Pillar Axiom vSphere Plug-In

User's Guide

ORACLE

PILLAR AXIOM

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Preface

Related Documentation

Information resources for Pillar Axiom systems:

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

For details about your VMware vSphere environment, refer to the vSphere documentation available on the VMware website at VMware Documentation (http://www.vmware.com).

Typographical Conventions

Table 1 Typography to mark certain content

Convention	Meaning
italics	Within normal text, words in italics indicate one of the following: • 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.

Table 1 Typography to mark certain content (continued)

Convention	Meaning
>	Indicates a menu item or a navigation path in a GUI. For example, “Click **Storage** > **Clone LUNs**” means to click the **Clone LUNs** link on the **Storage** page in the GUI.
...	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	http://www.oracle.com/support/index.html
Training	https://education.oracle.com
Documentation	• Oracle Technical Network: http://docs.oracle.com • From the Pillar Axiom Storage Services Manager (GUI): **Support** > **Documentation** • From Pillar Axiom 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
Contact Oracle	http://www.oracle.com/us/corporate/contact/index.html

CHAPTER 1

Introduction to the Pillar Axiom vSphere Plug-In

About Virtualization Plug-In Integration

The Pillar Axiom vSphere Plug-In integrates access to your Pillar Axiom systems with VMware vSphere and VMware vCenter Server. You can view, provision, and manage your Pillar Axiom system in the vSphere Client.

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 to 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 you could be switching between multiple storage application interfaces.

The Pillar Axiom vSphere Plug-In makes it easy to view and manage your storage without leaving the vSphere Client. The plug-in provides an additional tab in the vSphere Client to view Pillar Axiom storage and additional menus to manage your Pillar Axiom systems. The Pillar Axiom tab permits you to view details of your Pillar Axiom systems, and context menus make it possible to provision and manage Pillar Axiom storage objects. These features enable you to more easily map your datacenters and VMs to your physical storage and perform common storage management tasks.

Related concepts

- *About the VMware vSphere Environment*
- *VMware vSphere Product Overview*
- *About the Pillar Axiom vSphere Plug-In*

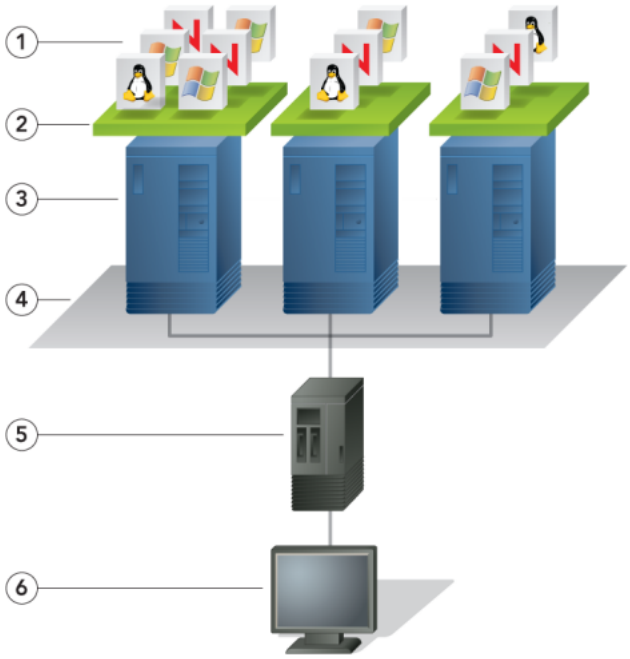
About the VMware vSphere Environment

The VMware vSphere environment makes it possible to manage disparate physical infrastructure in a datacenter as virtual pools of resources (processors, memory, storage, and networking).

The vSphere environment is made up of a number of software component layers and VMware applications. There are many VMware applications you can add to the vSphere environment to provide virtual machine (VM) and disk migration, load balancing, fault tolerance, high availability, backups, and distributed networking.

Each physical host in a vSphere environment runs the VMware ESX 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 vSphere environment are aggregated into pools of functional resources. These functional resources can be allocated (or assigned) to specific VMs and applications as needed.

Figure 1 VMware vSphere environment



Legend

1. VMs	4. Datacenter
2. Virtualization layer	5. vCenter Server
3. Host running ESX	6. vSphere Client

The ESX hosts use their network connections to access storage and to enable remote management. While it is possible to use a vCenter Server to administer a single ESX host, it is more typical for a vCenter Server to be used to administer a set of ESX hosts and their VMs.

For information about vCenter Server and vSphere, refer to the VMware Documentation (http://www.vmware.com/support/pubs/).

Related concepts

- *About Virtualization Plug-In Integration*
- *VMware vSphere Product Overview*
- *About the Pillar Axiom vSphere Plug-In*

VMware vSphere Product Overview

The VMware vSphere environment is composed of vSphere, ESX, and vCenter Server products. The Pillar Axiom vSphere Plug-In integrates Pillar Axiom systems with those products.

The Pillar Axiom vSphere Plug-In interacts with the following vSphere products:

VMware vSphere Client

A cloud-enabled 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).

VMware ESX and VMware ESXi

A virtualization layer run on physical servers that abstracts physical processor, memory, storage, and resources into logical resources that are then presented as multiple VMs. The physical machine becomes the host for VMs. The physical machine is thereafter referred to as a VM host or ESX host. Two versions of ESX are available, ESX and ESXi.

Note: Throughout this document, when ESX is stated, it applies to both ESX and ESXi.

VMware vCenter Server

A single Windows service that performs administrative functions for the ESX and ESXi hosts that are connected on a network. The vCenter Server directs the actions on the VMs and the VM hosts (ESX hosts).

The vCenter Server is installed to run automatically. The vCenter Server runs continuously in the background, performing its monitoring and managing activities. The vCenter Server runs even when no vSphere Clients are connected, and even if nobody is logged on to the computer where the vCenter Server resides. The vCenter Server must have network access to all the hosts it manages and be available for network access from any machine where the vSphere Client is run.

Multiple vCenter Server systems can be joined together using Linked Mode to allow them to be managed using a single vSphere Client connection.

VMware vSphere Client	The interface to vCenter Server, ESX and ESXi hosts, and VMs. The vSphere Client is installed on a Windows machine with network access to the vCenter Server system installation. While all vCenter Server activities are performed by a vCenter Server system, the administrator uses the vSphere Client to monitor, manage, and control the server. A single vCenter Server system can support multiple, simultaneously connected vSphere Clients.

For more information about vCenter Server and vSphere, refer to the VMware Documentation (http://www.vmware.com/support/pubs/).

Related concepts

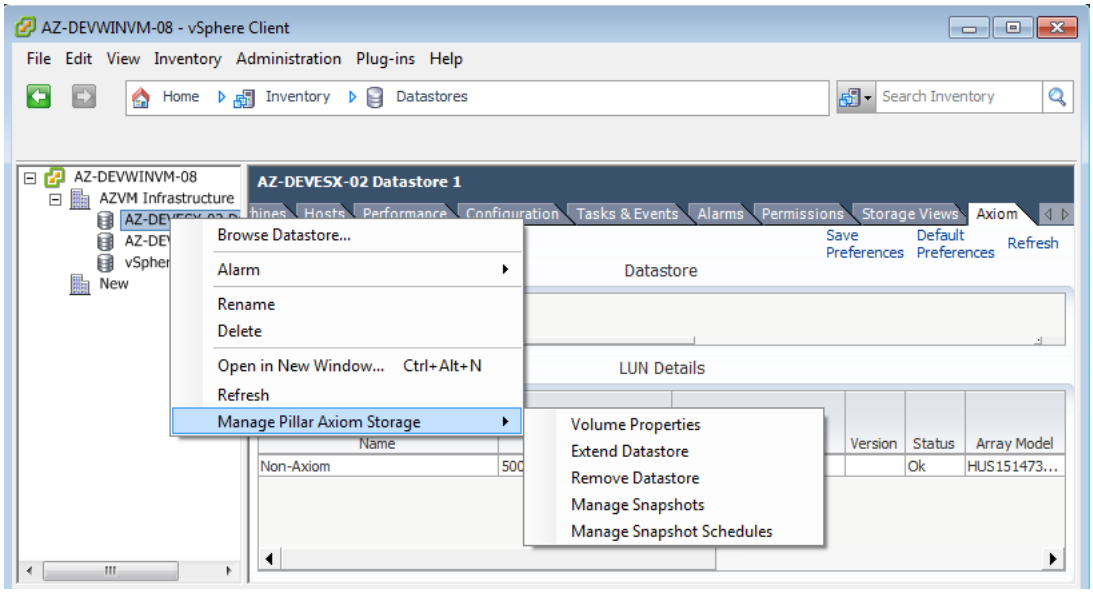
- *About Virtualization Plug-In Integration*
- *About the VMware vSphere Environment*
- *About the Pillar Axiom vSphere Plug-In*

About the Pillar Axiom vSphere Plug-In

The Pillar Axiom vSphere Plug-In permits you to access your Pillar Axiom storage and other storage through the vSphere Client.

Installing the Pillar Axiom vSphere Plug-In adds an Axiom tab and additional menus to the vSphere Client.

Figure 2 Pillar Axiom elements in the vSphere Client



The windows used for Pillar Axiom LUN creation and modification are similar to those of the Pillar Axiom management application, Pillar Axiom Storage Services Manager.

The installer for the Pillar Axiom vSphere Plug-In includes all software dependencies. No other software is required besides the VMware vCenter Server and the vSphere Client.

The Pillar Axiom vSphere Plug-In gives you access to the following functionality through the vSphere Client:

- View underlying data storage for hosts, virtual machines (VMs), and VMs (datastores).
- Create datastores on existing or new Pillar Axiom LUNs.
- View, create, modify, and delete LUNs.
- View, SAN hosts, Host Groups, Volume Groups, and Storage Domains.

- Create snapshots of datastores on Pillar Axiom storage, and recover data from snapshots.

Related concepts

- *About Virtualization Plug-In Integration*
- *About the VMware vSphere Environment*
- *VMware vSphere Product Overview*

Pillar Axiom vSphere Plug-In System Requirements

Make sure your environment meets the necessary hardware, software, and management networking requirements before you install and use the Pillar Axiom vSphere Plug-In with the VMware vCenter Server and vSphere Client.

Check the Pillar Axiom vSphere Plug-In Release Notes for any recent requirements or issues.

Related references

- *License Requirements*
- *Hardware Requirements*
- *Software Requirements*
- *Management Networking Requirements*

License Requirements

User licenses for VMware vCenter Server and vSphere are required.

You receive the VMware software licenses when you purchase the software from VMware. No additional Pillar Axiom licenses are required to use the Pillar Axiom vSphere Plug-In.

Hardware Requirements

The VMware vSphere and VMware vCenter Server must meet specific hardware requirements.

The server on which vCenter Server is installed must be a physical machine or virtual machine with access to a supported database. The vSphere Client machines must also meet specific hardware requirements.

The vCenter Server and vSphere Client hardware requirements can be found on the VMware website at VMware Documentation (http://www.vmware.com/support/pubs/).

Software Requirements

The VMware vSphere and VMware vCenter Server support the use of various software and operating system versions, and the Pillar Axiom vSphere Plug-In

has specific Pillar Axiom system software requirements. To use the Pillar Axiom vSphere Plug-In with the vSphere Client and vCenter Server, ensure that the Pillar Axiom systems, VMware products, and operating systems in your environment meet these requirements.

Required Pillar Axiom Software	Release 5: version 5.4 or later.
Required VMware Software	○ VMware ESX and ESXi versions 4.0, 4.1, and 5.0 ○ VMware vCenter Server versions 4.0, 4.1, and 5.0 ○ VMware vSphere Client versions 4.0, 4.1, and 5.0
Operating Systems	The Pillar Axiom vSphere Plug-In works with any of the Windows operating systems supported by the vCenter Server software. Refer to the VMware Documentation (http://www.vmware.com/support/pubs/) for the required operating system versions.

Management Networking Requirements

The host on which the Pillar Axiom vSphere Plug-In software is installed requires a secure TCP/IP connection for communication with the Pillar Axiom Pilot management controller.

To connect the control path, the network configuration must allow the vCenter Server host on which the plug-in is running to connect to TCP port 8083 on the Pilot Ethernet management interface. The plug-in communicates over HTTPS on this port with the WebCLI service running on the Pilot.

All other necessary ports can be configured during the TCP port assignment phase of the Pillar Axiom vSphere Plug-In installation.

Related references

- *Port Assignments*

CHAPTER 2

Install the Pillar Axiom vSphere Plug-In

About the Installation Process

Install the Pillar Axiom vSphere Plug-In with the application installer, which you can download from the Oracle Technology Network.

Install the plug-in onto the same host that contains the vCenter Server. We recommend that you install the plug-in in the default folder.

After the plug-in is installed, you can view your Pillar Axiom systems in the vSphere Client.

Related tasks

- *Download the vSphere Plug-In Software*
- *Install the Pillar Axiom vSphere Plug-In*
- *Update the Pillar Axiom vSphere Plug-In*
- *Verify the Pillar Axiom vSphere Plug-In Version*
- *Remove the Pillar Axiom vSphere Plug-In (Optional)*

Download the vSphere Plug-In Software

Download the software installation package from the Oracle Technical Network.

Prerequisite: Join the Oracle Technology Network (http://www.oracle.com/technetwork/community/join/why-join/index.html) to gain access to software and documentation downloads.

The software and documentation comes in a single archive package.

1. On the Oracle Technology Network, open the Pillar Axiom Downloads page (http://www.oracle.com/technetwork/server-storage/san-storage/downloads/index.html) in your browser.
2. Under the Pillar Axiom Downloads title, select **Accept License Agreement** to be able to download the software package.
3. Click 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 any documentation for the software.

After you download the software, you can install it on your system.

Related concepts

- *About the Installation Process*

Related tasks

- *Install the Pillar Axiom vSphere Plug-In*
- *Update the Pillar Axiom vSphere Plug-In*
- *Verify the Pillar Axiom vSphere Plug-In Version*
- *Remove the Pillar Axiom vSphere Plug-In (Optional)*

Install the Pillar Axiom vSphere Plug-In

Install the Pillar Axiom vSphere Plug-In on your vCenter Server host.

Prerequisites: You must obtain the following information about the Windows server upon which the vCenter Server is installed before you perform the installation. Otherwise, you cannot complete the installation.

- vCenter Server DNS name or its IP address
- vCenter Server username and password for the plug-in to authenticate with the vCenter Server
- Shutdown Port, HTTP Port, and HTTPS Port numbers available for the plug-in to use

Contact your IT department for this information.

1. Log in to the vCenter Server upon which you want to install the plug-in.
2. Extract the contents of the downloaded software archive to the vCenter Server.
3. Double-click the executable file you extracted.
4. When the setup wizard appears, click **Next** and follow the instructions for the license agreement.
5. Configure the plug-in to work with the vCenter Server. Provide the following information and then click **Next**.
   - Fully-qualified name or IP address of the vCenter Server
   - Username and password for the vCenter Server
   - Port numbers for the **Shutdown Port**, **HTTP Port**, and **HTTPS Port** fields
   - A new password for the keystore used to facilitate HTTPS communication between the vSphere Client and the plug-in
6. Follow the instructions to accept the default installation location and run the installation process.
7. When the installation completes, click **Finish**.
8. Restart the vSphere Client from which you intend to manage your Pillar Axiom systems.

Result:
When you launch the vSphere Client, the Axiom tab and context menus appear in the vSphere Client.

After you install the plug-in, create the recommended administrative accounts.

Related concepts

- *About Pillar Axiom vSphere Plug-In Registration*
- *About the Installation Process*

Related tasks

- *Download the vSphere Plug-In Software*
- *Update the Pillar Axiom vSphere Plug-In*
- *Verify the Pillar Axiom vSphere Plug-In Version*
- *Remove the Pillar Axiom vSphere Plug-In (Optional)*

Port Assignments

You can change the default port assignments during the Pillar Axiom vSphere Plug-In installation.

The ports shown in the following table are used for all communications between the plug-in, the vCenter Server, and the Pillar Axiom system. These ports permit the vCenter Server and the vSphere Client to connect to and communicate with the plug-in.

You can change any of the default port numbers if they are in use by other software.

Table 3 Default port numbers

Port type	Port Number	Description
Shutdown Port	8006	The server on which the plug-in is installed uses this port to listen for a shutdown command. Proper configuration of this port is required for the installation to succeed.
HTTP Port	8084	The port on which the plug-in listens for HTTP requests.
HTTPS Port	8446	The port on which the plug-in listens for HTTPS requests.

HTTPS WebCLI Port	8083	The port on which the plug-in communicates with the Pillar Axiom WebCLI service running on the Pilot. This port cannot be configured during installation.
		Use the following Axiom CLI command to verify that this service is enabled:
		`axiomcli webcli -list`
		If necessary, use the following Axiom CLI command to enable the service:
		`axiomcli webcli -enable`

Related references

- *Management Networking Requirements*

Update the Pillar Axiom vSphere Plug-In

When a new version of the Pillar Axiom vSphere Plug-In software is available, you can update your version of the plug-in software.

Prerequisites: You must obtain the following information about the Windows server upon which the vCenter Server is installed before you perform the installation. Otherwise, you cannot complete the installation.

- vCenter Server DNS name or its IP address
- vCenter Server username and password for the plug-in to authenticate with the vCenter Server
- Shutdown Port, HTTP Port, and HTTPS Port numbers available for the plug-in to use

Contact your IT department for this information.

1. Follow the instructions to remove the previous version of the plug-in software.

   Note: If you are updating from a previous 3.x version of the plug-in, removal is not necessary. You can install the update over the previous version. Follow the instructions for verifying the version of the plug-in to determine the version you are using.

2. Follow the instructions to download the update installation package from the Oracle Technology Network and extract the contents to the host containing the vCenter Server.
3. Follow the instructions to install the update version of the plug-in software on the host containing the vCenter Server.
4. Restart the vSphere Client from which you intend to manage your Pillar Axiom storage.

   Result:
   When you launch the vSphere Client, the Axiom tab and context menus appear in the vSphere Client.

Related concepts

- *About the Installation Process*

Related tasks

- *Download the vSphere Plug-In Software*
- *Install the Pillar Axiom vSphere Plug-In*
- *Verify the Pillar Axiom vSphere Plug-In Version*
- *Remove the Pillar Axiom vSphere Plug-In (Optional)*

Remove the Pillar Axiom vSphere Plug-In (Optional)

You can uninstall the Pillar Axiom vSphere Plug-In software from the host running the vSphere Client if you no longer need it.

Prerequisite: Close the vSphere Client before you remove the plug-in software.

Uninstalling the plug-in removes all traces of the software.

1. From the Windows **Start** menu select **Settings** > **Control Panel** > **Add or Remove Programs**.
2. From the **Add or Remove Programs** dialog, select the Pillar Axiom vSphere Plug-In software program, and click **Remove**.

   Result:
   The plug-in functionality is removed from the vSphere Client, but the plug-in remains in the Plug-in Manager list.

To remove the plug-in from the Plug-in Manager, you need to remove it from the vCenter Server. Go to the VMware Knowledge Base (http://kb.vmware.com) and search for Article 1025360.

Related concepts

- *About the Installation Process*

Related tasks

- *Download the vSphere Plug-In Software*
- *Install the Pillar Axiom vSphere Plug-In*
- *Update the Pillar Axiom vSphere Plug-In*
- *Verify the Pillar Axiom vSphere Plug-In Version*

CHAPTER 3

Configure the Environment

About Pillar Axiom vSphere Plug-In Registration

During the Pillar Axiom vSphere Plug-In installation, the plug-in registers with the vCenter Server, so no separate registration action is required.

Related tasks

- *Install the Pillar Axiom vSphere Plug-In*

About Connected Pillar Axiom Systems

Pillar Axiom systems must be connected to the vSphere environment for you to be able to view and manage them.

Besides the physical connection of the Pillar Axiom system to the vSphere environment, the vSphere software only becomes aware that a Pillar Axiom system is connected under the following circumstances:

- There is already a Pillar Axiom LUN mapped to that ESX host.
- You manually add a Pillar Axiom system.
- From the Pillar Axiom system, you present at least one LUN to a vSphere-managed ESX host.

Note: If you change the IP address of a Pillar Axiom system, you must reboot the ESX host to which the associated LUNs are mapped. Otherwise, the Pillar Axiom system will fail to authenticate.

Pillar Axiom systems that are connected to the vSphere environment are listed in the Axioms tab in the Axiom tab for hosts. You connect a Pillar Axiom system to the vSphere environment in the Select Axiom page that appears when you right-click an ESX host in the vSphere inventory tree and select a management task from the **Manage Axiom Storage** context menu.

Related tasks

- *Add a Pillar Axiom System to vSphere*

Add a Pillar Axiom System to vSphere

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

Prerequisite: Administrator credentials to enable access to the Pillar Axiom system.

1. In the vSphere inventory tree, right-click the ESX host you want to associate with the new Pillar Axiom system.
2. Select a **Manage Axiom Storage** task from the context menu.

   Example:
   Click **Manage Axiom Storage** > **Manage LUNs**.

   Result:
   A dialog shows the Pillar Axiom systems associated with the host.
3. In the dialog that shows the associated Pillar Axiom systems, right-click and select **Add Axiom**.
4. In the **Add Axiom** dialog, enter the following information for the Pillar Axiom system:
   - **IP Address**
   - **Login Name**
   - **Password**

   You need to obtain this information from your Pillar Axiom system administrator.
5. Click **OK**.

   Result:
   The new Pillar Axiom system appears in the list of associated Axioms.

Related concepts

- *About Connected Pillar Axiom Systems*

About Pillar Axiom Administrator Accounts

We recommend creating a unique Administrator 1 account as the operator account for the Pillar Axiom vSphere Plug-In.

You can create multiple administrator accounts in a Pillar Axiom system. Additional accounts are not necessary, but they are useful as good practice.

Someone with Administrator 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. We do not recommend using the Primary Administrator account as the plug-in operator account.

You can create additional accounts for other operators We recommend assigning Administrator 1 or Administrator 2 privileges to any additional operator accounts.

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

Related concepts

- *About Pillar Axiom Administrator Accounts*

About Pillar Axiom Credentials

You need to provide administrator login credentials to access a Pillar Axiom system in the vSphere Client.

You can enable access to a Pillar Axiom system by providing Pillar Axiom credentials when you select one of the following:

- The Axiom tab for an ESX host
- Any management task in the context menu displayed for a host or datacenter
- Any management task in the context menu displayed for a datastore

Enable Axiom Access from the Axiom Tab

You can enable access to a Pillar Axiom system by providing Pillar Axiom credentials when you select an Axiom in the Axioms tab for an ESX host.

Prerequisite: Administrator credentials to enable access to the Pillar Axiom system.

1. From the vSphere menu bar, select **Inventory** > **Host and Clusters**.
2. In the vSphere Inventory pane, select the host that contains the Pillar Axiom system you want to access.
3. Click the Axiom tab.
4. In the Axiom tab, select the **Axioms** tab.

   Result:
   All the Pillar Axiom systems associated with the selected host appear in the Axioms tab.
5. Right-click the Pillar Axiom system you want to access and select **Authenticate**.
6. In the Authenticate dialog, enter the administrator credentials in the **Login Name** and **Password** fields, and click **OK**.

   Result:
   If the credentials are authenticated, the success dialog displays. If the credentials do not authenticate, you are again prompted for credentials.

Make certain that you have the correct credentials for the selected Pillar Axiom system.

Enable Axiom Access from a Host or Datacenter

You can enable access to a Pillar Axiom system by providing Pillar Axiom credentials when you select a management task from the context menu displayed for a host or datacenter.

Prerequisite: Administrator credentials to enable access to the Pillar Axiom system.

In the vSphere Client, Pillar Axiom systems can be associated with datacenters or hosts. When you select a management task from the context menu for a host or datacenter, you are prompted to select an Axiom and provide credentials to enable access to that Axiom.

1. In the vSphere inventory tree, right-click the datacenter or ESX host with which the Pillar Axiom system is associated.
2. Select a **Manage Axiom Storage** task from the context menu.

   Example:
   Click **Manage Axiom Storage** > **Manage LUNs**.

   Result:
   A dialog shows the Pillar Axiom systems associated with the host or datacenter.
3. In the dialog that shows the associated Pillar Axiom systems, right-click the Pillar Axiom system with which you want to work, and select **Authenticate**.
4. In the **Authenticate** dialog, enter the administrator credentials in the **Login Name** and **Password** fields, and click **OK**.

   Result:
   If the credentials are authenticated, the success dialog displays. If the credentials do not authenticate, you are again prompted for credentials. Make certain that you have the correct credentials for the selected Pillar Axiom system.
5. When access is enabled, select the Pillar Axiom system and click **Next**.

Enable Axiom Access from a Datastore

You can enable access to a Pillar Axiom system by providing Pillar Axiom credentials when you select a datastore.

Prerequisite: Administrator credentials to enable access to the Pillar Axiom system.

Pillar Axiom systems can be associated with datastores. When you select a management task from the context menu for a datastore associated with a Pillar Axiom system, you will be prompted for login credentials for that Axiom.

1. In the vSphere inventory tree, right-click the datastore with which the Pillar Axiom system is associated.
2. Select a **Manage Axiom Storage** task from the context menu.

   Example:
   Click **Manage Axiom Storage** > **Volume Properties**.

   Result:
   The Axiom Authentication dialog prompts you for credentials for the Pillar Axiom system associated with the host or datacenter.
3. Enter the administrator credentials in the **Login Name** and **Password** fields, and click **Next**.

   Result:
   If the credentials are authenticated, the management task dialog displays. If the credentials are not authenticated, you are again prompted for credentials. Make certain that you have the correct credentials for the Pillar Axiom system.

About User Preferences

You can change the display of details in an Axiom tab by setting the user preferences for the tab.

The details that appear in the Axiom tab can be modified to suit your needs. You can modify the details to determine the appearance of items in the display tables. Possible options:

- Set which details to display.

  For example, if block size is not displayed, you can choose to show or hide the Block Size column.

- Sort the details in ascending or descending order.

  For example, if Axiom and non-Axiom LUNs are mixed together in the Vendor Name column, you can change the sort order of the column to list the Pillar LUNs separately from the non-Axiom LUNs.

- Set the column width so that the system will automatically resize the column to fit its contents.

  For example, if the length of a line exceeds the column width, you can increase the width of the column to display the entire line.

- Change the position of the column headings by dragging and dropping the headings to different locations.

  For example, if you want to see the capacity of a datastore displayed before the datastore name, you can drag the Capacity column heading to the first position in the table.

You can save user preferences so that your changes are still in effect the next time you login, or you can revert back to the default settings.

Note: You cannot save the sort order of a column.

Related tasks

- *Modify and Save User Preferences*

Modify and Save User Preferences

You can set user preferences to modify the appearance of an Axiom tab.

The details that appear in the Axiom tab can be modified to suit your needs. You can determine which details to display in the tables, the order of columns in the tables, and the order of items in each table column.

1. Select a host, a virtual machine (VM), or a datastore in the vSphere Inventory pane.
2. Click the Axiom tab.
3. Choose from the following options to modify the details that are displayed:
   - Click and drag a column heading to move the column to a new location.
   - Click the up or down arrow beside a column heading to change the sort order of items in the column.
   - Right-click an item in the displayed table and select **Show/Hide Columns** to choose which columns to display.

   Result:
   The changes occur after you make each modification.
4. Click **Save Preferences**.

   Result:
   The settings are saved and persist until further changes are made.

   Note: You cannot save the sort order of a column.
5. (Optional) If you want to revert back to the default display settings, click **Default Preferences**.

Related concepts

- *About User Preferences*

Verify the Pillar Axiom vSphere Plug-In Version

You can verify the version of the Pillar Axiom vSphere Plug-In software in the vSphere Plug-in Manager.

The vSphere Client has a built-in feature called Plug-in Manager. The Plug-in Manager displays the plug-ins that are installed in that instance of the vSphere Client. You can view information about each plug-in, including the plug-in name, vendor, version, status, progress, and errors. Checking the status and errors information is helpful if you encounter connection problems.

1. From the vSphere menu bar, click **Plug-ins > Manage Plug-ins**.
2. From the **Plug in Manager** dialog, select the Pillar Axiom vSphere Plug-In.
3. Check the version displayed.

Related concepts

- *About the Installation Process*

Related tasks

- *Download the vSphere Plug-In Software*
- *Install the Pillar Axiom vSphere Plug-In*
- *Update the Pillar Axiom vSphere Plug-In*
- *Remove the Pillar Axiom vSphere Plug-In (Optional)*

CHAPTER 4

Access Pillar Axiom Storage

Log In to the vSphere Client

The vSphere Client is the interface to the vCenter Server, ESX hosts, virtual machines (VMs), and datastores. You log in to the vCenter Server with the vSphere Client.

Prerequisite: The vSphere Client software package must already be installed on your client workstation.

When you launch the vSphere Client and log in, you are using the vSphere Client to log in to the vCenter Server.

1. Launch the vSphere Client application.

   Result:
   The VMware vSphere Client login dialog appears.

2. In the **IP Address / Name** field, enter either the IP address or name of the host upon which the vCenter Server is installed.

3. Enter the login credentials for the vCenter Server.

4. Click **Login**.

   Result:
   The vSphere Client opens to the vSphere **Hosts & Clusters** view, or the last page you visited when you last logged off.

Related concepts

- *About Accessing Pillar Axiom Storage in vSphere*
- *About the vSphere Plug-In Certificate*

Log Out of the vSphere Client

The Pillar Axiom vSphere Plug-In has no specific log off operation. When you exit the vSphere Client application, you log out from the plug-in.

When you have completed working with Pillar Axiom systems in the vSphere Client, we recommend that you exit the application. Otherwise, an unauthorized user may gain access to the Pillar Axiom system from your workstation.

1. In the vSphere Client menu, select **File** > **Exit**.

   Result:
   The vSphere Client closes.

Related concepts

- *About Accessing Pillar Axiom Storage in vSphere*
- *About the vSphere Plug-In Certificate*

About Accessing Pillar Axiom Storage in vSphere

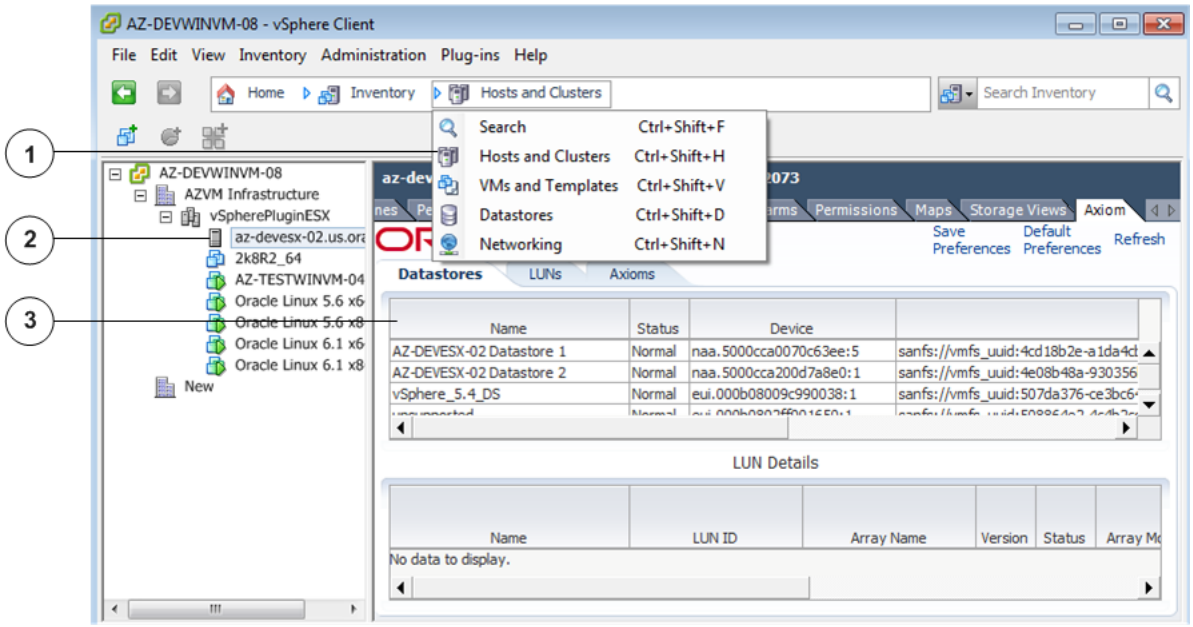
The Axiom tab in the vSphere Client provides a view of storage utilization in your Pillar Axiom system. The **Manage Pillar Axiom Storage** context menus in the vSphere Client provide access to storage management functions for your Pillar Axiom system.

You can view your Pillar Axiom systems without any special account privileges, but to modify storage objects, you need to have the appropriate administrator level privileges.

The Axiom tab is visible when you select a host, virtual machine, or datastore in the Inventory pane for one of the following vSphere Client Inventory views:

- Hosts and Clusters
- VMs and Templates
- Datastores

Figure 3 vSphere inventory views



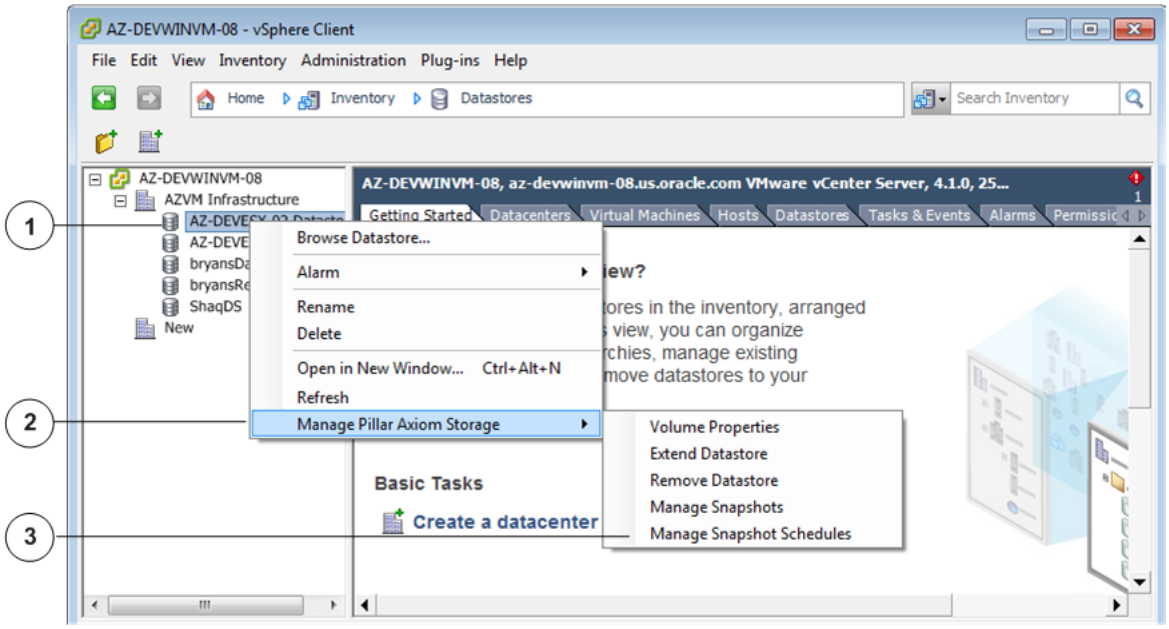
Legend
1. Inventory views drop-down list
2. Host selected in the Inventory pane
3. Axiom tab displayed in the content pane

To view your storage in relation to different storage objects, you select the appropriate Inventory view for that object.

- When you select a host in the Inventory pane, the Axiom tab displays detailed information about the datastores, LUNs, and Axioms associated with that host.
- When you select a virtual machine (VM) in the Inventory pane, the Axiom tab displays detailed information about the datastores and LUNs associated with that VM.
- When you select a datastore in the Inventory pane, the Axiom tab displays detailed information about the LUNs associated with that datastore.

You can manage storage objects in your Pillar Axiom systems by selecting management functions from one of the available context menus.

Figure 4 vSphere Client context menu for datastores



Legend
1. Datastore selected in the Inventory pane
2. Context menu
3. Management functions

The management function menu items that are available when you right-click a datacenter, host, or datastore in the inventory pane are listed in the following table.

Table 4 Manage Pillar Axiom Storage context menus

Datacenter	Host	Datastore
Manage LUNs	Manage LUNs	Volume Properties
Manage Volume Groups	Manage Volume Groups	Extend Datastore
Manage Storage Domains	Manage Storage Domains	Remove Datastore
Manage Host Groups	Manage Host Groups	Manage Snapshots
Create Datastore		Manage Snapshot Schedules
Manage Snapshot Schedules		

The first time you open the Pillar Axiom tab or click a Manage Pillar Axiom Storage management task, an “untrusted certificate” warning appears. To avoid seeing this warning, you need to install the certificate for the plug-in in a trusted certificate store. See the instructions for installing the certificate.

Related tasks

- *Log In to the vSphere Client*
- *Log Out of the vSphere Client*
- *View Pillar Axiom Storage in vSphere*
- *Manage Pillar Axiom Storage in vSphere*
- *Install the vSphere Plug-In Certificate*

View Pillar Axiom Storage in vSphere

The Axiom tab provides a detailed view of hosts, virtual machines (VMs), and datastores that contain Pillar Axiom storage content.

The Axiom tab is available only when you select a host, a VM, or a datastore in the vSphere Inventory pane.

1. On the vSphere navigation bar, click **Inventory**.
2. From the **Inventory** drop-down list, select one of the views from the options listed.

Result:
The content pane switches to the selected view.

3 Select a host, VM, or datastore in the Inventory pane.

Result:
The associated Axiom tab appears in the row of tabs above the content pane.

Note: An “untrusted certificate” warning appears the first time you click the Axiom tab. You need to click **Yes** to indicate that you trust the certificate for the Pillar Axiom vSphere Plug-In to work properly.

Related concepts

- *About Accessing Pillar Axiom Storage in vSphere*
- *About the vSphere Plug-In Certificate*

Manage Pillar Axiom Storage in vSphere

The **Manage Pillar Axiom Storage** menus enable you to manage Pillar Axiom storage content.

Manage Pillar Axiom Storage menus are available only when you right-click a datacenter, a host, or a datastore in the vSphere Inventory pane.

1 On the vSphere navigation bar, click **Inventory**.

2 From the **Inventory** drop-down list, select one of the views from the options listed.

Result:
The Inventory pane displays the objects that are available in the selected view.

3 Right-click the name of a datacenter, a host, or a datastore in the Inventory pane.

Result:
A context menu containing the **Manage Pillar Axiom Storage** menu item appears beside the name.

4 Position your cursor over the **Manage Pillar Axiom Storage** menu item to display the available management functions.

The management functions displayed depend on the type of object you right-clicked.

5 Select the management function you want to perform.

Result:
The appropriate wizard starts and guides you in performing the selected function.

Note: An “untrusted certifcate” warning appears the first time you click a Manage Pillar Axiom Storage management task. You need to click **Yes** to indicate that you trust the certificate for the Pillar Axiom vSphere Plug-In to work properly.

Related concepts

- *About Accessing Pillar Axiom Storage in vSphere*
- *About the vSphere Plug-In Certificate*

About the vSphere Plug-In Certificate

During installation, the Pillar Axiom vSphere Plug-in generates a self-signed certificate used to secure traffic between the vSphere Client and the vCenter Server.

The Common Name (CN) used for both the *issued to* and *issued by* parts of the certificate will match the vCenter Server name or IP address. Since these portions of the field are generated locally, they will not match the list of trusted issuers used by the browser embedded in the vSphere Client. Therefore, when you view the Axiom tab or click a Manage Pillar Axiom Storage Management task, a Security Alert dialog appears indicating the certificate is not trusted.

The certificate must be trusted in order to use the Pillar Axiom vSphere Plug-in. When the Security Alert dialog appears, you must click **Yes** to indicate that you trust the certificate. This indicates that you trust the certificate for the current session only. You can install the certificate in a trusted certificate store to keep this dialog from appearing each time you start the vSphere Client to use the plug-in.

Install the vSphere Plug-In Certificate

If you trust the Pillar Axiom vSphere Plug-In self-signed certificate, you need to install the certificate in a trusted certificate store to keep the Untrusted Certificate warning from appearing whenever you start the plug-in.

The first time you open the Pillar Axiom tab or click a Manage Pillar Axiom Storage management task, an Untrusted Certificate warning appears. You need to click **Yes** to indicate that you trust the certificate to use the plug-in in the current session. To keep this warning from appearing whenever you start the plug-in, you need to install the certificate in a trusted certificate store.

1. In the Security Alert dialog, click **View Certificate**.
2. In the Certificate window, click **Install Certificate**.
   Result:
   The Certificate Import Wizard starts.
3. Select the **Place all certificates in the following store** option and click **Browse**.
   Result:
   The Select Certificate Store window appears.
4. Select **Trusted root certificate authorities** > **Local Computer**.
5. Select the **Show physical stores** option and click **OK**.

6 Click **Next** and then **Finish** in the Certificate Import Wizard.

Result:
If the import is successful, the message `The import was successful` displays.

7 Click **OK**.

CHAPTER 5

View Pillar Axiom Storage

About Viewing Datastores

To view details about the hosts, datacenters, and virtual machines (VMs) associated with datastores in your vSphere environment, view the datastores in the Axiom tab in the vSphere Client.

You can view all of the datastores in a datacenter, a host, or a VM, or you can view details of a specific datastore. You can also view the volume properties of a particular datastore.

Related tasks

- *View All Datastores in a Datacenter*
- *View the Datastores Attached to a Host*
- *View the Datastores Attached to a Disk*

View All Datastores in a Datacenter

You can view all of the datastores in a datacenter at one time in the vSphere Client.

1. From the vSphere menu bar, select **Inventory > Datastores**.

   Result:
   All of the datastores appear in the Inventory pane, grouped under the datacenter to which they were added.

Related concepts

- *About Viewing Datastores*

Related tasks

- *View the Datastores Attached to a Host*
- *View the Datastores Attached to a Disk*

View the Datastores Attached to a Host

You can find details about the datastores used by a particular host by viewing the datastores in the Axiom tab in the vSphere Client.

1. In the vSphere Inventory pane at the left side of the vSphere Clent, select the host whose datastores you want to view.
2. From the vSphere tabs, click the Axiom tab.
3. On the Axiom tab, click the **Datastores** tab.

   Result:
   The **Datastores** tab displays all datastores attached to the selected host.
4. Select a datastore to see the **LUN Details** for that datastore.

   Result:
   The details for all LUNs in the datastore appear in the **LUN Details** table at the bottom of the Axiom tab.

   Note: If you have not yet enabled access to the Pillar Axiom system where the LUNs reside, the LUN Details will not include data from the Axiom. To enable access, click the Axioms tab, right-click the Axiom, select **Authenticate**, and enter your administrator credentials.

Related concepts

- *About Viewing Datastores*

Related tasks

- *View All Datastores in a Datacenter*
- *View the Datastores Attached to a Disk*

View the Datastores Attached to a Disk

You can find details about the datastores associated with a particular disk by viewing the datastore details in the Axiom tab available when you select a virtual machine (VM) in the vSphere Client.

When you select a VM in the Inventory pane, the Axiom tab lists the disks associated with that VM. Select a disk from that list to display details about the datastores associated with that disk.

1. In the vSphere inventory tree at the left side of the vSphere Client, select the VM that contains the disk with the datastores you want to view.

2 Click the Axiom tab.

3 On the Axiom tab, select a disk from those listed in the **Virtual Machine** section.

Result:
The datastores attached to the specified disk appear in the **Datastore Detail** section of the Axiom tab.

Related concepts

- *About Viewing Datastores*

Related tasks

- *View All Datastores in a Datacenter*
- *View the Datastores Attached to a Host*

About Viewing LUNs

You can view detailed information about all LUNs associated with a host, a virtual machine (VM), or a datastore in the Axiom tab in the vSphere Client.

When you select the LUNs tab in the Axiom tab for a host, a list of all LUNs associated with that host appears. Select a LUN to view details about that LUN in the **LUN Details** section at the bottom of the Axiom tab.

When you display the Axiom tab for a VM, a list of all disks associated with that VM appears. Select a disk to view detailed information about the LUNs associated with that disk in the **LUN Details** section at the bottom of the Axiom tab.

When you display the Axiom tab for a datastore, details about all the LUNs associated with that datastore appear in the **LUN Details** section at the bottom of the Axiom tab.

Related tasks

- *View LUN Details*
- *View LUN Details on a VM*
- *View LUN Details on a Datastore*
- *View Datastore Volume Properties*

View LUN Details

You can view detailed information about a particular LUN in the LUNs tab of the Axiom tab.

When you select a LUN, the details about the LUN display in the **LUN Details** section at the bottom of the Axiom tab.

1. From the vSphere menu bar, select **Inventory** > **Host and Clusters**.
2. In the vSphere Inventory pane, select the host that contains the LUN you want to view.
3. Click the Axiom tab.
4. In the Axiom tab, select the **LUNs** tab.

   Result:
   All the LUNs associated with the selected host appear in the Axiom tab.
5. Select the LUN whose detail you want to view.

   Result:
   Details about the selected LUN appear in the **LUN Details** section.

Note: If you have not yet enabled access to the Pillar Axiom system where the LUNs reside, the LUN Details will not include data from the Axiom. To enable access, click the Axioms tab, right-click the Axiom, select **Authenticate**, and enter your administrator credentials.

Related concepts

- *About Viewing LUNs*

Related tasks

- *View LUN Details on a VM*
- *View LUN Details on a Datastore*
- *View Datastore Volume Properties*

View LUN Details on a VM

You can view detailed information about a particular LUN in the Axiom tab for virtual machines (VMs).

When you select a VM disk, the details about the datastores and LUNs associated with the selected disk display in the LUN **Datastore Details** and **LUN Details** sections of the Axiom tab.

1. From the vSphere menu bar, select **Inventory > Host and Clusters**.
2. In the vSphere Inventory pane, select the VM that contains the LUN you want to view.
3. Click the Axiom tab.
4. In the Virtual Machine section of the Axiom tab, select the VM disk that contains the LUN you want to view.

   Result:
   Details about the LUN appear in the **LUN Details** section.

   Note: If you have not yet enabled access to the Pillar Axiom system where the LUNs reside, the LUN Details will not include data from the Axiom. To enable access, click the Axioms tab, right-click the Axiom, select **Authenticate**, and enter your administrator credentials.

Related concepts

- *About Viewing LUNs*

Related tasks

- *View LUN Details*
- *View LUN Details on a Datastore*
- *View Datastore Volume Properties*

View LUN Details on a Datastore

You can view detailed information about a particular LUN in the Axiom tab for datastores.

Details about a LUN display in the **LUN Details** section at the bottom of the datastore Axiom tab.

1. From the vSphere menu bar, select **Inventory** > **Datastores**.
2. In the vSphere Inventory pane, select the datastore that contains the LUN you want to view.
3. Click the Axiom tab.

   Result:
   Details about the LUN in the datastore appear in the **LUN Details** section.

   Note: If you have not yet enabled access to the Pillar Axiom system where the LUNs reside, the LUN Details will not include data from the Axiom. To enable access, click the Axioms tab, right-click the Axiom, select **Authenticate**, and enter your administrator credentials.

Related concepts

- *About Viewing LUNs*

Related tasks

- *View LUN Details*
- *View LUN Details on a VM*
- *View Datastore Volume Properties*

View Datastore Volume Properties

The Datastore Volume Properties option provides a display of all the property information for a datastore containing Pillar Axiom LUNs in one location.

The properties are gathered from and are available in existing vSphere Client dialogs and the **LUN Details** section of the datastore Axiom tab in the vSphere Client.

1. In the vSphere inventory tree, select the datastore with the volumes you want to view.

   This datastore must contain LUNs only from a single Pillar Axiom system.

2 Right-click the datastore and select **Manage Pillar Axiom Storage > Volume Properties**.

3 Provide authentication credentials for the Pillar Axiom system if you have not already provided them.

4 Select a LUN to view its properties.

5 Close the Volume Properties window when you are finished.

Related concepts

- *About Viewing LUNs*

Related tasks

- *View LUN Details*
- *View LUN Details on a VM*
- *View LUN Details on a Datastore*

CHAPTER 6

Create Storage Objects

About Creating Datastores

You can create a datastore using a new or existing Pillar Axiom LUN.

You associate the datastore with the LUN at the time you create the datastore.

The details about datastores in the vSphere environment can be found in the VMware Documentation (http://www.vmware.com/support/pubs/).

Related tasks

- *Create a Datastore Associated With an Existing LUN*
- *Create a Datastore Associated With a New LUN*
- *Extend a Datastore that Uses a Pillar Axiom LUN*
- *Remove a Datastore and Delete the Underlying LUNs*
- *Remove a Datastore and Keep the Underlying LUNs*
- *Add a Pillar Axiom System to vSphere*

Create a Datastore Associated With an Existing LUN

When you create a datastore, you associate it with a new or existing LUN. Follow these steps to create a datastore associated with an existing LUN.

Prerequisites:

- An ESX host with which to associate the datastore. The ESX host must already be attached to the datacenter.
- Administrator credentials to enable access to the Pillar Axiom system with which the new datastore will be associated.

You create a datastore in the vSphere Client.

1. On the vSphere Client navigation bar, select **Inventory** > **Datastores**.
2. In the vSphere inventory tree, right-click the datacenter in which you want to create a new datastore.

3 From the context menu, select **Manage Axiom Storage > Create Datastore**.

4 From the Select Axioms page, select the Pillar Axiom system from which you want to associate the LUN with the new datastore.

This is the Pillar Axiom system containing the LUN upon which you will create the new datastore.

5 Authenticate your login credentials to the Pillar Axiom system if you have not yet done so, and click **Next**.

Result:
The **Select Host** page appears and shows the selected datacenter and the nested ESX hosts contained there.

6 From the **Select Host** page, select the ESX host with which you want to associate the new datastore you are creating and click **Next**.

Result:
The **Add Storage** dialog appears and shows the LUNs that are already associated with the host you selected.

7 From the **Add Storage** dialog, select a LUN and click **Next**.

8 In the **Modify SAN LUN** page, verify the Quality of Service, Mapping, and Data Protection settings, and click **Next**.

9 In the **Create Datastore** page, provide a datastore name.

A datastore is constrained to a single datacenter. The datastore is uniquely named within the datacenter.

10 From the **Maximum File and Block Size** drop-down list, select the desired maximum file size.

11 Click **OK**.

Related concepts

- *About Creating Datastores*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create a Datastore Associated With a New LUN*
- *Extend a Datastore that Uses a Pillar Axiom LUN*
- *Remove a Datastore and Delete the Underlying LUNs*
- *Remove a Datastore and Keep the Underlying LUNs*
- *Add a Pillar Axiom System to vSphere*

Create a Datastore Associated With a New LUN

When you create a datastore, you associate it with a new or existing LUN. Follow these steps to create a datastore associated with a new LUN.

Prerequisites:

- An ESX host with which to associate the datastore. The ESX host must already be attached to the datacenter.
- Administrator credentials to enable access to the Pillar Axiom system with which the new datastore will be associated.

You create a datastore in the vSphere Client.

1. On the vSphere Client navigation bar, select **Inventory > Datastores**.
2. In the vSphere inventory tree, right-click the datacenter in which you want to create a new datastore.
3. From the context menu, select **Manage Axiom Storage > Create Datastore**.
4. From the Select Axiom page, select the Pillar Axiom system from which you want to associate the new LUN with the new datastore.

   This is the Pillar Axiom system in which you create the new LUN upon which you will create the new datastore. If the Axiom you want to use is not listed, you may need to add it to the vSphere environmment.
5. Authenticate your login credentials to the Pillar Axiom system if you have not yet done so, and click **Next**.

   Result:
   The **Select Host** dialog appears and shows the selected datacenter and the nested ESX hosts contained there.
6. From the **Select Host** dialog, select the ESX host with which you want to associate the new datastore you are creating and click **Next**.
7. From the **Add Storage** dialog, click **Create LUN**.
8. In the **Create SAN LUN** page, configure the Quality of Service, Mapping, and Data Protection settings, and click **Next**.

   Important! Be sure to map the LUN to the ESX host with which you associate the datatstore.

9 In the **Create Datastore** page, enter a datastore name.

A datastore is constrained to a single datacenter. The datastore is uniquely named within the datacenter.

10 From the **Maximum File and Block Size** drop-down list, select the desired maximum file size.

11 Click **OK**.

Related concepts

- *About Creating Datastores*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create a Datastore Associated With an Existing LUN*
- *Extend a Datastore that Uses a Pillar Axiom LUN*
- *Remove a Datastore and Delete the Underlying LUNs*
- *Remove a Datastore and Keep the Underlying LUNs*
- *Add a Pillar Axiom System to vSphere*
- *Create LUN: Manage LUNs Wizard*
- *Create LUN: Define Quality of Service*
- *Create LUN: Define Mapping to Specific Hosts*
- *Create LUN: Define Mapping to All Hosts*
- *Create LUN: Define Data Protection*

About Creating Pillar Axiom LUNs

You can create Pillar Axiom LUNs by using the Pillar Axiom vSphere Plug-In in the vSphere Client.

After you create a Pillar Axiom LUN, you associate the datastore with an ESX host. Then you can create a datastore on the LUN and either create a virtual machine (VM) on the datastore or create a new virtual disk that you associate with a VM. You can assign a Pillar Axiom LUN directly to the VM as a raw device mapping (RDM).

When you create a LUN, you configure the following attributes:

- LUN Quality of Service (QoS): QoS attributes allow you to set different priorities for different applications, users, or data flows, or to guarantee a certain level of performance to a data flow on the LUN.

  QoS attributes also allow you to assign the LUN to a volume group or Storage Domain. When you assign a LUN to a volume group, the LUN becomes part of a group of logical volumes that function as one administrative unit. When you assign a LUN to a Storage Domain, the LUN becomes part of a specific collection of Brick storage enclosures. After the LUN is assigned, the LUN becomes available for assignment as part of the resources of volume group or Storage Domain.

- LUN Mapping: Mapping a LUN to a host makes the LUN visible to that host. The LUN must be visible for the host to access it. You can then use existing vSphere commands and wizards to create new VMs and datastores that access the LUN through mapping.

- LUN Data Protection: This attribute determines how much capacity to allocate for the creation of clones of this LUN.

Refer to the *Pillar Axiom Administrator's Guide* for information.

Related concepts

- *About the Manage LUNs Wizard*

Related tasks

- *Create LUN: Manage LUNs Wizard*
- *Create LUN: Define Quality of Service*
- *Create LUN: Define Mapping to Specific Hosts*
- *Create LUN: Define Mapping to All Hosts*
- *Create LUN: Define Data Protection*

About the Manage LUNs Wizard

You use the Manage LUNs wizard when you create or modify a LUN.

The Manage LUNs page displays all the existing LUNs on the selected Pillar Axiom system, along with the options to create, modify, and delete LUNs. The Create SAN LUN page displays when you click **Create LUN** on the ManageLUNs page.

The Create SAN LUN page includes tabs for Quality of Service settings, mapping, and setting up data protection for the LUN you are creating.

Related concepts

- *About Creating Pillar Axiom LUNs*
- *About Modifying Pillar Axiom LUNs*

Related tasks

- *Create LUN: Manage LUNs Wizard*
- *Create LUN: Define Quality of Service*
- *Create LUN: Define Mapping to Specific Hosts*
- *Create LUN: Define Mapping to All Hosts*
- *Create LUN: Define Data Protection*
- *Modify LUN: Manage LUNs Wizard*
- *Modify LUN: Quality of Service*
- *Modify LUN: Mapped to Specific Hosts*
- *Modify LUN: Mapped to All Hosts*
- *Delete Pillar Axiom LUNs*
- *Modify LUN: Data Protection*

Create LUN: Manage LUNs Wizard

Run the Manage LUNs wizard to begin creating the LUN.

Prerequisites:

- Administrator credentials to enable access to the Pillar Axiom system where the LUN will be created.
- Add the Pillar Axiom system where the LUN will be created to the vSphere environment.

The Manage LUNs wizard guides you through the steps necessary to create a LUN on a Pillar Axiom system using the Pillar Axiom vSphere Plug-In.

1. In the vSphere inventory tree, right-click any ESX host.

   This ESX host doesn't need to be the host to which you want to associate the new LUN. Instead it provides the access point to create the LUN.

2. Click **Manage Axiom Storage > Manage LUNs**.

   Result:
   A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.

3. Select the Pillar Axiom system upon which you want to create the LUN.

4. Authenticate your login credentials to the Pillar Axiom system if you have not yet done so.

5. Click **Next**.

6. In the **Manage LUNs** page, click **Create LUN** to create a new LUN.

Related concepts

- *About Creating Pillar Axiom LUNs*
- *About the Manage LUNs Wizard*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create LUN: Define Quality of Service*
- *Create LUN: Define Mapping to Specific Hosts*
- *Create LUN: Define Mapping to All Hosts*
- *Create LUN: Define Data Protection*

Create LUN: Define Quality of Service

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

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

1. Click the **Quality of Service** tab.

2. Select a Storage Domain for the LUN from the drop-down list.

   Click the ellipsis button [...] to review the physical capacity attributes and the Brick types that are associated with the available Storage Domains.

3. Enter the **LUN Name**.

4 (Optional) Select the volume group to which you want the new LUN to belong.

Volume groups allow you to group logical volumes into one administrative unit. Click the ellipsis button [...] to view the characteristics of existing volume groups or create a new one.

5 From the **Storage Profile** drop-down list, select an existing profile or select **Custom** to create a new Storage Profile.

- If you select an existing Storage Profile, the system updates the QoS attributes as defined by the selected profile.
- If you select **Custom**, complete the following fields:

Storage Class	Specifies the type of storage media on which the volume resides. Refer to the Capacity by Storage Class table on the **Quality of Service** tab for more information about Storage Classes.
Typical Access	Identifies the type of access that is the most common or expected: Sequential, random, or mixed.
I/O Bias	Identifies the typical read-write ratio.
Priority Level	Determines the placement of the data relative to the drive spindles, the number of drives over which the data is striped, and the processing queue priority: Premium, high, medium, low, or archive.

6 Adjust the values in the following fields as necessary:

Redundancy	Identifies how many mirror copies of the original data are stored online: Standard or Double.
Background Copy Priority	Identifies the strategy the system should use to control the impact on performance when background tasks need to copy or move data from one location in the storage pool to another.

Allocated Logical Capacity	Identifies the amount of capacity to be allocated to the logical volume.
Addressable Logical Capacity	Provides an estimate of the physical storage capacity requirements based on your QoS attribute selections. This setting is useful when using thin provisioning on LUNs where the host OS and application are thin-friendly. The value is internal to the Pillar Axiom system; it will allocate more storage (up to the addressable limit) if needed.

7 (Optional) Click **OK** to create the LUN now.

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

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

Related concepts

- *About Creating Pillar Axiom LUNs*
- *About the Manage LUNs Wizard*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create LUN: Manage LUNs Wizard*
- *Create LUN: Define Mapping to Specific Hosts*
- *Create LUN: Define Mapping to All Hosts*
- *Create LUN: Define Data Protection*

Create LUN: Define Mapping to Specific Hosts

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

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

Important! If the mapping you create does not make the LUN visible to the ESX host you selected, the newly created LUN will not become visible under the selected host on the Axiom tab.

1 Click the **Mapping** tab.

2 Select the appropriate **Access Protocol**: Fibre Channel (FC), iSCSI, or both.

   This selection determines the protocols that will be permitted for accessing the LUN.

   Important! When you select both FC and iSCSI protocols, the system uses FC optimized and non-optimized paths as a preference over iSCSI paths. Also, the system does not mix load balancing between protocols.

3 Click the **Only selected hosts** option.

4 Select a control unit (CU) in the **LUN Slammer Control Unit Assignment** section.

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

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

5 To create a new host mapping, click **Create** and select values for the LUN mapping fields:

   - **Host Name**: Select the ESX host to associate to the LUN.
   - **LUN Number**: Select the number to assign to the LUN for the selected host and click **OK**. This number must be unique for that particular host. It does not need to be unique across all hosts.
   - (Optional) **Limit available LUN numbers to those not in use by ESX hosts**: In the Create LUN Mapping dialog box, the LUN numbers listed are those available for the selected Pillar Axiom host. Select this option to further restrict this list to only those LUN numbers not in use by that host as an ESX host in the vSphere environment. Selecting this option initiates a scan of the vSphere environment that might take several seconds to complete.

6 (Optional) Click **OK and Continue** to select additional hosts to map to the LUN.

7 In the **Ports Masked for this LUN** table, indicate which ports you want masked by selecting **Yes** or **No** in the Masked column.

   Refer to the *Pillar Axiom Administrator's Guide* for information about Slammers and port masking recommendations.

8 (Optional) Click **OK** to create the LUN now.

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

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

Related concepts

- *About Creating Pillar Axiom LUNs*
- *About the Manage LUNs Wizard*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create LUN: Manage LUNs Wizard*
- *Create LUN: Define Quality of Service*
- *Create LUN: Define Mapping to All Hosts*
- *Create LUN: Define Data Protection*

Create LUN: Define Mapping to All Hosts

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

When you need to provide unrestricted access to a LUN, such as when the LUN contains general purpose data to which all hosts need access, map the LUN to a unique LUN number.

1. Click the **Mapping** tab.
2. Select the appropriate **Access Protocol**: Fibre Channel (FC), iSCSI, or both.

   This selection determines the protocols that will be permitted for accessing the LUN.

   Important! When you select both FC and iSCSI protocols, the system uses FC optimized and non-optimized paths as a preference over iSCSI paths. Also, the system does not mix load balancing between protocols.
3. Select **All hosts may access this LUN using LUN number**.
4. Select a number for the LUN from the drop-down list to the right of the previous option.
5. Select a control unit (CU) in the **LUN Slammer Control Unit Assignment** section.

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

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

6 In the **Ports Masked for this LUN** table, indicate which ports you want masked by selecting **Yes** or **No** in the Masked column.

   Refer to the *Pillar Axiom Administrator's Guide* for information about Slammers and port masking recommendations.

7 (Optional) Click **OK** to create the LUN now.

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

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

Related concepts

- *About Creating Pillar Axiom LUNs*
- *About the Manage LUNs Wizard*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create LUN: Manage LUNs Wizard*
- *Create LUN: Define Quality of Service*
- *Create LUN: Define Mapping to Specific Hosts*
- *Create LUN: Define Data Protection*

Create LUN: Define Data Protection

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

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

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

1 Click the **Data Protection** tab.

2 Adjust the value in the **Maximum capacity (in GB) to allocate Clone LUNs** field by clicking the **Increment** or **Decrement** arrow or entering a new value in the field.

   Default value is the available capacity for Clone LUNs, which corresponds to the LUN capacity you set as the Addressable Logical Capacity for the LUN in the Quality of Service tab.

3 Click **OK** to save the LUN.

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

Related concepts

- *About Creating Pillar Axiom LUNs*
- *About the Manage LUNs Wizard*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create LUN: Manage LUNs Wizard*
- *Create LUN: Define Quality of Service*
- *Create LUN: Define Mapping to Specific Hosts*
- *Create LUN: Define Mapping to All Hosts*

CHAPTER 7

Modify Storage Objects

About Modifying Pillar Axiom LUNs

As needs change, you can modify the configuration of a previously created Pillar Axiom LUN.

You modify existing LUNs by launching the Manage LUNs Wizard from a datacenter or host in the inventory tree in the vSphere Client.

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

Related concepts

- *About the Manage LUNs Wizard*

Related tasks

- *Modify LUN: Manage LUNs Wizard*
- *Modify LUN: Quality of Service*
- *Modify LUN: Mapped to Specific Hosts*
- *Modify LUN: Mapped to All Hosts*
- *Delete Pillar Axiom LUNs*
- *Modify LUN: Data Protection*

Modify LUN: Manage LUNs Wizard

Run the Manage LUNs wizard to begin modifying the LUN.

Prerequisites:

- Administrator credentials to enable access to the Pillar Axiom system where the LUN will be modified.
- Add the Pillar Axiom system where the LUN will be modified to the vSphere environment.

The Manage LUNs wizard guides you through the steps necessary to modify a LUN on a Pillar Axiom system through the Pillar Axiom plug-in to the vSphere Client.

1. In the vSphere inventory tree, right-click any ESX host.

This ESX host doesn't need to be the host to which you want to associate the new LUN. Instead it provides the access point to create the LUN.

2 Click **Manage Axiom Storage** > **Manage LUNs**.

Result:
A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.

3 Select the Pillar Axiom system with the LUN you want to modify.

4 Authenticate your login credentials to the Pillar Axiom system if you have not yet done so.

5 Click **Next**.

6 In the **Manage LUNs** page, select a LUN.

7 Click **Modify LUN**.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Modify LUN: Quality of Service

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

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

1 Click the **Quality of Service** tab.

2 Modify the necessary volume group, Storage Domain membership settings, and QoS attributes.

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

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

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

Related concepts

- *About Pillar Axiom Administrator Accounts*

Modify LUN: Mapped to Specific Hosts

Remap the LUN to restrict access to one or more specific SAN hosts, or map additional hosts to the LUN.

To restrict access to a LUN, map it to one or more specific SAN hosts. Map additional hosts to extend access to more SAN hosts.

1. Click the **Mapping** tab.
2. Select the appropriate **Access Protocol**: Fibre Channel (FC), iSCSI, or both.

   This selection determines the protocols that will be permitted for accessing the LUN.

   Important! When you select both FC and iSCSI protocols, the system uses FC optimized and non-optimized paths as a preference over iSCSI paths. Also, the system does not mix load balancing between protocols.
3. Click the **Only selected hosts** option.
4. In the **Ports Masked for this LUN** table, you can select **Yes** or **No** in the Masked column to determine whether a port should be masked or not.
5. In the **LUN Slammer Control Unit Assignment** section, two Slammer control unit (CU) settings appear. The **Current Slammer CU** field is informational only. From the **Assigned Slammer CU** drop-down list, select a CU or select **auto-assign**.

   The system auto-assigns the LUN to an available Slammer CU.
6. Click **Create** to create a new host mapping.

   Select values for the LUN mapping fields:

   - **Host Name**: Select the ESX host to associate with the LUN.
   - **LUN Number**: Select the number to assign to the LUN for the selected host, and click **OK**. This number must be unique for that particular host. It need not be unique across all hosts.
   - (Optional) **Limit available LUN numbers to those not in use by ESX hosts**: In the Create LUN Mapping dialog box, the LUN numbers listed are those available for the selected Pillar Axiom host. Select this option to further restrict this list to only those LUN numbers not in use by that host as an ESX host in the vSphere environment. Selecting this option initiates a scan of the vSphere environment that might take several seconds to complete.

7 (Optional) Click **OK and Continue** to select additional hosts to map to the LUN.

8 Click **OK** to save all of your updates, or continue on to the **Data Protection** tab to make additional updates to the LUN.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Modify LUN: Mapped to All Hosts

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

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

1 Click the **Mapping** tab.

2 Select the appropriate **Access Protocol**: Fibre Channel (FC), iSCSI, or both.

This selection determines the protocols that will be permitted for accessing the LUN.

Important! When you select both FC and iSCSI protocols, the system uses FC optimized and non-optimized paths as a preference over iSCSI paths. Also, the system does not mix load balancing between protocols.

3 Click the **All hosts may access this LUN using LUN number** option.

4 Modify the number for the LUN from the drop-down list to the right of the previous option.

5 In the **LUN Slammer Control Unit Assignment** section, from the two Slammer control unit (CU) settings that appear: **Current Slammer CU** and **Assigned Slammer CU**, select a CU or select auto-assign.

6 Click **OK** to save all of your updates, or continue on to the Data Protection tab to make additional updates to the LUN.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Modify LUN: Data Protection

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

To make sure enough storage space exists for clones of a LUN, you can change the capacity allocated as a repository for clones when you modify the LUN.

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

1. Click the **Data Protection** tab.
2. Adjust the value in the **Maximum capacity (in GB) to allocate Clone LUNs** field by clicking the **Increment** or **Decrement** arrow.
3. Click **OK** to save all of your updates to the LUN.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Delete Pillar Axiom LUNs

When a Pillar Axiom LUN is no longer needed, you can delete it from the vSphere Client.

Prerequisites:

- Administrator credentials to enable access to the Pillar Axiom system where the LUN will be deleted.
- Be sure the volume to be deleted is not being accessed.

Deletion of a LUN fails if that LUN or any clones of the LUN are currently part of a datastore.

Caution Deleting a LUN through the Pillar Axiom vSphere Plug-In permanently removes *all data* on that LUN. *Data will be lost*.

Note: When you delete a LUN that is a parent or source for Clone LUNs, all child clones are deleted as well.

1. In the vSphere inventory tree, locate the ESX host with which the LUN is associated.
2. Click **Manage Axiom Storage** > **Manage LUNs**.

   Result:
   A page appears that shows the discovered Pillar Axiom systems that are connected to the vSphere environment.
3. Select the Pillar Axiom system where the LUN resides.
4. Authenticate your login credentials to the Pillar Axiom system if you have not yet done so, and click **Next**.
5. In the **Manage LUNs** page, select the LUN you want to delete from those listed on the page.
6. Click **Delete LUN**.

   Result:
   The LUN is deleted from the Pillar Axiom system and no longer appears in the list.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Extend a Datastore that Uses a Pillar Axiom LUN

With the Pillar Axiom vSphere Plug-In, you can extend the size of a datastore that utilizes a Pillar Axiom LUN without adding extents.

This option differs from the built-in datastore extend feature of vSphere, which allows you to extend a datastore by adding another extent (a new LUN) to the datastore. When you extend a datastore with the Pillar Axiom vSphere Plug-In option, you extend the underlying LUNs on the Pillar Axiom system. This option is available only for datastores created on Pillar Axiom LUNs.

Note: We recommend that you NOT extend datastores by creating new Axiom LUNs and adding them as extents. Instead, you should extend the capacity of the existing LUN.

1. In the vSphere inventory tree, select a datastore to be extended.

   Important! This datastore must contain LUNs from a single Pillar Axiom system.

2. Right-click the datastore and select **Manage Pillar Axiom Storage > Extend Datastore**.

3. Provide authentication credentials for the Pillar Axiom system if you have not already provided them.

4. In the **Extend Datastore** window, enter a new capacity for the datastore by doing one of the following:

   - To extend the total capacity of the datastore, enter a new capacity in the **Total New Capacity (GB)** field.
   - To extend the capacity of one or more associated LUNs, select the **Manually adjust the capacity of underyling LUNs** checkbox and enter a new capacity value for each LUN in the **New Capacity (GB)** field.

5. Click **OK**.

   Result:
   The size of the datastore is extended.

Related concepts

- *About Creating Datastores*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create a Datastore Associated With an Existing LUN*
- *Create a Datastore Associated With a New LUN*
- *Remove a Datastore and Delete the Underlying LUNs*
- *Remove a Datastore and Keep the Underlying LUNs*
- *Add a Pillar Axiom System to vSphere*

Remove a Datastore and Delete the Underlying LUNs

When a datastore is no longer needed, you can delete it from its associated host in the vSphere Client. You can choose to delete the underlying LUNs that are associated with the datastore.

Prerequisites:

- Administrator credentials to enable access to the Pillar Axiom system to which the LUN and datastore are mapped.
- Back up any necessary virtual machine (VM) files on the datastore.

When you remove a datastore, you have the option of deleting the underlying LUNs or keeping the underlying LUNs to use in other datastores. Follow these steps if you want to delete the underlying LUNs.

Note: We recommend that you use the Pillar Axiom vSphere Plug-In **Remove Datastore** command, not the native vSphere Client **Delete** command, to delete datastores associated with Pillar Axiom LUNs.

1. In the vSphere inventory tree, select a datastore to be removed.

   Important! This datastore must contain LUNs from a single Pillar Axiom system.

2. Right-click the ESX host, and select **Manage Pillar Axiom Storage > Remove Datastore**.
3. Provide authentication credentials for the Pillar Axiom system if you have not already provided them.
4. In the **Remove Datastore** window, select the datastore you want to remove.
5. View the details of the LUNs associated with the datastore to confirm you want the LUNs to be deleted as well.
6. Select the **Delete any underlying Axiom LUNs** checkbox to delete the LUNs along with the datastore.
7. Click **Delete**.

   Result:
   The datastore and associated LUNs are deleted.

   Note: If you use the Remove Datastore command to delete any underlying Axiom LUNs, the system must recondition the space from those LUNs before you can allocate it for new LUNs.

Related concepts

- *About Creating Datastores*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create a Datastore Associated With an Existing LUN*
- *Create a Datastore Associated With a New LUN*
- *Extend a Datastore that Uses a Pillar Axiom LUN*
- *Remove a Datastore and Keep the Underlying LUNs*
- *Add a Pillar Axiom System to vSphere*

Remove a Datastore and Keep the Underlying LUNs

When a datastore is no longer needed, you can delete it from its associated host in the vSphere Client. You can choose to keep the underlying LUNs that are associated with the datastore.

Prerequisites:

- Administrator credentials to enable access to the Pillar Axiom system to which the LUN and datastore are mapped.
- Back up any necessary virtual machine (VM) files on the datastore.

When you remove a datastore, you have the option of deleting the underlying LUNs or keeping the underlying LUNs to use in other datastores. Follow these steps to keep the underlying LUNs. You can use the LUNs that remain to create another datastore on top of a VM or for assigning to a VM as a raw device mapping (RDM).

1. In the vSphere inventory tree, select a datastore to be removed.

   Important! This datastore must contain LUNs from a single Pillar Axiom system.

2. Right-click the datastore and select **Manage Pillar Axiom Storage > Remove Datastore**.
3. Provide authentication credentials for the Pillar Axiom system if you have not already provided them.
4. In the **Remove Datastore** window, select the datastore you want to remove.
5. View the details of the LUNs associated with the datastore to determine whether you want the LUNs to remain.

   If you do not delete the underlying LUNs, the datastore data remains on the LUNs.

6. View the LUN mapping details to determine which specific hosts to unmap.

   If you do not select specific hosts to unmap, the delete command will delete all mappings between LUNs and hosts.

7. Click **Delete**.

   Result:
   The datastore is deleted, and the underlying LUNs are retained.

Related concepts

- *About Creating Datastores*
- *About Pillar Axiom Administrator Accounts*

Related tasks

- *Create a Datastore Associated With an Existing LUN*
- *Create a Datastore Associated With a New LUN*
- *Extend a Datastore that Uses a Pillar Axiom LUN*
- *Remove a Datastore and Delete the Underlying LUNs*
- *Add a Pillar Axiom System to vSphere*

CHAPTER 8

Manage Storage Objects

About Volume Groups

Volume groups provide a way to organize related Pillar Axiom volumes (LUNs) into groups so that they can be managed together.

Volume groups provide organizational units that you can use to manage collections of LUNs. Related LUNs can be grouped together in a volume group, and volume groups can be nested within other volume groups to provide a hierarchical organization of LUNs and volume groups.

With the Pillar Axiom vSphere Plug-In, you can create or remove volume groups, and you can manage the assignment of LUNs to volume groups, from the vSphere Client.

Create a Volume Group

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

Prerequisite Administrator credentials to enable access to the Pillar Axiom system.

You can organize related LUNs into volume groups so that they can be managed together, and you can nest volume groups within parent volume groups to show complex relationships.

1. In the vSphere inventory tree, right-click an ESX host or a datacenter.
2. Click **Manage Pillar Axiom Storage > Manage Volume Groups**.

   Result:
   A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.
3. Select the Pillar Axiom system for which you want to create the volume group and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.

4 Click **Next**.

5 In the Manage Volume Groups page, select the **Volume Groups** tab.

6 Click **Create**.

7 Enter a name for the new volume group in the blank line you just added to the Volume Group list.

8 (Optional) Select the name of a parent volume group from the drop-down list in the Parent Volume Group Name column if you want to nest this volume group within a parent volume group.

9 Enter a value for the Maximum Logical Capacity in GB, or use the **Increment** and **Decrement** arrows to change the value.

   This value must be equal to or greater than the sum of the capacity of all LUNs to be included in the volume group.

10 Click **OK** to save the new volume group.

After you create the volume group, you need to follow the instructions for modifying a volume group to add volumes to the volume group.

Remove a Volume Group

You can delete a volume group when the volume group is no longer needed.

Prerequisite	Administrator credentials to enable access to the Pillar Axiom system.

Before you can remove a volume group, you must remove any LUNs included in the volume group in the Volumes tab of the Manage Volume Groups page .

1 In the vSphere inventory tree, right-click an ESX host or datacenter.

2 Click **Manage Pillar Axiom Storage > Manage Volume Groups**.

   Result:
   A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.

3 Select the Pillar Axiom system for which you want to remove the volume group and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.

4 Click **Next**.

5 In the Manage Volume Groups page, select the **Volume Groups** tab.

6 Select the volume group in the table and click **Remove**.

7 Click **OK** to delete the volume group.

Assign Volumes to a Volume Group

You can assign a volume (LUN) to a volume group in the Volumes tab of the Manage Volume Groups page.

Assign a LUN to a volume group, or remove a LUN from a volume group, in the Volumes tab.

1 In the vSphere inventory tree, right-click an ESX host or a datacenter.

2 Click **Manage Pillar Axiom Storage > Manage Volume Groups**.

Result:
A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.

3 Select the Pillar Axiom system to which you want to assign the volume group and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.

4 Click **Next**.

5 In the **Volumes** tab of the Manage Volume Groups page, select a LUN.

6 In the Volume Groups column, select one of the following from the drop-down list:

- A new volume group for the LUN
- **<none>** to remove the LUN from the volume group

Note: You must remove all LUNs from a volume group before you can remove the volume group.

7 Click **OK**.

About Host Groups

A host group is a named, logical collection of SAN hosts.

Host groups are useful if you have host clusters, each of which contains many hosts and each host contains a few initiators. If a host cluster is not defined in the Pillar Axiom GUI as a host group, when you want to map a LUN to the cluster, you need to map each SAN host to the LUN one at a time. Futhermore, if you need to move a host to a different cluster, you must manually update each LUN mapping, also one at a time.

A more efficient method is to define the cluster as a host group and then assign the SAN hosts to the host group. When you subsequently move a host from one host group to another, all of the initiators associated with that host inherit the LUN mapping associated with that host group.

Host groups have the following properties:

- A host can belong to only one host group.
- You can map an unlimited number of hosts to a host group.
- A host group can have zero or more mappings.
- You can map a LUN to either a host or a host group.
- If a host group has mappings, then all hosts in the host group will have all of the mappings of the host group, but any given host can also have other mappings. No mappings can conflict.
- When assigning a host with mappings to a host group without mappings, you have the option to migrate mappings on the host to the host group, making those mappings available to all hosts in the group, not just the single host.

Related tasks

- *Create a Host Group*
- *Remove a Host Group*
- *Update Host Group Membership*

Create a Host Group

To facilitate mapping a LUN to multiple SAN hosts, you can group the hosts into a host group.

Prerequisite	Administrator credentials to enable access to the Pillar Axiom system.

If a cluster of SAN hosts or group of associated hosts does not already belong to a host group in the Pillar Axiom GUI, you can use the Pillar Axiom vSphere Plug-In in the vSphere Client to create a host group.

1. In the vSphere inventory tree, right-click an ESX host or a datacenter.
2. Click **Manage Pillar Axiom Storage** > **Manage Host Groups**.

   Result:
   A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.
3. Select the Pillar Axiom system for which you want to create the host group and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.
4. Click **Next**.
5. In the Manage Host Groups page, select the **Group** tab.
6. Click **Create**.
7. Enter a name for the new host group in the blank line you just added to the Groups list.
8. Click **OK** to complete the host group creation.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Remove a Host Group

You can delete a host group when the host group is no longer needed.

Prerequisite	Administrator credentials to enable access to the Pillar Axiom system.

When you delete a host group, that host group no longer appears in the Pillar Axiom GUI or the vSphere Client, but the SAN hosts in the host group remain in the vSphere environment.

1. In the vSphere inventory tree, right-click an ESX host or a datacenter.
2. Click **Manage Pillar Axiom Storage** > **Manage Host Groups**.

Result:
A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.

3 Select the Pillar Axiom system for which you want to remove the host group and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.

4 Click **Next**.

5 In the Manage Host Groups page, select the **Groups** tab.

6 Select the host group in the table and click **Remove**.

7 Click **OK** to delete the host group.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Update Host Group Membership

You can change the collection of SAN hosts in a host group by adding or removing hosts from the host group membership.

Prerequisite	Administrator credentials to enable access to the Pillar Axiom system.

A SAN host can be a member of only one Pillar Axiom host group, but you can modify host group membership by adding or removing hosts from a host group.

1 In the vSphere inventory tree, right-click an ESX host or a datacenter.

2 Click **Manage Pillar Axiom Storage > Manage Host Groups**.

Result:
A dialog appears that shows the Pillar Axiom systems that are connected to the vSphere environment.

3 Select the Pillar Axiom system for which you want to update the membership, and authenticate your login credentials to the Pillar Axiom system if you have not yet done so.

4 Click **Next**.

5 In the Manage Host Groups page, select the **Hosts** tab.

6 In the Hosts tab, perform the following steps:

- Locate the SAN host in the Name column in the table.
- In the Host Group column, select the group that you want to associate with the SAN host from the Host Group drop-down list.

7 Click **OK** to complete the update of the membership.

Related concepts

- *About Pillar Axiom Administrator Accounts*

About Storage Domains

Storage Domains allow storage administrators to assign logical volumes to a specific collection of Bricks. Such assignments can be made to reduce contention among volumes, to implement different levels of security for those volumes, or both.

Note: Storage Domains might limit the ability of the system to provide the best optimization of the storage arrays and system performance.

A Storage Domain is defined as:

> A subset of a virtual storage pool consisting of a defined group of Brick storage enclosures. This group can consist of any assortment of Bricks, regardless of Storage Class, capacity, or any other attribute. A Storage Domain is typically used to provide specific allocation or security features for a collection of logical volumes.

Refer to the *Pillar Axiom Administrator's Guide* for information.

Related tasks

- *Create a Storage Domain*
- *Remove a Storage Domain*
- *Assign a Brick to a Storage Domain*
- *Assign a Volume to a Storage Domain*

Create a Storage Domain

You can create a new Storage Domain in the vSphere Client with the Pillar Axiom vSphere Plug-In.

Prerequisites: Administrator credentials to enable access to the Pillar Axiom system.

The plug-in adds the new Storage Domain to the associated Pillar Axiom system.

1. On the vSphere Client navigation bar, select **Inventory > Hosts and Clusters**.
2. In the vSphere inventory tree, right-click an ESX host or datacenter.
3. From the context menu, select **Manage Axiom Storage > Manage Storage Domains**.

4 Select the Pillar Axiom system for which you want to create the Storage Domain and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.

5 In the Manage Storage Domains page, in the Storage Domains tab, click **Create**.

6 In the new row that appeared in the table, enter the name for the new Storage Domain, and click **OK**.

Result:
The new Storage Domain is created and appears in the table.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Remove a Storage Domain

You can remove a Storage Domain in the vSphere Client with the Pillar Axiom vSphere Plug-In.

Prerequisites: Administrator credentials to enable access to the Pillar Axiom system.

Remove a Storage Domain when it is no longer needed. Removing a Storage Domain in the vSphere Client removes it from the associated Pillar Axiom system.

1 On the vSphere Client navigation bar, select **Inventory > Hosts and Clusters**.

2 In the vSphere inventory tree, right-click an ESX host or datacenter.

3 Select the Pillar Axiom system from which you want to remove the Storage Domain and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.

4 From the context menu, select **Manage Axiom Storage > Manage Storage Domains**.

5 In the Manage Storage Domains page, in the Storage Domains tab, click **Remove**.

6 In the Storage Domains table, select the Storage Domain to be delete and click **OK**.

Result:
The Storage Domain is removed and no longer appears in the table.

Related concepts

- *About Pillar Axiom Administrator Accounts*

Assign a Brick to a Storage Domain

You can assign a Brick storage enclosure to a Storage Domain in the vSphere Client with the Pillar Axiom vSphere Plug-In.

Assign a Brick to a different Storage Domain on the Manage Storage Domains page.

1. On the vSphere Client navigation bar, select **Inventory > Hosts and Clusters**.
2. In the vSphere inventory tree, right-click an ESX host or datacenter.
3. Select the Pillar Axiom system in which you want to assign a Brick to the Storage Domain and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.
4. From the context menu, select **Manage Axiom Storage > Manage Storage Domains**.
5. In the **Bricks** tab of the Manage Storage Domains page, select a Brick.
6. In the Storage Domains column, select a new Storage Domain for the Brick from the drop-down list.
7. Click **OK**.

Assign a Volume to a Storage Domain

You can assign a volume (LUN) to a Storage Domain on the Manage Storage Domains page.

Assign a LUN to a Storage Domain, or assign it to a different Storage Domain, by selecting the Storage Domain in the Volumes tab.

1. On the vSphere Client navigation bar, select **Inventory > Hosts and Clusters**.
2. In the vSphere inventory tree, right-click an ESX host or datacenter.
3. Select the Pillar Axiom system for which you want to assign a volume to the Storage Domain and authenticate your login credentials with the Pillar Axiom system if you have not yet done so.
4. From the context menu, select **Manage Axiom Storage > Manage Storage Domains**.

5 In the **Volumes** tab of the Manage Storage Domains page, select a LUN.

6 In the Storage Domains column, select a new Storage Domain for the LUN from the drop-down list.

7 Click **OK**.

About Storage Profiles

When configuring a logical volume, you can select a collection of predefined properties to apply to that volume. This collection of properties is called a *Storage Profile*.

You can either use a profile that you previously created in the Pillar Axiom Storage Services Manager graphical user interface (GUI) for the Pillar Axiom system, or you can select one of the pre-configured profiles.

The vSphere Plug-In interface allows you to see the composition of the available Storage Profiles while creating new storage volumes so that you can make an informed choice when selecting a profile. Unlike the Pillar Axiom Storage Services Manager, the GUI for the vSphere Plug-in does not permit the creation of new Storage Profiles.

Related tasks

- *Select a Storage Profile*

Select a Storage Profile

You can choose an appropriate Storage Profile while creating or modifying a LUN.

You select Storage Profiles in the Create SAN LUN page in the Manage LUNs wizard.

1. In the vSphere inventory tree, right-click an ESX host to which the LUN is associated.
2. From the context menu, select **Manage Axiom Storage** > **Manage LUNs**.

   Result:
   A page appears that shows the Pillar Axiom systems that are connected to the vSphere environment.
3. Select the Pillar Axiom system to which the LUN is associated.
4. Authenticate your login credentials to the Pillar Axiom system if you have not yet done so, and click **Next**.
5. In the Manage LUNs page, do one of the following:
   - Click **Create LUN** to create a new LUN.
   - Select a LUN and click **Modify LUN** to modify an existing LUN.
6. In the **Quality of Service** tab, click the ellipsis button beside the Storage Profile drop-down list.

   Result:
   A table listing the attributes of the available Storage Profiles appears.
7. Select the Storage Profile that has the attributes that best suit your needs from the **Storage Profile** drop-down list.
8. Click **OK** to save the LUN with your settings.

Related concepts

- *About Storage Profiles*

CHAPTER 9

Manage Datastore Snapshots

About Datastore Snapshots

The Pillar Axiom vSphere Plug-In enables you to create a snapshot of an entire datastore, delete a datastore snapshot, and recover data from a datastore snapshot.

To start working with datastore snapshots, you use the Manage Snapshots window in the vSphere Client.

Related concepts

- *About Managing Snapshots*

Related tasks

- *Create a Datastore Snapshot*
- *Delete a Datastore Snapshot*
- *Restore Data from a Datastore Snapshot*

About Managing Snapshots

You use the Manage Snapshots page when you create, delete, or recover a datastore snapshot.

When you click **Create Snapshot** on the Manage Snapshots page, you are prompted for a snapshot name. The Manage Snapshots page displays all the existing snapshots on the selected datastore. The **Delete Snapshot** and **Recover Snapshot** buttons are activated when you select one of these snapshots. Available options for managing snapshots:

- Create a new snapshot
- Delete an existing snapshot
- Recover data from an existing snapshot

Related concepts

- *About Datastore Snapshots*

Related tasks

- *Create a Datastore Snapshot*
- *Delete a Datastore Snapshot*
- *Restore Data from a Datastore Snapshot*

Create a Datastore Snapshot

You can create clones of all the LUNs in an entire datastore by creating a snapshot of that datastore in the vSphere Client with the Pillar Axiom vSphere Plug-In.

When you create a datastore snapshot, you create a Clone LUN of each LUN contributing to that datastore on the Pillar Axiom system. The plug-in stores the name you provide and the timestamp as metadata.

1. In the vSphere inventory tree, select the datastore for which you want to create a snapshot.

   This datastore must contain LUNs only from a single Pillar Axiom system.

2. Right-click the datastore and select **Manage Pillar Axiom Storage > Manage Snapshots**.

3. In the Axiom Authentication dialog, enter the authentication credentials for the system with which you want to work (if you have not yet authenticated).

   Result:
   The Manage Snapshots page displays a list of any existing snapshots of the datastore. Expand a snapshot name to display a list of the Clone LUNs included in the snapshot.

4. Click **Create Snapshot**.

5. In the Create Snapshot dialog, enter a name for the snapshot, and then click **OK**.

6. Click **Done** when finished

Delete a Datastore Snapshot

You can delete a datastore snapshot created with the Pillar Axiom vSphere Plug-In when it is no longer needed.

Deleting a snapshot removes it from the inventory of snapshots taken of the datastore.

1. In the vSphere inventory tree, select the datastore from which you want to delete a snapshot.

   This datastore must contain LUNs only from a single Pillar Axiom system.

2. Right-click the datastore and select **Manage Pillar Axiom Storage > Manage Snapshots**.

   Result:
   The Manage Snapshots page displays a list of the existing snapshots.

3. Provide authentication credentials for the Pillar Axiom system if you have not already provided them.

4. Select the snapshot to be deleted, and click **Delete Snapshot**.

5. Click **OK** to confirm that you want to delete the snapshot.

Restore Data from a Datastore Snapshot

You can restore data from a datastore snapshot in the vSphere Client with the Pillar Axiom vSphere Plug-In.

Prerequisite: No Clone LUNs of the snapshot are associated with the datastore to be restored. If any Clone LUNs of the snapshot are detected on the datastore, a warning message displays instructing you to try with a different datastore.

Restoring data from a datastore snapshot creates a recovery datastore where data from a point of time in the past can be accessed.

1. In the vSphere inventory tree, select the datastore to which you want to restore data.

   This datastore must contain LUNs only from a single Pillar Axiom system.

2. Right-click the datastore and select **Manage Pillar Axiom Storage > Manage Snapshots**.

   Result:
   The Manage Snapshots page displays a list of the existing snapshots.

3. Provide authentication credentials for the Pillar Axiom system if you have not already provided them.

4 From the listed snapshots, select the snapshot you want to recover and then click **Recover Snapshot**.

Result:
The names of the Clone LUNs in the snapshot appear in the **Clone LUN Name** column.

5 Enter a name for the new datastore where you can access the recovered snapshot in the **Datastore Name** field.

6 Select the **Host Name** and **LUN Number** from the drop-down lists.

Note: The LUN numbers listed are those available for the selected Pillar Axiom host.

Select the **Limit available LUN numbers to those not in use by ESX hosts** option to further restrict this list to only those LUN numbers not in use by that host as an ESX host in the vSphere environment.

Selecting this option initiates a scan of the vSphere environment that might take several seconds to complete.

7 Click **OK** to create a datastore containing the data recovered from the snapshot.

About Managing Snapshot Schedules

You can create, modify, or delete a snapshot schedule on the Manage Snapshot Schedules page.

The Manage Snapshot Schedules page displays all the existing schedules for taking snapshots of the selected datastore or data center. Available options for managing snapshot schedules:

- Create a new schedule
- Modify an existing schedule
- Delete an existing schedule

When you create a snapshot schedule, you have the option of enabling the schedule so that it starts creating snapshots at the start date and time, or you can leave the snapshot schedule disabled and keep it in reserve to enable when you need it.

If a snapshot schedule fails three times, it is automatically disabled, and an event is logged in the vSphere Client **Tasks & Events** tab. No error is displayed, so if a snapshot is not created on schedule, you should check the event log.

Related tasks

- *Create a Snapshot Schedule*
- *Modify a Snapshot Schedule*
- *Delete a Snapshot Schedule*

Create a Snapshot Schedule

You can create a schedule that controls how often you want to take snapshots of a datastore in the vSphere Client with the Pillar Axiom vSphere Plug-In.

Create a snapshot schedule to automate snapshot operation at a predictable interval.

1. In the vSphere inventory tree, select a datastore containing non-clone Pillar Axiom LUNs.
2. Right-click the datastore and select **Manage Pillar Axiom Storage > Manage Snapshot Schedules**.

   Result:
   The Manage Snapshot Schedules page displays a list of the existing snapshot schedules.

3 Provide authentication credentials for the vCenter server, if you have not already provided them.

4 Provide authentication credentials for the Pillar Axiom system, if you have not already provided them.

5 Click **Create Schedule**.

6 In the Create Snapshot Schedule dialog, complete or assign a value to the following options:

Schedule Name — Enter a descriptive name for the schedule.

Volume Group — Select the name of the volume group containing the LUNs to be included in the snapshot from the drop-down list.

Enabled — Select the check box to enable the schedule to run. Clear the check box if you want to enable the schedule later.

Start Date and Time — Enter a date and time, and then select the frequency with which the snapshots are to be created. Valid frequencies:

- **Once**: A single snapshot will be created at the scheduled **Start Date and Time**.
- **Hourly**: Select an interval from the drop-down list.
- **Daily**: Select a day from the drop-down list.
- **Weekly**: Select an interval from the drop-down lists and (optionally) a day of the week. If you do not select a day of the week, the scheduled snapshot will take place on the day of the week of the **Start Date and Time**.

Login credentials

Axiom — Use the credentials provided or clear the Use Current Credentials check box to specify a different **Login Name** and **Password**.

vCenter Server	Use the credentials provided or clear the Use Current Credentials check box to specify a different **Login Name** and **Password**.

Important! Be sure to update these credentials in your schedule if the credentials change.

7 Click **OK** to create the snapshot schedule.

Result:
If you selected **Enabled**, the schedule will create snapshots as specified.

8 Click **Done** to leave the Manage Snapshot Schedules page.

Modify a Snapshot Schedule

You can modify an existing snapshot schedule in the vSphere Client with the Pillar Axiom vSphere Plug-In.

A snapshot schedule controls how often to take snapshots of a datastore. You can modify the frequency at which snapshots are created, or you can enable or disable the snapshot schedule.

1 In the vSphere inventory tree, select a datastore containing non-clone LUNs from a single Pillar Axiom System.

This datastore can be the one for which you want to modify a snapshot schedule, or the datacenter containing the datastore for which you want to modify a snapshot schedule.

2 Right-click the datastore or datacenter and select **Manage Pillar Axiom Storage > Manage Snapshot Schedules**.

Result:
The Manage Snapshot Schedules page displays a list of the existing snapshot schedules.

3 Provide authentication credentials for the vCenter server, if you have not already provided them.

4 Provide authentication credentials for the Pillar Axiom system, if you have not already provided them.

5 From the listed schedules, select the schedule you want to modify and then click **Modify Schedule**.

6 Make any necessary changes to the schedule in the Modify Snapshot Schedule page.

7 Click **OK** to save changes to the schedule.

8 Click **Done** to leave the Manage Snapshot Schedules page.

Delete a Snapshot Schedule

You can delete an existing schedule in the vSphere Client with the Pillar Axiom vSphere Plug-In.

Delete a snapshot schedule when you no longer need to take snapshots of a datastore at regular intervals.

1 In the vSphere inventory tree, select a datastore containing non-clone LUNs from a single Pillar Axiom System.

This datastore can be the one from which you want to delete a snapshot schedule, or the datacenter containing the datastore from which you want to delete a snapshot schedule.

2 Right-click the datastore or datacenter and select **Manage Pillar Axiom Storage > Manage Snapshot Schedules**.

Result:
The Manage Snapshot Schedules page displays a list of the existing snapshot schedules.

3 Provide authentication credentials for the vCenter Server, if you have not already provided them.

4 Provide authentication credentials for the Pillar Axiom system, if you have not already provided them.

5 From the listed schedules, select the schedule you want to delete and then click **Delete Schedule**.

6 Click **OK** to confirm that you want to delete the schedule.

7 Click **Done** to leave the Manage Snapshot Schedules page.

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