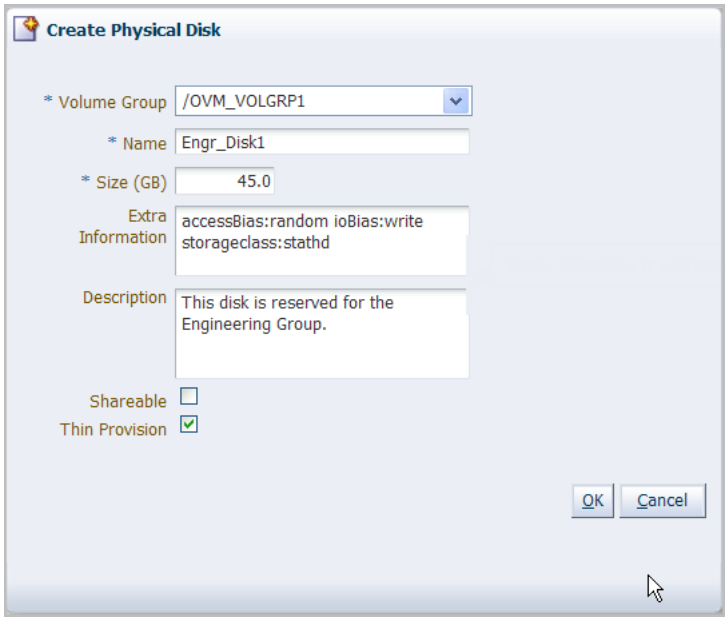
It is not possible to specify a number for a physical disk. When you are presenting (mapping) a Pillar Axiom physical disk to an access group, the plug-in automatically assigns the physical disk the next available physical disk number.

You can select to make a physical disk shareable between virtual machines. When the physical disk is shareable, multiple virtual machines can use it as storage. For more information about sharing disks, refer to the Oracle Documentation (http://www.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 Pillar Axiom plug-in sets the allocated capacity to 0 and sets the addressable capacity to the value you provide. Refer to the *Pillar Axiom Administrator's Guide* for more information about thin provisioning.

To create a Pillar Axiom physical disk, you use the Create Physical Disk dialog. The following image shows the dialog.

Figure 3 Create Physical Disk dialog



Refer to the *Pillar Axiom Administrator's Guide* for information about Pillar Axiom systems and physical disks.

For information about Oracle VM and access groups, refer to the Oracle Documentation (http://www.oracle.com).

Related concepts

- *Modifying Physical Disks Outside of Oracle VM*

Related tasks

- *Add a Pillar Axiom System to Oracle VM*
- *Create a Pillar Axiom Physical Disk*
- *Present/Unpresent a Physical Disk to an Access Group*
- *Modify a Pillar Axiom Physical Disk*

Create a Pillar Axiom Physical Disk

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

Prerequisites

- Pillar Axiom login credentials with Administrator 1 privileges.
- The Pillar Axiom system where the physical disk will be created has been added and registered with the Oracle VM environment.

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

Note: The Pillar Axiom system refers to physical disks as LUNs.

1. On the Oracle VM Manager menu bar, select **View > Hardware**.
2. In the Hardware view of the navigation pane, select the **Storage** tab and expand the **Storage Arrays** folder.
3. From the available storage arrays, select the Pillar Axiom system upon which you want to create the physical disk.
4. Select the **Physical Disks** tab in the content area of the page.
5. In the menu bar on the Physical Disks tab, click the **Create Physical Disk** icon.
6. In the Create Physical Disk dialog, enter the following:

Name	Identifies the name that is assigned to a physical disk for administrative purposes. Physical disk names must be unique across the Pillar Axiom system and must be 82 or fewer UTF characters, or 255 or fewer ASCII characters.
Size	Specifies the capacity of the physical disk in GB.
Extra Information	Specifies the priority level of the physical disk. The field is a free-form text area that accepts the format **`<option>[:<value>][<option>[:value>]]`**. **Note:** Only use spaces to separate options from each other, *not* between option and colon or colon and value. For example: `accessBias:random ioBias:write storageclass:stathd` **Note:** If the option has no value argument associated with it, input only the option name. The following options can be specified: ○ **`allocatedCapacity`** ○ **`redundancy`** ○ **`accessBias`**

- **ioBias**
- **cloneCapacity**
- **slammerNode**
- **storageDomain**
- **storageClass**
- **copyPriority**
- **suppressConservativeMode**
- **maskedSlammerPorts**

Note: A storage class must be specified if the Pillar Axiom system has more than one storage class.

For detailed information about each of these options, refer to the *Pillar Axiom CLI Reference Guide*.

Description Indicates the description of the Pillar Axiom physical disk.

Shareable Determines whether the physical disk will be shareable across virtual machines.

For more information about sharing disks, refer to the Oracle Documentation (http://www.oracle.com).

Thin Provision Determines whether the physical disk will be created as a thin provisioned physical disk.

Refer to the *Pillar Axiom Administrator's Guide* for more information about thin provisioning.

7 Click **OK**.

Result:
The physical disk is created and displays in the table on the Physical Disks tab page.

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

For more information about creating a physical disk, refer to the information about creating LUNs in the *Pillar Axiom Administrator's Guide*.

Related concepts

- *About Creating Pillar Axiom Physical Disks*

Related tasks

- *View Physical Disks*
- *Modify a Pillar Axiom Physical Disk*
- *Delete a Pillar Axiom Physical Disk*

Modify a Pillar Axiom Physical Disk

You may 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 graphical user interface (GUI).

Prerequisites

- Pillar Axiom 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 Pillar Axiom system refers to physical disks as LUNs.

Refer to the *Pillar Axiom Administrator's Guide* for information about modifying physical disks.

1. On the Oracle VM Manager menu bar, select **View** > **Hardware**.
2. In the Hardware view of the navigation pane, select the **Storage** tab and expand the **Storage Arrays** folder.
3. From the available storage arrays, select the Pillar Axiom system upon which the physical disk you want to modify resides.
4. Select the physical disk.
5. In the menu bar on the **Physical Disks** tab, click the **Edit Physical Disk** icon.
6. In the Edit Physical Disk dialog, edit 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 Pillar Axiom system and must be 82 or fewer UTF characters, or 255 or fewer ASCII characters.

New Size

Specify the size you want to increase the physical disk.

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

Extra Information

Specifies the priority level of the physical disk. The field is a free-form text area that accepts the format **`<option>[:<value>][<option>[:value>]]`**.

Note: Only use spaces to separate options from each other, *not* between option and colon or colon and value. For example: `accessBias:random ioBias:write storageclass:stathd`

Note: If the option has no value argument associated with it, input only the option name.

The following options can be specified:

- **`allocatedCapacity`**
- **`redundancy`**
- **`accessBias`**
- **`ioBias`**
- **`cloneCapacity`**
- **`slammerNode`**
- **`storageDomain`**
- **`storageClass`**
- **`copyPriority`**
- **`suppressConservativeMode`**
- **`maskedSlammerPorts`**

Note: A storage class must be specified if the Pillar Axiom system has more than one storage class.

For detailed information about each of these options, refer to the *Pillar Axiom CLI Reference Guide*.

Description	Indicates the description of the Pillar Axiom physical disk.
Shareable	Determines whether the physical disk will be available to share across storage arrays.
Thin Provision	This option is not available to modify.

7 Click **OK**.

Result:
The changes are applied to the physical disk and display in the table on the **Physical Disks** tab page.

Related tasks

- *View Physical Disks*
- *Create a Pillar Axiom Physical Disk*
- *Delete a Pillar Axiom Physical Disk*

Delete a Pillar Axiom Physical Disk

When a physical disk is no longer needed in a Pillar Axiom system, you can delete it in the Oracle VM Manager graphical user interface (GUI). Be sure the volume to be deleted is not being accessed.

Prerequisites

- Pillar Axiom login credentials with Pillar Axiom dedicated account privileges.
- If the source physical disk had clones, the clones have been removed.

  Note: If you try to delete a source physical disk that has clones, the plug-in will issue a error stating that these clones must be removed before the source is capable of being deleted.

Caution Deleting a physical disk through the Oracle VM Manager permanently removes all data that reside on that physical disk. Data will be lost.

1 On the Oracle VM Manager menu bar, select the **View** > **Hardware**.

2 In Hardware view of the navigation pane, select the **Storage** tab and expand the **Storage Arrays** folder.

3 From the available storage arrays, select the Pillar Axiom system upon which the physical disk you want to delete resides.

4 Select the **Physical Disks** tab in the content area of the page.

5 Select the physical disk to be deleted from those listed in the table on the Physical Disks tab.

6 In the menu bar on the Physical Disks tab, click the **Delete** icon.

7 In the Delete Confirmation dialog, click **OK**.

Result:
The physical disk is deleted from the Pillar Axiom system and no longer appears in the table.

Note: When a physical disk is deleted, the storage for that disk must be reconditioned by the Pillar Axiom system before it will be available for creation of new physical disks. This reconditioning may take some time on very large physical disks.

Related tasks

- *View Physical Disks*
- *Create a Pillar Axiom Physical Disk*
- *Modify a Pillar Axiom Physical Disk*

About Managing Pillar Axiom 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 Pillar Axiom 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. A Clone LUN retains the same QoS parameters as the source LUN and consumes storage capacity from the Clone LUN repository that was allocated for the source LUN.

Important! Make sure that the clone space does not fill up, consuming the maximum amount of space allocated. We strongly recommend that you monitor the amount of space available and modify the volume to allocate more clone space as needed.

Related concepts

- *About Managing Pillar Axiom Physical Disks*
- *About Access Groups*
- *About Volume Groups*

Related references

- *Review Event Logs*
- *Mapping Oracle Terms to Pillar Axiom Terms*

About Viewing Clone Physical Disks

You can view detailed information about clone physical disks in the Oracle VM environment using the Oracle VM Manager graphical user interface (GUI).

When you add a Pillar Axiom system and register it with Oracle VM, a Volume Groups folder is automatically added under the Pillar Axiom system in the navigation area. The volume groups that are created display in the Volume Groups folder. When clone physical disks are created in that volume group, the clone physical disks are visible nested under the volume group.

Related tasks

- *View a Clone Physical Disk*

View a Clone Physical Disk

You can view detailed information about a particular clone physical disk in a Pillar Axiom system in the Oracle VM Manager graphical user interface (GUI).

When you select a clone physical disk, details about the clone display in a table on the Physical Disks tab page.

1. On the Oracle VM Manager menu bar, select the **View** drop-down list, and then select **Hardware**.
2. In Hardware view of the navigation pane, select the **Storage** tab and then the **Storage Arrays** folder.
3. Select the Pillar Axiom storage array that contains the clone physical disk you want to view.
4. Select the **Physical Disks** tab in the content area of the page.

   The existing physical disks and clone physical disks display in the table.
5. Locate the clone physical disk you want to view.

   You can sort the columns in the display table to suit your needs. If a clone is part of an access group or volume group, you can also view information about the clone from the access groups and volume groups tabs.

Related concepts

- *About Viewing Clone Physical Disks*

Related tasks

- *Create a Clone Physical Disk*
- *Modify a Clone Physical Disk*
- *Delete a Clone Physical Disk*

About Creating Clone Physical Disks

After you add a Pillar Axiom system, you can create physical disks and clone physical disks using the Oracle VM Manager graphical user interface (GUI). 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 a Pillar Axiom system, physical disks are referred to as LUNs, and clone physical disks are referred to as Clone LUNs.

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 *Pillar Axiom Administrator's Guide* for information about Pillar Axiom systems, physical disks (LUNs), and clone physical disks (Clone LUNs).

For information about Oracle VM, refer to the Oracle Documentation (http://www.oracle.com).

Related tasks

- *Add a Pillar Axiom System to Oracle VM*
- *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 graphical user interface (GUI).

1. On the Oracle VM Manager menu bar, select the **View** drop-down list, and select **Hardware**.
2. In Hardware view of the navigation pane, select the **Storage** tab and expand the **Storage Arrays** folder.
3. From the available storage arrays, select the Pillar Axiom system that contains the source physical disk you want to clone.
4. Select the **Physical Disks** tab and select the source physical disk you want to clone.
5. In the menu bar on the Physical Disks tab, click the **Clone Physical Disk** icon.
6. In the Clone Physical Disk dialog, select or enter the following:

Clone Target Type	Storage Array. This is the Pillar Axiom storage array.
Clone Target	Indicate the Pillar Axiom system upon which you want the clone physical disk to reside. If needed, you can click the

	Search icon to look through the available storage servers in the Search Clone Target dialog.
Clone Type	Thin Clone. This is a thinly provisioned physical disk.

7 Click **OK**.

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.

Result:
The clone physical disk is created and displays in the table on the Physical Disks tab page.

Related concepts

- *About Creating Clone Physical Disks*

Related tasks

- *View a Clone Physical Disk*
- *Modify a Clone Physical Disk*
- *Delete a Clone Physical Disk*

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 at a later time modify the current configuration for the clone physical disk. You can modify an existing clone physical disk from the Oracle VM Manager graphical user interface (GUI).

Prerequisites

- Pillar Axiom login credentials with dedicated account privileges

In a Pillar Axiom system, physical disks are referred to as LUNs, and clone physical disks are referred to as Clone LUNs.

Refer to the *Pillar Axiom Administrator's Guide* for information about modifying clone physical disks (Clone LUNs).

1 On the Oracle VM Manager menu bar, select the **View > Hardware**.

2 In Hardware view of the navigation pane, select the **Storage** tab and expand the **Storage Arrays** folder.

3 From the available storage arrays, select the Pillar Axiom system upon which the clone physical disk you want to modify resides.

4 Select the **Physical Disks** tab in the content area of the page.

5 Select the clone physical disk.

6 In the menu bar on the Physical Disks tab, click the **Edit Physical Disk** icon.

7 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 Pillar Axiom system and must be 82 or fewer UTF characters, or 255 or fewer ASCII characters.

New Size — Specify the size 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 — Specifies the priority level of the physical disk. The field is a free-form text area that accepts the format **`<option>[:<value>][<option>[:value>]]`**.

Note: Only use spaces to separate options from each other, *not* between option and colon or colon and value. For example: `accessBias:random ioBias:write storageclass:stathd`

Note: If the option has no value argument associated with it, input only the option name.

The following options can be specified:

- **`allocatedCapacity`**
- **`redundancy`**
- **`accessBias`**
- **`ioBias`**
- **`cloneCapacity`**
- **`slammerNode`**

- **`storageDomain`**
- **`storageClass`**
- **`copyPriority`**
- **`suppressConservativeMode`**
- **`maskedSlammerPorts`**

Note: A storage class must be specified if the Pillar Axiom system has more than one storage class.

For detailed information about each of these options, refer to the *Pillar Axiom CLI Reference Guide*.

Description Indicates the description of the Pillar Axiom 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.

8 Click **OK**.

Result:
The clone physical disk is modified and displays in the table on the **Physical Disks** tab page.

Related tasks

- *View a Clone Physical Disk*
- *Create a Clone Physical Disk*
- *Delete a Clone Physical Disk*

Delete a Clone Physical Disk

When a clone physical disk is no longer needed in a Pillar Axiom system, you can delete it in the Oracle VM Manager graphical user interface (GUI). Be sure the volume to be deleted is not being accessed.

Prerequisites

- Pillar Axiom login credentials with dedicated account 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.

1. On the Oracle VM Manager menu bar, select the **View** > **Hardware**.
2. In Hardware view of the navigation pane, select the **Storage** tab and expand the **Storage Arrays** folder.
3. From the available storage arrays, select the Pillar Axiom system upon which the clone physical disk you want to delete resides.
4. Select the **Physical Disks** tab in the content area of the page.
5. Select the clone physical disk to be deleted from those listed in the table on the Physical Disks tab.
6. In the menu bar on the Physical Disks tab, click **Delete Physical Disk**.
7. On the Delete Confirmation dialog, click **OK**.

   Result:
   The clone physical disk is deleted from the Pillar Axiom system and no longer appears in the table.

Related tasks

- *View a Clone Physical Disk*
- *Create a Clone Physical Disk*
- *Modify a Clone Physical Disk*

About Access Groups

In the Oracle VM environment, access groups are storage area network (SAN) hosts, 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 graphical user interface (GUI).

The Oracle Axiom Storage Connect plug-in automatically creates an access group for each SAN host on a Pillar Axiom system.

A single access group represents a single host.

Before presenting (mapping) an access group to a Pillar Axiom physical disk, add the initiators to the access group.

When you present a Pillar Axiom 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 Pillar Axiom storage array for it to recognize the new access group.

For information about creating and deleting access groups, refer to the Oracle Documentation (http://www.oracle.com).

Related concepts

- *About Managing Pillar Axiom Physical Disks*
- *About Managing Pillar Axiom Clone Physical Disks*
- *About Volume Groups*
- *About Viewing Access Groups*

Related references

- *Review Event Logs*
- *Mapping Oracle Terms to Pillar Axiom Terms*

Related tasks

- *View Access Groups*
- *Present/Unpresent a Physical Disk to an Access Group*

About Viewing Access Groups

You can view detailed information about the access groups in the Oracle VM Manager graphical user interface (GUI).

When you add a Pillar Axiom system and register it with Oracle VM, an Access Groups folder is automatically added under the Pillar Axiom system in the

navigation area. The access groups known to the Oracle VM are visible in the Access Groups folder.

After adding a new access group, you need to refresh the Pillar Axiom storage array for it to recognize the new access group.

For more information about access groups, refer to the Oracle Documentation (http://www.oracle.com).

Related concepts

- *About Access Groups*

Related tasks

- *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 graphical user interface (GUI).

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

For information about configuring storage array access through access groups, refer to the Oracle Documentation (http://www.oracle.com).

1. From the Oracle VM Manager menu bar, select **View** > **Hardware**.
2. In Hardware navigation area, select the **Storage** tab and then the **Storage Arrays** folder.
3. Select the Pillar Axiom storage array that contains the access group you want to view.
4. Expand the access group folder, and select the access group whose information you want to view.

   Result:
   Details about the selected access group display in the Access Groups and Events tabs in the content area of the page.
5. (Optional) To modify the appearance of the displayed columns, select the **View** drop-down list and select one of:

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 GUI.

Related concepts

- *About Viewing Access Groups*
- *About Access Groups*

Related tasks

- *Present/Unpresent a Physical Disk to an Access Group*

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 adding, or presenting, the physical disk to an access group in the Oracle VM Manager graphical user interface (GUI). Conversely, the physical disk is removed from the access group by unpresenting the physical disk from the access group.

For information about configuring storage array access through access groups, refer to the Oracle Documentation (http://www.oracle.com).

1. From the Oracle VM Manager menu bar, select **View > Hardware**.
2. In Hardware navigation area, select the **Storage** tab and then the **Storage Arrays** folder.
3. Select the Pillar Axiom storage array that contains the access group to which you want to present a physical disk.
4. In the content area of the page, select the **Access Groups** tab, and select the access group to which you want to present the physical disk.
5. Select **Present/Unpresent Physical Disk**.
6. In the Present/Unpresent Physical Disk dialog, select a physical disk from the Available Physical Disks section.
7. Click the arrow to move the physical disk to the Selected Physical Disks section.

8 Repeat as needed to present additional physical disks.

9 (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.

10 Click **OK**.

Result:
The presented physical disk or physical disks display in the Physical Disks section of the Access Groups tab page.

Related concepts

- *About Viewing Access Groups*
- *About Access Groups*
- *About Creating Pillar Axiom Physical Disks*

Related tasks

- *View Access Groups*

About Volume Groups

Volume groups are organizational units that can contain any grouping of logical volumes and nested volume groups. When you add a Pillar Axiom system and register it with Oracle VM, a Volume Groups folder is automatically added under the Pillar Axiom system in the navigation area. The volume groups known to the Oracle VM are visible in the Volume Groups folder.

You can view detailed information about volume groups in the Oracle VM Manager graphical user interface (GUI). However, to create or delete a volume group, you must use the Pillar AxiomGUI or command line interface (CLI). It is not possible to make modifications to volume groups through Oracle VM Manager.

For information about creating or deleting volume groups, refer to the *Pillar Axiom Administrator's Guide* or the *Pillar Axiom CLI Reference Guide*.

Note: After adding a new volume group, you need to refresh the Pillar Axiom storage array for it to recognize the new volume group.

Related concepts

- *About Managing Pillar Axiom Physical Disks*
- *About Managing Pillar Axiom Clone Physical Disks*
- *About Access Groups*

Related references

- *Review Event Logs*
- *Mapping Oracle Terms to Pillar Axiom Terms*

Related tasks

- *View Volume Groups*

View Volume Groups

You can view detailed information about a particular volume group in the Oracle VM Manager graphical user interface (GUI).

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

1. On the Oracle VM Manager menu bar, select **View** > **Hardware**.
2. In Hardware navigation area, select the **Storage** tab and then the **Storage Arrays** folder.
3. Select the Pillar Axiom storage array that contains the volume group you want to view.
4. Expand the Volume Groups folder, and select the volume group whose information you want to view.

   You can expand a volume group to view the physical disks contained there.

   Result:
   Details about the selected volume group display in the Info, Physical Disks, and Events tabs in the content area of the page.
5. (Optional) To modify the appearance of the displayed columns, select the View drop-down list and select one of:

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 GUI.

Related concepts

- *About Volume Groups*

Review Event Logs

The Oracle Axiom Storage Connect plug-in logs events, API 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 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 Axiom CLI calls, refer to the *Pillar Axiom CLI Reference Guide*.

Related concepts

- *About Managing Pillar Axiom Physical Disks*
- *About Managing Pillar Axiom Clone Physical Disks*
- *About Access Groups*
- *About Volume Groups*
- *Administrator Account Recommendations*
- *Modifying Physical Disks Outside of Oracle VM*
- *Provisioning Pillar Axiom Storage for Oracle VM Server*
- *About Creating Pillar Axiom Physical Disks*

Related tasks

- *Add a Pillar Axiom System to Oracle VM*
- *Create a Pillar Axiom Physical Disk*
- *Present/Unpresent a Physical Disk to an Access Group*

CHAPTER 4

Best Practices

Administrator Account Recommendations

You can create multiple administrator accounts of different types in a Pillar Axiom system. Additional accounts are not necessary, but they are useful. We recommend creating a dedicated account that is assigned the administrator 1 role for use with the Oracle Axiom Storage Connect plug-in. The use of the primary system administrator account for the plug-in is not recommended.

Refer to the *Pillar Axiom Administrator's Guide* for details about administrator accounts.

Related concepts

- *About Pillar Axiom Administrator Accounts*
- *About Adding Pillar Axiom Systems to Oracle VM*
- *About Pillar Axiom Administrator Accounts*
- *Modifying Physical Disks Outside of Oracle VM*
- *Provisioning Pillar Axiom Storage for Oracle VM Server*

Related references

- *TCP Port Assignments*
- *Oracle Axiom Storage Connect System Requirements*
- *Pillar Axiom System Optimal Workload Configuration*
- *Review Event Logs*
- *Mapping Oracle Terms to Pillar Axiom Terms*

Related tasks

- *Download the Oracle Axiom Storage Connect Plug-In Installer*
- *Install the Oracle Axiom Storage Connect Plug-In*
- *Update the Oracle Axiom Storage Connect Plug-In*
- *Remove Oracle Axiom Storage Connect Plug-In (Optional)*
- *Add a Pillar Axiom System to Oracle VM*
- *Log In to the Oracle VM Manager*
- *Log Out of the Oracle VM Manager*
- *Access Storage in Oracle VM*

Modifying Physical Disks Outside of Oracle VM

When you make changes to Pillar Axiom physical disks and clone physical disks that were created through the Oracle VM Manager graphical user interface (GUI), 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 Pillar Axiom 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 Pillar Axiom system is visible in Oracle VM Manager, it should be modified using the Pillar Axiom CLI and Pillar Axiom GUI, not the Oracle VM Manager.

There are many physical disk properties you can specify 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 GUI.

For detailed information about the available property options, see the *Pillar Axiom CLI Reference Guide*.

Related concepts

- *Administrator Account Recommendations*
- *Provisioning Pillar Axiom Storage for Oracle VM Server*
- *About Creating Pillar Axiom Physical Disks*

Related references

- *Pillar Axiom System Optimal Workload Configuration*
- *Review Event Logs*
- *Mapping Oracle Terms to Pillar Axiom Terms*

Related tasks

- *Modify a Pillar Axiom Physical Disk*

Provisioning Pillar Axiom Storage for Oracle VM Server

To optimize your storage performance and avoid potential bottlenecks between Pillar Axiom storage and Oracle VM, we recommend you follow the established provisioning guidelines.

Refer to the *Pillar Axiom Administrator's Guide* for information and instructions about provisioning Pillar Axiom storage for optimal performance. Use the search terms *storage profile* to find information about predefined storage profiles for applications.

Related concepts

- *Administrator Account Recommendations*
- *Modifying Physical Disks Outside of Oracle VM*

Related references

- *Pillar Axiom System Optimal Workload Configuration*
- *Review Event Logs*
- *Mapping Oracle Terms to Pillar Axiom Terms*

Pillar Axiom System Optimal Workload Configuration

To optimize your storage performance and avoid potential bottlenecks with Pillar Axiom systems, we recommend you follow these optimal workload configuration guidelines.

Configure the following Quality of Service (QoS) parameters for each type of Oracle VM workload:

Operating system disks	○ Priority level: High ○ Access type: Random ○ I/O bias: Read
Swap space	○ Priority level: Medium ○ Access type: Sequential ○ I/O bias: Mixed
Applications with typical workloads	○ Priority level: Premium ○ Access type: Sequential ○ I/O bias: Mixed
Applications with high transactional writes	○ Priority level: Premium ○ Access type: Random ○ I/O bias: Write

Related concepts

- *Administrator Account Recommendations*
- *Modifying Physical Disks Outside of Oracle VM*
- *Provisioning Pillar Axiom Storage for Oracle VM Server*

APPENDIX A

Glossary

Oracle Axiom Storage Connect Glossary

Access group Access groups are the host servers that can interact with (or be aware of) a specific physical disk or mount a file system. Access groups correspond to Storage Area Network (SAN) hosts or Internet Small Computer Systems Interface (iSCSI) hosts.

Clone physical disk A point-in-time, thin-provisioned read-write, partial-block snapshot of a physical disk that you intend to split from the original physical disk for immediate access. A clone physical disk retains the same Quality of Service (QoS) parameters as the source physical disk and consumes storage capacity from the clone physical disk repository that was allocated for the source physical disk.

Storage array Any block-based storage device, including Fibre Channel (SAN), Ethernet (iSCSI), or direct connect-based (Small Computer Systems Interface (SCSI), Serial Attached Storage (SAS), and Direct Attached Storage (DAS)) devices.

Storage element Refers to any type of storage that the storage array supports. For example, physical disks, clones, and so on.

Storage server Refers to either a SAN or Network Attached Storage (NAS) server, depending on the type of plug-in.

Volume group An object that is used to organize filesystems and physical disks. Volume groups can be nested.

APPENDIX B

Terminology Differences

Mapping Oracle Terms to Pillar Axiom Terms

This appendix describes the differences in terminology used between the Oracle VM and Pillar Axiom system interfaces.

Table 6 Mapping Oracle terms to Pillar Axiom terms

Oracle VM terms	Pillar Axiom 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 graphical user interface (GUI) because the Oracle Axiom Storage Connect

Table 6 Mapping Oracle terms to Pillar Axiom terms (continued)

Oracle VM terms	Pillar Axiom terms	Notes
		plug-in removes the prefix before returning the name to Oracle VM.
Split clone	None	Pillar Axiom clones cannot be separated from their parent and still retain the same ID. Split clones are not supported.
Storage array	Pillar Axiom SAN systems	
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 Axiom Storage Connect.

Related concepts

- *About Managing Pillar Axiom Physical Disks*
- *About Managing Pillar Axiom Clone Physical Disks*
- *About Access Groups*
- *About Volume Groups*
- *Administrator Account Recommendations*
- *Modifying Physical Disks Outside of Oracle VM*
- *Provisioning Pillar Axiom Storage for Oracle VM Server*

APPENDIX C

Known Issues

Known Issues

There are a number of issues related to Oracle VM, the Pillar Axiom system, and the Oracle Axiom Storage Connect plug-in.

The following issues are known at the time of this release:

Table 7 Known issues

Issue	Workaround or planned fix
[70035] Although the Pillar Axiom system supports both Fibre Channel (FC) and iSCSI connections, it cannot be registered as both a SAN Storage Array and iSCSI Storage Array.	This is an Oracle VM limitation. You must register the Pillar Axiom system as either a FC or iSCSI storage array, but not both. No workaround or fix is planned.
[70677] Display of used capacity differs in the Oracle VM Manager and Pillar Axiom system's graphical user interface (GUI).	The capacity values displayed in Oracle VM Manager will match the values in the Pillar Axiom CLI more accurately than those in the Pillar Axiom GUI. This issue is due to the way Oracle VM reports capacities. To see the capacity information in the CLI, issue the command: `system -list -details -storage`
[70164] When attempting to delete a physical disk that has one or more clones, Oracle VM and Oracle Storage Connect will not complete the task.	Delete any clones before attempting to delete the physical disk itself. This issue is planned to be fixed in Oracle VM 3.0.3.
[70659] The Oracle VM Info tab page, which displays the configuration of a registered Pillar Axiom system,	The Pillar Axiom system does not support clone splitting.

Table 7 Known issues (continued)

Issue	Workaround or planned fix
erroneously indicates that Synchronous clone splitting is supported by the system.	This reporting of support is planned to be fixed in Oracle VM 3.0.3.
[70676] When a Pillar Axiom system is first registered with Oracle VM, the system is queried for information such as its name, model, description, location, contact name, and so on. If any of these are subsequently modified on the Pillar Axiom system, Oracle VM will not reflect these changes, even if the system is refreshed in Oracle VM.	This is a known issue in Oracle VM. No known workaround or fix exists at this time.
[70721] When removing the last initiator from an access group, Oracle VM Manager will falsely report a failed operation. However, the initiator is correctly removed from the access group on the Pillar Axiom system.	This is a known issue in Oracle VM. After the task has displayed a Failed status, refresh the storage array to sync the Oracle VM Manager data with the Pillar Axiom system. The access group will no longer appear in the access group list because all relevant initiators have been removed. This issue is planned to be fixed in Oracle VM 3.0.3.
[70722] If an access group contains initiators on the Pillar Axiom system prior to registering the storage array in Oracle VM Manager, the access group will be listed without containing the initiators after registration.	This is a known issue in Oracle VM. For Oracle VM Manager to associate its initiators with the correct access group, edit the access group through Oracle VM and manually add the initiators. Refreshing the storage array afterwards will complete the syncing process.
[70824] Initiators added to an access group after a physical disk has been presented to Oracle VM will not have that physical disk automatically presented to the new initiators. However, if another physical disk is presented to the group, all of the initiators will be displayed, including the newly added initiators.	Create the access group with all of the initiators before presenting to one or more physical disks.

Table 7 Known issues (continued)

Issue	Workaround or planned fix
[70763 and 70784] Oracle VM 3.0.2 has limited support for editing the properties of a physical disk. The only property that can be modified is the physical disk size. Although the Oracle VM edit dialog allows you to specify a new name, extra information, and description, any values entered for those items are ignored.	This is an Oracle VM limitation. No known workaround or fix exists at this time. Modifying the Extra Information field is planned to be fixed in Oracle VM 3.0.3 and a future release of the plug-in.
[70930] It is possible to assign an initiator that is already associated to an access group to a different access group. This action may cause unintended side effects with physical disk presentation.	This issue will be fixed in a future release of the plug-in.

Related concepts

- *About Creating Pillar Axiom Physical Disks*

Related tasks

- *Add a Pillar Axiom System to Oracle VM*
- *Create a Pillar Axiom Physical Disk*
- *Present/Unpresent a Physical Disk to an Access Group*

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