

Hitachi Storage Plug-in for VMware vCenter

v04.3.0

User's Guide

This guide provides information about installing, configuring, and managing Hitachi Storage Plug-in for VMware vCenter.

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Preface

This guide explains how to install, configure and use Hitachi Storage Plug-in for VMware vCenter with supported storage systems.

Intended audience

This document is intended for operators (also called VM manager) of VMware management console (VMware vSphere Client) to verify the configurations of the storage system and perform setting operations (creation of a datastore) using the storage system.

Readers of this document should be familiar with the following:

- Using Microsoft Windows Server family operating systems.
- Using the VMware vSphere Client.

Release notes

Read the release notes before installing and using this product. They may contain requirements or restrictions that are not fully described in this document or updates or corrections to this document. Release notes are available on Hitachi Vantara Support Connect: <https://knowledge.hitachivantara.com/Documents>.

Referenced documents

The documents below are either referenced by this document, or supply more information related to this product's features.

Hitachi documents:

- *Hitachi Ops Center API Configuration Manager REST API Reference Guide*, MK-99CFM000
- *Hitachi NAS File Storage REST API Reference Guide*, MK-92HNAS088

VMware documents:

- VMware vSphere ESXi and vCenter Server 6.5/6.7





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Document conventions

This document uses the following typographic conventions:

Convention	Description
Bold	<ul style="list-style-type: none"> Indicates text in a window, including window titles, menus, menu options, buttons, fields, and labels. Example: Click OK. Indicates emphasized words in list items.
<i>Italic</i>	<ul style="list-style-type: none"> Indicates a document title or emphasized words in text. Indicates a variable, which is a placeholder for actual text provided by the user or for output by the system. Example: <code>pairedisplay -g group</code> <p>(For exceptions to this convention for variables, see the entry for angle brackets.)</p>
Monospace	Indicates text that is displayed on screen or entered by the user. Example: <code>pairedisplay -g oradb</code>
< > angle brackets	<p>Indicates variables in the following scenarios:</p> <ul style="list-style-type: none"> Variables are not clearly separated from the surrounding text or from other variables. Example: <code>Status-<report-name><file-version>.csv</code> Variables in headings.
[] square brackets	Indicates optional values. Example: [a b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: { a b } indicates that you must choose either a or b.
vertical bar	<p>Indicates that you have a choice between two or more options or arguments. Examples:</p> <p>[a b] indicates that you can choose a, b, or nothing.</p> <p>{ a b } indicates that you must choose either a or b.</p>

This document uses the following icons to draw attention to information:

Icon	Label	Description
	Note	Calls attention to important or additional information.
	Tip	Provides helpful information, guidelines, or suggestions for performing tasks more effectively.
	Caution	Warns the user of adverse conditions and/or consequences (for example, disruptive operations, data loss, or a system crash).
	WARNING	Warns the user of a hazardous situation which, if not avoided, could result in death or serious injury.

Conventions for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 kilobyte (KB)	1,000 (10^3) bytes
1 megabyte (MB)	1,000 KB or $1,000^2$ bytes
1 gigabyte (GB)	1,000 MB or $1,000^3$ bytes
1 terabyte (TB)	1,000 GB or $1,000^4$ bytes
1 petabyte (PB)	1,000 TB or $1,000^5$ bytes
1 exabyte (EB)	1,000 PB or $1,000^6$ bytes

Logical capacity values (for example, logical device capacity, cache memory capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 cylinder	Mainframe: 870 KB

Logical capacity unit	Value
	Open-systems: <ul style="list-style-type: none"> ▪ OPEN-V: 960 KB ▪ Others: 720 KB
1 KB	1,024 (2 ¹⁰) bytes
1 MB	1,024 KB or 1,024 ² bytes
1 GB	1,024 MB or 1,024 ³ bytes
1 TB	1,024 GB or 1,024 ⁴ bytes
1 PB	1,024 TB or 1,024 ⁵ bytes
1 EB	1,024 PB or 1,024 ⁶ bytes

Accessing product documentation

Product user documentation is available on Hitachi Vantara Support Connect: <https://knowledge.hitachivantara.com/Documents>. Check this site for the most current documentation, including important updates that may have been made after the release of the product.

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Thank you!

Chapter 1: Overview of Hitachi Storage Plug-in for VMware vCenter

Hitachi Storage Plug-in for VMware vCenter integrates Hitachi storage system information and provisioning operations into the vSphere Client.

This integration allows VMware product administrators to perform storage provisioning operations from within the VMware user interface, which offers greater convenience than having to switch between VMware and Hitachi management software to perform common operations involving both.

Overview of Hitachi Storage Plug-in for VMware vCenter's functions

Hitachi Storage Plug-in for VMware vCenter provides functions to view storage information, provision datastores, and delete datastores.

View

The View function displays the storage system information registered in the storage plug-in, the datastore on the ESXi host using the storage system, and virtual machine information.

Provision Datastore

The Provision Datastore function creates an LU used as a datastore for a Virtual Machine File System (VMFS), a Network File System (NFS), and also for Raw Device Mapping objects (RDMs) by a storage system registered in the Hitachi Storage Plug-in.

Delete Datastore/LU

The Delete Datastore function is a one-step operation that removes datastores or LUs from storage systems registered with the storage plug-in. It does not remove datastores or LUs that were created without using the storage plug-in.

Key terms and concepts

The term vSphere is a collective name for the VMware-based virtual environment, which includes the VMware vSphere software, VMware vCenter Server software, VMware ESXi clusters and hosts managed by the vCenter Server, and the virtual machines (VMs) and vApps hosted on those ESXi clusters.

For details about these concepts, see the *Hitachi Ops Center API Configuration Manager REST API Reference Guide*, and the VMware documentation provided by VMware Inc.

Term	Description
Datastore	Virtual area used to store a virtual machine image on ESXi. The actual area is created on a local disk or external storage system.
HDP	Hitachi Dynamic Provisioning. An optional function of the storage system to reduce complicated design. A large volume of virtual capacity eliminates reliance on device capacity.
Virtual storage machine (VSM)	The unit that is used to manage virtualized storage system resources.
Hitachi Ops Center	Storage management software suite, supporting storage resource operation in Enterprise environments.
Hitachi Ops Center API Configuration Manager	Software included in Hitachi Ops Center. Hitachi Ops Center API Configuration Manager REST API provides the Web API, which follows the principles of Representational State Transfer (REST), for getting information about Hitachi storage systems or changing the configuration of Hitachi storage systems.
HNAS	Hitachi NAS Platform is a network-attached storage system that allows storage capacity from back-end arrays to be accessed over TCP/IP using SMB, NFS, iSCSI, and FTP.
Host Group	Host Groups represent storage array LU masking configurations, which allow a set of HBA ports to access a set of LUs.
Hitachi NAS File Storage REST API	Hitachi NAS File Storage REST API is a REST API which allows REST client applications to configure and collect information from Hitachi file storage systems.
RDM	Raw Device Mappings are VMware configuration objects which allow VMs to directly access LUs.

Chapter 2: System Requirements

Required system configuration for Hitachi Storage Plug-in for VMware vCenter

A system that uses Hitachi Storage Plug-in for VMware vCenter to manage storage systems consists of the following components:

- Hitachi Storage Plug-in for VMware vCenter
 - Plug-in

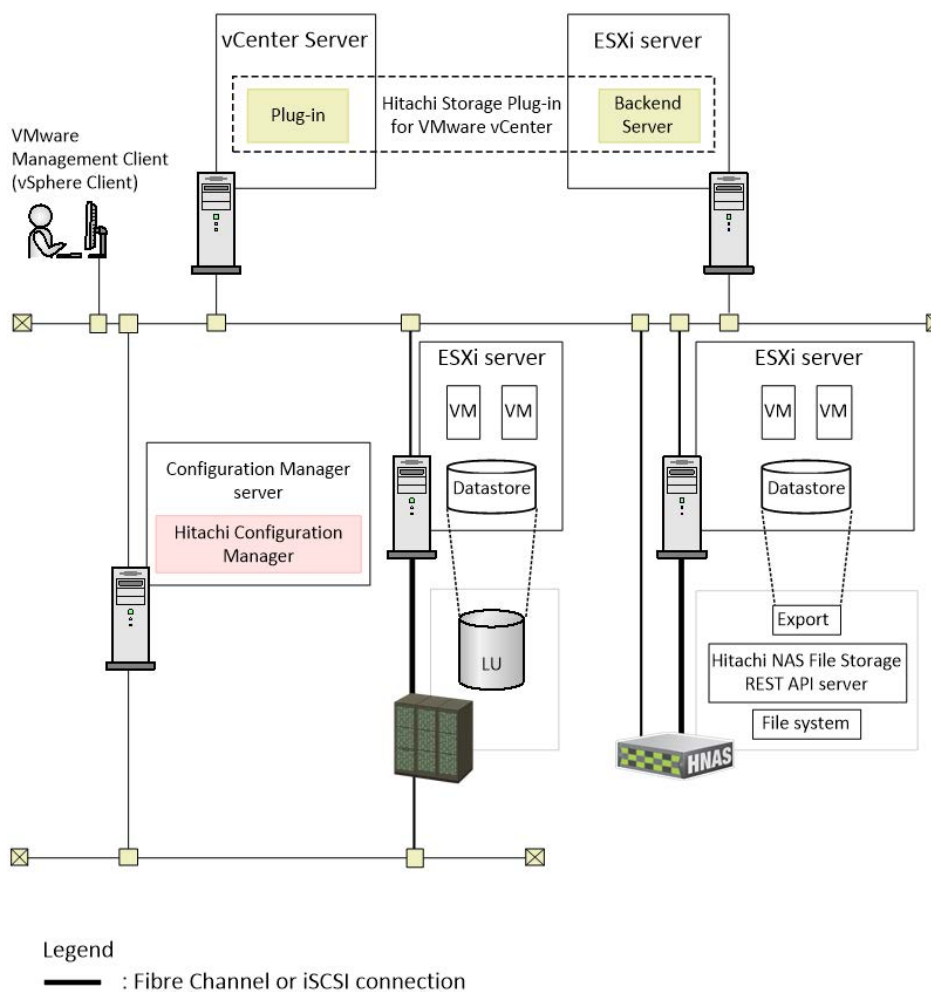
This plug-in runs on the vCenter Server and is stored on the Backend Server as a ZIP file. The plug-in is installed on the vCenter Server.
 - Backend Server

This is a virtual machine that is deployed to and runs on the ESXi server. You can send requests from the vCenter Server to the Configuration Manager server, and perform operations on the storage systems.

You can deploy an ESXi server by preparing an ESXi server for the Backend Server, or by sharing an existing ESXi server.
- Depending on the storage system you are using, you will need one of the following software products for managing storage systems:
 - Hitachi Ops Center API Configuration Manager

When you register a storage system in Hitachi Ops Center API Configuration Manager, enable the settings for receiving configuration change notifications from the storage system.
 - Hitachi NAS File Storage REST API

The following example shows a typical system configuration that includes Hitachi Storage Plug-in for VMware vCenter.



- VMware software components require access to storage systems using TCP/IP.
- ESXi must have Fibre Channel or TCP/IP connectivity to storage systems, for details, see [Storage system requirements \(on page 15\)](#).

Hardware requirements

Backend Server


Item	Requirements	Whether the setting is changeable at deployment
Name of the virtual machine	HitachiStoragePlugin_<version>-00 (default)	Yes
OS	Oracle Linux 7.5 (64-bit)	No
CPU	vCPU (4)	No

Item	Requirements	Whether the setting is changeable at deployment
Memory	8 GB	No
HDD free space	50 GB	No

Software requirements



Caution: If the vSphere Client is not installed before the storage plug-in is installed, the storage plug-in will fail to install.

Software	Version
VMware vCenter Server	<p>One of the following is required:</p> <ul style="list-style-type: none"> ▪ VMware vCenter Server Appliance 6.7 (Update 1) ▪ VMware vCenter Server Appliance 6.7 (Update 2) ▪ VMware vCenter Server Appliance 6.7 (Update 3) <p> Tip: The vSphere Client is included with the VMware vCenter Server.</p>
VMware ESXi	<p>One of the following is required:</p> <ul style="list-style-type: none"> ▪ VMware ESXi 6.5 (Update 2) ▪ VMware ESXi 6.5 (Update 3) ▪ VMware ESXi 6.7 ▪ VMware ESXi 6.7 (Update 1) ▪ VMware ESXi 6.7 (Update 2) ▪ VMware ESXi 6.7 (Update 3)

Software	Version
Hitachi Ops Center API Configuration Manager (Hitachi Ops Center Component)	<p>Storage systems and compatible versions:</p> <ul style="list-style-type: none"> ▪ VSP E990: 10.1.0 or later ▪ VSP F350, F370, F700, F900: 8.6.0 or later ▪ VSP G350, G370, G700, G900: 8.6.0 or later ▪ VSP F400, F600, F800: 8.6.2 or later ▪ VSP G200, G400, G600, G800: 8.6.2 or later ▪ VSP N400, N600, N800: 8.6.4 or later ▪ VSP 5100, 5500, 5100H, 5500H: 10.0.0 or later ▪ VSP F1500: 8.6.2 or later ▪ VSP G1500: 8.6.2 or later ▪ VSP G1000: 8.6.2 or later
Hitachi NAS File Storage REST API server	The version 7 series (7.1.0 or later) is required for managing an NFS datastore by using HNAS/VSP Nx00 and Hitachi Storage Plug-in.
<p>Microsoft Windows:</p> <ul style="list-style-type: none"> ▪ Microsoft Internet Explorer ▪ Mozilla Firefox ▪ Google Chrome <p>Mac OS:</p> <ul style="list-style-type: none"> ▪ Mozilla Firefox ▪ Google Chrome 	<p>Installed on the VMware Management client.</p> <p>We recommend using the latest version.</p>

Storage system requirements

Storage system	Firmware version	Interface / Host port
VSP E990	93-02-01 or later	Fibre Channel, iSCSI
VSP F350, F370, F700, F900 VSP G350, G370, G700, G900	When Hitachi Ops Center API Configuration Manager 8.6.0 or 8.6.1 is used: 88-01-xx or later	Fibre Channel, iSCSI

Storage system	Firmware version	Interface / Host port
	When Hitachi Ops Center API Configuration Manager 8.6.2 or later is used: 88-03-01 or later	
VSP F400, F600, F800 VSP G200, G400, G600, G800	83-05-25 or later	Fibre Channel, iSCSI
VSP N400, N600, N800	83-06-01 or later	Fibre Channel, iSCSI, NAS
VSP 5100, 5500, 5100H, 5500H	90-01-42 or later	Fibre Channel, iSCSI
VSP F1500 VSP G1000 VSP G1500	80-06-61 or later	Fibre Channel, iSCSI
HNAS 4000	13.5 or later	NAS

Restrictions and considerations

The following restrictions and considerations apply when using the Hitachi Storage Plug-in for VMware vCenter.

Capacity Saving setting in Provision Datastore

If a dedupe and compression program product is installed on the following storage systems, you can set up Capacity Saving: VSP E990 storage systems, VSP F350, F370, F700, F900 storage systems, VSP G350, G370, G700, G900 storage systems, and VSP 5100, 5500, 5100H, 5500H storage systems. To check whether a dedupe and compression program product is installed, contact your storage system administrator.

Communication port for the Configuration Manager server

By default, the Backend Server uses TCP port number 23450 (http) or 23451 (https) to communicate with the Configuration Manager server. Verify that other software applications are not using those port numbers. If they are, use Add Storage System to change the port numbers in the Configuration Manager server. After installing the Hitachi Storage Plug-in, the port number that you want to use must be enabled to communicate with the Configuration Manager server.

RAID level

RAID0/1+0/1/5/6 are supported. VSP Ex00 models, VSP Fx00 models, and VSP Gx00 models support RAID1, RAID5, and RAID6.



Note: Do not use RAID0 in the storage system because it does not have data redundancy.

Registering multiple storage systems that have the same serial number

You cannot register multiple storage systems that have the same serial number in the Hitachi Storage Plug-in.

Restrictions of the host group name or iSCSI target name

Host group names or iSCSI target names may not include brackets ([]).

User role

We recommend that users who will use the Hitachi Storage Plug-in be assigned the administrator role. To create a role that has the minimum privileges necessary to use the storage plug-in, select the following check boxes:

- Extension > Register extension
- Extension > Update extension
- Global > Log event
- Host > Configuration > Storage partition configuration
- Tasks > Create task
- Tasks > Update task



Note: If you want to assign a role you created to a user or group, you must select Propagate to children.

Resource group

The Hitachi Storage Plug-in does not support resource group management. If you use the Hitachi Storage Plug-in, verify the following:

- Storage users registered with the Hitachi Storage Plug-in can view all resource groups. If the user's view of resource groups is limited, the Hitachi Storage Plug-in will not operate correctly.
- If the target storage system is a VSM, the Hitachi Storage Plug-in can create datastores for a resource group belonging to the VSM.

Security Update of Oracle Linux

If a problem occurs in Oracle Linux, which is preinstalled as the guest OS on the Backend Server, contact Oracle Support. At this time, you might need to purchase support services from Oracle. After the Backend Server is deployed, the Backend Server administrator must install security updates for Oracle Linux. For information about installing security updates, see the documentation related to Oracle Linux.

Chapter 3: Setting up the Hitachi Storage Plug-in for VMware vCenter

When you install the Hitachi Storage Plug-in for VMware vCenter, deploy the Backend Server, run the shell script, and customize configuration files as needed. Later on, your site can uninstall the Hitachi Storage Plug-in for VMware vCenter.

Installing the Hitachi Storage Plug-in for VMware vCenter

Install Hitachi Storage Plug-in for VMware vCenter by performing the following procedure:

1. [Deploying a Backend Server \(on page 18\)](#)
2. [Running a shell script on the Backend Server \(registering the plug-in\) \(on page 19\)](#)
3. [Logging in to the vSphere Client to confirm that installation is complete \(on page 20\)](#)

Before installing the Hitachi Storage Plug-in for VMware vCenter, set up the vSphere environment and confirm that the storage system is ready to use Hitachi Storage Plug-in for VMware vCenter.

Deploying a Backend Server

Deploy the Backend Server by using the distributed OVA file.

Before you begin

Obtain the network information (IP address, gateway, and netmask) of the Backend Server.

Procedure

1. In vSphere Client, select **VMs and Templates > VMs > Actions > Deploy OVF Template**.
2. In **Select an OVF template**, select **Local file**, and then specify the `HitachiStoragePlugin_<version>-00.ova` file.
Click **Next**.
3. In **Select a name and folder**, enter the name of the virtual machine (Backend Server) that you want to deploy. The default is "HitachiStoragePlugin_<version>-00".
Click **Next**.

4. In **Select a compute resource**, select the destination compute resource for this operation.
Click **Next**.
5. In **Review details**, click **Next**.
6. In **Select storage**, select the storage for the configuration and disk files.
Click **Next**.
7. In **Select networks**, select a destination network for each source network.
Click **Next**.
8. In **Customize template**, enter the network information of the Backend Server in IPv4 format.
Click **Next**.
9. In **Ready to complete**, click **Finish**.
The name of the Backend Server that you entered in step 3 appears in the list **Virtual Machines** on the vSphere Client.
10. Turn on the power of the Backend Server.

Running a shell script on the Backend Server (registering the plug-in)

Run a shell script on the Backend Server to register in the vCenter Server the location of the plug-in stored on the Backend Server.

Before you begin

Obtain vCenter Server information (IP address, user name, and password).

The vCenter Server user account must have Administrator permissions.

Procedure

1. Log in to the Backend Server as the root user.
The initial password for the root user is "password". For security, change the initial password.
2. Run the following shell script.

```
/usr/local/hitachi-storage-plugin/StoragePluginforVMwarevCenter.sh <IP-address-of-vCenter-Server> <user-name-of-the-vCenter-Server> <password-of-the-vCenter-Server> registration
```

If no default domain is set for the vCenter Server, specify a domain by adding the domain name to <user-name-of-the-vCenter-Server> (for example, administrator@vsphere.local).



Note: If Hitachi Storage Plug-in for VMware vCenter is used on multiple vCenter Servers, specify the IP address of each vCenter Server, and then run the shell script on the Backend Server.

Logging in to the vSphere Client to confirm that installation is complete

Log in to the vSphere Client to confirm whether the plug-in you registered to the vCenter Server was successfully installed.

Procedure

1. Log in to the vSphere Client as a user with administrator permissions.
2. In the list of **Client Plug-Ins** under **Administration**, make sure that **Hitachi Storage Plug-in** is enabled.



Tip: The **Hitachi Storage Plug-in** icon is also added to **Shortcuts** in the vSphere Client.



Note: Specify settings so that the system time of the vCenter Server and the system time of the Backend Server are the same. To synchronize the time of the Backend Server with the time of the NTP server, specify settings for the NTP server on the ESXi server where the Backend Server is running. For details, see the VMware manual provided by VMware Inc.

Upgrading the Hitachi Storage Plug-in for VMware vCenter

To upgrade the Hitachi Storage Plug-in for VMware vCenter:

1. [Deploying a Backend Server \(on page 18\)](#)
Deploy the new version of the Backend Server.
2. [Migrating the configuration files from an older version of the Backend Server \(on page 20\)](#)
3. [Upgrading the vCenter Server plug-in \(on page 21\)](#)
4. [Migrating the IP address of an older version of the Backend Server \(on page 22\)](#)
5. [Deleting the Backend Server \(on page 23\)](#)
Delete the older version of the Backend Server.
6. [Logging in to the vSphere Client to confirm that installation is complete \(on page 20\)](#)



Note: If you do not need the new version to inherit the settings from the older version, skip steps 2 and 4.

Migrating the configuration files from an older version of the Backend Server

To migrate the configuration files from an older version of the Backend Server to a new version of the Backend Server, run a shell script on the new version of the Backend Server.

The following configuration files can be migrated.

Folder	File
/usr/local/hitachi-storage-plugin/jetty/webapps/conf	<ul style="list-style-type: none"> ▪ HiStorageMgrConfig.xml ▪ hivcenter.config ▪ HNAS_multiaccount.xml ▪ log4j2.xml ▪ modelname.config ▪ multiaccount.xml
/var/log/hitachi-storage-plugin	<ul style="list-style-type: none"> ▪ StoragePlugin.log ▪ StoragePlugin.log.N

Before you begin

- Obtain the IP address and password for the older version of the Backend Server.
- Turn on the older version of the Backend Server.

Procedure

1. Log in to the new version of the Backend Server as the root user.
The initial password for the root user is "password". For security, change the initial password.
2. Run the following shell script.

```
/usr/local/hitachi-storage-plugin/BackendServerUpgrade.sh <IP-address-
of-the-older-version-of-the-Backend-Server> <password-of-the-older-
version-of-the-Backend-Server>
```

Upgrading the vCenter Server plug-in

Run a shell script on the new version of the Backend Server to upgrade in the vCenter Server the location of the plug-in stored on the Backend Server.

Before you begin

Obtain vCenter Server IP address, user name, and password.

The vCenter Server user account must have Administrator permissions.

Procedure

1. Log in to the new version of the Backend Server as the root user.
The initial password for the root user is "password". For security, change the initial password.

2. Run the following shell script.

```
/usr/local/hitachi-storage-plugin/StoragePluginforVMwarevCenter.sh <IP-address-of-vCenter-Server> <user-name-of-the-vCenter-Server> <password-of-the-vCenter-Server> upgrade
```

If no default domain is set for the vCenter Server, specify a domain by adding the domain name to <user-name-of-the-vCenter-Server> (for example, administrator@vsphere.local).

Migrating the IP address of an older version of the Backend Server

To use the IP address of an older version of the Backend Server for a new version of the Backend Server, change the settings in vSphere Client.

Before you begin

Obtain the IP address of the older version of the Backend Server.

Procedure

1. Shut down the new and old versions of the Backend Server.
2. Follow the procedure in [Changing network information of the Backend Server \(on page 24\)](#) to change the IP address of the new version of the Backend Server to that of the old version.
3. Turn on the new version of the Backend Server.

Uninstalling the Hitachi Storage Plug-in for VMware vCenter

Uninstall Hitachi Storage Plug-in for VMware vCenter by performing the following procedure:

1. [Running a shell script on the Backend Server \(unregistering the plug-in\) \(on page 22\)](#)
2. [Deleting the Backend Server \(on page 23\)](#)
3. [Logging in to the vSphere Client to confirm that uninstallation is complete \(on page 23\)](#)

Running a shell script on the Backend Server (unregistering the plug-in)

Run a shell script on the Backend Server to unregister the plug-in from the vCenter Server.

Before you begin

Obtain vCenter server information (IP address, user name, and password).

The vCenter Server user account must have Administrator permissions.

Procedure

1. Log in to the Backend Server as the root user.
2. Run the following shell script.

```
/usr/local/hitachi-storage-plugin/StoragePluginforVMwarevCenter.sh <IP-address-of-vCenter-Server> <user-name-of-the-vCenter-Server> <password-of-the-vCenter-Server> unregistration
```

If no default domain is set for the vCenter Server, specify a domain by adding the domain name to <user-name-of-the-vCenter-Server> (for example, administrator@vsphere.local).

Deleting the Backend Server

If you no longer use the Backend Server, delete the virtual machine that is used as the Backend Server from the vSphere Client.

Procedure

1. If the power to the Backend Server is on, turn off the power.
2. On the vSphere Client, select the Backend Server in the list **Virtual Machines** and then select **Actions > Delete from Disk**.

Logging in to the vSphere Client to confirm that uninstallation is complete

Log in to the vSphere Client to confirm whether the plug-in was uninstalled from the vCenter Server.

Procedure

1. Restart the vSphere Client service.
For details about how to restart the vSphere Client service, see [Starting and stopping services in the vCenter Server \(on page 23\)](#).
2. Log in to the vSphere Client as a user with administrator permissions.
3. In the list of **Client Plug-Ins** under **Administration**, make sure that **Hitachi Storage Plug-in** has been deleted.



Tip: The icon of Hitachi Storage Plug-in is also deleted from **Shortcuts** of the vSphere Client.

Starting and stopping services in the vCenter Server

In the vCenter Server, you can start or stop the vSphere Client service.

Procedure

1. Log in as a root user to the vCenter Server.
2. Enter the following commands:
 - To start the service:


```
# service-control --start vsphere-ui
```
 - To stop the service:


```
# service-control --stop vsphere-ui
```

Restarting services on the Backend Server

To enable configuration files, restart the services on the Backend Server.

Procedure

1. Log in to the Backend Server as the root user.
2. Run the following command on the Backend Server.

```
systemctl restart jetty_sp
```

Changing network information of the Backend Server

Change network information (IP address, gateway, and netmask) of the Backend Server.

Before you begin

Network information (IP address, gateway, and netmask) of the Backend Server has been verified.

Procedure

1. If the power to the Backend Server is on, turn off the power.
2. From the navigator of vSphere Client, select the Backend Server, and then select **Configure > Settings > vApp Options**.
3. In **Properties**, select **Gateway**, **Netmask**, and **IP Address**, click **SET VALUE**, and then set a value.
4. Turn on the power of the Backend Server.
5. Register the Hitachi Storage Plug-in again in the vCenter Server.
For details about how to register, see [Running a shell script on the Backend Server \(registering the plug-in\) \(on page 19\)](#).



Caution: If you migrate the virtual machine that is used as the Backend Server to a different vCenter Server from the vCenter Server to which it was originally deployed, you will not be able to make changes in vApp Options. If this occurs, uninstall the plug-in and the Backend Server according to the procedure in [Uninstalling the Hitachi Storage Plug-in for VMware vCenter \(on page 22\)](#), and then deploy the Backend Server again.

Changing the configuration files

By editing the configuration files, you can change the settings of the Backend Server log file and of LUN IDs. To change the settings of the Backend Server log file, edit the `log4j2.xml` file. To change the settings of LUN IDs, edit the `hivcenter.config` file.



Note: If you change a configuration file, restart the service. See [Restarting services on the Backend Server \(on page 24\)](#).

Log file

Edit `log4j2.xml` file to change the settings in the Backend Server log file (`StoragePlugin.log`).

The `log4j2.xml` file is stored in the following location:

```
/usr/local/hitachi-storage-plugin/jetty/webapps/conf
```

You can change the following settings:

Log file size

How to edit:

```
<SizeBasedTriggeringPolicy size="<size>"/>
```

- Specify a unit (KB, MB, or GB) for `<size>`. For example, 10MB.
- Specify `<size>` by using single byte alphanumeric characters. Specify a decimal number.
- If the value is omitted or an invalid value (a value other than a single-byte value) is used, the default value of 10 MB is used.

Number of log generations

When a log file's size exceeds the specified maximum size, the log files will rotate (i.e. `log.0.txt` will become `log.1.txt`).

How to edit:

```
<DefaultRolloverStrategy max="<number-of-generations>" />
```

- Specify `<number-of-generations>` in single-byte decimal numbers.
- If the value is omitted or an invalid value (a value other than a single-byte value) is used, the default value of 19 generations is used.

Log level**How to edit:**

```
<Root level="<log-level>">
```

Specify one of the following for `<log-level>`:

- `info`: Outputs processing information only.
- `warn`: Outputs warnings and processing information.
- `error`: Outputs general errors, warnings, and processing information.
- `fatal`: Outputs fatal errors, general errors, warnings, and processing information.

LUN ID

On the Storage Configuration screen of the Provision Datastore wizard, you can specify LUN IDs. You can change the range of LUN IDs that can be specified on this screen by editing the `hivcenter.config` file to set the maximum and minimum values of the range.

The `hivcenter.config` file is stored in the following location:

```
/usr/local/hitachi-storage-plugin/jetty/webapps/conf
```

Edit the file with a text editor using alphanumeric characters. While editing this file, be sure to press `<Enter>` at the end of each line, including the file's final line (the file should end with a blank line).

- Specify values for `<minimum-LUN-ID>` and `<maximum-LUN-ID>` in `[MinLUNID=<minimum-LUN-ID>]` and `[MaxLUNID=<maximum-LUN-ID>]`, respectively.
- Specify values that are equal to or greater than 0.
- The maximum value that can be specified as a LUN ID for storage systems is different from that which can be specified for ESXi hosts. Be sure to check the specifications of the storage system or ESXi host that you are using.
- If no values are specified or an invalid value (a value outside the valid range, a value including a multi-byte character, or a minimum value that is greater than the maximum value) is specified, the default values of 0 and 1023 are used for the minimum value and maximum value, respectively.



Note: If you do not specify a value for LUN ID on the Storage Configuration screen of the Provision Datastore wizard, a value (which might be outside of the range defined by `<minimum-LUN-ID>` and `<maximum-LUN-ID>`) will be automatically assigned.

Chapter 4: Using the Hitachi Storage Plug-in for VMware vCenter

When needed, you can access the plug-in, add and remove storage systems, and perform storage provisioning operations from within the vSphere Client.

Accessing the Hitachi Storage Plug-in

When the storage plug-in is installed, the Hitachi Storage Plug-in icon is added to the vSphere Client window.

Procedure

1. Log in to the vSphere Client from a browser.
2. Click the **Shortcuts**.
3. Click the Hitachi Storage Plug-in icon.

Adding a storage system

Use **Add Storage System** to register storage systems to be monitored by the storage plug-in. The registration procedure differs slightly according to the type of storage system you want to add.



Note: To correctly display global-active device (GAD) volumes with Hitachi Storage Plug-in, you will need to use Hitachi Ops Center API Configuration Manager to manage both the primary storage system and the secondary storage system.

Adding a block storage system

You can add storage systems of the following models as block storage systems: VSP E series, VSP F series, VSP G series, VSP N series, and VSP 5000 series.

Procedure

1. In the **Storage System** window, click **Add Storage System**.
2. On **Model**, select a storage system.
3. Click **Next**.

4. On **Information**, enter the following information for the Configuration Manager server:
 - **IP Address**
 - **Port Number**

To use SSL communication between Hitachi Storage Plug-in and the Configuration Manager server, select **Use SSL**.
5. Click **Next**.
6. On **Physical Storage Discovery**, select all physical storage systems to be registered and all physical storage systems on which the VSMs that will be registered exist. (You can select multiple physical storage systems at the same time.)
Click **Next**.
7. On **Authorization**, enter the user ID and password for each of the selected physical storage systems.
Click **Next**.
8. On **Virtual Storage Discovery**, select all physical storage systems and VSMs that will be registered. (You can select multiple physical storage systems and VSMs at the same time.)



Tip: The list of storage systems displays values acquired from Configuration Manager.

9. On **Summary**, confirm the model and other information for the storage system you selected.
10. Click **Finish**.



Note: If the connection fails (for example, a communication error occurs, the required storage systems are not displayed, or the user ID or password is incorrect), troubleshoot the issue or contact your storage system administrator to verify your user account.

Adding a file storage system

You can add a VSP Nx00 NAS module or a HNAS storage system as a file storage system.

Procedure

1. In the Hitachi Storage Plug-in window, click **Add Storage System**.
2. On **Model**, select **VSP Nx00 NAS module / HNAS**; click **Next**.
3. On **Information**, enter the IP address and port number for the Hitachi NAS File Storage REST API server or for one of the storage controllers; click **Next**.
4. On **Admin EVS**, enter the IP address, user ID, and password for the EVS server. If you entered the IP address of one of the storage controllers on the **Information**, enter that same IP address here, then click **Next**.
5. On **Summary**, verify the settings. Use the **Back** button to modify any of the settings.
6. Click **Finish**.

7. Refresh the storage system. See [Refreshing storage system information \(on page 30\)](#).

Removing a storage system

You have two options to remove a storage system from being monitored by the storage plug-in:

- Using the icon in the Storage Systems List window.
- From the Actions list in the Storage Systems List window.



Note: Even if you remove storage systems using Remove Storage System, datastores or LUs created by using the Hitachi Storage Plug-in remain. If you want to remove those datastores or LUs, register the storage systems again, and then use [Deleting datastores \(on page 38\)](#).

Procedure

1. In the Navigator pane, click **Storage Systems**.
2. Select the storage system you want to remove from the **Storage Systems** list.
3. Right-click the storage system, and then click **Remove Storage System**.
4. Click **Yes**.

Refreshing storage system information

Use Refresh Storage System to update the information for all or selected storage systems. Refreshing the storage systems from the Home screen updates the information for all storage systems while refreshing from the Storage Systems list screen updates the information for selected storage systems only.



Note:

- When you use the following file storage systems, always refresh the storage system information after adding a storage system, provisioning a datastore, or deleting a datastore.
 - VSP Nx00 NAS module
 - HNAS 4000
- If you change the storage system configuration by using other tools, refresh the applicable storage system information before provisioning or deleting a datastore.

You can run Refresh Storage System from the Objects screen or under Actions.

Refreshing all storage systems

When all registered storage systems have not been refreshed recently, you may be prompted to refresh. Refreshing storage systems from the Home window refreshes the information for all registered storage systems. To refresh information for a single storage system, run Refresh from the Storage Systems list screen.

Procedure

1. Go to the Home screen of the Hitachi Storage Plug-in.
2. In the message, click **Yes**.
3. Click **OK**.

All registered storage systems information will be refreshed. If you like to select individual storage systems, run refresh from the Storage Systems screen.

The progress of the refresh is shown in the **Recent Tasks** pane.

Refreshing the storage task completes.

4. Click the **Refresh** icon in the vSphere Client title bar to display the refreshed information.

Refreshing selected storage systems

Refreshing storage systems from the Storage Systems list refreshes information for the selected storage systems.

Before you begin

Before refreshing a storage system, check whether any of the following settings for the user account specified to register the storage system have been changed:

- The password is changed.
- The account is removed.
- The View authority of the target storage system is removed from the account.

If any of these settings have been changed, delete the storage system and then register it again. Otherwise a task error message is displayed, and "N/A" might be displayed in some columns, such as the status column, in the storage system view.

Procedure

1. On the Hitachi Storage Plug-in screen, click the **Storage Systems**.
2. Select the storage systems.
3. In the **Actions** drop down, choose **Refresh Storage System**.

4. In the verifying message, click **Yes**.

5. If a second confirmation message appears, click **OK**.

The progress of the refresh is shown in the **Recent Tasks** pane.

The Refresh Storage task completes.

6. Click the **Refresh** icon in the vSphere Client title bar to display the refreshed information.

Provisioning datastores

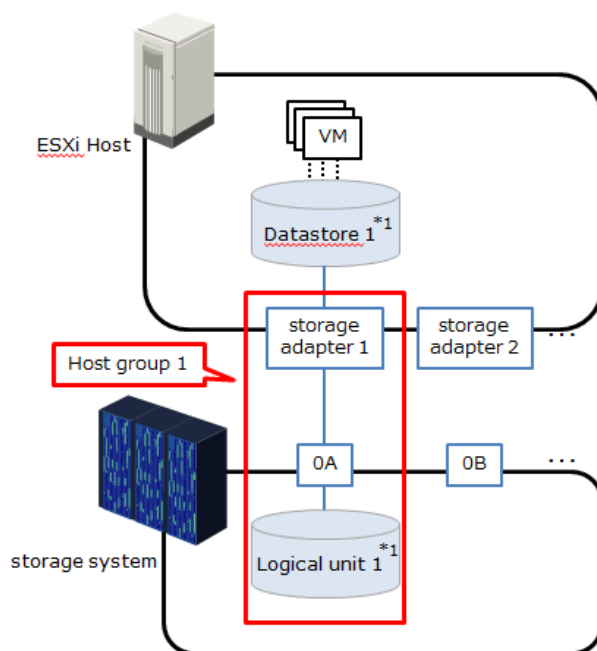
The Provision Datastore command enables you to create LUs for use as VMFS datastores/RDMs as well as an export for use as NFS datastores by a storage system registered in the Hitachi Storage Plug-in.

Overview of Provision Datastore

Before you begin

Create the host group or iSCSI target in which the WWN for the ESXi HBA is registered. Otherwise, the host group or iSCSI target will not appear on the selection screen.

An example of the host group used to assign the LU:



Example of host group: *1 Logical unit and datastore are created in the Provision Datastore.

Host group 1	Name	BL360-B0-9
	Port	0A
	WWN	Storage adapter 1
	Logical unit	Logical unit 1 *1

The Provision Datastore is available in the following screens:

- Storage Devices list screen (Provision Datastore icon)
- Datastores list screen (Provision Datastore icon)
- Datastores list screen (Actions menu)

Creating a datastore

This feature allows VMware datastores to be created, including the storage objects necessary to support them. Both VMFS and NFS datastores and Raw Device Mappings are supported.

Creating VMFS datastores

Before you begin

- Verify that all involved ESXi hosts have Fibre Channel connectivity to the storage system.
- Choose a storage system upon which to create an LU.
- Verify the DP pool that creates the LU used in the VMFS datastore.
- Verify the Host group or iSCSI target of the storage system in which the WWN or iSCSI name of the storage adapter (HBA ESXi host) is set.
- Make sure that the storage system information and vSphere environment information are current. If the information is not up to date, run Refresh Storage System.

Procedure


1. In the Hitachi Storage Plug-in navigator, click **Storage Devices**.
2. Click the **Provision Datastore** icon to start the Provision Datastore.
3. On the **Type** screen, choose **VMFS datastore**, then click **Next**.
4. On the **VMFS Version** screen, choose the VMFS version, then click **Next**.
5. On the **Name and Capacity** screen, determine how many datastores you want to create (single or multiple).

To create a single datastore	To create multiple datastores
1. Select Single Datastore creation .	1. Choose Multiple Datastore creation .
2. Enter a name (3 - 42 characters) for the datastore. Acceptable characters: alphanumeric, space, ! # () + - , . = @ _	2. Enter a name (3 - 42 characters) for the datastore. Acceptable characters: alphanumeric, space, ! # () + - , . = @ _
3. Enter a value for the datastore capacity as allowed by the ESXi server you are using (2 - 65535 GB). The total	3. In Number of datastores , enter the number of the datastores you want to create. You can create up to 256 datastores.

To create a single datastore	To create multiple datastores
capacity of the datastore is displayed on the Total column.	4. For the Starting Number , enter a starting number (0 - 999) for the datastores. The datastore name is displayed on the datastore Name column.
	5. In Datastore Capacity , enter a capacity value for each datastore (2 - 65535 GB). The total capacity of the datastore is displayed on the Total column.

6. Click **Next**.
7. On the **Storage Adapter** screen, select the storage adapter for the datastores.
 - a. From **Select Cluster or Host**, select the cluster or ESXi host.
 - b. Select the storage adapter.
 - c. Click **Next**.
8. On the **Storage Configuration** screen, configure the storage system for the datastore(s).
 - a. Select **Storage System**.
 For VSMs, the serial numbers for the VSMs and physical storage systems are displayed in **Storage System**.

```
<Storage model>_<Virtual storage serial number>(<Physical storage serial number>)
```
 - b. Select **Storage Pool / RAID Group**.
 - c. Select **Capacity Saving** if you chose VSP E990, VSP F350, F370, F700, F900, VSP G350, G370, G700, G900, or VSP 5100, 5500, 5100H, 5500H.
 - d. Specify a value for **LUN ID**.
 You can specify this item if you selected **Single Datastore creation** on the **Name and Capacity** screen and selected a storage system that is managed by Hitachi Ops Center API Configuration Manager. You can specify a value in the range from 0 to 1023. If you do not specify a value for **LUN ID**, a value will be automatically set.

 **Tip:** To change the range of LUN IDs that can be specified, edit the `hivcenter.config` file. See [Changing the configuration files \(on page 25\)](#).
 - e. If you select VSM for the **Storage System** in step a, the **Use LDEV ID from the resource group of selected Virtual Storage Machine** check box becomes

active and can be selected. If you select a physical storage system for the **Storage System**, the check box cannot be selected.

- When the check box is not selected: An LDEV is created by using an LDEV ID that is reserved for meta_resource.
 - When the check box is selected: An LDEV is created by using an LDEV ID that is reserved for a resource group within the VSM.
- f. Select **Host Group/Target**.
 - g. Click **Next**.
 9. On the **Summary** screen, confirm the settings for the datastore. Click a screen name to modify any settings.
 10. Click **Finish**. The datastore creation progress and results can be viewed in the **Recent Tasks** of the vSphere Client.



Note: You can cancel the Provision Datastore after the datastore creation process starts; however, rollback is not enabled. Any LUs already created will remain on the storage system and must be deleted manually.

Creating LUs for Raw Device Mapping (RDM)

Before you begin

- Verify that the storage adapter is connected to the storage system (HBA ESXi host).
- Choose the storage system for creating the LU used for RDM.
- Verify the DP pool that creates the LU used for RDM.
- Verify the Host group or iSCSI target of the storage system in which the WWN or iSCSI name of the storage adapter (HBA ESXi host) is set.
- Make sure that the storage system information and vSphere environment information are current. If the information is not up to date, run Refresh Storage System.

Procedure


1. In the Hitachi Storage Plug-in navigator, click **Storage Devices**.
2. Click the **Provision Datastore** icon to start the Provision Datastore.
3. On the **Type** screen, select **LUN for Raw Device Mapping**, click **Next**.
4. On the **Capacity** screen, choose **Single LUN creation** or **Multiple LUN creation**.

For Single LUN creation	For Multiple LUN creation
1. Choose Single LUN creation .	1. Choose Multiple LUN creation .
2. Enter a value for the LUN capacity (2 GB-65,535 GB).	2. Enter the number of LUs (256 maximum) you want to create.

For Single LUN creation	For Multiple LUN creation
3. Click Next .	3. Enter a capacity value for each LU (2-65,535 GB). The total capacity for the multiple LU is displayed on the Total .
	4. Click Next .

5. On the **Storage Adapter** screen, select the storage adapter for the LUs.
 - a. From **Select Cluster or Host**, select the virtual machine on which the LUs are to be created.
 - b. Select the storage adapter for the LUs.
 - c. Click **Next**.
6. On the **Storage Configuration** screen, configure the storage system for the LUs.
 - a. Select **Storage System**.
 For VSMs, the serial numbers for the VSMs and physical storage systems are displayed in **Storage System**.

```
<Storage model>_<Virtual storage serial number>(<Physical storage serial number>)
```
 - b. Select **Storage Pool**.
 - c. Select **Capacity Saving** if you chose VSP E990, VSP F350, F370, F700, F900, VSP G350, G370, G700, G900, or VSP 5100, 5500, 5100H, 5500H.
 - d. Specify a value for **LUN ID**.
 You can specify this item if you selected **Single LUN creation** on the **Capacity** screen and selected a storage system that is managed by Hitachi Ops Center API Configuration Manager. You can specify a value in the range from 0 to 1023. If you do not specify a value for **LUN ID**, a value will be automatically set.

 **Tip:** To change the range of LUN IDs that can be specified, edit the `hivcenter.config` file. See [Changing the configuration files \(on page 25\)](#).
 - e. Select **Host Group/Target**.
 - f. Click **Next**.
7. On the **Summary** screen, confirm the settings for the LUs. Click a screen name to modify any settings.
8. Click **Finish**. The datastore creation progress and results can be viewed in the **Recent Tasks** pane of the vSphere Client.



Note: You can cancel the LU creation process after the datastore creation process starts; however, any LUs already created will remain on the storage system and must be deleted manually. Delete them manually using **Delete Datastore**. Contact your storage system administrator for additional assistance.

Creating NFS datastores

Use the Provision Datastore wizard to create an NFS Datastore.



Note: Only the storage manager can view an LDEV-labeled creation.

Before you begin

- If a file system is not created on the HNAS storage system prior to datastore creation, the file system is not displayed at the time of selection in the Provision Datastore procedure. You need to set the following:
 - The NFS export and the storage system for the connection.
 - The NAS storage system for NFS datastore.
 - File systems and folders for NFS datastore.
 - The ESXi for datastore creation.

Also, verify the created file system and availability on the HNAS storage system.

- Make sure that the storage system information and vSphere environment information are current. If the information is not up to date, run Refresh Storage System.

Procedure

1. On the Hitachi Storage Plug-in screen, click **Storage Devices**.
2. Click **Provision Datastore** to start the Provision Datastore wizard.
3. On the **Type** screen, select **NFS Datastore** and then click **Next**.
4. On the **Storage Information** screen, select a storage system from the drop-down menu and then click **Next**.
5. On the **File System** screen, select a file system and then click **Next**.



Caution: Only file systems from Admin EVS-targeted user accounts are displayed in the list. If no file systems are displayed, ask your storage system administrator to verify your user account settings.

6. On the **Export Configuration** screen, select an NFS export or select the **Create New Export** check box.

To create an NFS Export: Select an NFS export and then click **Next**.

To create new export:

- a. Check the **Create New Export** box.
- b. Enter the NFS export name.
- c. Enter the directory path to the ESXi host.
- d. Enter the host IP address.
- e. Set a **Snapshot Option**.
- f. Set a **Local Read Cache**.
- g. Set a **Transfer to Replication Target**.
- h. Click **Next**.

7. On the **Datastore Configuration**, enter a name for the datastore. The export path will be displayed after entering a name.
 - Acceptable characters (3-42 characters) are alphanumeric, space, ! # () + - , . = @ -
 - If you do not want to edit the datastore, check the **Mount NFS as Read Only**.
8. Click **Next**.
9. On the **Host Configuration** screen, select NFS datastore host. Click **Next**.
10. On the **Summary** screen, confirm the settings. Click a screen name to go back and modify settings.
11. Click **Finish**. The datastore creation progress and results can be viewed in the **Recent Tasks** pane of the vSphere Client.

After the datastore is created, Click **Refresh Storage System** to update the storage system information. Then the LU appears in the **Storage Devices** list.



Note: You can cancel the Provision Datastore; however, the NFS export already created will remain in the HNAS. To delete an NFS export, contact your storage system administrator for assistance.

Cancelling Provision Datastore

You can cancel Provision Datastore after the datastore creation process is started, however, rollback is not enabled. Any LUs already created remain on the storage system and must be deleted manually.

When you cancel Provision Datastore, rollback is disabled. Created LUs on the storage system remain. Delete LUs accordingly.

Procedure

1. Click **Refresh Storage System**.
2. Click **Delete datastore**, then manually delete any LUs remaining on the storage system. See [Deleting datastores \(on page 38\)](#) or ask the storage administrator for deletion of storage LUN output in the message.
3. Verify that all LUs have been deleted.
If the target storage system model is the VSP Nx00 NAS module or HNAS 4000, click **Refresh Storage System** and then verify that the LUs have been deleted.

Deleting datastores

Use Delete datastore to delete datastores/LUs on storage systems that are registered with the Hitachi Storage Plug-in.

Some datastores cannot be deleted using the deleting datastore command. Use the vSphere Client to delete the following:

- VVol Datastore
- Datastores with a virtual machine or virtual machine template
- Datastores with multiple LUs
- Datastores with pair-configured LUs
- Datastores with LUs used in a Raw Device Mapping (RDM)

If you are still unable to delete a datastore, ask your storage administrator to delete it for you.

Deleting a VMFS datastore/LU

You can delete the VMFS datastores/LUs that are registered in Hitachi Storage Plug-in on storage systems.



Caution: Even after datastores/LUs that were created by selecting Deduplication And Compression have been deleted from the Plug-in screen, it might take some time before the LUs in the storage system are completely deleted. For this reason, free space in the pool might not increase immediately after the deletion.

Before you begin

Make sure that the storage system information and vSphere environment information are up to date. If the information is not up to date, run Refresh Storage System.

Procedure

1. On the Hitachi Storage Plug-in window, click **Storage Devices**.
2. Under **Datastore**, on **Storage Devices**, select the datastore/LU you want to delete. You can delete only one datastore at a time.
3. Click **Delete Datastore** icon.
4. Click **Yes** to confirm deletion.



Note: To cancel the task, click **Cancel**. When you cancel **Delete Datastore**, the LUN that is not deleted remains. Delete unnecessary LUNs.

The results of the **Delete Datastore** appear in the vSphere Client task. When you click the **Refresh** icon, the **Recent Tasks** pane displays the Delete Datastore task.

Deleting an NFS datastore

Before you begin

Make sure that the storage system information and vSphere environment information are up to date. If the information is not up to date, run Refresh Storage System.

Procedure

1. On the Hitachi Storage Plug-in window, Click **Storage Devices**.
2. Select the NFS datastore you want to delete.
3. Click **Actions** menu.
4. Select **All Hitachi Storage Plug-in Actions**.
5. Click **Delete Datastore**.
6. Click **Yes**.
The results of the **Delete Datastore** appear in the vSphere Client task.
7. Run **Refresh Storage System** to retrieve the latest storage system and vSphere environment information.

Chapter 5: Information Display

Hitachi Storage Plug-in for VMware vCenter displays Hitachi storage system information in the vSphere Client. This information includes views of storage system properties and related objects, and lists of storage devices, ESXi hosts, datastores and virtual machines.

Datastores information

Once a Hitachi storage system has been registered with the Hitachi Storage Plug-in, datastores backed by that storage system will appear on this screen. Only datastores created by using the Hitachi Storage Plug-in will appear.

If you select a datastore from the list, a Hitachi Storage Information area will appear on the Summary tab.

This area displays Hitachi storage system configuration objects associated with the datastore. For example, if a datastore is backed by an LU, information identifying the LU's storage system and LUN will appear in this area.

To display this information, first select a datastore, then click Summary.

Host information

The Hosts screen displays the ESXi hosted registered storage system in Hitachi Storage Plug-in.

Once a storage system has been registered with the Hitachi Storage Plug-in, ESXi hosts which consume resources from that storage system will appear on the Hosts screen.

When an ESXi host is selected, a Hitachi Storage Information area will appear under Summary. This area displays information about the storage systems associated with the selected ESXi host.

To display this information, first select an ESXi host, then click Summary.

Virtual Machines information

The Virtual Machines list displays the virtual machines list of the registered datastores in the Hitachi Storage Plug-in.

Once a Hitachi storage system is registered with the Hitachi Storage Plug-in, virtual machines which consume resources from that storage system will be displayed.

If you select a virtual machine from the list, a Hitachi Storage Information area will appear on the Summary.

This area displays Hitachi storage system configuration objects associated with the virtual machine. For example, if a virtual machine resides on a VMFS filesystem backed by a Hitachi LU, information identifying the LU's storage system and LUN will appear in this area.

To display this information, complete the following procedure.

Procedure

1. Select a virtual machine.
2. click **Summary**.

Chapter 6: Troubleshooting

Troubleshooting the Hitachi Storage Plug-in installation

If a problem occurs during the installation of the Hitachi Storage Plug-in, an error message is displayed. Follow the error message for further directions.

If you cannot identify the problem, review the troubleshooting information.

Troubleshooting Hitachi Storage Plug-in operational errors

If problems occur while using the Hitachi Storage Plug-in, error information is displayed and output to a log file. Follow the error message for further directions.

If you cannot identify the problem, verify the following:

- All requirements are met.
- Review the operating environment and [Troubleshooting storage system errors \(on page 43\)](#) topic.



Note: If you are using Hitachi Ops Center API Configuration Manager, the status of the task to refresh configuration information might not be "Succeeded". To check the status of the task to refresh the configuration information of a storage system managed by Hitachi Ops Center API Configuration Manager, contact your storage system administrator.

If none of the above solves the problem, contact customer support.

Troubleshooting storage system errors

When errors occur within a storage system, the Hitachi Storage Plug-in may propagate up through the and/or ESXi, and appear in the corresponding component's logs.

The following procedures explain how to investigate storage system errors.

Procedure

1. Check the storage system environment.
Confirm that the storage system is online and healthy.

Also, confirm that the storage system requirements are fulfilled, and that the storage system's configuration complies with what's described in [Restrictions and considerations \(on page 16\)](#). Even if these requirements were met at the time Hitachi Storage Plug-in for VMware vCenter was installed, changes to the storage system made thereafter may have yielded an unsupported configuration.
2. Confirm Ethernet connections.
Confirm that the storage system is attached to the LAN with a network cable.
3. Confirm the IP address.
Confirm that the IP address being used to access the storage system matches the IP address displayed in its management interface.
4. Confirm the TCP port number.
Verify that the TCP port number used to access the storage system has not changed.

If the TCP port number has changed, add `df-damp-snm <storage system port number>/tcp` to the VMware management client's Services file.
5. Confirm firewall settings.
Verify that the storage system's accessible using TCP/IP. Depending on specifics which will vary between environments, it may be necessary to adjust firewall settings to allow this access.
6. Confirm ESXi connectivity.
Verify the following:
 - a. Whether Fibre Channel and TCP/IP connectivity between the ESXi host and the storage system is healthy.
 - b. Whether LU masking is configured correctly on the storage system. For Fibre Channel access, LU masking is represented by host group objects. For iSCSI access, it's represented by iSCSI target objects.

Troubleshooting Hitachi Ops Center API Configuration Manager server errors

If a problem occurs while you are using the storage plug-in, a failure may have occurred on the Hitachi Ops Center API Configuration Manager server. Verify the following:

Procedure

1. Confirm items of the Hitachi Ops Center API Configuration Manager server environment.
Verify that the Hitachi Ops Center API Configuration Manager server started without problems. Also, verify that the Hitachi Ops Center API Configuration Manager service has not stopped.

2. Confirm TCP/IP connectivity.
Verify that the Hitachi Ops Center API Configuration Manager server is attached to the LAN with a network cable.
3. Confirm the IP address.
Verify that the IP address used to access Hitachi Ops Center API Configuration Manager matches the IP address it's configured to use.
4. Confirm the TCP port number.
Verify that the TCP port number used for the Hitachi Ops Center API Configuration Manager server is correct. Register the new number if the TCP port number is different.
5. Confirm firewall settings.
Verify that Hitachi Ops Center API Configuration Manager is accessible using TCP/IP. If it's inaccessible, a firewall configuration change may be required to allow access.
6. Resources managed by Hitachi Ops Center API Configuration Manager.
 - a. Ensure that the desired storage system is registered with Hitachi Ops Center API Configuration Manager.
 - b. If a resource group lock is preventing Hitachi Ops Center API Configuration Manager from collecting information from the storage system, it may be necessary to remove the lock.
 - c. Verify that Hitachi Ops Center API Configuration Manager is able to retrieve information from and configure the storage system.
 - d. Verify that the storage system information gotten by Hitachi Ops Center API Configuration Manager is consistent with the information displayed using more low-level Hitachi management interfaces, such as Storage Navigator or CCI.
7. Confirm the storage system user account.
 - a. Verify that the storage system account is valid and enabled.
 - b. Verify that the storage system account password is correct.
 - c. Verify that the storage system account is configured with view and modify privileges.

Troubleshooting Provision Datastore function errors

Retry of Provision Datastore

LUs created by the Provision Datastore may not appear immediately in vSphere Client. If this occurs, either retry the operation, or use the rollback feature (described below) to revert storage objects created by this to their state prior to its use.

It may also be necessary to run Refresh Storage System after using the Provision Datastore, before newly created storage objects will appear in vSphere Client's Storage Devices list.

Procedure

1. Verify the failure message shown in the **Recent Tasks**.

2. Go to the home window of the Hitachi Storage Plug-in.
3. Click **Yes** on the warning message.
The Provision Datastore task on the Recent Tasks pane will be marked complete when the retry is finished.
4. **Refresh** the storage system.

Rollback of Provision Datastore

Procedure

1. Verify the failure message shown in **Recent Tasks** when Provision Datastore fails.
2. Go to the home window of Hitachi Storage Plug-in.
3. Click **No** on the warning.
4. Click **Yes** on the next warning message to continue the rollback of **Provision Datastore**.
5. Click the **Refresh** icon to display the rollback progress status on the **Recent tasks**. Once Recent Tasks has been refreshed, the task should appear to have been completed.



Note: The information displayed in **Recent Tasks** may not update itself automatically. To update Recent Tasks, click the **Refresh** icon.

Provision Datastore task stops before completing

If you did not run the Retry or Rollback, the task remains in-process and the created LUs remain on the server. Verify the following:

If the task stops while creating storage system LUs.

1. Display the event of the task.
2. Delete the storage array LU created by the partially completed task.
3. Run Refresh Storage System to retrieve the latest information.

If the task stops after creating an LU, yet before performing target LU masking (the host group operation), or if the task stops after LU masking and before ESXi has detected the LU.

1. Display the event task.
2. Remove the LU created by the task that failed to complete from the host group object, if applicable.
3. Delete the LU created by the incomplete task.
4. Run Refresh Storage System to retrieve the latest information.

If the task stops during datastore creation.

1. Run Refresh Storage System to retrieve the latest information.
2. Delete LU using the Delete Datastore.
3. Run Refresh Storage System a second time to ensure that the latest information is displayed.

Stops while retrying NFS Export Creation

Procedure

1. Views the task event.
2. Report the error message to customer support.
3. Run **Refresh Storage System**.

Stops while creating an NFS datastore

Procedure

1. Refresh the storage system.
2. Report the error message for customer support.
3. Run **Refresh Storage System** again.

Troubleshooting datastore deletion errors

This section describes how to retry Delete Datastore operations and how to recover when Delete Datastore stops prematurely.

Retry of Delete Datastore

Procedure

1. View the error message shown in the **Recent Tasks** pane.
2. Go to the home window of Hitachi Storage Plug-in.
3. Click **Yes** on the warning message.
4. Watch **Recent Tasks** to observe the **Delete Datastore** task. If the **Delete Datastore** operation succeeds, it appears in **Recent Tasks** as complete.
5. Run the **Refresh Storage System** after using **Delete Datastore**.

Delete Datastore stops before it has completed

If the vSphere Client service stops while a Delete Datastore task is running, it may leave a partial storage configuration in place. These procedures describe how to recover from this situation.

If the task stops during the confirmation of LU usage status or datastore deletion.

1. Run Refresh Storage System to retrieve the latest information.
2. Observe the Datastores list to determine whether the LU being deleted remains in the list. If it remains, try Delete Datastore again.
3. Delete the LU.
4. Run Refresh Storage System to retrieve the latest information.

If the task stops while unmapping or deleting the LU.

1. Verify that the LU has been deleted from the storage system.
2. Run Refresh Storage System to retrieve the latest information.

Chapter 7: Log files

Hitachi Storage Plug-in for VMware vCenter logs messages to several different log files. This chapter explains which log file(s) correspond to each component included with and related to this product, and how to collect them while receiving customer support.

Information Collected During Problem Occurrence


When a problem cannot be solved by troubleshooting, provide the following to customer support.

Checking the browser information for vSphere Client

You can check the browser and the browser version used for vSphere Client.

Confirm vSphere Client version

Procedure

1. Click the following icon at the top of vSphere Client, and then click **About VMware vSphere:** 
2. Confirm the vSphere Client version displayed in the dialog box.

Collect log files from the Hitachi Storage Plug-in

You can collect the Hitachi Storage Plug-in files from the vCenter Server, the Backend Server, and the ESXi host, and then archive the collected files into a ZIP file.

Before you begin

- Check the IP address and the root user password of the vCenter Server from which you want to collect the log files. If you want to collect log files from multiple vCenter Servers, check the IP addresses and the root user passwords for all vCenter Servers from which you want to collect log files. If a Linked Mode group is configured, check the IP addresses and root user password for all vCenter Servers in the group.
- Configure the BASH shell settings for vCenter Server as explained in the documentation provided by VMware, Inc. (<https://kb.vmware.com/s/article/2100508>)

Procedure

1. Log in to the Backend Server as the root user. Use the `GetLog.sh` script to collect the Backend Server and vCenter Server log files.

Syntax

```
/usr/local/hitachi-storage-plugin/GetLog.sh [<IP-address-of-
vCenter-Server> <password-of-the-vCenter-Server-root-user>]
```

Output-destination directory

`/var/log/hitachi-storage-plugin`

Archive file

`StoragePluginLog.tar.gz`

The following files and directories are collected by `GetLog.sh`:

- vCenter Server:

Directory: `/storage/log/vmware/vsphere-ui/logs/`

All files and all subdirectories stored in this directory are collected.

- Backend Server:

Directory	File
<code>/usr/local/hitachi-storage-plugin/jetty/webapps/</code>	<code>version.txt</code>
<code>/usr/local/hitachi-storage-plugin/jetty/webapps/conf/</code>	<ul style="list-style-type: none"> ■ <code>HiStorageMgrConfig.xml</code> ■ <code>hivcenter.config</code> ■ <code>HNAS_multiaccount.xml</code> ■ <code>log4j2.xml</code> ■ <code>modelname.config</code> ■ <code>multiaccount.xml</code>
<code>/var/log/hitachi-storage-plugin/</code>	<ul style="list-style-type: none"> ■ <code>spVmProps.log</code> ■ <code>StoragePlugin.log</code> ■ <code>StoragePlugin.log.n</code> ■ <code>StoragePlugin_CreateCertification.log</code> ■ <code>StoragePluginforVMwarevCenter.log</code>
<code>/var/log/</code>	<ul style="list-style-type: none"> ■ <code>messages</code> ■ <code>messages-YYYYMMDD</code>

**Note:**

- If a failure occurs in communications with the vCenter Server, an error message is displayed and the `GetLog.sh` script ends.
 - If you run the `GetLog.sh` script with no argument specified, only the Backend Server log file will be collected.
- If there are multiple vCenter Servers on which the plug-in is registered, enter `yes` to collect the log files from the next vCenter Server and then specify the IP address and the root user password of the next vCenter Server as arguments. Repeat this process for each vCenter Server. If you use a Linked Mode group, collect the log files from all vCenter Servers in the group.
 - If you have only one vCenter Server, or if you finish collecting log files from multiple vCenter servers, enter `no` to end the processing.
2. Log in to the ESXi host, and manually collect the log files. Collect the files in the following directory.
 - Directory: `/var/log/`
 - File:
 - `vpaa.log`
 - `vmkernel.log`
 3. Archive the collected files into a ZIP file.

**Note:**

Before sending the log files to customer support, check the files to make sure that they do not contain any security-related information, such as passwords.

Collect vCenter and ESXi information

Confirm the vCenter Server version

Procedure

1. From the **home** screen of vSphere Client, select **Hosts and Clusters**.
2. From the tree view, select vCenter Server, and then confirm the version displayed in **Summary** screen.

Collect ESXi information

Procedure

1. Go to the **Home** screen of vSphere Client.
2. Select **Hosts and Clusters**.

3. Select ESXi to see the version in **Summary**.

Collect storage system information

Collect logs and trace files (if available) using Storage Navigator.

How to collect Hitachi Ops Center API Configuration Manager information

Collect Windows Event Log information

Procedure

1. Open Windows **Event Viewer**.
2. In **Event Viewer**, right click on the event log category (at least Application and System), and click **Save All Events As**.
3. Input a file name for the export file in the **File name** box.
4. Click the appropriate file format in the **File type** box, click **Save**.

Collect Windows system information

Procedure

1. Open Microsoft System Information.
If an icon for this does not appear in Administrative Tools, it can be started from a cmd or PowerShell command prompt by entering msinfo32.
2. Click **Export** from the **File** menu.
3. Input the file name in the **File name** field.
4. Click **Save**.

Collect Hitachi Ops Center API Configuration Manager maintenance information

Hitachi Ops Center API Configuration Manager includes a feature which allows its maintenance information to be collected.

See the *Hitachi Ops Center API Configuration Manager REST API Reference Guide* for more information.

Collect vCenter Server Appliance information

Collect the Support Bundle. For example, from the vCenter Server Appliance Management Interface, run **Summary > Create Support Bundle**.



Note: See the VMware vCenter Server documentation for steps to create a VMware Support Bundle.

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