

Hitachi Storage Connector for Cisco UCS[®] Director

User's Guide
v02.1.0


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Preface

This document describes how to use the Hitachi Storage Connector for Cisco UCS® Director.

This preface includes the following information:

- ▣ [Intended Audience](#)
- ▣ [Software Version](#)
- ▣ [Release Notes](#)
- ▣ [Document Organization](#)
- ▣ [Referenced Documents](#)
- ▣ [Document Conventions](#)
- ▣ [Conventions for Storage Capacity Values](#)
- ▣ [Getting Help](#)
- ▣ [Comments](#)

Note  The use of *Hitachi Storage Connector for Cisco UCS® Director* and all other Hitachi Data Systems products is governed by the terms of your agreements with Hitachi Data Systems.

Intended Audience

This user guide addresses users of the Hitachi Storage Connector for Cisco UCS® Director. This user guide is designed for experienced users of Cisco UCS Director.

We assume that the Administrator installing the Connector is well versed in administration of Hitachi Storage subsystems, including creating accounts, licensing hardware, and configuring software and storage. Content related to the administration of Hitachi storage is not duplicated in this document.

Software Version

This document revision applies to Hitachi Storage Connector for Cisco UCS Director software version **v02.1.0** and Cisco UCS Director version **5.4.0.0 and 5.5.0.1**.

Release Notes

Release notes can be found on the documentation CD. Release notes contain requirements and more recent product information that may not be fully described in this manual. Be sure to review the release notes before installation.

Document Organization

The following table provides an overview of the contents and organization of this document. Click the [chapter title](#) in the left column to go to that chapter. The first page of each chapter provides links to the sections in that chapter.

Chapter	Description
Introduction	Description of supported storage systems, tasks, and workflows
System Requirements and Installation	Overview of installation process, required hardware and software, and installation of the Hitachi Storage Agent (REST-based web service) and the Connector for Cisco UCS Director
Workflows and Tasks	Import workflows, set task inputs, and validate workflows
Logging and Troubleshooting	Log name, location, and forwarding instructions. Troubleshooting information for Hitachi Storage Agent and the Connector for Cisco UCS Director

Referenced Documents





#	Name	Description
1	<i>Global-Active Device User Guide MK-92RD8072</i>	Describes and provides instructions for using the global-active device (GAD) feature of the Hitachi Virtual Storage Platform G1000 (VSP G1000) and Hitachi Virtual Storage Platform G200, G400, G600, G800 (VSP G200, G400, G600, G800) storage systems.
2	<i>Metro REST API Specification Version 3.2.0, SDK-95REST001-03</i>	Specification for the REST API which is the foundation of the Storage Agent.

Document Conventions

This document uses the following typographic conventions:

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click OK .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: <i>copy source-file target-file</i> Note: Angled brackets (<>) also indicate variables.
screen/code	Indicates text on the screen or that you enter. Example: # pairdisplay -g oradb
<> angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: # pairdisplay -g <group> Note: Italic font also indicates variables.
[] square brackets	Optional values. Example: [a b] indicates that you can select a, b, or nothing.
{ } braces	Required or expected values. Example: { a b } indicates that you must select either a or b.
vertical bar	A choice between two or more options or arguments. Examples: [a b] indicates that you can select a, b, or nothing. { a b } indicates that you must select either a or b.

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

Icon	Label	Description
	Note	Calls attention to important and/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).
	WARNING	Warns the user of severe conditions and/or consequences (for example, destructive operations).

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 KB	1,000 bytes
1 MB	1,000 ² bytes
1 GB	1,000 ³ bytes
1 TB	1,000 ⁴ bytes
1 PB	1,000 ⁵ bytes
1 EB	1,000 ⁶ bytes

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

Logical Capacity Unit	Value
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
1 BLOCK	512 bytes

Getting Help

The Hitachi Data Systems Support Center staff is available 24 hours a day, seven days a week. Provisions for patches and fixes are restricted to normal business hours, 8 a.m. to 5 p.m. PST.

To reach us, visit the support website for current telephone numbers and other contact information: <http://www.hds.com/services/support/>.

Before calling the Hitachi Data Systems Support Center, provide as much information about the problem as possible, including:

- ▣ The circumstances surrounding the error or failure.
- ▣ The exact content of any error messages displayed on the host systems.
- ▣ Logging information as detailed in the *Logging and Troubleshooting* section of this document.

Comments

Please send us your comments on this document: doc.comments@hds.com. Include the document title, number, and revision, and refer to specific section(s) and paragraph(s) whenever possible. **Thank you!** (All comments become the property of Hitachi Data Systems Corporation.)



Introduction

The Hitachi Storage Connector for Cisco UCS Director supports tasks that you can use for inventory, for orchestration, and in workflows. To aid in storage management and troubleshooting, the Storage Connector for Cisco UCS Director provides system logging options and troubleshooting support.

This chapter contains the following sections:

- ▣ [Supported Storage Systems](#)
- ▣ [Supported Tasks](#)

Supported Storage Systems

The Storage Connector for Cisco UCS Director supports the following Hitachi storage systems. In Cisco UCS Director, a single account controls each type of storage system.

- Hitachi Virtual Storage Platform G/F800, G/F600, G/F400 and G200 (VSP Gx00 and Fx00), and Unified variants
- Hitachi Virtual Storage Platform G1000 (VSP G1000)
- Hitachi Virtual Storage Platform (VSP)
- Hitachi Unified Storage VM (HUS VM)

Required Storage System Microcode

Minimum microcode/firmware requirements are as follows:

System Model	Microcode/Firmware
VSP G/F800, G/F600, G/F400, G200	83-02-04
VSP G1000	80-03-34
VSP	70-06-35
HUS VM	73-03-44

Supported Configurations

Figure 1 is a reference architecture approved by Cisco Systems, Inc. For more details on supported hardware configurations, see the [Cisco UCS Director 5.4 compatibility matrix](#).

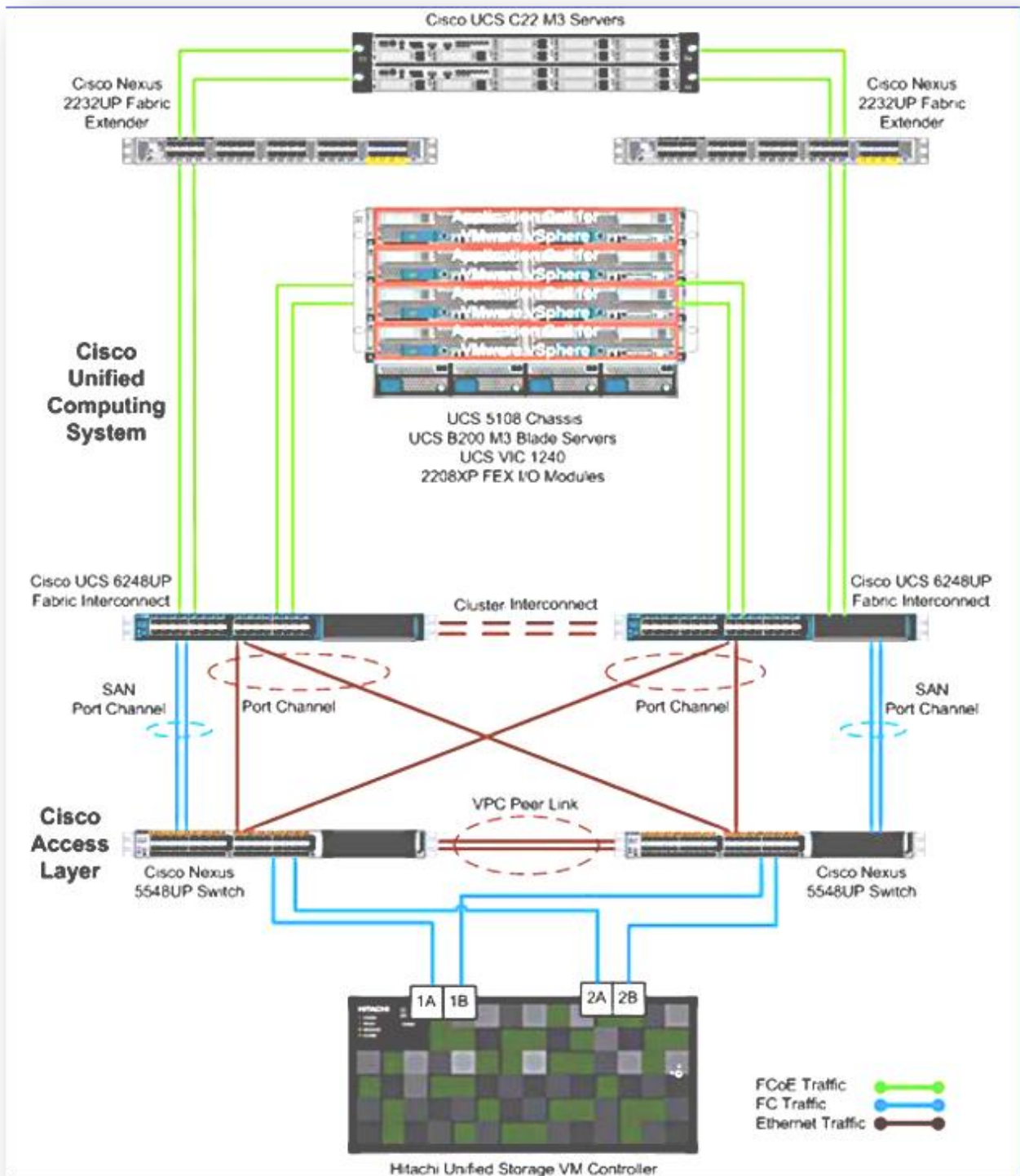


Figure 1. Cisco-verified Configuration


The reference architecture mirrors closely the configuration used for testing and qualification of the Hitachi Storage Connector for UCS Director. However,

configuration of a Pod in the Virtual, Computer, and Networking layers is only limited by what Cisco UCS Director supports.

Storage System Inventory

The Storage Connector for Cisco UCS Director collects the following storage system information that is displayed by the Cisco UCS Director:

- Storage capacity
- Microcode and SVP IP Addresses
- Storage system components:
 - Ports and Port World Wide Names (WWPNs)
 - Parity Groups
 - Logical Units (LDEVs)
 - Host Groups
 - Pools
 - Local Replication
 - License Information
 - Hitachi System Tasks
 - Storage Agent

Note  When using a Hitachi Storage system with Resource Groups implemented, only items to which the user has permissions are shown.

Storage System Licenses

To use the features provided by the Storage Connector, the following licenses must be installed on your Hitachi storage system:

- Dynamic Provisioning
- LUN Manager
- Hitachi Storage Navigator

For Local Replication support, the following licenses are required:

- Shadow Image
- Thin Image

Supported Tasks

The Storage Connector for Cisco UCS Director supports the following tasks for the supported Hitachi storage systems.

Grouping	Task Name	Description
Logical device (LDEV)	Create LDEV	Create a basic or dynamic provisioning logical device
	Create Dynamic Pool	Create a dynamic or thin image pool
	Delete Dynamic Pool	Delete a dynamic or thin image pool
	Expand Pool	Expand the capacity of a dynamic pool by adding more pool volumes
	Shrink Pool	Reduce the capacity of a dynamic pool by removing pool volumes
	Edit Pool	Change Threshold, Warning, Subscription Limit and toggle Multi-Tiering
	Delete LDEV	Delete a logical device
	Format LDEV	Format a logical device
	Set As Command Device	Designate an LDEV as a command device for use with other Hitachi applications
Host group management	Add Host to Host Group	Add a host HBA WWN to a host group
	Add LUN Path to Host Group	Add logical units to a host group
	Create Host Group	Create a new host group
	Delete Host Group	Delete an existing host group
	Remove Host from Host Group	Remove a host WWN from the host group
	Remove LUN Path from Host Group	Remove logical unit mappings from a host group
	Enable/Disable Host Mode for Host Group	Set the host group mode according to host OS
Storage virtualization (vSphere 5.5 and 6.0)	Associate LUN as Datastore	Create a new VMware Datastore from new LUN or Extend existing Datastore with a new LUN
	Delete Datastore	Delete a VMware datastore (underlying LDEV remains intact)
SAN Operations	Get Storage Port WWPN	Provided to allow for Workflows that involve SAN operations (for example, zoning changes)

Grouping	Task Name	Description
Local Replication	Create ShadowImage Pair	Pair Primary and Secondary Volumes for replication
	Create Thin Image Pair	Pair Primary and Snapshot Volumes
	Resync Pair	Synchronize Primary to Secondary volumes
	Restore Pair	Copy data from Secondary to Primary volume
	Split Pair	Split replication pairs
	Delete Pair	Delete replication pairing (but not volumes)
Remote Replication	Create GAD Pair	Create a Global Active Device Pair
	Split GAD Pair	Split a Global Active Device pair. Synchronization between Primary and Secondary is suspended.
	Resync GAD Pair	Resync a Global Active Device pair. The pairing is resumed between Primary and Secondary devices. Data is copied from Primary to Secondary.
	Delete GAD Pair	Delete Global Active Device Pair. Pairing is deleted but data on Primary and Secondary LDEVs remains intact.
Resource Groups	Create Resource Group	Create a Resource Group
	Delete Resource Group	Delete a Resource Group Note: Resource Group must be empty.
	Add Resource to Resource Group	Add LDEVs and Host Groups to existing Resource Groups
	Remove Resource from Resource Group	Remove LDEVs and Host Groups from existing Resource Groups

Host Group Management

When adding hosts to a Host Group, the Host Name is optional; however, if you add a Host to a Host Group without a name, adding a name or renaming after the addition is not supported at this time. You must delete the host and re-add to include the Host Name.

Custom Tasks

Provided with this release is the documentation required to assemble custom tasks. Customers may reference the Metro REST API Specification to execute operations that are not currently built-in to the Hitachi Storage Connector. Support for writing and debugging custom tasks is not provided.

System Requirements and Installation

This chapter contains the following sections:

- ▣ [Summary of Steps](#)
- ▣ [Architecture](#)
- ▣ [Required Hardware and Software](#)
- ▣ [Install the Hitachi Storage Agent](#)
- ▣ [Install the Hitachi Storage Connector](#)

Summary of Steps

1. Assemble the required hardware and software.
2. Download the .iso file that contains all connector-related files.
3. Deploy the Hitachi Storage Agent virtual appliance.
4. Add the Hitachi Storage Open Automation Connector to Cisco UCS Director.
5. In Cisco UCS Director, create a Hitachi pod from a generic source pod or use an existing Hitachi pod.
6. Add Hitachi storage accounts to the pod.
7. Test connections to the Hitachi storage account.

Architecture

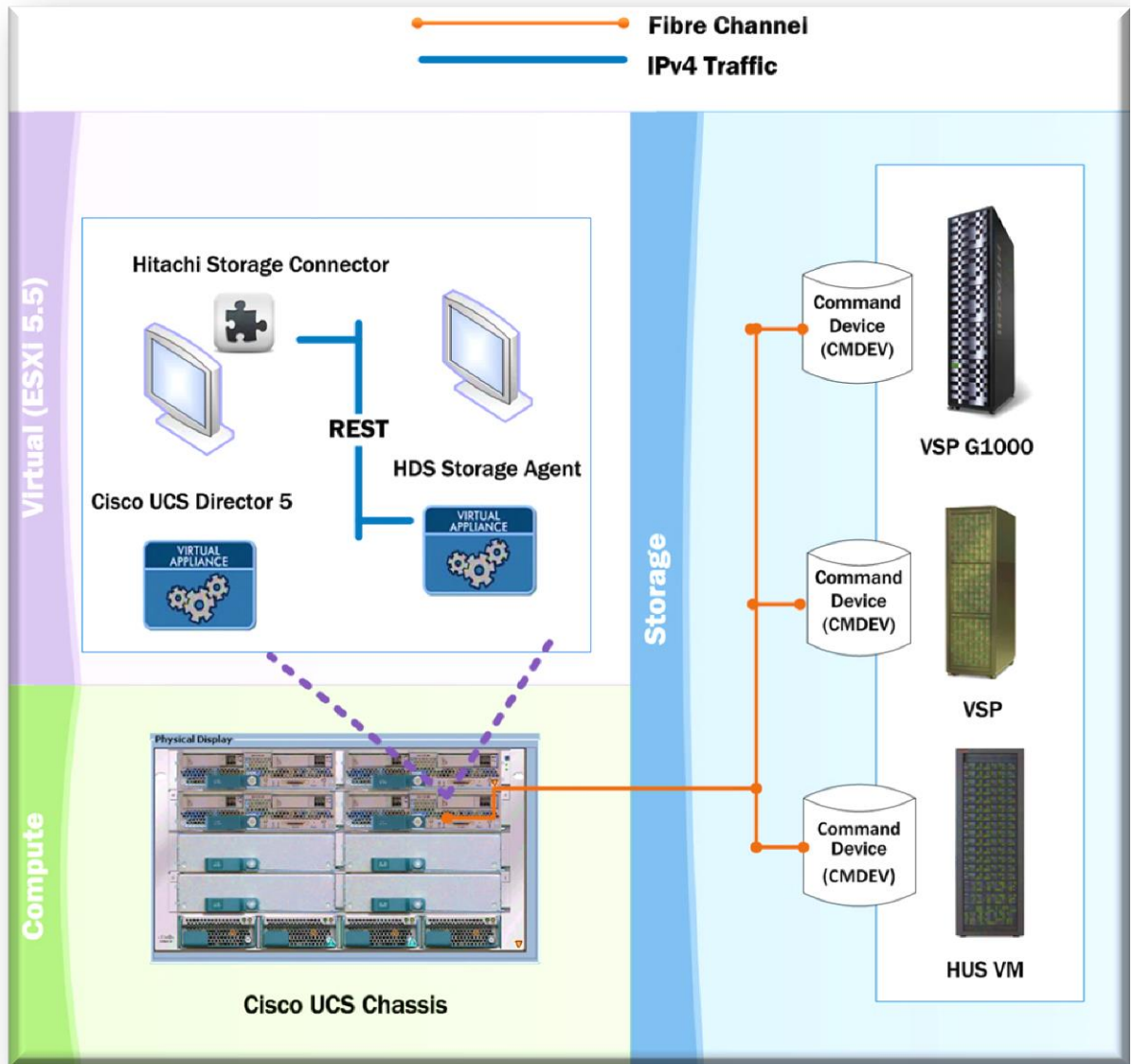


Figure 2 High-Level Connector Diagram

Required Hardware and Software

- ▣ Supported Hitachi storage, microcode, and licenses
- ▣ Hitachi storage system serial number
- ▣ Hitachi Storage Navigator (SVP) IP Address
- ▣ Hitachi Storage Navigator user account with administrator rights
- ▣ Software: UCS Director 5.4.0.0 or 5.5.0.1 with appropriate license
- ▣ Virtualization: VMWare ESXi 5.5 or 6.0
- ▣ Hitachi Storage Agent v02.1.0

Supported Storage Agent Configurations

Configuration	Supported
Multiple Hitachi Storage systems in a single Pod with a Single Storage Agent	Yes, up to 10
Multiple accounts from a single Hitachi Storage system assigned to multiple Pods with multiple Storage Agents	Yes, each account must be mapped to a Storage Agent on a separate ESXi instance
Multiple accounts from a single Hitachi Storage system in multiple Pods with a Single Agent	No (see Figure 3 below)

Agent Configuration Diagram

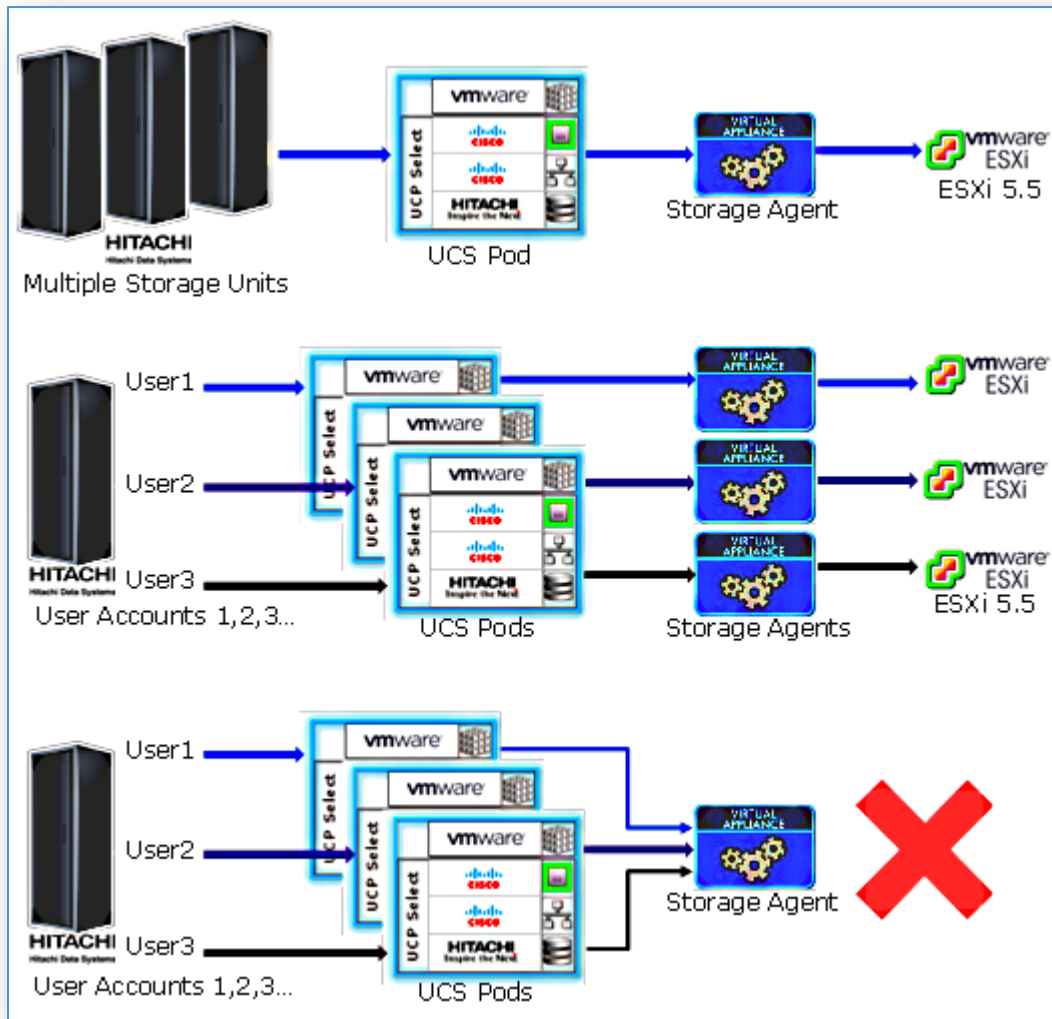


Figure 3. Configuration Examples

Hitachi Storage Agent Requirements

Virtual Appliance

- ▣ VMware ESXi 5.5 server with the following:
 - 1 GB of free memory
 - A datastore with 1 GB of available space
 - A command device from the Hitachi storage system
- ▣ VMware vSphere Client (or vSphere Web Client)
- ▣ A static IPv4 address to assign to the virtual appliance

Download Files

The Hitachi-UCSD-Plugin-v02.1.0.iso file contains:

File	Description
HDSStorageConnector-v02.1.0.zip	Hitachi Storage Connector
HDSStorageAgent-v02.1.0.ova	Hitachi Storage Agent Virtual Appliance

Install the Hitachi Storage Agent v02.1.0 (Powered by Metro)

The Hitachi Storage Agent is a web service that relays requests between Hitachi storage systems and Cisco UCS Director using the Metro REST API interface. You must install and configure the Hitachi Storage Agent before adding a Hitachi storage account to Cisco UCS Director.

Install the Hitachi Storage Agent by deploying the Hitachi Storage Agent Virtual Appliance on an ESXi 5.5 or 6.0 server.


Deploy a Virtual Appliance

Prerequisite: Create Command Devices

Communication between the Hitachi Storage Agent and the Hitachi storage system is carried in-band and requires a command device. We recommend that you create a command device and map it to the ESXi host before completing the following steps. For instructions on how to install, configure, and map a command device for your storage system, see the chapter "Setting the Command Device" in the following document. For your convenience, this chapter has also been reproduced in [Chapter 6](#) of this document.

Document	Description
<i>Command Control Interface: Installation and Configuration Guide, MK-90RD7008</i>	Describes command control interface (CCI) features, installation, and configuration for the following Hitachi storage systems: HUS VM, VSP, VSP G1000, and G/Fx00 Series.

The following figure illustrates the required command device settings. The settings are the same for all supported storage subsystems.


Note  When creating a command device, the sequence of events is important. Do not map the LDEV to a Host Group before designating it a command device.

Command Device : Enable Disable

Command Device Attributes :

Command Device Security :	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable
User Authentication :	<input checked="" type="radio"/> Enable	<input type="radio"/> Disable
Device Group Definition :	<input type="radio"/> Enable	<input checked="" type="radio"/> Disable

Deploy the Virtual Appliance

Note  Do not power on the virtual machine before mapping the command devices or else they will not be configured. If the Virtual Machine is already on after mapping the command device, you must reboot to initiate the Discovery sequence.

- Using vSphere Client, connect either to a vSphere vCenter instance or directly to the ESXi server.
- From the vSphere Client **File** menu, select **Deploy OVF Template**. The Deploy Wizard opens.
- Complete the following options in the Deploy Wizard.

Option	Description
Source	Type a URL or navigate to the OVA package location.
OVF template details	Verify that you selected the correct OVA template for this installation.
End user license agreement	Accept the end user license agreement.
Name and location	Name the appliance or keep the default name.

Option	Description
Specify Host/Cluster	Select whether to deploy the virtual machine on the host or cluster (vCenter only).
Networking Info	Static IPv4 address, Gateway, and DNS for the Hitachi Storage Agent
Storage	Select the datastore location for virtual machine files.
Provisioning	Select the provisioning type. Both thin and thick provisioning are supported.

The virtual appliance is deployed to the specified ESXi host. The speed of this process depends on the network speed. It takes about two minutes on a typical Gigabit Ethernet connection.

4. Before powering on the virtual machine, map the command device to the [Hitachi storage system](#).
 - a. Right-click the newly deployed virtual appliance and select **Edit Settings**.
 - b. On the **Hardware** tab, click **Add > Hard Disk > Raw Device Mapping**.
 - c. Select the previously created [Command Device](#).
 - d. Accept all the defaults. Click **Finish**.
5. Power on the virtual machine. The Hitachi Storage Agent queries for command devices and configures itself automatically.



Tip If you have trouble identifying the command devices, you can match the Device WWN with the LDEV ID. The last four digits of the Device WWN, starting with naa.6006, correspond to the LDEV ID.

Install the Hitachi Storage Connector

Prerequisites

Locate the **HDSStorageConnector-v02.1.0** file extracted from the .iso file that you [downloaded](#) from the Cisco Solution Partners site.

Install and Deploy the Connector

1. Log in to Cisco UCS Director by using the Admin role credential.
2. In Cisco UCS Director, from the **Administration** menu, select **Open Automation**.
3. On the **Connectors** tab, click **Add**.
4. Extract the files from **HDSStorageConnector-v02.1.0**. Click **Open**.

5. Click **Upload**, and then click **Submit**.
6. Select the newly added module. Click **Enable**.
7. Use SSH to connect to the Cisco UCS Director instance and log in as **shelladmin** (Default password is **changeme**).
8. To enable the Hitachi Storage Connector, stop all services (option 3), and then restart all services (option 4).

Note After the Cisco USC Director becomes available, be sure to check that the Connector is Enabled/Active in the same location where it was added.



Create a Pod in Cisco UCS Director

In Cisco UCS Director, create a Hitachi pod to contain all your Hitachi storage accounts. Alternatively, locate an existing pod already in use for a Hitachi product such as Unified Computing System (UCP) Select.

Note A pod may contain more than one storage account, but a single storage account may not be added to multiple pods.



1. In Cisco UCS Director, click **Converged** in the menu, and then click **Add**.
2. Complete the required fields.
3. Select **Generic** or **UCP Select** from the menu, and then click **Add**.

Add Hitachi Storage Accounts to the Pod

For each storage system to be used, add a Hitachi storage account to your pod. Accounts are available for generic pods or UCP Select pods.

Do the following to add a Hitachi storage account:

1. In Cisco UCS Director, from the **Administration** menu, select the **Physical Accounts** tab. Click **Add**.
2. Select the pod you created.
3. Under **Category**, select **Storage**.
4. Select the desired model of Hitachi storage, and click **Submit**.
5. Complete the form as required. See the following table for a description of the fields.

Label	Description	Optional/ Required
Account Name	Choose a name by which this for this account. We suggest a portion of the serial number to make identification easier.	Required
Description	Description of the physical hardware	Optional
Storage Serial Number	Serial number of the Hitachi Storage Connector	Required
Storage IP Address	IPv4 address of the storage SVP	Required
Storage User	Authorized user on the SVP with storage administrator rights	Required
Storage Password	User password (administrator privileges)	Required
Agent IP Address	IP Address of the Hitachi Storage Agent virtual appliance	Required
Agent Port	TCP port on which the Hitachi Storage Agent Listens. Default is 8444.	Required
Contact	Contact information for storage administrator	Optional
Location	Physical location of storage	Optional

6. Click **Submit**.

The time required to add the account depends on the size of the storage system and network speed.

About Resource Group Support

In this release of the Storage Connector, we include basic support for Resource Groups. The Storage Connector filters out those resources for which it has no access, based on the Storage User designated in the initial setup of the storage subsystem. Configuration changes to Resource Groups must be made on the SVP or through Hitachi Command Suite.

Firewall Considerations

From Cisco UCS Director to the Hitachi Storage Agent appliance TCP port 8444 must be open.

From the Hitachi Storage Agent to the Hitachi Storage SVP TCP port 1099 must be open.

Test Connection to the Hitachi Storage Account

You can find out about connection problems in a few ways:

- ▣ After the Storage Connector for Cisco UCS Director is added to Cisco UCS Director, the connector warns about connection problems.
- ▣ Use the Test Connection action within Cisco UCS Director:
 - From the Administration menu, click **Physical Accounts**.
 - In the **Physical Accounts** tab, highlight the account to be tested.
 - Click **Test Connection**.



Global Active Device

Global Active Device (GAD) operations are now supported on eligible arrays. This section explains how to use the Hitachi Storage Connector for Cisco UCS Director to perform device Pairing, Splitting, Resyncing, and Deleting. For information about setting up GAD, either hardware or software, see the [Referenced Documents](#) section.

- ▣ [Prerequisites](#)
- ▣ [Setup Remote Connections](#)
- ▣ [Create GAD Pair](#)

Prerequisites

Before attempting Global Active Device (GAD) operations, you must ensure the following:

- The hardware and software has been configured according the *Global-Active Device User Guide MK-92RD8072*
- The appropriate licenses have been installed and activated
- A single Storage Agent is mapped to both storage systems involved in the GAD operations
- Both Hitachi Accounts, one per storage system, have been added to Cisco UCS Director according to the section [Add Hitachi Storage Accounts to the Pod](#).

Note

If any GAD operations fail, please check that the same operation performed in Hitachi Command Suite is functional. If the operation fails in both Cisco UCS Director and Hitachi Command Suite, the setup is likely incomplete or invalid.

Setup Remote Connections

As with Hitachi Command Suite, the Hitachi Storage Connector needs to know which storage systems are involved in Global Active Device pairing. If the storage systems added to UCS Director already have established GAD pairs, the Hitachi Storage Connector automatically configures the Remote Connections dialogue based on this pairing information.

To configure Remote Connections, follow these steps:

- From the **Converged** View, double-click one of the storage systems involved in the GAD pairing.
- Click the **Remote Replication tab**.
- Double-click the row displaying the total number of established pairs.
- Click the tab labeled **Remote Connections**.
- Click **Add Remote Connection**.
- Select the relevant remote storage system, and then click **Submit**.

All systems compatible with GAD are then listed, but no configuration checking is done.

Create GAD Pair

After having completed the Remote Connections setup, it is now possible to create a GAD pair. Navigate to the **Remote Replication** tab. Click **Create Pair**, and then the following dialogue box opens:

Create Pair

Local Storage

Primary LDEV ID *

Remote Storage

Remote Storage Account *


Secondary LDEV ID *

Quorum Disk ID *

Options

Copy Pace ▼

All fields with red asterisks are mandatory. The selections should be made in order from top to bottom.

Note  If Secondary LDEVs are not available, this means that that no suitable devices were found. Secondary LDEVs must be identical in size and configuration to the Primary LDEV.

4

Tasks

Hitachi provides [tasks](#) for use with the Storage Connector for Cisco UCS Connector. These tasks are the building blocks of workflows that automate a Data Center.

- ▣ [General Tasks](#)
- ▣ [Local Replication Tasks](#)
- ▣ [Remote Replication Tasks](#)

General Tasks

Listed below are the general tasks that enhance Cisco UCS Director after you install the Hitachi Storage Connector.

Create LDEV

Creates thick or thin device (V-VOLs) on Parity Groups and Hitachi Dynamic Pools, respectively.



Tip Use this task between the built-in Start and End Loop tasks to create multiple devices in a single workflow.

Delete LDEV

Deletes thick or thin devices (V-VOLs) that are not mapped to Host Groups.

Caution You cannot reverse this task.



Set As Command Device

Designates an LDEV as a command device. Optionally, you may select the specific attributes of the command device. The LDEV must not already be mapped to a Host Group. The device may use Basic or Dynamic Provisioning. After completion, you can map the device to a Host Group.

Create Host Group

Creates a new Host Group on a specific port. Optionally, you may add a host during the creation process, or you may leave the Host Group empty. When adding a new host, specify the HBA WWN manually.



Tip For multipathing, try adding the Create Host Group task in succession for each path required.

Delete Host Group

This task deletes a Host Group that has no LUN mappings.

Caution You cannot reverse this task.



Add Host to Host Group

This task adds an existing or new host to a Host Group. If the Host is new to the Hitachi storage, enter the WWN manually; otherwise, pick it from the list.

Tip



Use with the Create Host Group task to create multiple paths.

Remove Host from Host Group

Removes Host HBA WWN from a specified Host Group.

Add LUN Path to Host Group

Takes an existing LDEV and adds it to a specified Host Group. Optionally, by using **Map Using Host System**, you may select the host; the task automatically becomes part of all Host Groups to which the HBA belongs.

Tip



For multipathing, try adding the Add LUN Path to Host Group task in succession for each path required.

Remove LUN Path from Host Group

Removes a single LUN path from a specified Host Group.

Set Host Mode for Host Group

Sets the Host Mode for a given Host Group. Select from pre-defined options and/or select custom Host Mode Options.

Format LDEV

Formats a specified LDEV.

Associate LUN as Datastore

Takes an existing LDEV and creates a VMware vSphere 5.5 or 6.0 Datastore. Optionally, you may extend an existing Datastore. Note that this operation does not affect the underlying pool.



Tip Use the Create LDEV task with this task to create a new datastore on a new LDEV.

Create Dynamic Pool

Creates a Hitachi Dynamic Pool or Thin Image Pool on one or more specified LDEVs. Creating a Thin Image pool is optional. Note that only LDEVs that are 1) equal or greater than 8GB and 2) not mapped to any Host Groups are shown. Optionally, have the pool LDEVs formatted upon rollback; if you do not, underlying pool LDEVs are placed in BLOCKED state after rollback and need to be formatted.

Expand Pool

Expand a DP pool by adding volumes to it. Expand an existing DP pool by converting it into an HDT pool, which changes the pool type and allows you to configure tiers that support a mix of drive types and RAID levels.

Shrink Pool

Allows for Dynamic Provisioning pools to have some of the LDEVs removed. One LDEV must remain, and the Subscription Limit must not be exceeded as the result of removing an LDEV.

Edit Pool

Allows for the modification of the following: Subscription Limit, Warning Threshold, and Multi-Tiering (enable/disable).

Delete Datastore

Uses the VMware API to delete a datastore. Note that the underlying LDEV remains. You cannot reverse this task.

Delete Dynamic Pool

Deletes a Hitachi Dynamic Pool or Thin Image Pool. Note that the underlying Pool LDEVs are placed in BLOCKED state after Deletion. This is expected behavior. Format the LDEVs to restore them to Normal state.

Get Storage Port WWPN

This task returns the WWPN of a given storage port. This is for useful in workflows where the WWPN is needed (that is, when manipulating SAN zoning).

Local Replication Tasks

Create ShadowImage Pair

This task is used to Create ShadowImage Pairs. Choose a Primary (P-VOL) and Secondary Volume (S-VOL) of the same block size. You must have Storage Administrator (Local Copy) role to perform ShadowImage (SI) operations. Optionally, reserve a Consistency Group ID (must not be in use). Choose **Quick Split** or **Non Split**.

- ▣ **Quick Split** (default): Splits the new pair, and then copies the data so that the S-VOL is immediately available for read and write I/O. The storage system copies the remaining differential data to the S-VOL in the background.
- ▣ **Non Split**: Copies the differential data to the S-VOL, and then splits the new pair.

Note



If you are simultaneously creating an L1 pair and an L2 pair, to prevent a failure and splitting the L2 pair before the pair is split (PSUS status), select **Non Split**.

See the *Hitachi ShadowImage® User Guide* for more information.

Create Thin Image Pair

Used to create Hitachi Thin Image (HTI) Pairs. Choose a Primary and Secondary Volume of the same block size. Optionally, reserve a Consistency Group ID (must not be in use).

Resync Pair

A full-forward resynchronization from the P-VOL to the S-VOL. Only the P-VOL is accessible to hosts for read/write operations. You may only synchronize L2 pairs. May be applied to a Consistency Group. Valid for ShadowImage (SI) and Thin Image (TI).

Restore Pair

A full restoration from the Secondary Volume (S-VOL) to the Primary Volume (P-VOL). The differential data is updated to the P-VOL. During a restore, you can delete or suspend the pairs, but you cannot create, split, or resynchronize pairs that share the same P-VOL. The P-VOL is inaccessible to hosts. Valid for ShadowImage (SI) and Thin Image (TI).

Split Pair

Splits the new pair, and then copies the data so that the S-VOL is immediately available for read and write I/O. The storage system copies the remaining differential data to the S-VOL in the background. Valid for ShadowImage (SI) and Thin Image (TI). Optionally, you can perform this action on a Consistency Group or Snapshot Group.

Delete Pair

Deletes the SI pairs that you no longer need. Deleting a pair unpairs the P-VOL and S-VOL but does not delete their data. You can use the volumes of deleted pairs in another pair. Valid for ShadowImage (SI) and Thin Image (TI).

Remote Replication

Create GAD Pair

Establishes new Global Active Device (GAD) pairs between supported storage systems. Execution of this task assumes that the GAD setup is complete and operational.

Split GAD Pair

Interrupts the synchronization of the GAD pair.

Resync GAD Pair

Re-establishes the synchronization between Primary and Secondary volumes.

Delete GAD Pair

Delete the GAD pairs that you no longer need. Deleting a pair unpairs the Primary and Secondary volumes, but does not delete their data or the devices.

Logging and Troubleshooting

This chapter includes the following sections:

- ▣ [Logging](#)
- ▣ [Troubleshooting](#)

Logging

The Cisco UCS Director handles logging for the Connector.

View Logs

1. From the Cisco UCS Director, select **Administration** from the menu, and then select **Support Information**.
2. From the Support Information drop down, select **Show Log > Infra Manager > Show Logs**.

A browser page displays all recent activity. The page can be saved and shared with the Hitachi Data Systems Support Center, if desired.

View Storage Agent Log

1. From the Cisco UCS Director, select **Converged** and the **Pod** containing the Hitachi Storage.
2. Double-click the Hitachi Storage, and then click the **Storage Agent** tab.
3. Double-click the Storage Agent listed, and then the log is loaded.

Troubleshooting

Storage Connector for Cisco UCS Director

Symptom	Possible Cause	Resolution
The HDSStorageConnector -v02.1.0 module has been added, but no Hitachi storage systems are available.	Cisco UCS Director services have not been restarted after adding the module.	Connect via SSH to the Cisco UCS Director instance. Stop all Director-related services, and then restart.
	The module is not enabled.	Highlight the module and click Enable . Restart Cisco UCS Director.
Unable to add the Hitachi storage physical account.	Hitachi storage accounts are only available for UCP Select and generic pods.	Ensure that the pod type is generic or UCP Select.
	The Hitachi Storage Agent is not configured properly.	See Hitachi Storage Agent .
	The user does not have sufficient rights.	Ensure that the user has Administrator rights.

Symptom	Possible Cause	Resolution
	Command device mapped after booting or not mapped	Make sure that a command device is mapped to the VM as a Raw Device Mapping (RDM). Reboot the VM if mapping was done after VM was powered on.
	The IP address of storage systems and/or Storage Agent is unreachable.	Ensure that no proxy or firewall exists between the Cisco UCS Director network and the Storage Navigator.
Information <LDEV/Host Group, etc> Missing.	Inventory collection has not happened or is in progress.	If the account was added recently, wait for inventory collection to finish.
	Command device is not configured correctly.	User Authentication and Command Device Security options must be enabled on the command device. Restart the Storage Agent after making this change Note: An LDEV must be command device enabled before adding to a Host Group.

Hitachi Storage Agent v02.1.0

Events within the Hitachi Storage Agent are logged to two files:

```
/var/log/metro.log
/var/log/histor.log
```

Forward Logs for Assistance

If more assistance is needed, use the following log collection script.

Run the `collect_metro_info.sh` script located in the `/opt/hitachi/metro` directory.

Check the Network Configuration

Confirm that the IP and gateway information was correctly assigned during deployment. The easiest way to do this is by using SSH and connecting to the IPv4 address of the virtual machine.

Default user name: `root` Default password: `hitachi`

1. Once connected, check the networking configuration by issuing the following command:

```
/opt/vmware/share/vami/vami_config_net
```

The following menu appears:

```
0) Show Current Configuration (scroll with
Shift+PgUp/PgDown)
1) Exit this program
2) Default Gateway
3) Hostname
4) DNS
5) Proxy Server
6) IP Address Allocation for eth0
```

2. To see the current configuration, enter **0** or press **Enter**.
3. Make changes as necessary using the provided menu options.

Check the Hitachi Storage Agent (Virtual Appliance and Linux Server)

To test the Hitachi Storage Agent, run the `metro_check.sh` script.

1. Open the directory `/opt/hitachi/metro`.
2. Run `./metro_check.sh`.

Successful output looks like the following:

```
Metro RPM Install Check      [ PASS ]
Metro Process Check          [ PASS ]
Metro cURL Check              [ PASS ]
Metro Monitor Check          [ PASS ]
Metro Port 8444 Check        [ PASS ]
All command devices that exist on this machine:
```

LDEV ID	Device	Storage Serial
814	/dev/sdb	210040

Command devices used by Metro:

```
Device: /dev/sdb
LDEV ID: 814
```

Storage Array Serial Number: 210040
Metro HORCM Instance Number: 555
HORCM Process State: Running

Use the following table to troubleshoot test failures.

Test	Troubleshooting Tips
Metro RPM Install Check	Failure indicates that the Storage Agent RPM package was not installed correctly or is corrupted. Deploy a new Storage Agent appliance or contact Global Support.
Metro Process Check	Metro Process Check failures are most likely due to failures of the first three checks. If the Metro Process Check fails when the first three tests are successful, look at <code>/var/log/metro.log</code> for more information.
Metro cURL Check	The Metro cURL Check tests whether the Hitachi Storage Agent accepts HTTPS requests. Failure may indicate a problem with the network configuration. Check the network settings as outlined in the previous section.
Metro Monitor Check	If the final check fails, this should not affect the functionality of Storage Agent, but it is indicative of a configuration problem during installation. Contact Support if this occurs.
Metro Port 8444 Check	A failure of this check may indicate firewall issues, either on the network or on the appliance itself. Check that TCP port 8444 is open.

In addition to the self-test script, you can check to see if the Storage Agent can see the mapped command devices by issuing the following command:

```
ls /dev/sd* | /HORCM/usr/bin/inqraid
```

In the output, the LDEV should say OPEN-V-CM, similar to the following:

```
/dev/sdb -> CHNO = 0 TID = 1 LUN = 0  

[SQ] CL2-D Ser = 93935 LDEV =7179 [HITACHI ] [OPEN-V-CM]  

A-LUN[PoolID 0003] SSID = 0x0020
```


Excerpt from the CCI Guide

This chapter contains the following section, reproduced from the *Command Control Interface Installation and Configuration Guide*, MK-90RD7008:

- ▣ [Setting the Command Device](#)

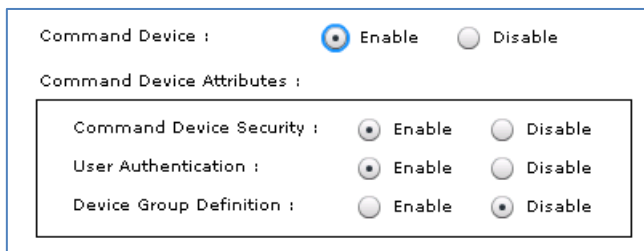
Setting the Command Device

For in-band CCI operations, commands are issued to the RAID storage system through the command device. The command device is a user-selected, dedicated logical volume on the storage system that functions as the interface to the CCI software on the UNIX/PC host. The command device is dedicated to CCI operations and cannot be used by any other applications. The command device accepts read and write commands that are executed by the storage system and returns read requests to the UNIX/PC host.

The command device can be any OPEN-V device that is accessible to the host. A LUSE volume cannot be used as a command device. The command device uses 16 MB, and the remaining volume space is reserved for CCI and its utilities. A virtual LUN volume as small as 36 MB can be used as a command device.

First, you set the command device using Hitachi Command Suite or Device Manager - Storage Navigator, and then you define the command device in the HORCM_CMD section of the configuration definition file for the CCI instance on the attached host. When you use a command for provisioning, user authentication is required. Set enable the user authentication on the security attribute of a command device.

The following figure illustrates the required command device settings. The settings are the same for all supported storage subsystems.



The screenshot shows a configuration window for a Command Device. At the top, there is a label 'Command Device :' followed by two radio buttons: 'Enable' (which is selected) and 'Disable'. Below this is a section titled 'Command Device Attributes :'. Inside this section, there are three rows of settings, each with a label and two radio buttons: 'Command Device Security :' with 'Enable' selected and 'Disable' unselected; 'User Authentication :' with 'Enable' selected and 'Disable' unselected; and 'Device Group Definition :' with 'Enable' unselected and 'Disable' selected.

To set a command device, follow these steps:

1. Make sure the device that is to be set as a command device does not contain any user data. Once a volume is set as a command device, it is inaccessible to the host.
2. Log on to Hitachi Command Suite or Storage Navigator, and then connect to the storage system on which you want to set a command device.
3. Configure the device as needed before setting it as a command device. For example, you can create a custom-size device that has 36 MB of storage capacity for use as a command device. For instructions, see the Provisioning manual or the Virtual LUN manual for the storage system.
4. Locate and select the device, and then set the device as a command device. If you want to use the CCI Protection Facility, also enable command device security at this time. For instructions, see the

Provisioning Installing and configuring CCI 2-11 Command Control Interface Installation and Configuration Guide manual or the LUN Manager manual for the storage system. For information about the Protection Facility, see the Command

5. Write down the system raw device name (character-type device file name) of the command device (for example, `/dev/rdisk/c0t0d1s2` in Solaris, `\\.\CMD-Ser#-ldev#-Port#` in Windows). You need this information when you define the command device in the configuration definition file.

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