

Hitachi Virtual Storage Platform with Cisco Intersight Cloud Orchestrator

Best Practices Guide

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Contents

Chapter 1: Best Practices Guide	5
Chapter 2: Prerequisites	7
VSP configuration.....	7
Cisco Intersight.....	7
Workflow creation.....	8
Chapter 3: Best practices	15
User-defined workflows.....	15
Monitor VSP inventory	15
Chapter 4: Provisioning	18
New Storage Volume.....	18
New Storage Pool.....	21
Edit Storage Pool.....	25
Expand Storage Pool.....	28
Compress Storage Pool.....	31
Remove Storage Pool.....	33
New Storage Host and Connect Initiators to Storage Host (Host Group)	35
Disconnect Initiators from Storage Host	40
Remove Storage Host (Host Group).....	43
New Storage LUN ID.....	46
Remove Storage LUN ID (LUN paths).....	48
Expand Storage Volume.....	51
Find Storage Volume by ID.....	54
Format Storage Volume	57
Remove Storage Volume.....	60
Chapter 5: Clones	63
Copy Hitachi Volume.....	63
Chapter 6: Snapshots	66
New Hitachi Snapshot Pair	66
Remove Hitachi Snapshot Pair.....	68
New Hitachi Snapshot Data.....	69
Cascade Snapshots.....	72

Restore Hitachi Snapshot Data.....	74
Remove Hitachi Snapshot Data.....	77
Chapter 7: Best practices	79
System-defined workflows.....	79
New Storage Host	79
New VMFS Datastore.....	82
Update Storage Host	87
Update VMFS Datastore	90
Remove Storage Host.....	93
Remove VMFS Datastore.....	96
Chapter 8: Conclusion.....	100

Chapter 1: Best Practices Guide

This best practices guide covers day 1 to N capabilities of the Hitachi Virtual Storage Platform(VSP) managed with Cisco Software-as-a-Service (SaaS) Intersight cloud operations platform. The Cisco and Hitachi Adaptive Solution is the latest converged infrastructure offering that is managed exclusively by Cisco Intersight, allowing administrators to instantly consolidate their applications onto an efficient modular, scalable system that allows cloud-based infrastructure management for the entire stack. It is designed to meet the requirements of modern applications and improve operational efficiency, agility, and scale with its modular architecture. With this approach, Hitachi VSP management can be completely executed by using Cisco Intersight, which enables senior storage administrators to delegate basic tasks to their organization in a self-service manner.

Infrastructure managers can view information on servers, storage, and network equipment from a single screen, and using Cisco Intersight Cloud Orchestrator (ICO) to execute and automate daily operations with the use of built-in tasks and workflows. This approach contributes to the elimination of silos in the process of setting up new environments and in the situation when the operation management is split between multiple administrators for different infrastructure equipment. Cisco Intersight provides a single UI that can be managed centrally, thus making it easy to exchange information and reduce communication time between different administrators.

With Cisco Intersight and Hitachi VSP integration businesses can do the following:

- View a unified inventory of storage assets.
- Reduce the operational load of infrastructure administrators as Cisco Intersight removes the need to transition between the operation screens of the management software of each piece of infrastructure equipment when using conventional operations management.
- Delegate the enabling of repetitive tasks to novice team members using the ICO workflow.
- Provide role base access control (RBAC) to resources within the data center from a single platform.
- Eliminate the need for managing data center ecosystem separately because all components can be managed from Cisco Intersight.
- Extend the life of older storage systems by virtualizing behind the Hitachi VSP . For more information on Hitachi Universal Volume Manager (UVM) from Cisco Intersight, see the [Hitachi Virtual Storage Platform Universal Volume Manager with Cisco Intersight Best Practices Guide](#).

Furthermore, Hitachi storage systems offer a simplified approach to managing the data center by allowing multiple management options and features which allow further operational expenditure savings from built-in capacity savings function in form of deduplication and compression. Cisco Unified Computing System (UCS) backed by the Hitachi VSP provides customers a future-proof converged infrastructure stack backed by one of the most reliable enterprise storage systems which guarantees 100% data availability.

For more information on how Cisco Intersight can help solve complex operational situations in the data center users can see [Cisco and Hitachi Adaptive Solutions: Leveraging Hitachi Storage with Cisco Intersight for Consolidated Management and Automation](#).

This guide is written for professional services staff, such as storage administrators, VMware administrators, sales engineers, field consultants, and validated Hitachi and Cisco resale partners. Readers of this document must have knowledge of RAID systems and functionality, and converged infrastructure.

Chapter 2: Prerequisites

This section describes the prerequisites required to follow steps outlined within this best practices guide managing the Hitachi Virtual Storage Platform (VSP) and Cisco Intersight.

VSP configuration

Hitachi VSP storage configuration is based on UCS with VSP best practices as outlined in the Cisco and Hitachi Adaptive Solutions for Converged Infrastructure: https://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/UCS_CVDs/cisco_hitachi_adaptivesolutions_ci.html. Additionally, port mapping can be obtained from the Cisco and Hitachi Adaptive Solution with Cisco UCS X-Series Modular System and Hitachi Virtual Storage platform Reference Architecture Guide: <https://www.hitachivantara.com/en-us/pdf/architecture-guide/cisco-adaptive-solutions-with-cisco-ucs-x-series-modular-system-vsp.pdf> in the section *Physical cabling for the UCS 6454 with Hitachi Virtual Storage Platform*.

Cisco Intersight

Cisco Intersight

To enable Hitachi VSP management using Cisco Intersight, the following prerequisites must be configured and operational:

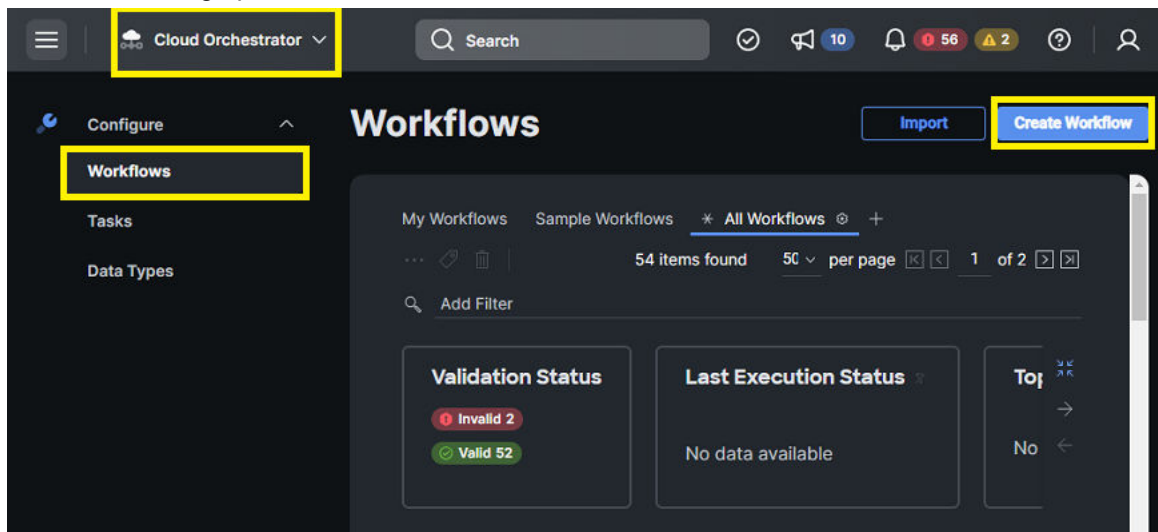
- Hitachi VSP storage system
- Hitachi Ops Center API Configuration Manager
- Cisco Intersight Assist OVA
- Cisco Intersight account and license
- Domain Name System (DNS) server

For more information, see the Integrating Hitachi Virtual Storage Platform with Cisco Intersight Quick Start Guide: <https://www.hitachivantara.com/en-us/pdf/architecture-guide/integrating-virtual-storage-platform-with-cisco-intersight.pdf>.

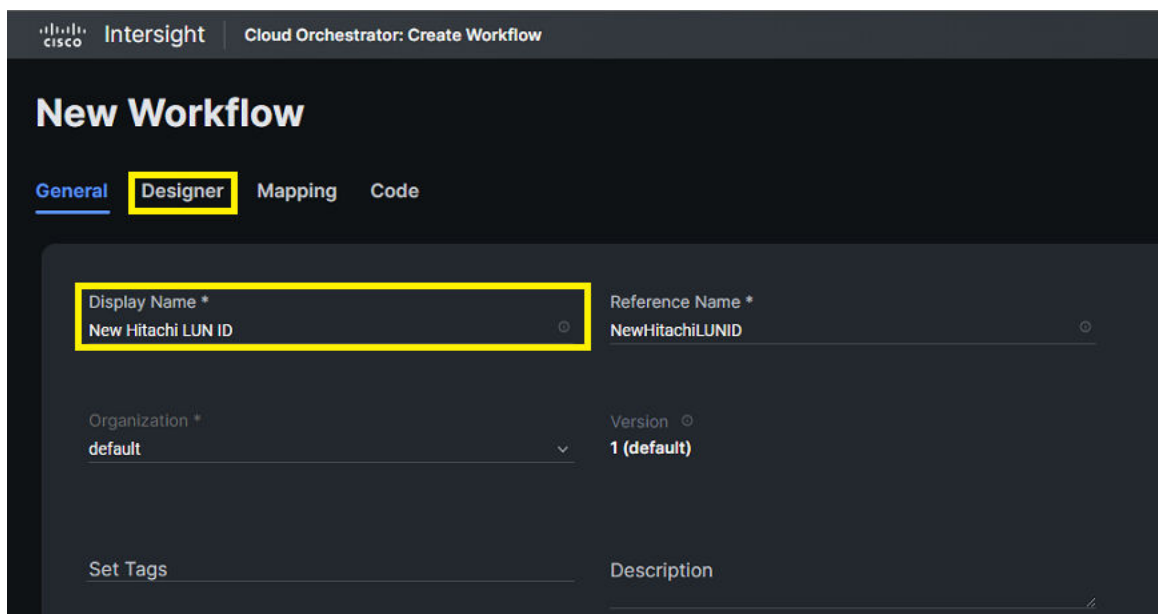
Workflow creation

Workflow creation

To enable workflow execution, users must compile tasks and create workflows from the Cisco Intersight UI to execute storage operations using ICO. After logging in to Cisco Intersight, users must select Cloud Orchestrator from the administration drop-down menu and select Workflows from the subtree menu and then select Create Workflow. The following figure shows the vantage point of where workflows must be created.



When Create Workflow is selected, the New Workflow wizard appears, users must define a Display Name, and then select the Designer tab to select which specific task or series of tasks they would like to execute within the workflow. The following figure shows an example of a new workflow task called New Hitachi LUN ID.



After the Designer tab is selected within the New Workflow wizard, the designer workspace along with the list of tasks is presented. Users must search for the task they would like to execute within the workflow using the built-in search function. In the following example, New Storage LUN ID is selected, and the task is then dragged and dropped onto the work pane. After the task has been mapped, users must select the Mapping tab to correlate workflow inputs correctly.

The screenshot shows the 'New Workflow' wizard in the Cisco Intersight Cloud Orchestrator. The 'Mapping' tab is active. A search bar contains 'New Storage LUN ID'. Below the search bar, the task details for 'New Storage LUN ID' are shown, including a description, system-defined status, and inputs/outputs. The task is also shown in a workflow diagram with 'Start', 'Success', and 'Failed' nodes.

After the Mapping tab is selected, link the corresponding workflow inputs into the respective task inputs by selecting Edit as shown in the following figure.

The screenshot shows the 'New Workflow' interface in the Cisco Intersight Cloud Orchestrator. The 'Mapping' tab is active, displaying a table of workflow inputs and outputs. The 'Workflow Inputs' column is empty. The 'Task Inputs' column shows a list of inputs for the 'New Storage LUN ID' task, with the 'Storage Device' input type highlighted and its 'Edit' button visible. The 'Task Outputs' column shows a list of outputs for the same task, including 'Host', 'Volume', 'LUN number', 'Volume Id', and 'LUN Path'.

After the edit input mapping wizard appears, users must select input type Direct Mapping, map to Workflow Input, and select Add workflow input.

The screenshot displays the 'Edit Input Mapping: Storage Device' configuration interface in Cisco Intersight Cloud Orchestrator. The breadcrumb trail shows 'New Workflow > Task: New Storage LUN ID'. The main heading is 'Edit Input Mapping: Storage Device', with a sub-instruction: 'Configure/Assign the value from available options.' The configuration area is titled 'Type of Mapping' and contains three dropdown menus, each highlighted with a yellow border:

- Input:** Set to 'Direct Mapping'.
- Map to:** Set to 'Workflow Input'.
- Input Name *:** Set to 'Add Workflow Input'.

A blue information banner below the 'Input' dropdown reads: 'Map a workflow input, a workflow variable, or any previous task output to this input.'

Under the add workflow input wizard, no changes are required, and default inputs can be used, click Add.

Add Input ✕

Display Name *
Storage Device ○

Reference Name *
StorageDevice ○

Description ○

Value Restrictions

Required ○

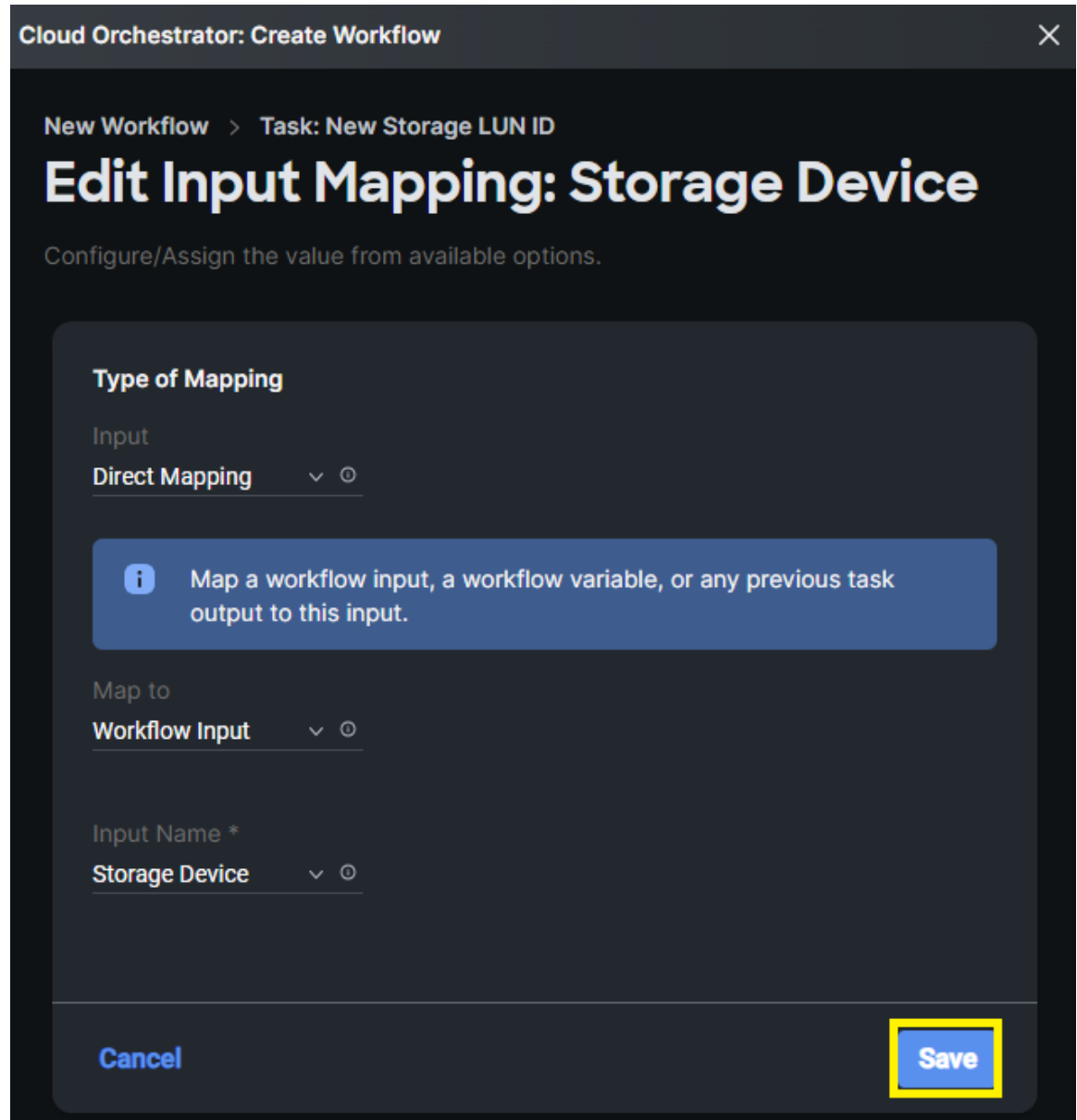
Collection/Multiple ○

Type
Storage Target Datatype ▼ ○

Set Default Value ○

Cancel Add

After input mappings have been set, click Save.



The screenshot shows a dark-themed dialog box titled "Cloud Orchestrator: Create Workflow" with a close button (X) in the top right corner. The breadcrumb path is "New Workflow > Task: New Storage LUN ID". The main heading is "Edit Input Mapping: Storage Device" in large white text. Below the heading is the instruction "Configure/Assign the value from available options." The dialog contains three dropdown menus: "Type of Mapping" set to "Direct Mapping", "Map to" set to "Workflow Input", and "Input Name *" set to "Storage Device". An information box with a blue background and white text states: "Map a workflow input, a workflow variable, or any previous task output to this input." At the bottom, there are two buttons: "Cancel" on the left and "Save" on the right, which is highlighted with a yellow border.

This procedure must be repeated for all input parameters of a task being used within a workflow. The following figure shows the state of the workflow after all input mappings have been defined.

The screenshot shows the 'New Workflow' creation interface in Cisco Intersight Cloud Orchestrator. The 'Mapping' tab is selected, displaying a visual mapping of workflow parameters. The 'Workflow Inputs' column lists 'Storage Device', 'Storage Vendor Virtual Machine', 'Host', 'Storage Vendor Host Identifier', and 'Storage Vendor LUN Options'. The 'Task Inputs' column lists 'New Storage LUN ID', 'Storage Device', 'Storage Vendor Virtual Machine', 'Host', 'Storage Vendor Host Identifier', and 'Storage Vendor LUN Options'. The 'Task Outputs' column lists 'New Storage LUN ID', 'Host', 'Volume', 'LUN number', 'Volume Id', and 'LUN Path'. The 'Workflow Outputs' column is currently empty, showing 'No Workflow Outputs'. The 'Save' button in the top right corner is highlighted with a yellow box.

Users must select Save after workflow has been designed and mapping parameters are identified as in the figure provided above. If everything has been validated correctly, the new workflow appears as Valid and can now be executed.

The screenshot shows the 'Edit Workflow' interface for a workflow named 'New Hitachi LUN ID'. The 'Mapping' tab is selected, and the workflow is now marked as 'Valid', indicated by a green checkmark icon in a yellow box. The 'Workflow Inputs' column lists 'Storage Device' and 'Storage Vendor Virtual Machine'. The 'Task Inputs' column lists 'New Storage LUN ID' and 'Storage Device'. The 'Storage Device' task input is connected to the 'Storage Vendor Virtual Machine' workflow input via a green arrow.

Chapter 3: Best practices

User-defined workflows

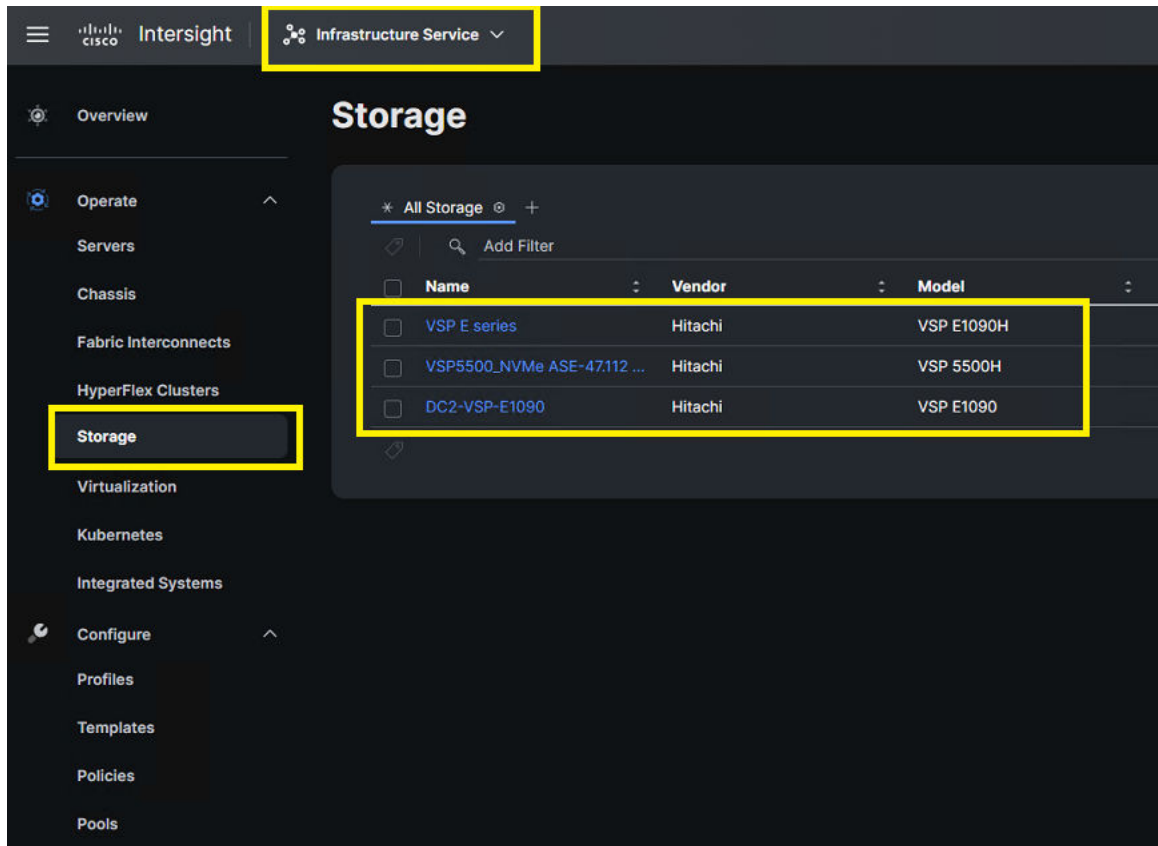
Before following the best practices, confirm items outlined in the [Prerequisites \(on page 0 \)](#) section of this document been verified. Additionally, confirm workflows for tasks required to be executed from ICO have been created, see [Workflow creation \(on page 8\)](#) for additional details. Additionally, all input parameters and successful execution of workflows can be validated by referring to Hitachi Storage Navigator or using Hitachi RAIDCOM Command Control Interface (CCI).

Monitor VSP inventory

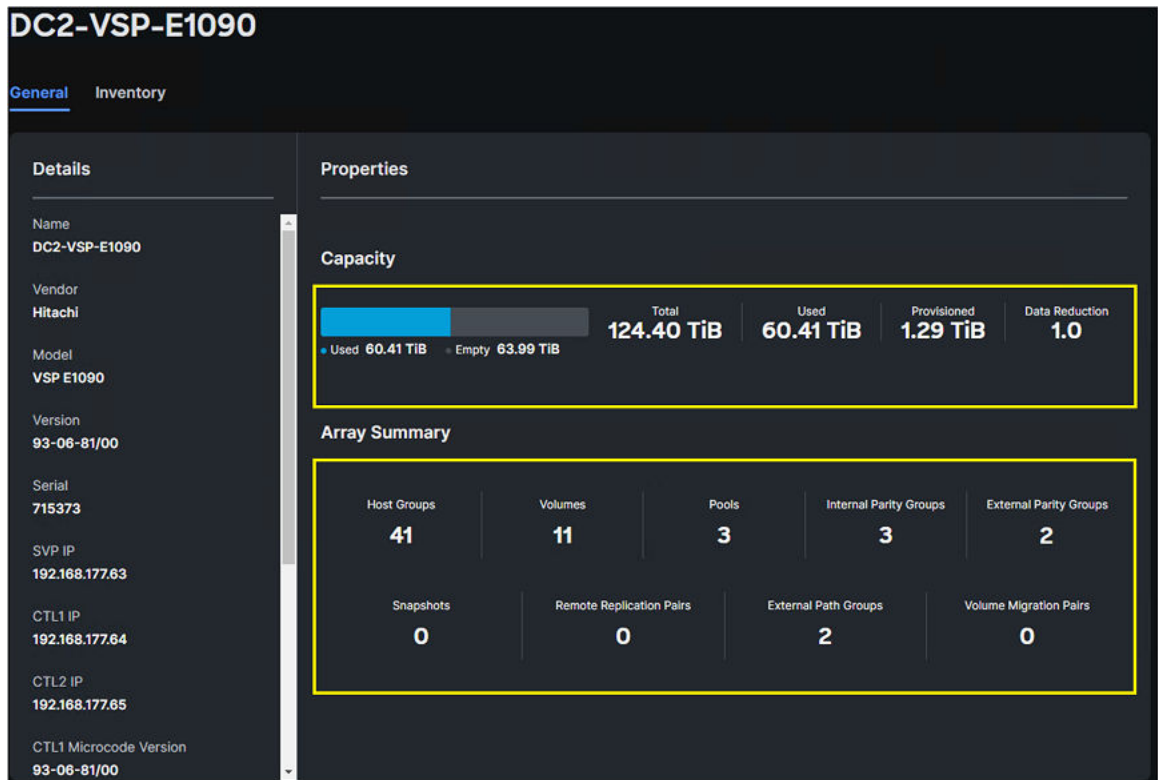
Cisco Intersight Infrastructure Service (IIS) enables administrators to view storage system statistics and usage natively from Cisco Intersight reducing overhead by allowing administrators to use Intersight as their single management platform for their data center operations.

Before you begin

Log in to Intersight and select Infrastructure Service > Storage and select a VSP model.



After a VSP is chosen, a General summary page is displayed that highlights capacity, statistics, and usage.



Additionally, the Inventory tab can be selected to which administrators will have access to Logical resources, such as Host Groups, Volumes, Pools, Parity Groups (Internal and External), Snapshots, Remote Replication Pair, External Path Groups, Volume Migration Pairs, and Hardware resources native to the VSP, such as Controllers, Drives, and Ports.

← Storage
DC2-VSP-E1090

General Inventory

Sections

- LOGICAL
- Host Groups
- Volumes
- Pools
- Parity Groups
- Snapshots
- Remote Replication Pairs
- External Path Groups**
- Volume Migration Pairs
- HARDWARE
- Controllers
- Drives
- Ports

External Path Groups

2 items found 10 per page 1 of 1

Add Filter

Name	External Storage Serial	External Storage Product ID
0	451833	VSP Gx00
1	-	SVC

1 of 1

Chapter 4: Provisioning

This chapter provides step-by-step instructions on how to use ICO tasks to manage the HitachiVSP storage system. ICO tasks are listed in order from the perspective of a green field deployment, where end users are setting up the environment for the first time.

New Storage Volume

The New Storage Volume function enables LDEV creation from internal or external parity groups. In the scope of this document, New Storage Volume enables administrators to create a basic logical device (LDEV) that can be added as a pool volume or carve virtual volumes from an available Dynamic Provisioning (HDP) or Hitachi Dynamic Tiering (HDT) pools to allocate to end hosts. In the case of Snapshot replication tasks in ICO, the New Storage Volume task will also be used to create an S-VOL from an available HDP or HDT pool.

The following figure shows the Cisco Intersight task New Storage Volume along with its input parameters.

^ New Storage Volume

Create a storage volume with volume name and volume size as inputs. Generates the volume name and volume size as outputs.

System Defined
Yes

Inputs
Storage Device*
Storage Vendor Virtual Machine*
Storage Vendor Aggregate*
Storage Vendor Volume Options*
Volume Capacity*

Outputs
Volume
Volume Capacity
Volume Id

Targets
Hitachi Virtual Storage Platform

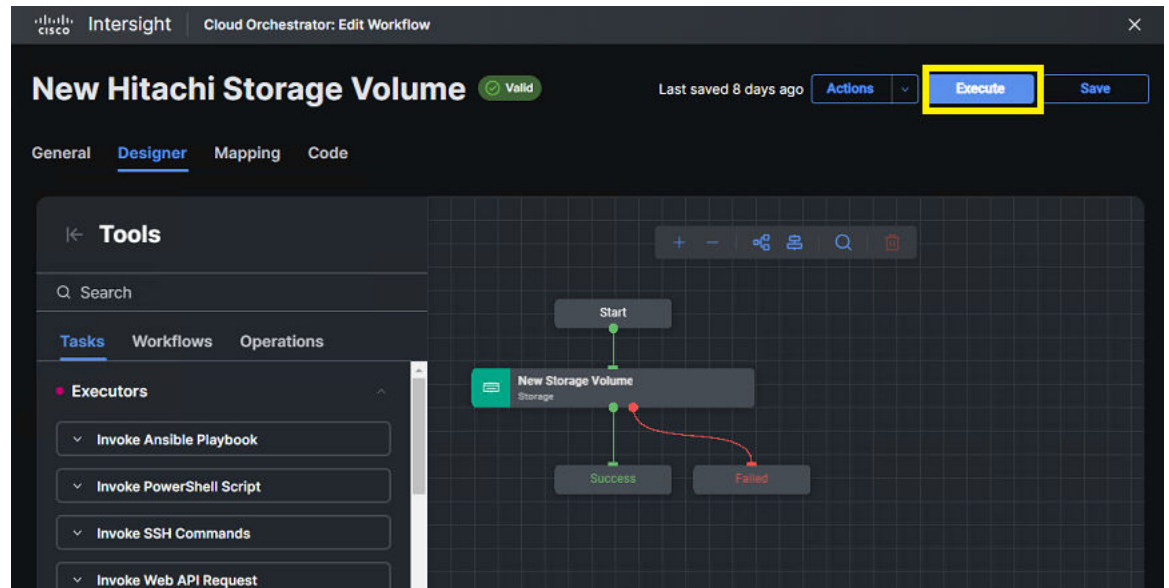


Note: Data Direct Mapping (DDM) is not supported from the Configuration Manager Rest API. The capacity limit for volumes is 4 TB.

To create a New Storage Volume from ICO, follow these steps.

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, when creating a basic LDEV for pool creation. Administrators must define the target VSP storage system, specify a **Parity Group ID**, define a **Volume Label**, set **Data Reduction** mode to disabled, and specify volume capacity and unit. After it's completed, click **Execute**.

Cloud Orchestrator: Edit Workflow

Execute Workflow: NewHitachiStorageVolume

Storage Device *

Selected Storage Device VSP E series

Hitachi volume option.

Pool Id

Parity Group
1-1

External Parity Group

Volume Label
UCS_Pool_Volume_0

Data Reduction Mode
disabled

Volume Capacity

Size *
500

Unit *
GiB

Cancel Execute

- Alternatively, when allocating a V-VOL using a pool, administrators must define **Pool ID**, **Volume Label**, **Data Reduction** mode, and **Volume Capacity**.

Storage Device *

Selected Storage Device DC2-VSP-E1090

Hitachi volume option.

Pool Id
2

Parity Group

External Parity Group

Volume Label
App_Vol_Comp_Dedup

Data Reduction Mode
compression_deduplication

Volume Capacity

Size *
100

Unit *
GiB

Cancel Execute

If input parameters are correct, ICO displays **Success** after the task is complete.

New Hitachi Storage Volume Valid Last saved 11 days ago Execute

General Designer Mapping Code History

Rollback Clone Execution

Start

New Storage Volume

Success Failed

Execution
New Hitachi Storage ... - Jul 10, 2023 11:25 PM

Organization
default Status
Success

Workflow Inputs

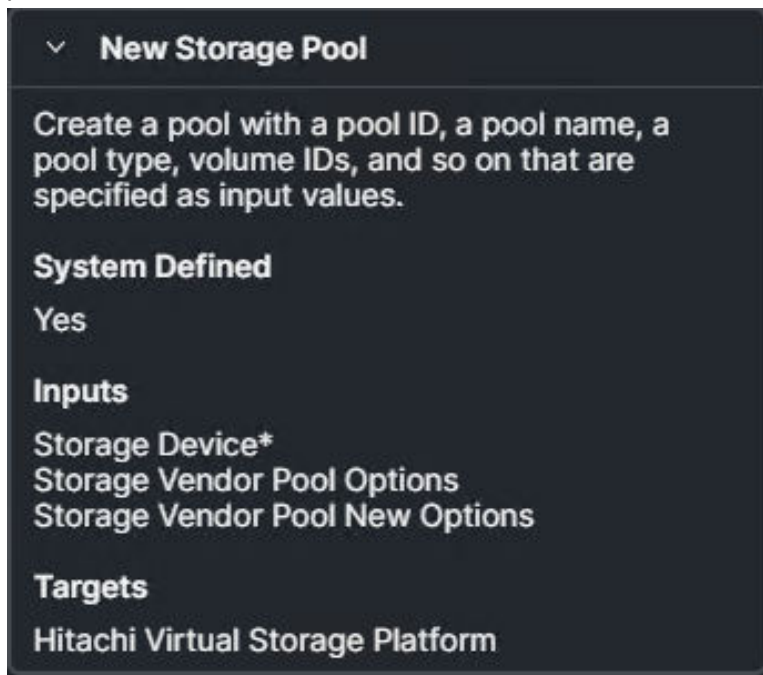
Start	Jul 10, 2023 11:25:38 PM
1 New Storage Volume	Jul 10, 2023 11:25:44 PM
Success	Jul 10, 2023 11:25:44 PM

New Storage Pool

The New Storage Pool capability is used to create either Hitachi Dynamic Provision (HDP), Hitachi Dynamic Tiered (HDT), or Thin Image (TI) pools from ICO. After pools have been created, administrators can use typical thin provisioning or dynamic tiering operations and

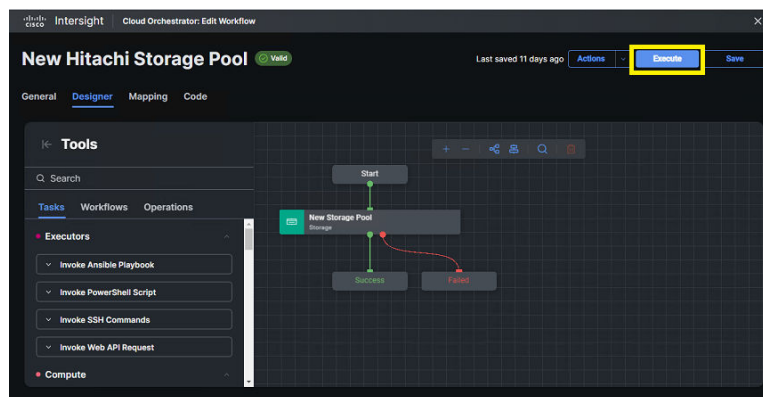
controller-based compression and deduplication for volumes carved within the pool using the function [New Storage Volume](#) (on page 18).

The following image shows the Cisco Intersight task, New Storage Pool along with its input parameters.



Procedure

1. Verify that the workflow has been created, see [Workflow creation](#) (on page 8) section of this document.
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Pool Name**, **Pool Type (HDP/HDT/HTI)**, **Pool Volume**, **Warning and Depletion Thresholds**, and **Suspend Snapshot** settings. If multiple pool volumes are required, the **+** icon can be used to define additional capacity. Click **Execute**.



Note: Suspend Snapshot Setting: Administrators can specify whether to suspend Thin Image pairs when the depletion threshold is exceeded. You can specify this attribute if the pool to be created is an HDP pool for storing snapshot data. By setting value to true, Thin Image pairs will be suspended when the depletion threshold is exceeded. By setting value to false, Thin Image pairs will not be suspended when the depletion threshold is exceeded. You cannot specify this parameter for Thin Image pools.

Cloud Orchestrator: Edit Workflow

Execute Workflow: NewHitachiStoragePool

Storage Device *
Selected Storage Device VSP E series

Pool Id *
4

Hitachi Pool New Options

Pool Name *
UCS_Application_Pool

Pool Type *
HDP pool

Deduplication Volume

Pool Volumes *
74 + 0 - 65279

Warning Threshold
70 1 - 100

Depletion Threshold
80 1 - 100

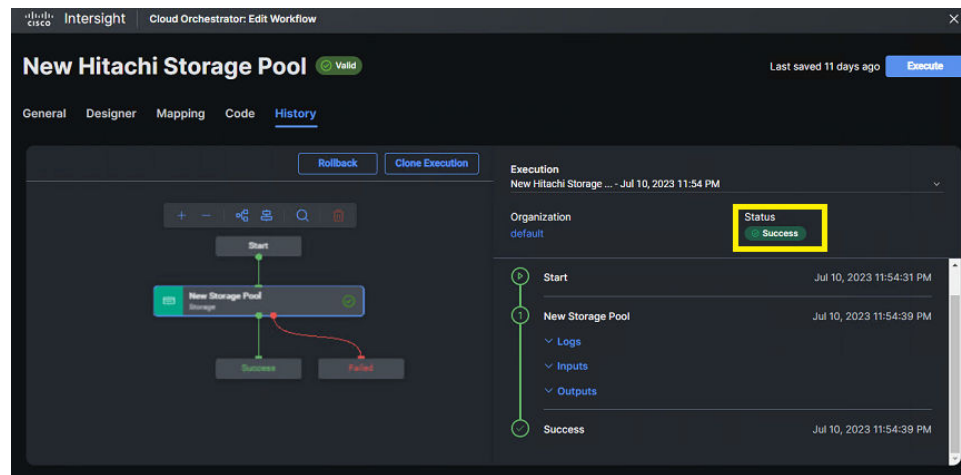
Suspend Snapshot
false

Cancel Execute



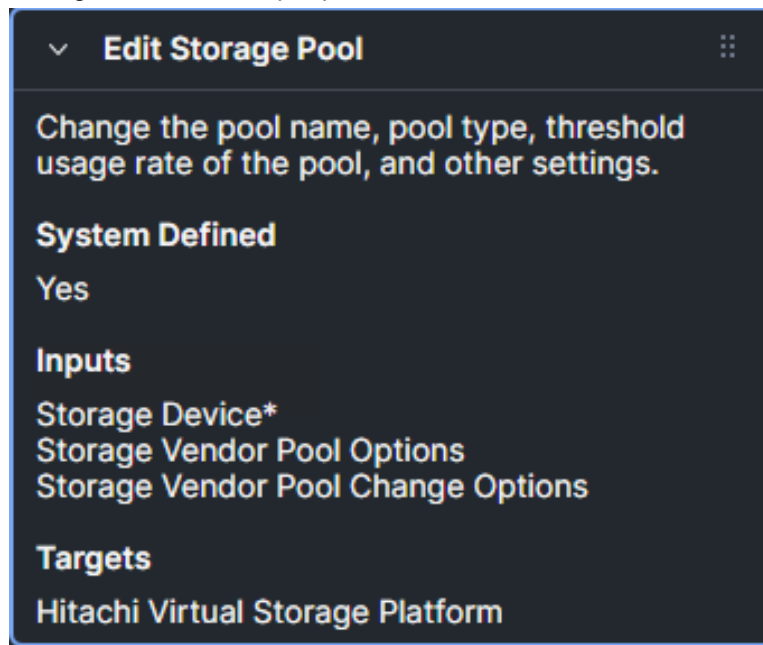
Note: When creating HDP or HDT pools, define multiple **Pool Volumes** for additional capacity by selecting the + icon.

If input parameters are correct, ICO displays **Success** after the task is complete.



Edit Storage Pool

Administrators can edit storage pool parameters from the ICO task Edit Storage Pool after initial pool configuration. From this task, parameters, such as Pool Name, Pool Type, Warning and Depletion Thresholds, Suspend Snapshot, Subscription Limit, and Protection Functions for Virtual Volumes can be modified. The following figure shows the Intersight task Edit Storage Pool and its input parameters.



Note: Setting the protection function for a virtual volume when HDP and HDT pools are full or a dynamic provision (DP) pool volume is blocked, users can specify whether it is possible to perform read and write operations for a DP volume that uses the target DP pool.

Pool Full (PF): If the DP pool is full, read and write operations are not possible. If the DP pool volume is blocked, read and write operations are possible.

Pool-VOL Blockade (PB): If the DP pool volume is blocked, read and write operations are not possible. If the DP pool is full, read and write operations are possible.

Full or Blockade (FB): If the DP pool is full or the DP pool volume is blocked, read and write operations are not possible.

No Blocking (NB): Even if the DP pool is full or the DP pool volume is blocked, read and write operations are possible for the target DP volume.

Note: The Protection function cannot be set to Thin Image pools.

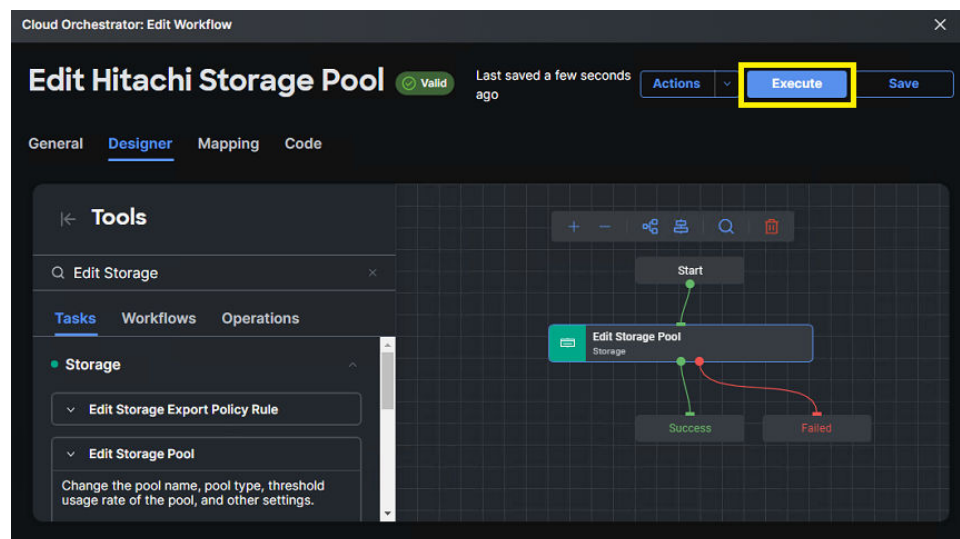
Note: Suspend Thin Image pairs when the depletion threshold is exceeded. You can specify this attribute for HDP pools that contain snapshot data.

- "true": Suspend Thin Image pairs when the depletion threshold is exceeded.
- "false": Do not suspend Thin Image pairs when the depletion threshold is exceeded.

To use Edit Storage Pool from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Pool ID**, **Pool Name**, **Pool Type**, **Warning and Depletion Thresholds**, **Suspended Snapshots**, **Subscription Limit**, and **Protection Function for Virtual Volumes**. Click **Execute**.

Cloud Orchestrator: Edit Workflow

Execute Workflow: EditHitachiStoragePool

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

Pool Id *
Selected Pool Id 4

Hitachi Pool Change Options

Pool Name
UCS_Application_Pool_Prod

Pool Type
HDP pool

Deduplication Volume

Warning Threshold
80

Depletion Threshold
90

Suspend Snapshot
false

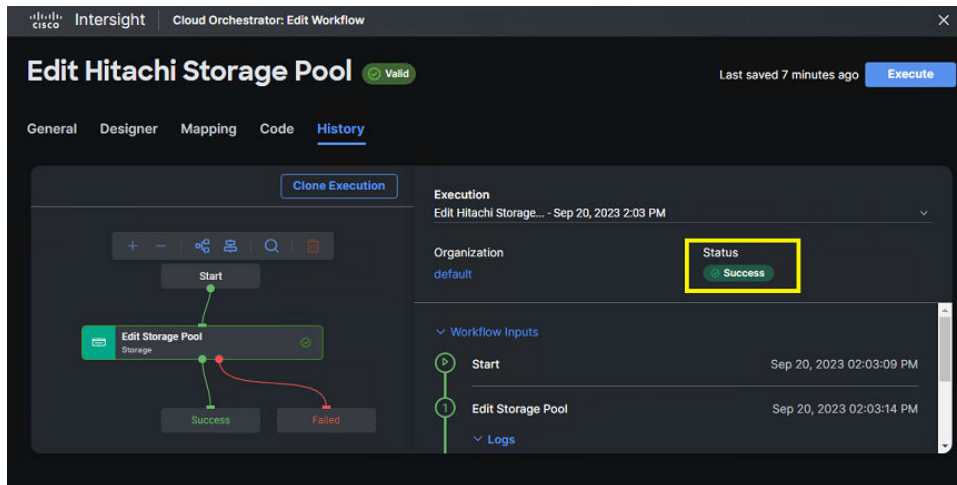
Subscription Limit
300

Protection Function for Virtual Volume
PF

Cancel **Execute**

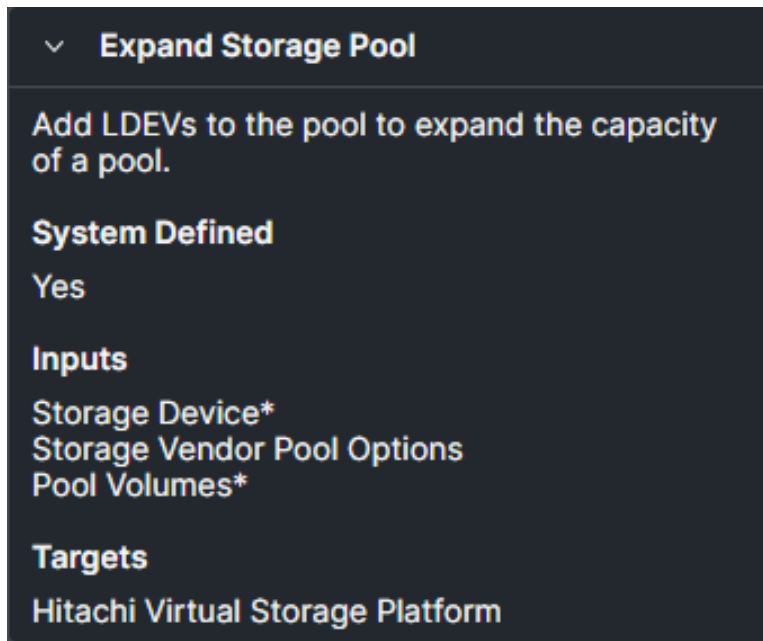
Result

If the input parameters are correct, ICO displays Success after the task is complete.



Expand Storage Pool

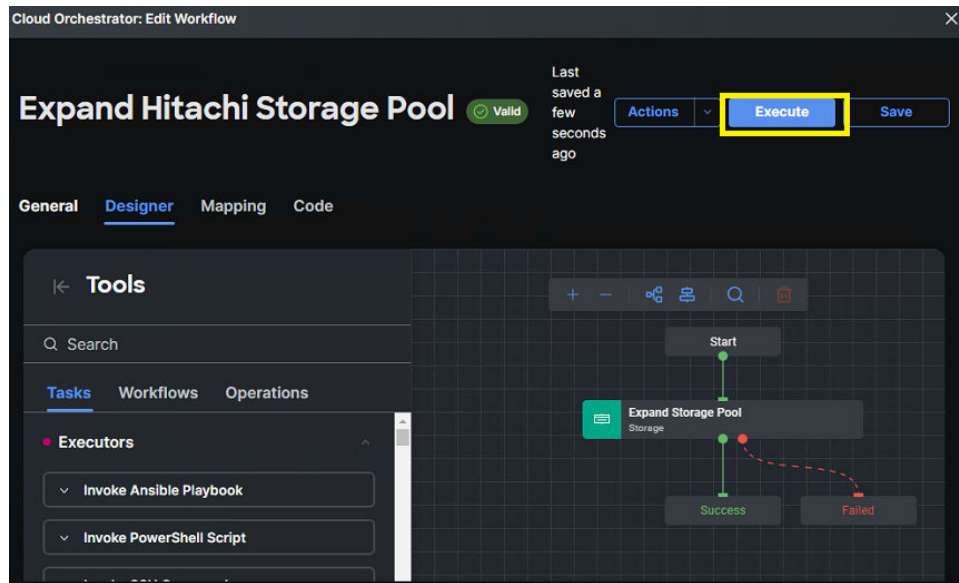
If the capacity of a Pool needs to be expanded, the ICO task Expand Storage Pool is used to provide additional capacity. Before using Expand Storage Pool, verify the basic LDEV is available or create it from ICO task New Storage Volume. The following figure shows the Intersight task, Expand Storage Pool along with its input parameters.



To use Expand Storage Pool from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Pool Volume ID**, if required the **+** icon can be used to define multiple pool volumes. Click **Execute**.

Cloud Orchestrator: Edit Workflow ✕

Execute Workflow: ExpandHitachiStorageel

Execute Workflow

Fill Attributes

General

Organization *
default ▼ ○

Workflow Instance Name
Expand Hitachi Storage Pool ○

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series ✎ ✕

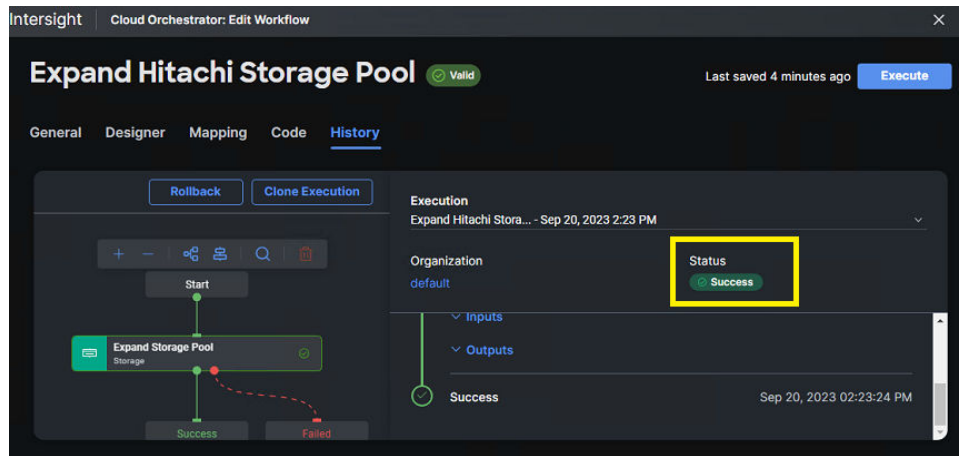
Pool Id * ○
Selected Pool Id 4 ✎ ✕

Pool Volumes *
65 ○ +
0 - 65279

Cancel Execute

Result

If the input parameters are correct, ICO displays Success after the task is complete.



Compress Storage Pool

The Compress Storage Pool task within ICO allows administrators to shrink pool capacity as required. Before compressing a storage pool, verify that the basic LDEV IDs are obtained from Hitachi Storage Navigator and RAIDCOM Command Control Interface (CCI).

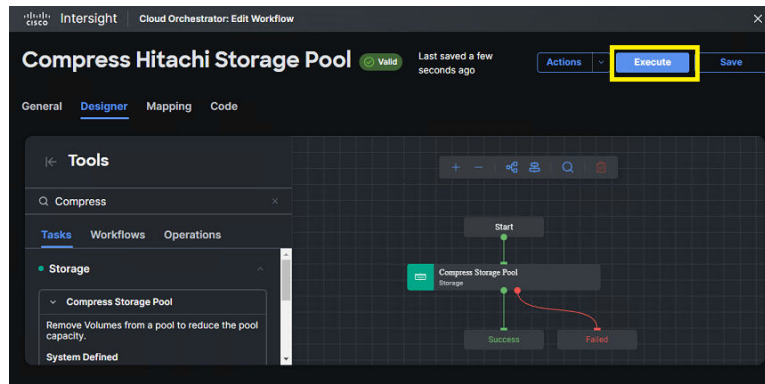
The following figure shows the Intersight task, Expand Storage Pool along with its input parameters.



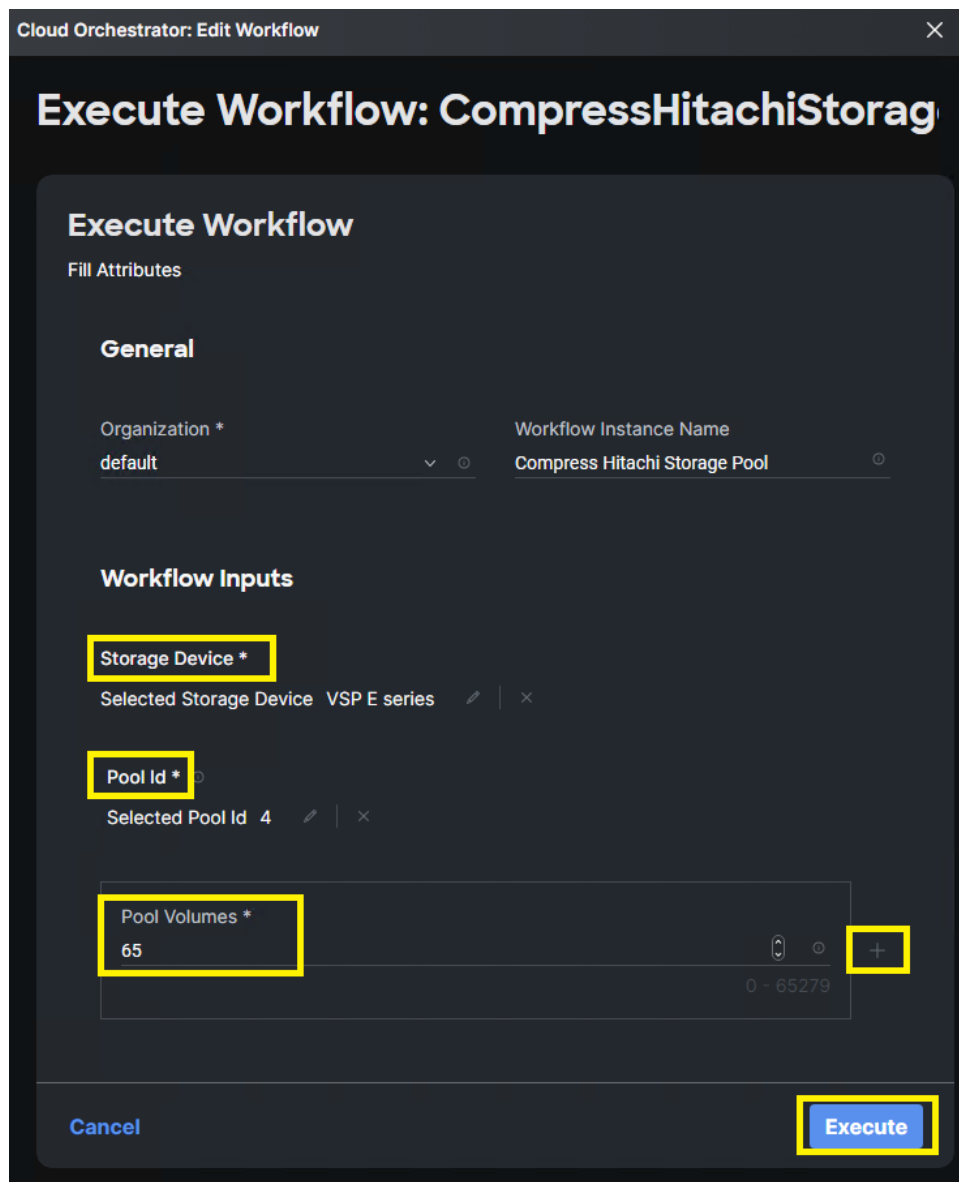
To use Compress Storage Pool from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.

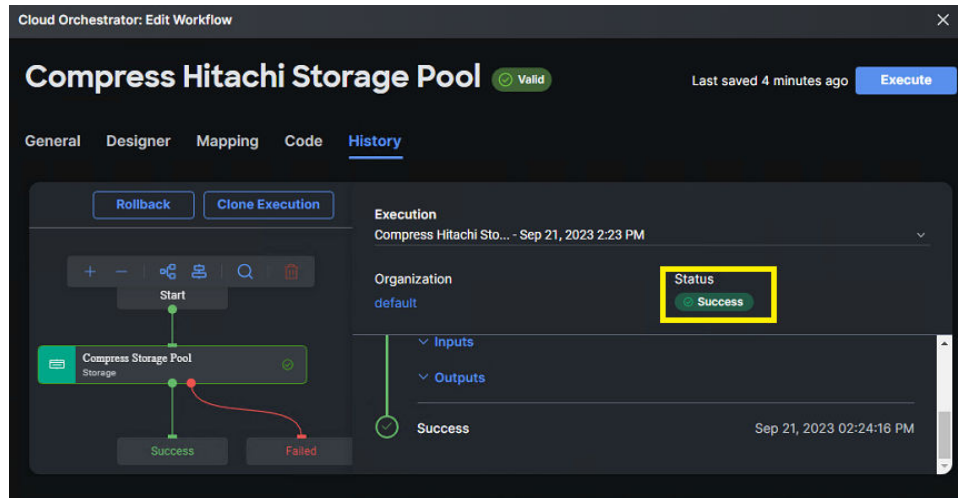


- From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Pool Volume ID**, if required the **+** icon can be used to define multiple pool volumes. Click **Execute**.



Result

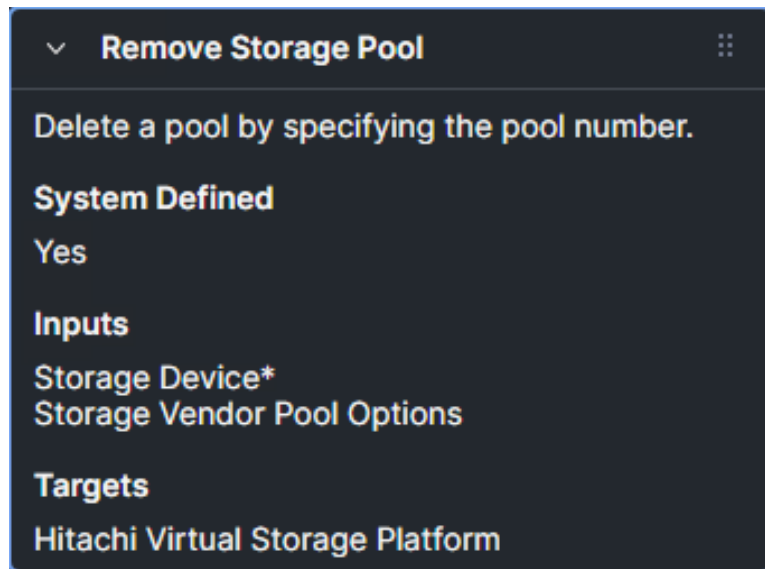
If the input parameters are correct, ICO displays Success after the task is complete.



Remove Storage Pool

ICO enables administrators to delete VSP storage pools as needed. Before using ICO task Remove Storage Pool, confirm correct pool ID is obtained from Hitachi Storage Navigator, RAIDCOM (CCI), or Cisco IIS.

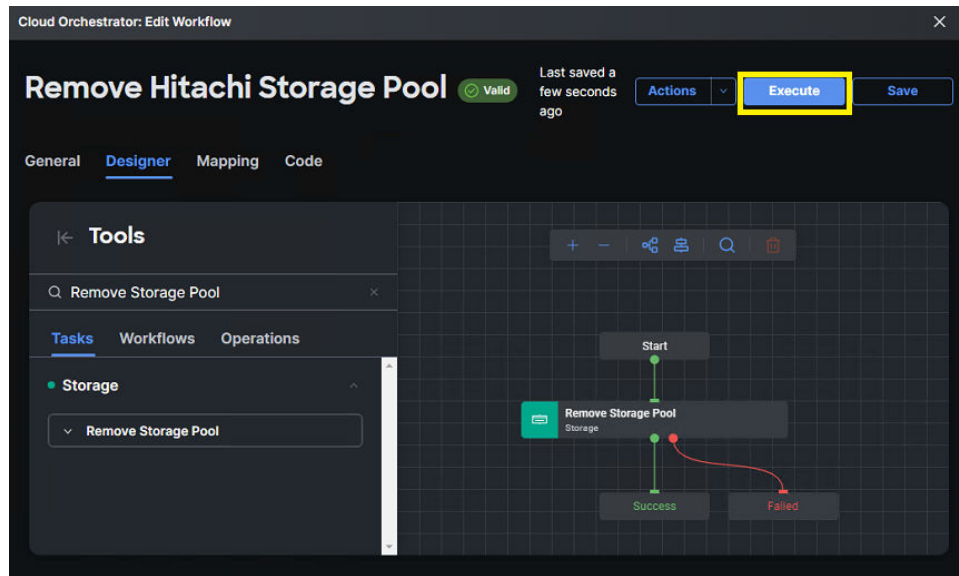
The following figure shows the Intersight task Remove Storage Pool and its input parameters.



To use Remove Storage Pool from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and **Pool ID**. Click **Execute**.

The screenshot shows a dark-themed dialog box titled "Execute Workflow: RemoveHitachiStoragePool". At the top, it says "Cloud Orchestrator: Edit Workflow". Below the title, there's a section "Execute Workflow" with a sub-section "Fill Attributes".

General

Organization *
default

Workflow Instance Name
Remove Hitachi Storage Pool

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

Pool Id *
Selected Pool Id 4

At the bottom, there are two buttons: "Cancel" and "Execute".

Result

If the input parameters are correct, ICO displays Success after the task is complete.

New Storage Host and Connect Initiators to Storage Host (Host Group)

Within Cisco Intersight, the concept of creating VSP host groups that contains applicable host mode, host mode options and initiator WWNs will require a combination of tasks, which include New Storage Host and Connect Initiators to Storage Host. While each task can be used standalone, it is a best practice to combine these two tasks to create a complete host group in a single workflow. New Storage Host enables users to define a host group name and apply host mode, and host mode options.

The following figure shows the Intersight task New Storage Host along with its input parameters.

▼ **New Storage Host**

Create a storage host with host name and list of WWNs and IQNs to be associated with it as input. Storage host is the entity used to associate initiators to storage and expose as LUNs. Host can map to different terms for Storage vendors. For NetApp ONTAP storage this maps to iGroup. Outputs are host name, and associated IQN or WWN list.

System Defined

Yes

Inputs


Storage Device*
 Host*
 Storage Vendor Host Identifier*
 Storage Vendor Virtual Machine*
 List of WWNs
 List of IQNs
 Storage Vendor Host Options*

Outputs

Host
 List of WWNs
 List of IQNs
 Storage Vendor Host Identifier

Targets

Hitachi Virtual Storage Platform

 **Note:** When using New Storage Host in a standalone workflow configuration, WWNs input will not be added to host group.

Connect Initiators to Storage Host enables users to allocate the WWN to the host group after using New Storage Host to create the host group.

The following figure shows the Intersight task Connect Initiators to Storage Host along with its input parameters.

▼ **New Storage Host**

Create a storage host with host name and list of WWNs and IQNs to be associated with it as input. Storage host is the entity used to associate initiators to storage and expose as LUNs. Host can map to different terms for Storage vendors. For NetApp ONTAP storage this maps to iGroup. Outputs are host name, and associated IQN or WWN list.

System Defined

Yes

Inputs

Storage Device*
 Host*
 Storage Vendor Host Identifier*
 Storage Vendor Virtual Machine*
 List of WWNs
 List of IQNs
 Storage Vendor Host Options*

Outputs

Host
 List of WWNs
 List of IQNs
 Storage Vendor Host Identifier

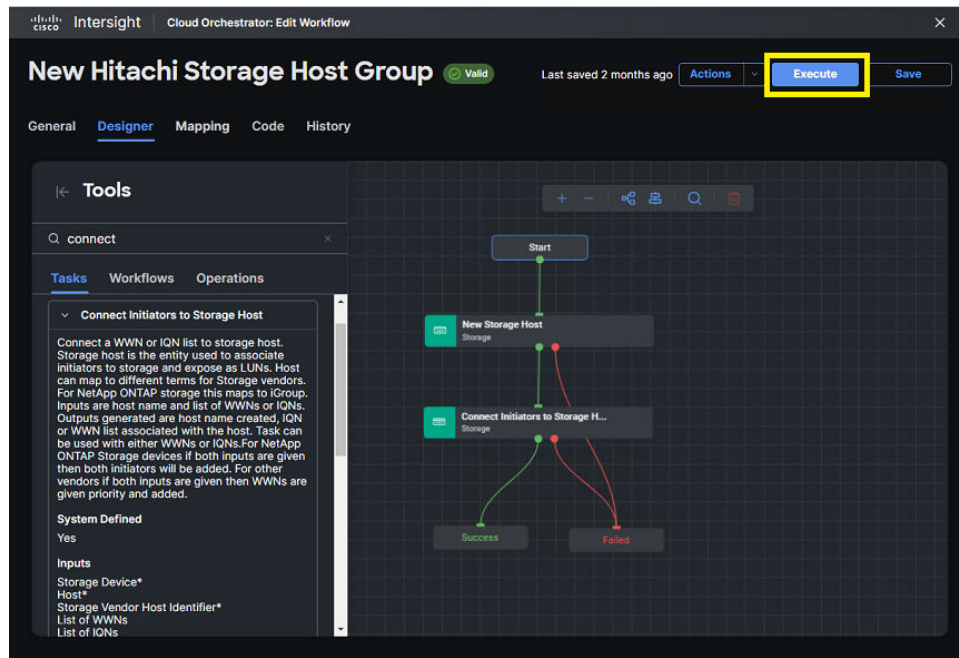
Targets

Hitachi Virtual Storage Platform

To create a Host Group from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Host** (host group name), **Port ID**, **Host Group Number**, **Initiator WWN** and **Host Mode VMware Extension**. Additionally multiple **Host Mode Options** can be added by selecting the **+** icon. For VMware deployments 54, 63, and 114 are selected. Click **Execute**.

Cloud Orchestrator: Edit Workflow

Execute Workflow: NewHitachiStorageHostGroup

Execute Workflow
Fill Attributes

General

Organization *
default

Workflow Instance Name
New Hitachi Storage Host Group

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

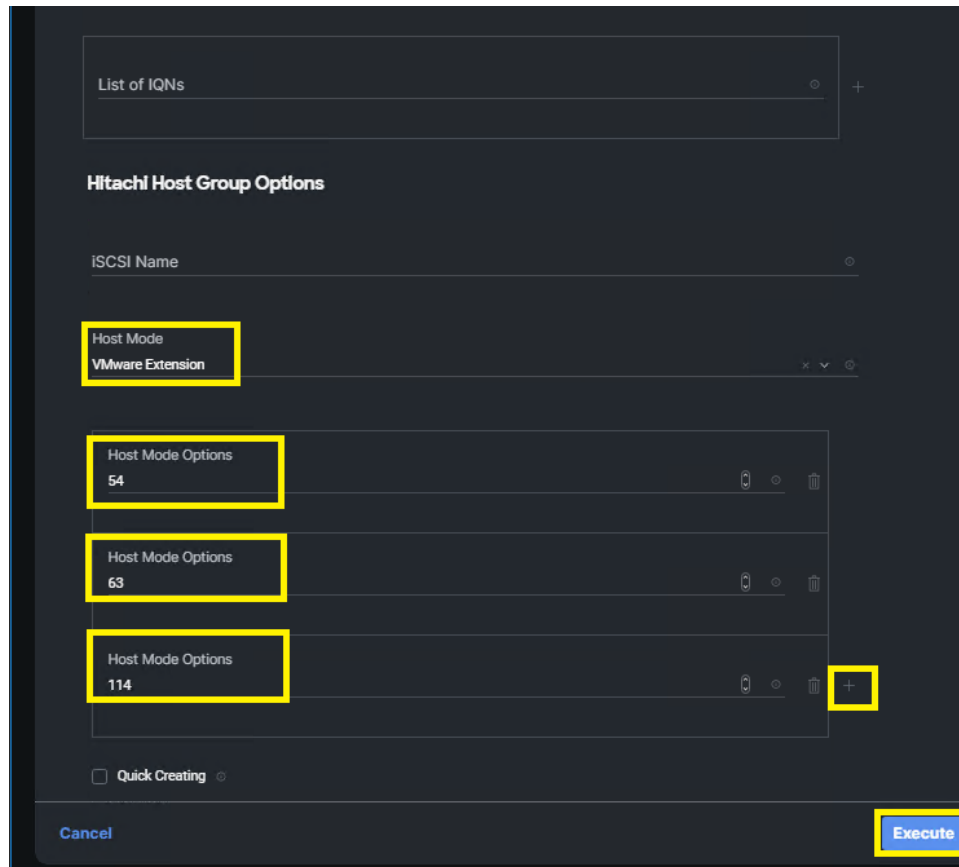
Host *
VSI_x210c_M6-10_Fab_A

Hitachi Host Group Parameter

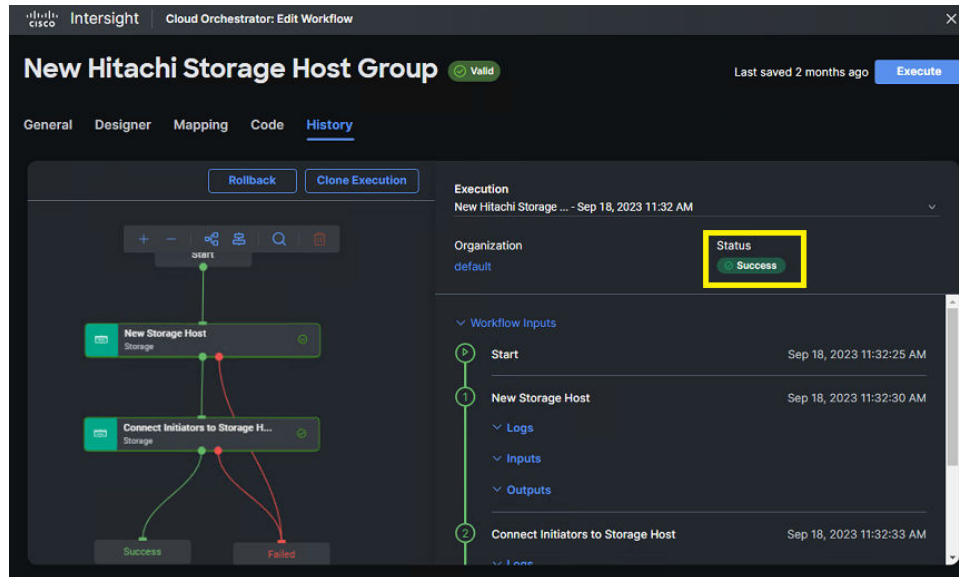
Port Id *
CL1-A

Host Group Number *
239

List of WWNs
20000025B5860A13



If input parameters are correct, ICO displays **Success** after the task is complete.



Disconnect Initiators from Storage Host

If administrators want to remove an initiator WWN from a storage host, ICO task Disconnect Initiators from Storage Host can be used. With this task, the host group will not be deleted.

The following figure shows the Cisco Intersight task Disconnect Initiators from Storage Host along with its input parameters.

▼ **Disconnect Initiators from Storage Host** ⋮

Disconnect a WWN or IQN list from storage host with host name and list of WWNs or IQNs as inputs. Generates as output host name created, IQN or WWN list associated with the host. Task can be used to with either WWNs or IQNs, and if both inputs are given then WWNs are given priority and added.

System Defined

Yes

Inputs

Storage Device*
Host*
Storage Vendor Host Identifier*
List of WWNs.
List of IQNs.

Outputs

Host
List of WWNs
List of IQNs
Wwn_Iqn

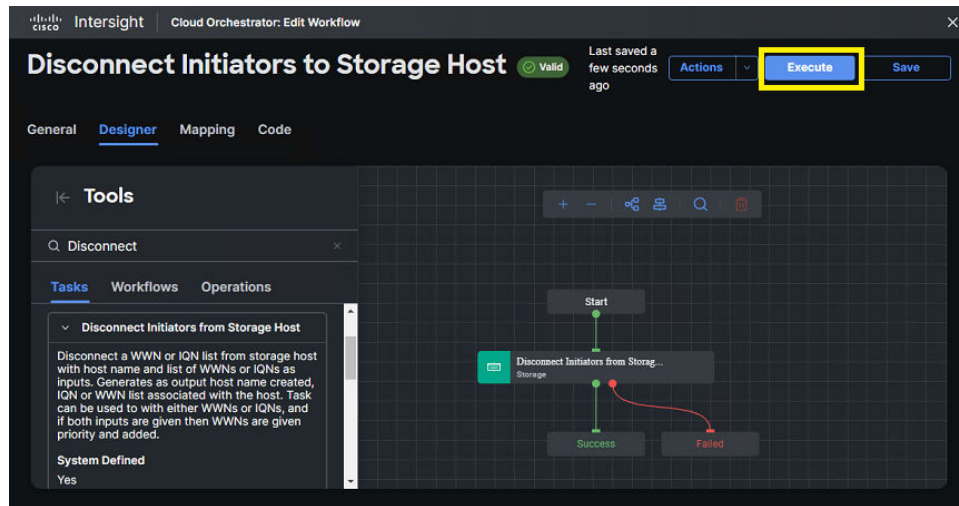
Targets

Hitachi Virtual Storage Platform

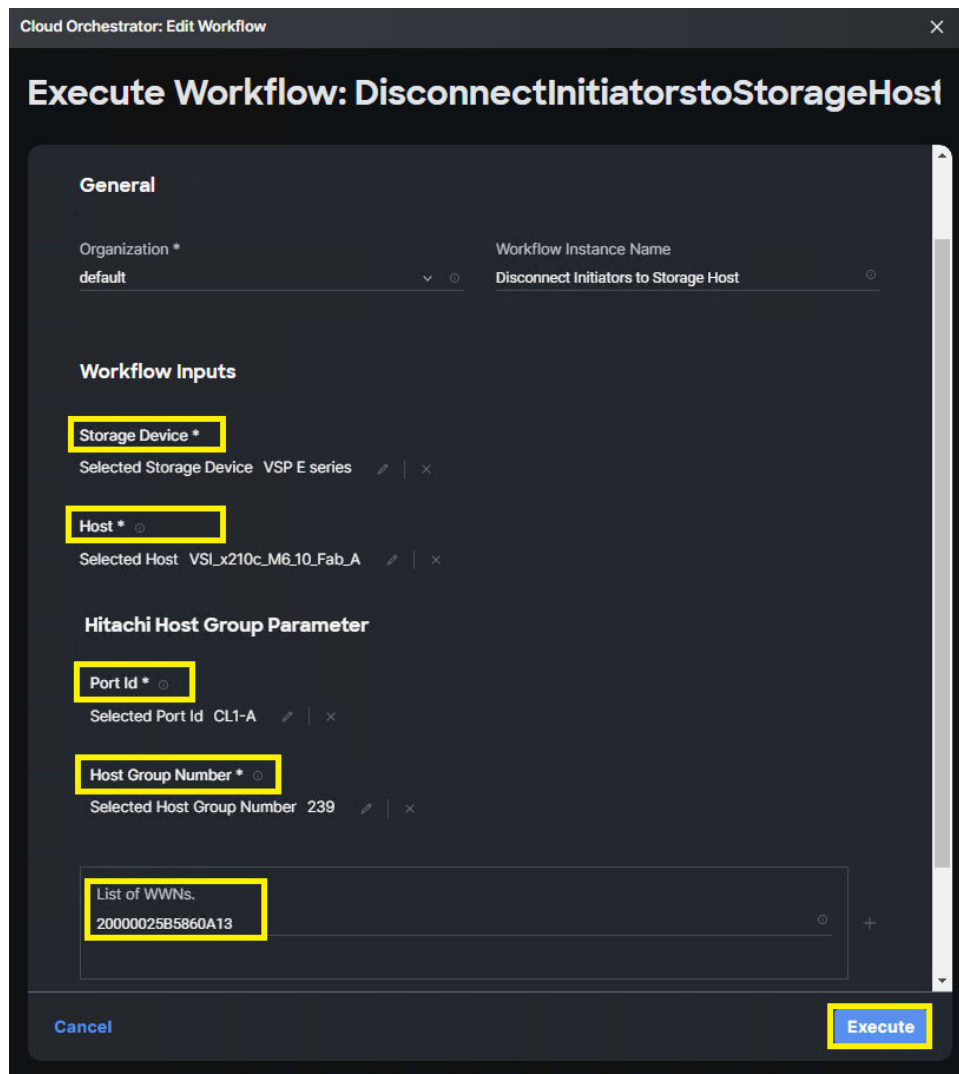
Before completing this operation, confirm host groups have been created. To WWN from a Storage Host from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



- From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Host (host group name)**, **Port ID**, **Host Group Number**, **WWN** of initiator that is in question of being removed. Click **Execute**.



If input parameters are correct, ICO displays **Success** after the task is complete.

Remove Storage Host (Host Group)

ICO enables administrators to remove the entire host groups from the Remove Storage Host task. This will allow administrators to delete the host group along with any WWNs that it contains. Alternatively, if administrators would like to keep the host group but remove the initiator WWN inside of the host group, see [Disconnect Initiators to Storage Host \(on page 40\)](#).

The following figure shows the Cisco Intersight task Remove Storage Host along with its input parameters.

▼ **Remove Storage Host**

Remove a storage host with host name as input. Storage host is the entity used to associate initiators to storage and expose as LUNs. Host can map to different terms for Storage vendors. For NetApp ONTAP storage this maps to iGroup. On successful execution, the host name deleted is generated as output.

System Defined

Yes

Inputs

Storage Device*

Host*

Storage Vendor Host Identifier*

Storage Vendor Virtual Machine*

Outputs

Host

Storage Vendor Host Identifier

Targets

Hitachi Virtual Storage Platform

NetApp Active IQ Unified Manager

Pure Storage FlashArray

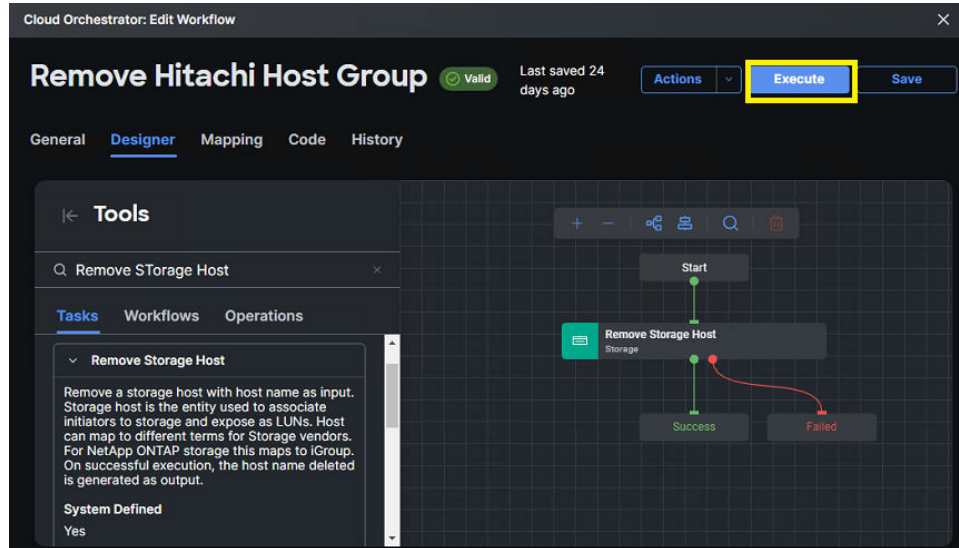
Before completing this operation, confirm host groups have been created.

To Remove Storage Host from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.

3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Host (host group name)**, **Port ID**, and **Host Group Number**. Click **Execute**.

Cloud Orchestrator: Edit Workflow

Execute Workflow: RemoveHitachiHostGroup

Execute Workflow

Fill Attributes

General

Organization *
default

Workflow Instance Name
Remove Hitachi Host Group

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

Host *
Selected Host VSI_x210c_M6_10_Fab_A

Hitachi Host Group Parameter

Port Id *
Selected Port Id CL1-A

Host Group Number *
Selected Host Group Number 239

Cancel **Execute**

If input parameters are correct, ICO displays **Success** after the task is complete.

Intersight | Cloud Orchestrator: Edit Workflow

Remove Hitachi Host Group Valid

Last saved 24 days ago **Execute**

General Designer Mapping Code **History**

Clone Execution

Execution
Remove Hitachi Host ... - Sep 18, 2023 12:10 PM

Organization
default

Status **Success**

Workflow Inputs

Start Sep 18, 2023 12:10:14 PM

1 Remove Storage Host Sep 18, 2023 12:10:17 PM

Logs

Inputs

New Storage LUN ID

The **New Storage LUN ID** function enables mapping of an LDEV to the host from host group selection and defining the LUN ID mapped to the host. In the scope of this document **New Storage LUN ID** will be used after [New Storage Volume \(on page 18\)](#) task has carved a V-Vol from the available HDP or HDT pools.

The following figure shows the Cisco Intersight task New Storage LUN ID along with its input parameters.

^ **New Storage LUN ID**

Connect storage to a host with host name and details needed to create LUN ID. On successful execution, host name, details of the LUN ID are generated. For NetApp ONTAP Storage, connect storage LUN to an iGroup with Inputs as LUN name and iGroup name. iGroup is referred as Host for input. On successful execution iGroup name, LUN name and LUN number are generated as outputs.

System Defined

Yes

Inputs

Storage Device*

Storage Vendor Virtual Machine*

Host*

Storage Vendor Host Identifier*

Storage Vendor LUN Options*

Outputs

Host

Volume

LUN number

Volume Id*

LUN Path

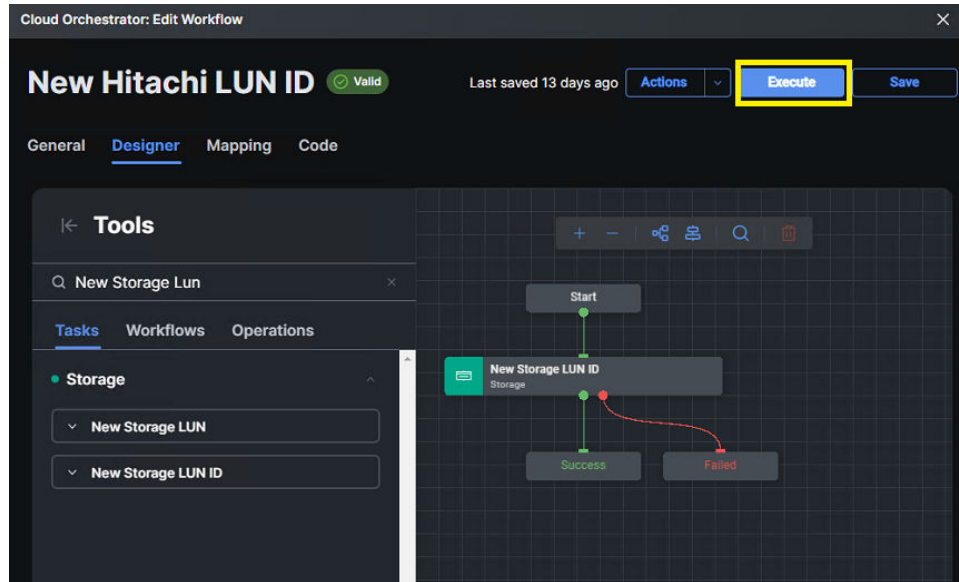
Targets

Hitachi Virtual Storage Platform

Before completing this operation, verify that zoning is in place, and that host groups have been created. To add LUN mappings from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Host (host group name)**, **Port ID**, **Host Group Number**, **LDEV**, and **LUN number**. Click **Execute**.



Note: LDEV IDs are in decimal format.

Cloud Orchestrator: Edit Workflow

Execute Workflow: NewHitachiLUNID

default | New Hitachi LUN ID

Workflow Inputs

Storage Device *
Selected Storage Device DC2-VSP-E1090

Host *
Selected Host B200-DC1-ESXi01_Fab_A

Hitachi Host Group Parameter

Port Id *
Selected Port Id CL7-B

Host Group Number *
Selected Host Group Number 4

Volume *
Selected Volume 1

LUN number
65

0 - 16384

Cancel Execute

If input parameters are correct, ICO displays **Success** after the task is complete.

Remove Storage LUN ID (LUN paths)

Remove Storage LUN ID is used to remove an LDEV that has been mapped to a Hitachi VSP host group with an associated LUN ID to the respective operating system.

The following figure shows the Cisco Intersight task Remove Storage LUN ID task along with its input parameters.

▼ **Remove Storage LUN ID**

Disconnect storage from Host and hence remove the LUN ID. Storage host is the entity used to associate initiators to storage and expose as LUNs. Host can map to different terms for Storage vendors. For NetApp ONTAP Storage, disconnect Storage LUN from an iGroup with LUN name and iGroup name as inputs. On successful execution iGroup name and the LUN Path are generated as outputs.

System Defined
 Yes

Inputs
 Storage Device*
 Storage Vendor Virtual Machine*
 Storage Vendor Host Identifier*
 Host*
 Storage Vendor LUN number*

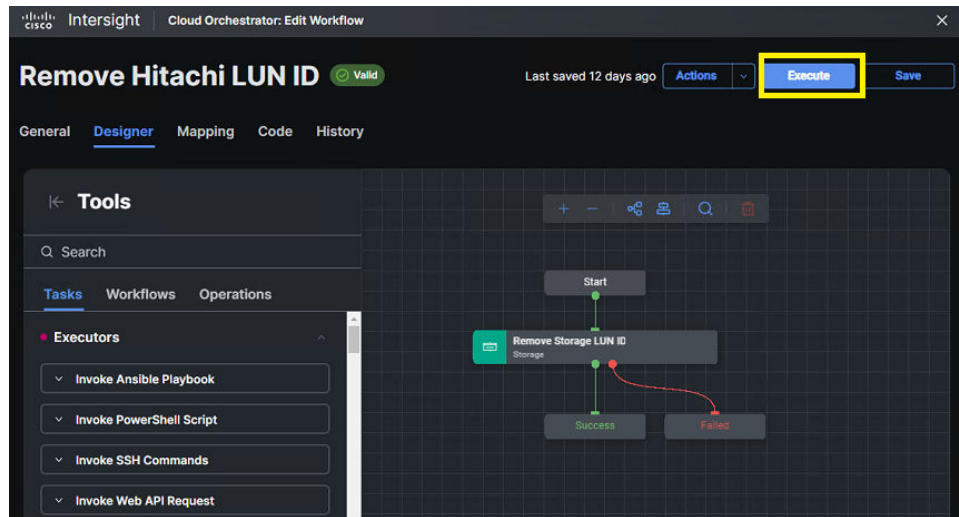
Outputs
 Host
 Volume
 LUN number
 LUN Path

Targets
 Hitachi Virtual Storage Platform

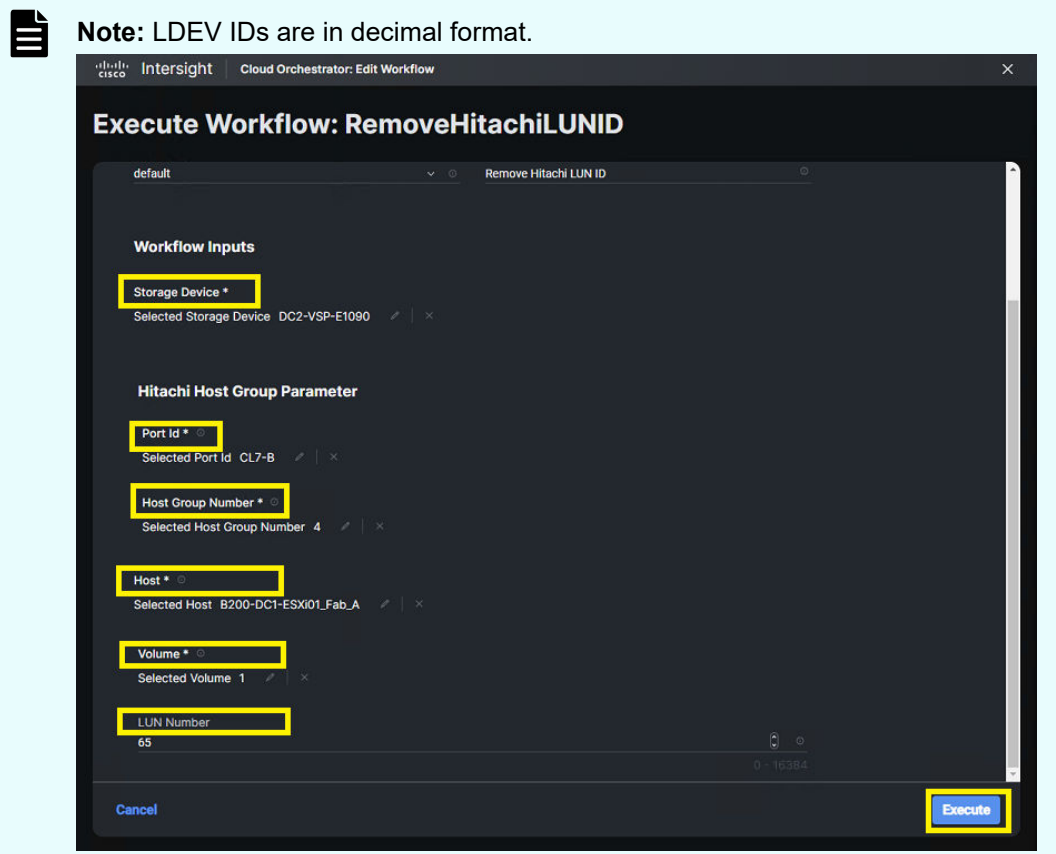
To remove LUN mappings from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



- From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **Host (host group name)**, **Port ID**, **Host Group Number**, **LDEV** and **LUN** number. Click **Execute**.



If input parameters are correct, ICO displays **Success** after the task is complete.

The screenshot displays the Cisco Intersight Cloud Orchestrator interface for editing a workflow titled "Remove Hitachi LUN ID". The interface includes a "Valid" status indicator and a "Last saved 12 days ago" timestamp. The "History" tab is active, showing a workflow diagram with a "Start" node, a "Remove Storage LUN ID" task, and "Success" and "Failed" end nodes. The "Execution" panel on the right shows the workflow's execution history, including the "Status" (Success), "Organization" (default), and "Workflow Inputs" (Start, Remove Storage LUN ID, Success) with their respective timestamps.

Expand Storage Volume

The Expand Storage Volume task within ICO enables administrators to define additional capacity to Virtual Volumes (V-VOLs) after they are carved from an HDP or HDT pool.

The following figure shows the Intersight task, Expand Storage Volume along with its input parameters.

▼ **Expand Storage Volume**

Expand a volume with volume name and size as inputs. On successful execution, volume name and size are generated as outputs.

System Defined

Yes

Inputs

Storage Device*

Volume*

Storage Vendor Expand Volume Capacity*

Storage Vendor Virtual Machine*

Outputs

Volume

Volume Capacity

Targets

Hitachi Virtual Storage Platform



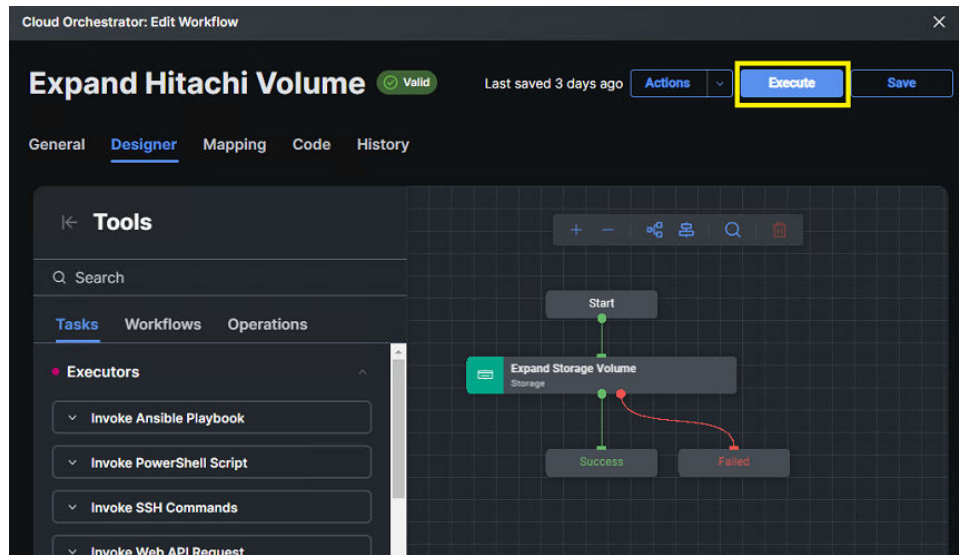
Note: Expand Storage Volume will not work with parity groups, LDEVs carved from parity or pass through volumes. LDEVs can only be expanded as part of an HDP or HDT pool. If using pass-through volumes with production data, best practice is to use Move Hitachi Volume to migrate data to internal parity group using HDP or HDT pools, then expanding the volume.

As a best practice, storage administrators must be aware of the total physical capacity of an HDP or HDT pool, as with the Hitachi VSP thin provisioning is used.

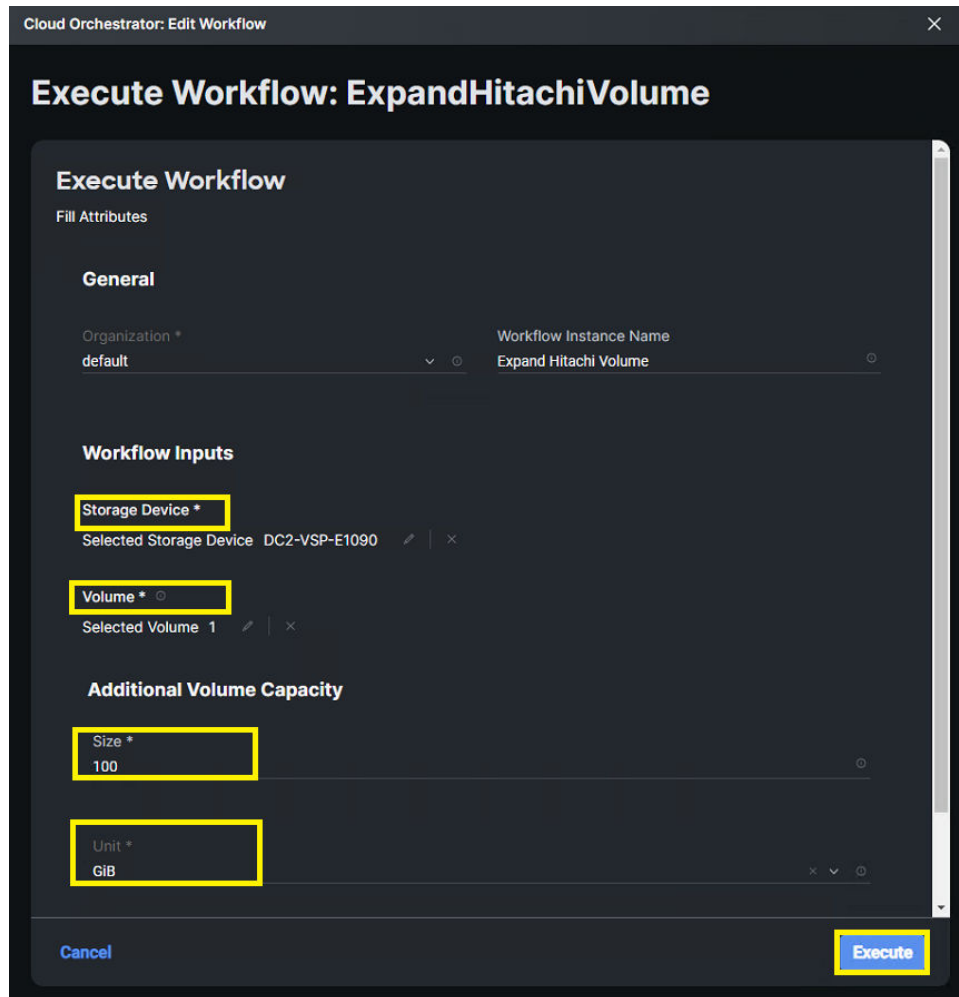
To use Expand Storage Volume from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.

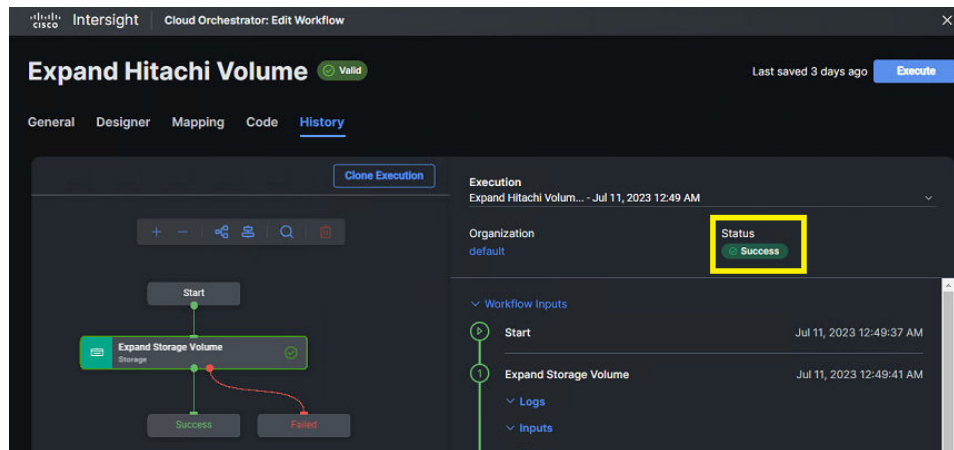


- From the **Execute Workflow** wizard, select the target VSP storage system, and specify the **LDEV**, **Size**, and **Unit**. Click **Execute**.



Result

If the input parameters are correct, ICO displays Success after the task is complete.



Find Storage Volume by ID

ICO enables administrators to find volumes using the Network Addressing Authority (NAA) ID that in the case of VMware can be obtained from VMware vCenter or ESXi operating system. Using this task enables administrators to confirm volume details and volume ID in decimal format to use within other ICO workflows.



Note: The first six digits in an NAA ID, see the vendor, while the last 24 digits see the LUN's serial number.

The following figure shows the Cisco Intersight task **Find Storage Volume** by ID and its input parameters.

▼ **Find Storage Volume by ID**

Find details of a storage volume given the volume identifier like NAA Id or EUI Id. Generates as output volume details associated with the storage device.

System Defined
Yes

Inputs
Storage Device*
Storage Vendor Find Volume Options*

Outputs
Volume
Volume Size
Volume Id
Storage Virtual Machine

Targets
Hitachi Virtual Storage Platform

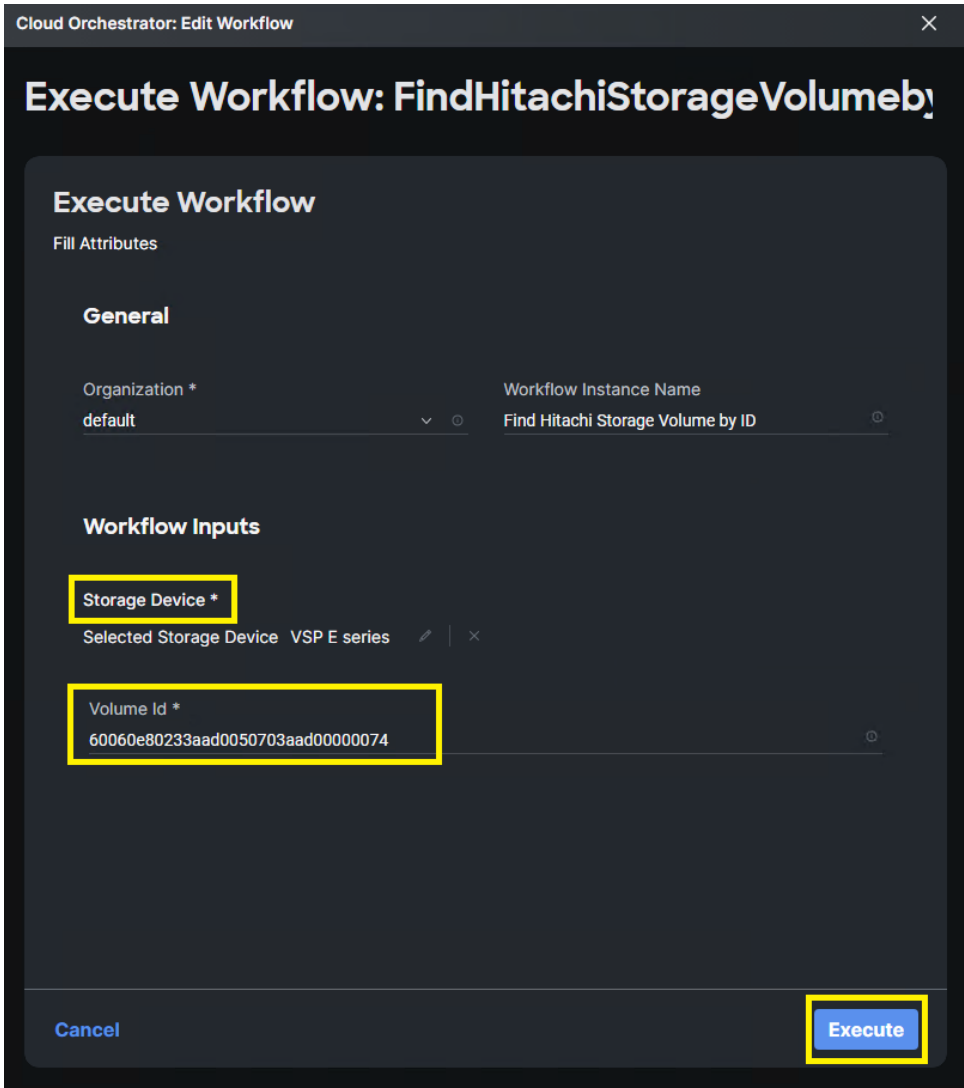
To use Find Storage Volume by ID from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.

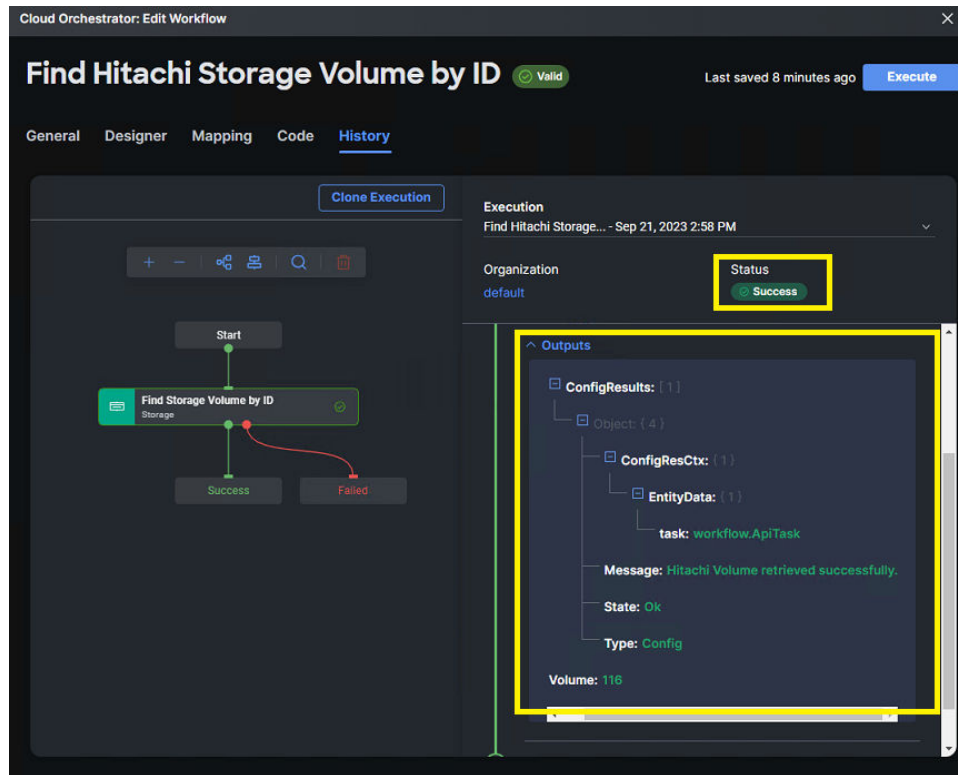
The screenshot shows the 'Intersight Cloud Orchestrator: Edit Workflow' interface. The title bar includes the Cisco Intersight logo and the text 'Intersight Cloud Orchestrator: Edit Workflow'. The main heading is 'Find Hitachi Storage Volume by ID' with a 'Valid' status indicator and a timestamp 'Last saved a few seconds ago'. There are 'Actions', 'Execute', and 'Save' buttons. Below the heading are tabs for 'General', 'Designer', 'Mapping', and 'Code'. The 'Designer' tab is active, showing a workflow canvas with a 'Start' node, a 'Find Storage Volume by ID' task node, and 'Success' and 'Failed' end nodes. A left-hand 'Tools' panel is visible, containing a search bar and a list of tasks under the 'Storage' category, including 'Find Storage LUN by ID' and 'Find Storage Volume by ID'.

4. From the **Execute Workflow** wizard, select the target VSP storage system, and the **NAA ID**. Click **Execute**.



Result

If input parameters are correct, ICO displays Success after the task is complete. Additionally, under Outputs volume information is displayed for the NAA ID.

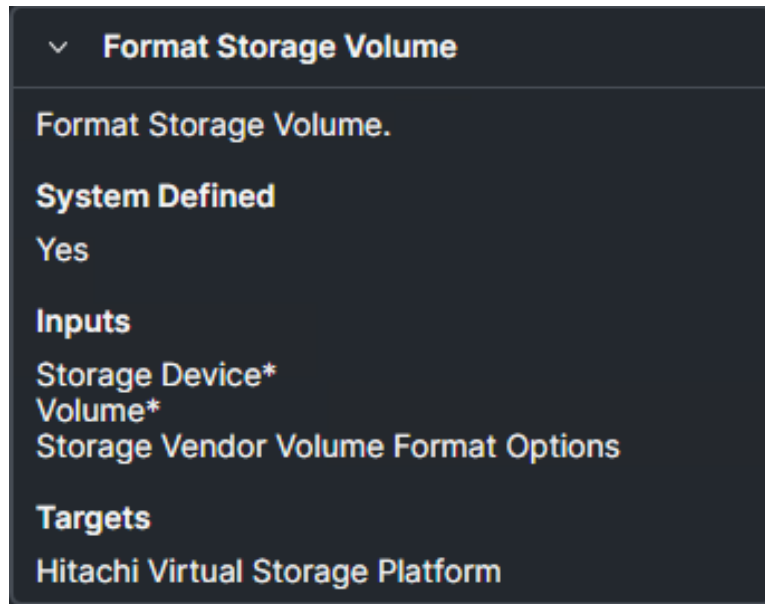


Format Storage Volume

ICO enables administrators to format data from internal, external, or virtual volumes as needed. This allows administrators to wipe data that may reside on the VSP ahead of deleting or reallocating the volumes. Two format options are presented in the ICO task, Format (FMT) which can be applied to internal, virtual, and external volumes, and quick format (QFMT) which are for internal volume LDEVs only with the caveat of not applying to parity groups with accelerated compression enabled.

Additionally, if required, the Force Format option can be used to forcibly format the DP volume for which the capacity saving function (compression or deduplication) is enabled.

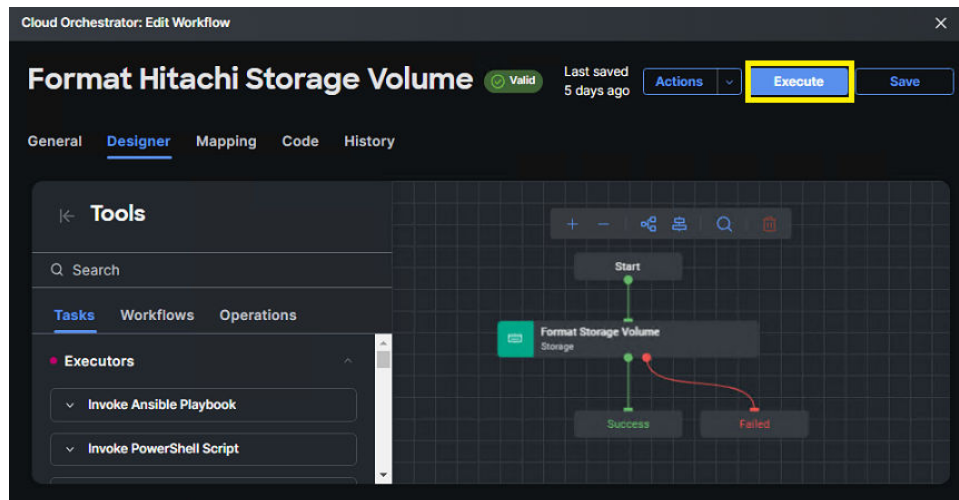
The following figure shows the Cisco Intersight task Format Storage Volume along with its input parameters.



To use Format Storage Volume from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and the **Volume** that requires formatting. From the drop-down select the format option **FMT** or **QFMT**. If volume has capacity saving function enabled, apply **Force Format**. Click **Execute**.

Cloud Orchestrator: Edit Workflow ✕

Execute Workflow: FormatHitachiStorageVolume

Execute Workflow
Fill Attributes

General

Organization *
default

Workflow Instance Name
Format Hitachi Storage Volume

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

Volume *
Selected Volume 94

Hitachi Volume Format Option

Format Type *
FMT

Force Format

Cancel Execute

Result

If input parameters are correct, ICO displays Success after the task is complete.



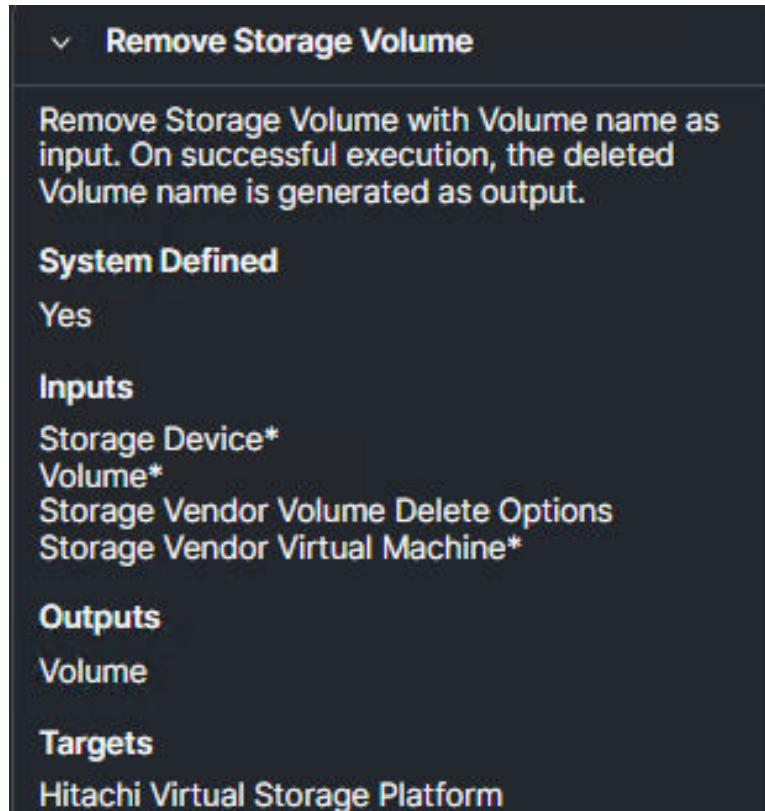
Remove Storage Volume

The Remove Storage Volume task from ICO enables administrators to delete internal or external volume sets.



Note: Before using Remove Storage Volume task, verify that LUN paths have been deleted and that volume is not in any local or remote replication sets. If volume is being used as a pool volume, verify that the pool is deleted.

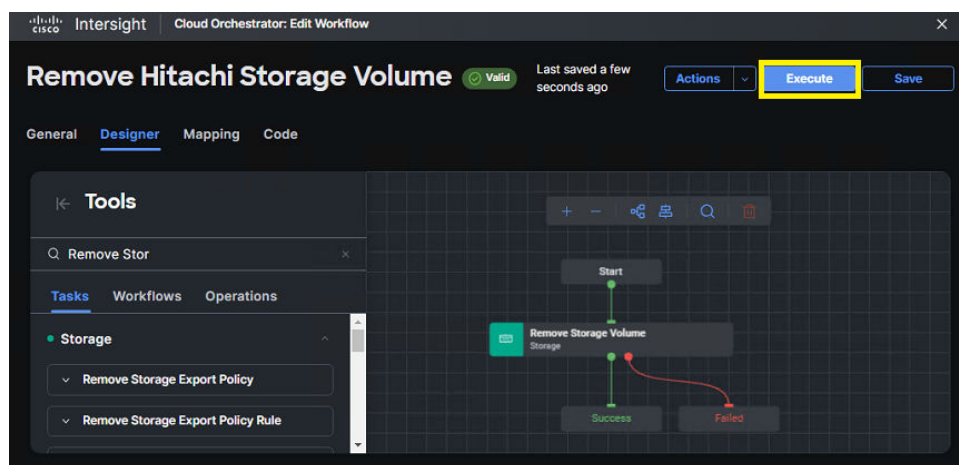
The following figure shows the ICO task Remove Storage Volume and its input parameters.



To use Format Storage Volume from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the VSP storage system, and the **Volume**. If volume has capacity saving function enabled, apply **Force Delete**. Click **Execute**.

Cloud Orchestrator: Edit Workflow

Execute Workflow: RemoveHitachiStorageVolume

Execute Workflow

Fill Attributes

General

Organization *
default

Workflow Instance Name
Remove Hitachi Storage Volume

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

Volume *
Selected Volume 94

Force Delete

Cancel Execute

If input parameters are correct, ICO displays **Success** after the task is complete.

Intersight | Cloud Orchestrator: Edit Workflow

Remove Hitachi Storage Volume Valid

Last saved 3 minutes ago Execute

General Designer Mapping Code History

Clone Execution

Execution
Remove Hitachi Stora... - Sep 26, 2023 3:00 PM

Organization
default

Status
Success

Start Sep 26, 2023 03:00:23 PM

1 Remove Storage Volume Sep 26, 2023 03:00:28 PM

Logs

Inputs

Outputs

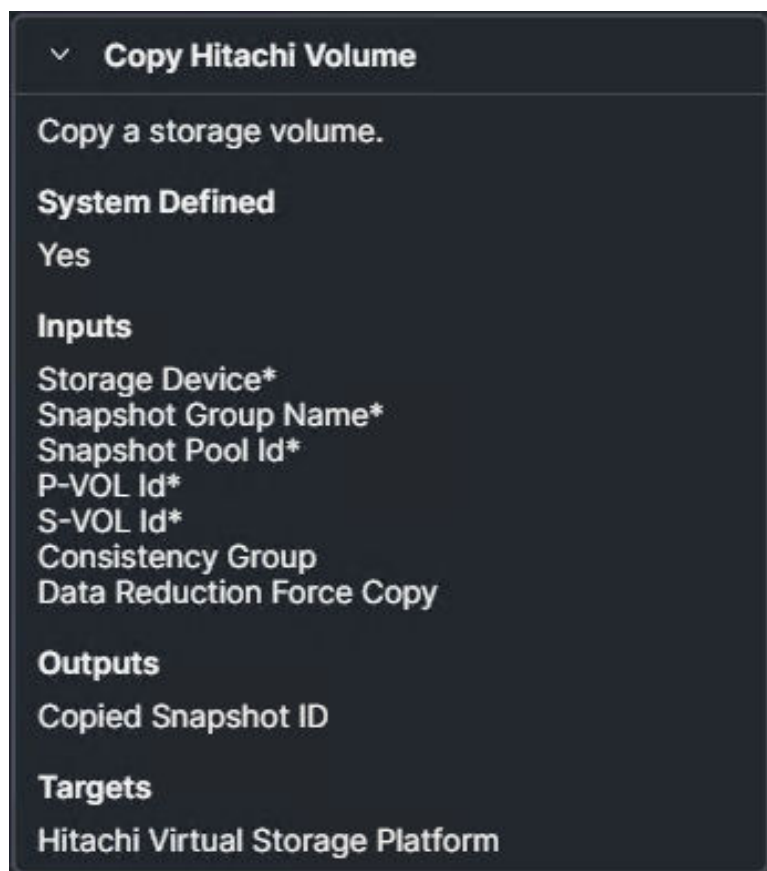
Success Sep 26, 2023 03:00:28 PM

Chapter 5: Clones

Copy Hitachi Volume

Copy Hitachi Volume is used to use in-system replication in the form of snap clones. Snap clones enable 1:1 identical copies of data within the target VSP storage system, unlike TI snapshots which are point in time differential copies which share a common P-VOL. Before creating a snap clone, administrators must confirm P-VOL, S-VOL, and pools are in place.

The following figure shows the Cisco Intersight task Copy Hitachi Volume and its input parameters.



To use Copy Hitachi Volume, follow these steps:

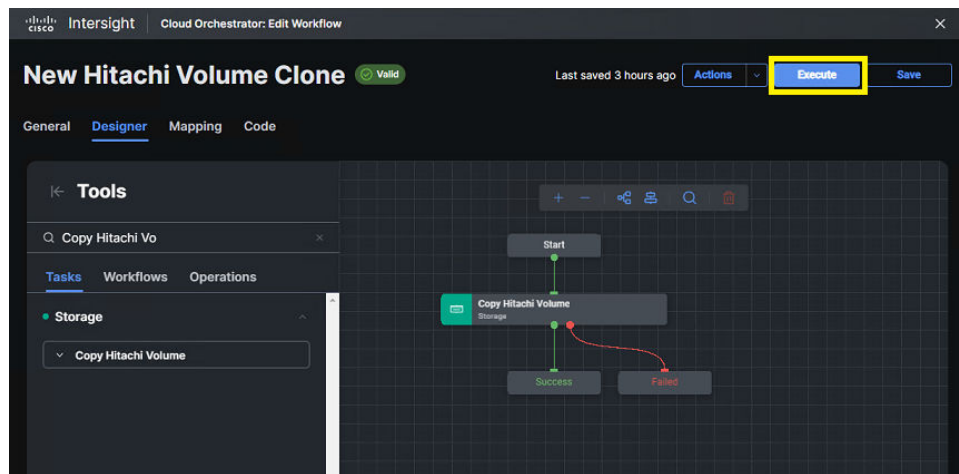
Note: S-VOLs do not require host mappings to create a Snap Clone.

Note: Volumes that are already used as S-VOLs cannot be reused for new Snap Clone operations.

Note: Volumes that are part of migration plans cannot be used for S-VOLs, administrators can use ICO function Remove Hitachi Pair for Volume Migration to remove volumes from migration plans.

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, **Primary Volume ID**, **Secondary Volume ID**, **Snapshot Pool ID**, and **Snapshot Group Name**. Click **Execute**.

Note: If the P-VOL has capacity saving function enabled, administrators must select the **Data Reduction Force Copy Attribute** to create TI pair.

Note: Consistency Group can be used to group a set of volumes together to be recovered together.

Note: LDEVs IDs are decimal.

Cloud Orchestrator: Edit Workflow

Execute Workflow: NewHitachiVolumeClone

General

Organization *
default

Workflow Instance Name
New Hitachi Volume Clone

Workflow Inputs

Storage Device *
Selected Storage Device DC2-VSP-E1090

Snapshot Group Name *
App_Clone

Snapshot Pool Id *
2

P-VOL Id *
Selected P-VOL Id 1

S-VOL Id *
Selected S-VOL Id 3

Consistency Group

Data Reduction Force Copy

Cancel Execute

If input parameters are correct, ICO displays **Success** after the task is complete

Intersight | Cloud Orchestrator: Edit Workflow

New Hitachi Volume Clone Valid

Last saved 2 days ago Execute

General Designer Mapping Code History

Clone Execution

Execution
New Hitachi Volume C... - Jul 14, 2023 8:55 PM

Organization
default

Status
Success

Workflow Inputs

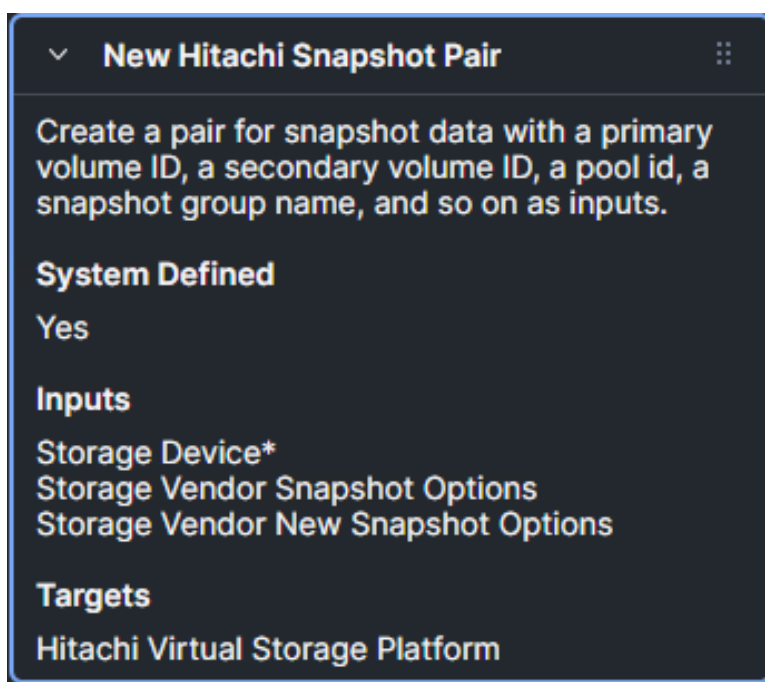
- Start Jul 14, 2023 08:55:23 PM
- Copy Hitachi Volume Jul 14, 2023 08:55:28 PM
- Logs
- Inputs

Chapter 6: Snapshots

New Hitachi Snapshot Pair

New Hitachi Snapshot Pair enables in-system replication in the form of Thin-Image (TI) snapshots on the VSP system. TI snapshots are point-in-time differential copies that can be used for quick backups or test-dev copies of data that can be distributed among organizations. Before using New Hitachi Snapshot Pair, administrators must verify that S-VOL is available as the same capacity as the P-VOL, and an HDP, HDT, or Thin Image pool is available to store the differential copies.

The following figure shows the Intersight task New Hitachi Snapshot Pair and its input parameters.



To use New Hitachi Snapshot Pair, follow these steps:



Note: S-VOLs do not require host mappings to create a TI pair.



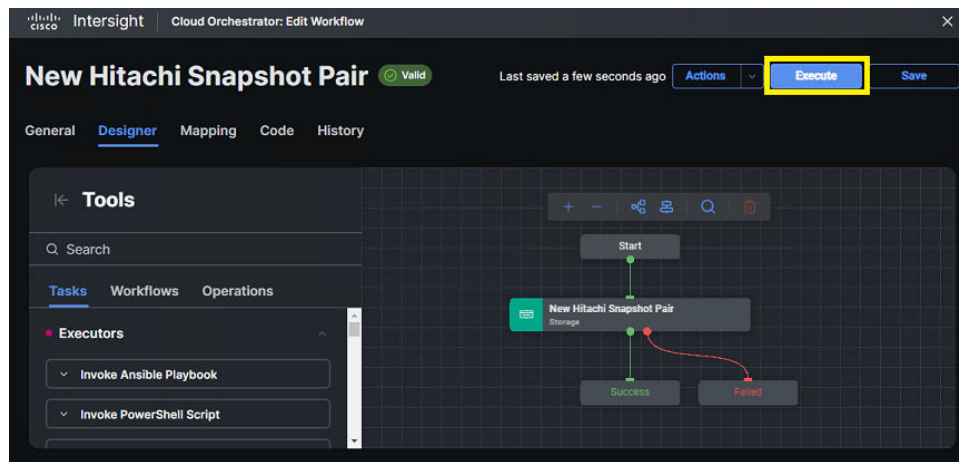
Note: Volumes that are already used as S-VOLs cannot be reused for new TI pairs.

Note: Volumes that are part of migration plans cannot be used for S-VOLs, administrators can use ICO function Remove Hitachi Pair for Volume Migration to remove volumes from migration plans.

Note: S-VOLs cannot have capacity saving functionality enabled.

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, **Primary Volume ID**, **Secondary Volume ID**, **Snapshot Pool ID**, and **Snapshot Group Name**. Click **Execute**.

Note: If a P-VOL has capacity saving function enabled, administrators must select the **Data Reduction Force Copy Attribute** to create a TI pair.

Note: Auto Split capability can be used to take on-demand snapshots using single workflow, alternately if this is not checked, administrators must use **New Hitachi Snapshot Data** to split the pair and create a point-in-time snapshot.

Note: Consistency Group can be used to group a set of volumes together and perform parallel execution of operations.

Note: LDEVs IDs are decimal.

Execute Workflow: NewHitachiSnapshot

Organization * default Workflow Instance Name New Hitachi Snapshot Pair

Workflow Inputs

Storage Device *
Selected Storage Device DC2-VSP-E1090

Primary Volume Id *
Selected Primary Volume Id 1

Secondary Volume Id *
Selected Secondary Volume Id 3

Snapshot Pool Id *
Selected Snapshot Pool Id 2

Snapshot Group Name *
App_Vol_Snap_Group

Consistency Group

Auto Split

Data Reduction Force Copy

Cancel **Execute**

If input parameters are correct, ICO displays **Success** after the task is complete.

Remove Hitachi Snapshot Pair

The Remove Hitachi Snapshot Pair cleans up the P-VOL and S-VOL relationship for a defined TI pair. This is the inverse operation for New Hitachi Snapshot Pair.

The following figure shows the Cisco Intersight task Remove Hitachi Snapshot Pair and its input parameters.

Remove Hitachi Snapshot Pair

Delete the specified pair for snapshot data with a primary volume ID and a secondary volume ID.

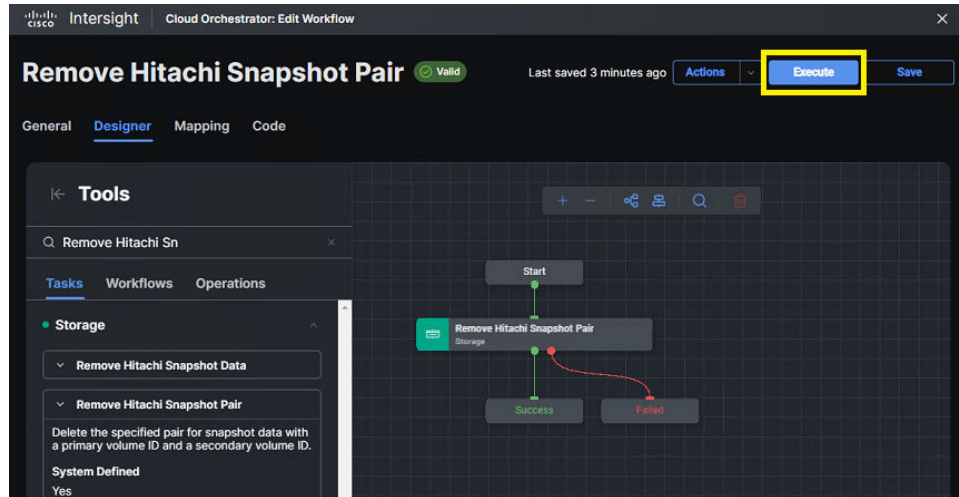
System Defined
Yes

Inputs
Storage Device*
Storage Vendor Snapshot Options

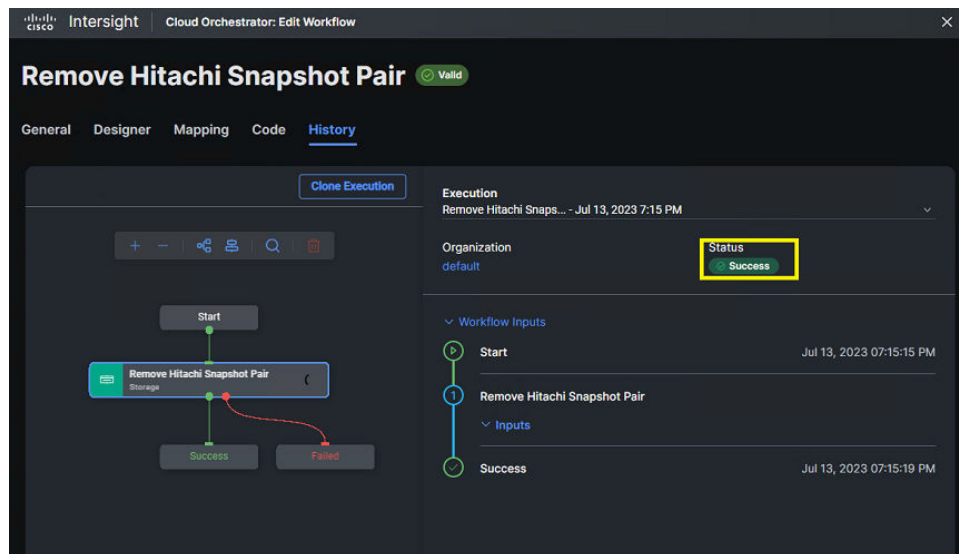
Targets
Hitachi Virtual Storage Platform

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.

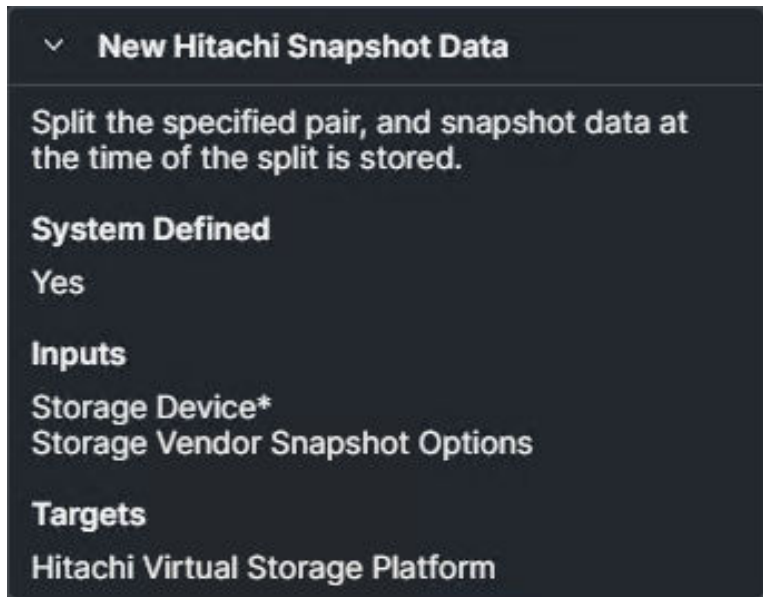


4. From the **Execute Workflow** wizard, select the target VSP storage system, **Primary Volume ID**, **Secondary Volume ID**, **Snapshot Pool ID**, and **Snapshot Group Name**. Click **Execute**.
If input parameters are correct, ICO displays **Success** after the task is complete.



New Hitachi Snapshot Data

New Hitachi Snapshot Data operation splits the TI pair and provides a point in time copy of data that resides on the P-VOL. New Hitachi Snapshot data is used after New Hitachi Snapshot Pair has been executed from ICO if the auto split capability was not defined. The following figure shows the Cisco Intersight task New Hitachi Snapshot Data and its input parameters.

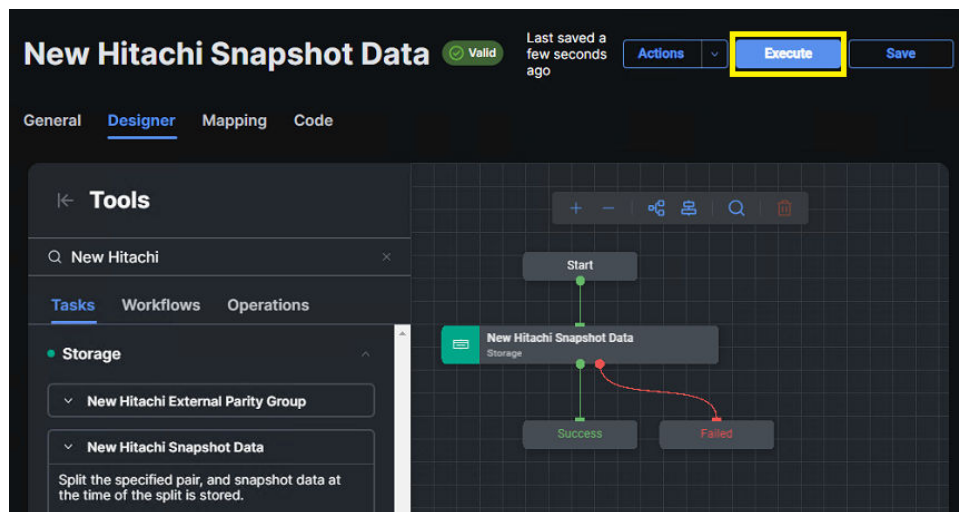


The New Hitachi Snapshot Data task within ICO is used to split a TI pair to provide a point in time copy of data.

To use New Hitachi Snapshot Data from ICO, follow these steps:

Procedure

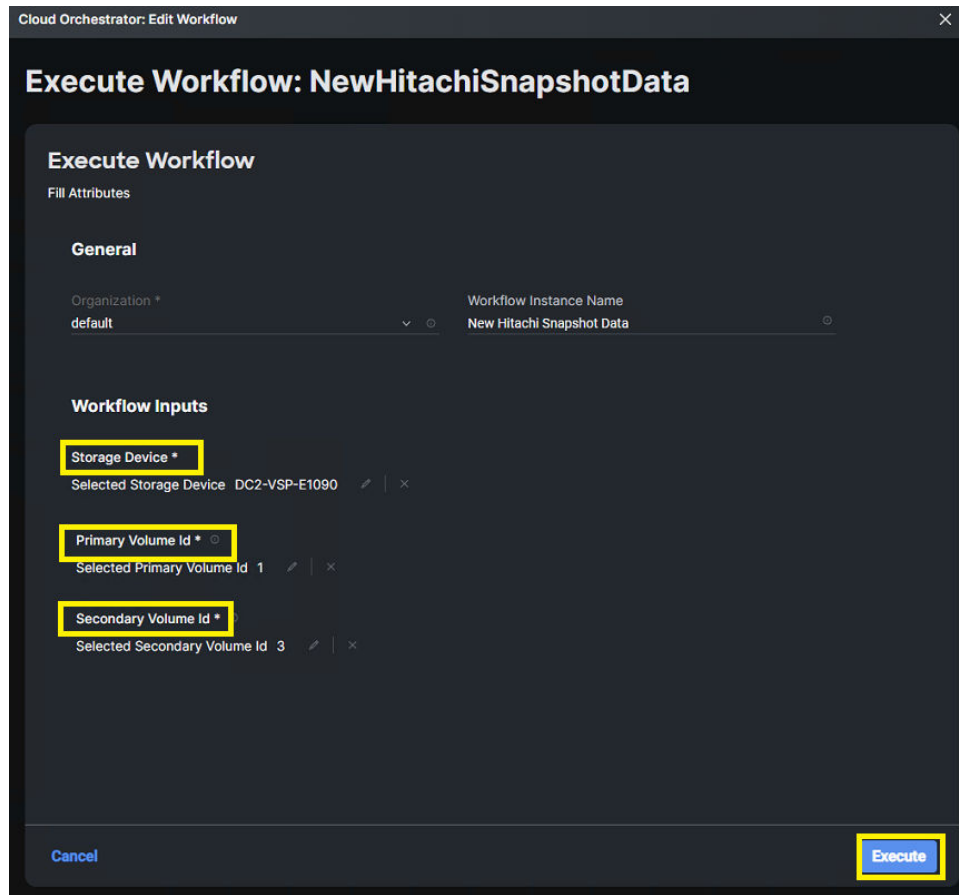
1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



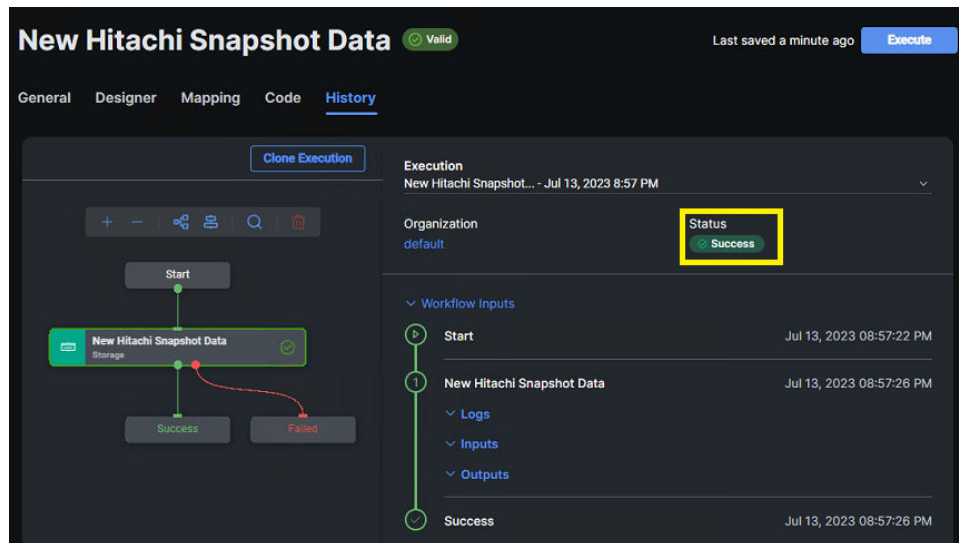
4. From the **Execute Workflow** wizard, select the target VSP storage system, and **P-VOL** and **S-VOL** IDs. Click **Execute**.



Note: LDEV IDs are in decimal format.



If input parameters are correct, ICO displays **Success** after the task is complete.



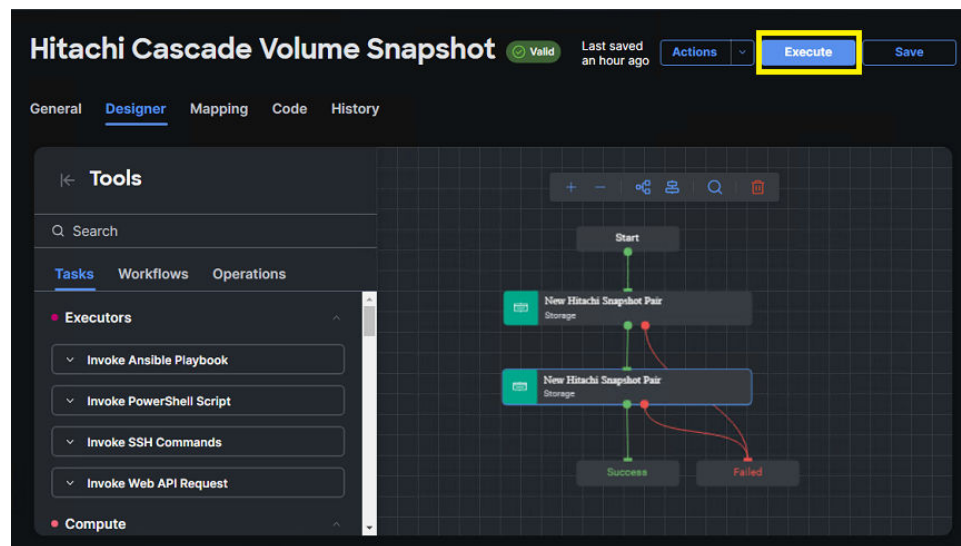
Cascade Snapshots

ICO task New Hitachi Snapshot Pair can be created and executed in sequence to provide cascaded snapshots also known as Snap on Snap. Workflows can be created, so that a single primary snapshot taken from a production volume, enables multiple (identical) secondary snapshots to be created at a specific point in time, allowing identical data distribution among users, for development or analysis purposes.

To use New Hitachi Snapshot Pair from ICO to create cascade snapshots, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#). For cascade snapshots, ICO task **New Hitachi Snapshot Pair** must be created in sequence, for as many leg volumes required.
2. From **Intersight Cloud Orchestrator**, select the created workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the Execute Workflow wizard, select the target VSP storage system, and **P-VOL** and **S-VOL IDs**, platform type, **Snapshot Pool ID**, and **Snapshot Group Name** for both legs of the snapshot. Select the **Auto Split** option to take a point-in-time snapshot from the same workflow. Click **Execute**.

Note: LDEV IDs are in decimal format.

Note: Auto Split allows point-in-time copy after the pair is created.

Note: **Data Reduction Force Copy** allows pair creation when capacity saving feature is enabled on the VSP for virtual volumes.

Note: Consistency Group creation allows storage operations to be executed concurrently on grouped pairs.

Cloud Orchestrator

Execute Workflow: HitachiCascadeVolumeSnapshot

Workflow Inputs

Storage Device *
 Selected Storage Device VSP E series

Storage Vendor Snapshot Options

Platform Type
 Pure FlashArray Hitachi Virtual Storage Platform NetApp Active IQ Unified Manager None

Primary Volume Id *
 Selected Primary Volume Id 79

Secondary Volume Id *
 Selected Secondary Volume Id 76

Storage Vendor New Snapshot Options

Platform Type
 Pure FlashArray Hitachi Virtual Storage Platform NetApp Active IQ Unified Manager None

Snapshot Pool Id *
 Selected Snapshot Pool Id 1

Snapshot Group Name *
 Dev_Snap_Group

Consistency Group

Auto Split

Data Reduction Force Copy

5. If input parameters are correct, ICO displays **Success** after the task is complete.

Restore Hitachi Snapshot Data

Restore Hitachi Snapshot Data puts the TI pair back into PAIR status and overwrites P-VOL data with that of the S-VOL as a disaster recovery option.

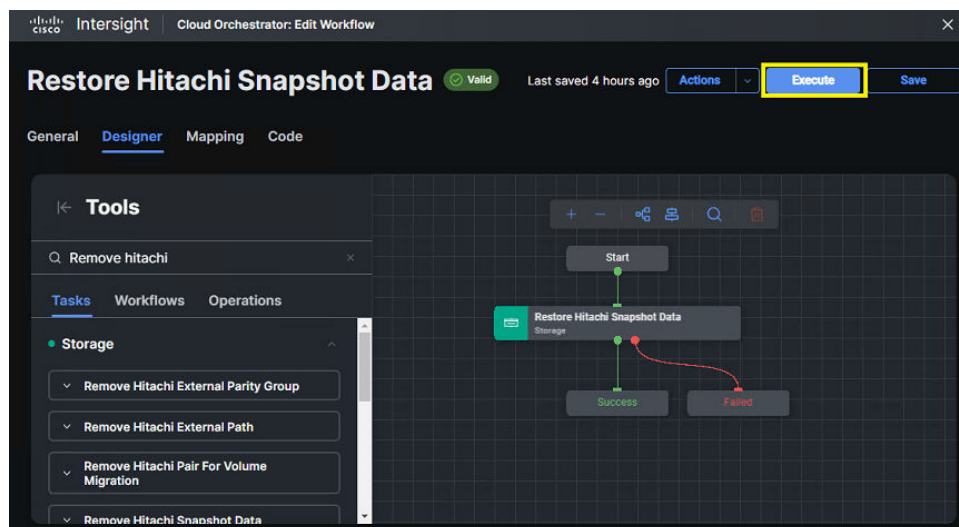
The following figure shows the Cisco Intersight task Restore Hitachi Snapshot Data and its input parameters.



To use Restore Snapshot Data from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and **P-VOL** and **S-VOL** IDs. Click **Execute**.



Note: LDEV IDs are in decimal format.

Cloud Orchestrator: Edit Workflow

Execute Workflow: RestoreHitachiSnapshotData

Execute Workflow

Fill Attributes

General

Organization *
default

Workflow Instance Name
Restore Hitachi Snapshot Data

Workflow Inputs

Storage Device *
Selected Storage Device DC2-VSP-E1090

Primary Volume Id *
Selected Primary Volume Id 1

Secondary Volume Id *
Selected Secondary Volume Id 3

Cancel Execute

If input parameters are correct, ICO displays **Success** after the task is complete.

Intersight Cloud Orchestrator: Edit Workflow

Restore Hitachi Snapshot Data Valid

Last saved 4 hours ago Execute

General Designer Mapping Code History

Clone Execution

Execution
Restore Hitachi Snap... - Jul 13, 2023 11:18 PM

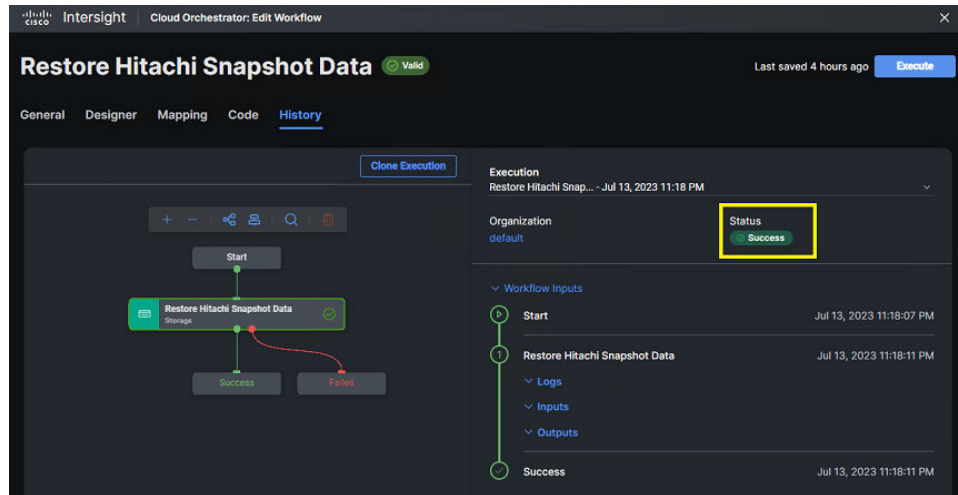
Organization
default **Status**
Success

Workflow Inputs

- Start Jul 13, 2023 11:18:07 PM
- Restore Hitachi Snapshot Data Jul 13, 2023 11:18:11 PM
- Logs
- Inputs
- Outputs
- Success Jul 13, 2023 11:18:11 PM

Remove Hitachi Snapshot Data

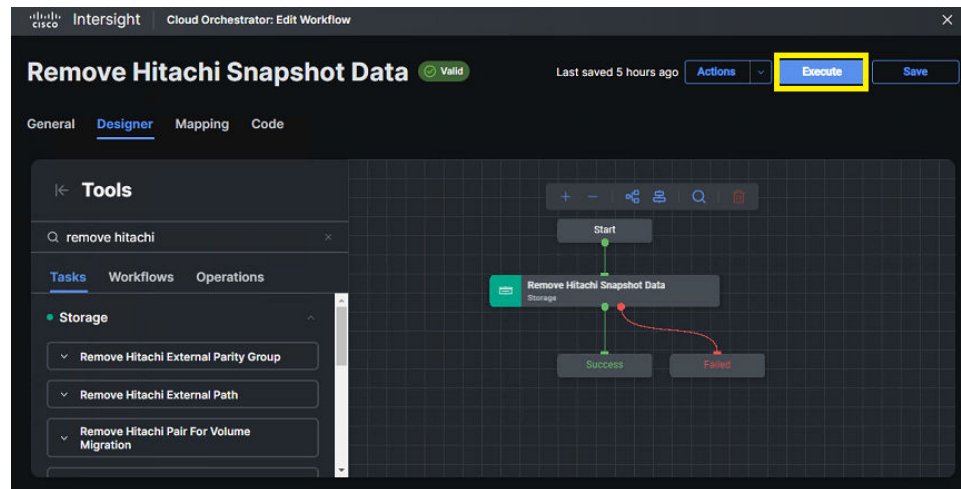
Remove Hitachi Snapshot Data task within ICO enables administrators to wipe snapshot data from S-VOL used within TI pair. The following figure shows the Cisco Intersight task Remove Hitachi Snapshot Pair and its input parameters.



To use Remove Hitachi Snapshot Data from ICO, follow these steps:

Procedure

1. Verify that the workflow has been created, see [Workflow creation \(on page 8\)](#).
2. From **Intersight Cloud Orchestrator**, select the workflow.
3. On the **Edit Workflow** window, click **Execute**.



4. From the **Execute Workflow** wizard, select the target VSP storage system, and **P-VOL** and **S-VOL** IDs. Click **Execute**.



Note: LDEV IDs are in decimal format.

Cloud Orchestrator: Edit Workflow

Execute Workflow: RemoveHitachiSnapshotData

Execute Workflow

Fill Attributes

General

Organization *
default

Workflow Instance Name
Remove Hitachi Snapshot Data

Workflow Inputs

Storage Device *
Selected Storage Device DC2-VSP-E1090

Primary Volume Id *
Selected Primary Volume Id 1

Secondary Volume Id *
Selected Secondary Volume Id 3

Cancel Execute

If input parameters are correct, ICO displays **Success** after the task is complete.

Intersight Cloud Orchestrator: Edit Workflow

Remove Hitachi Snapshot Data Valid

Last saved 5 hours ago Execute

General Designer Mapping Code History

Clone Execution

Execution
Remove Hitachi Snaps... - Jul 14, 2023 12:08 AM

Organization
default

Status
Success

Workflow Inputs

- Start Jul 14, 2023 12:08:50 AM
- Remove Hitachi Snapshot Data Jul 14, 2023 12:08:53 AM

Logs

- Object: [4]
- ConfigResCtc: [1]

Chapter 7: Best practices

System-defined workflows

Before following the best practices, verify that [Prerequisites \(on page 0 \)](#) is complete. This section of this document covers the predefined workflows from Cisco Intersight that are applicable to the Hitachi VSP. System-defined workflows provide an alternative to manually creating workflows for certain functions. All input parameters and successful execution of workflows can be validated by referring to Hitachi Storage Navigator, or using Hitachi RAIDCOM Command Control Interface (CCI).

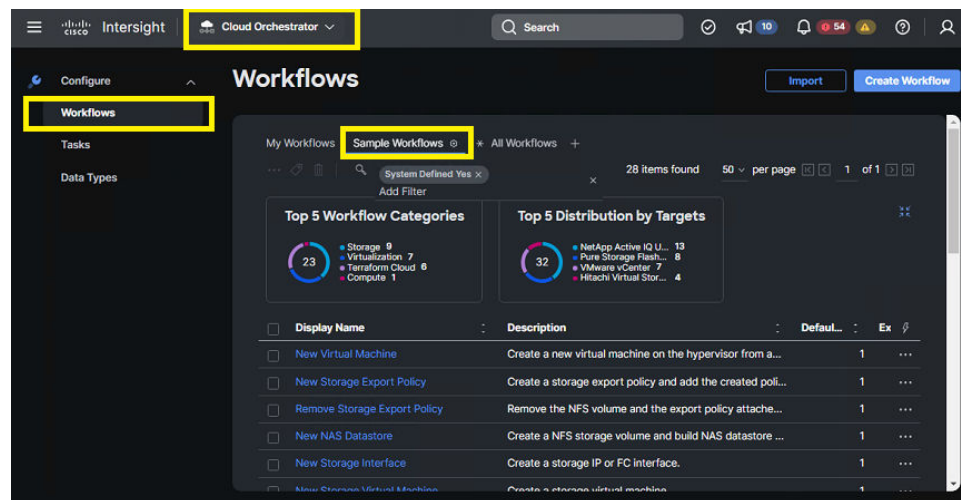
New Storage Host

In the case of the Hitachi VSP, New Storage Host system-defined workflow will allow administrators to create a Host Group without adding WWNs. To successfully add WWNs to the host group users must use the user defined task [New Storage Host and Connect Initiators to Storage Host \(Host Group\) \(on page 35\)](#) or the system-defined workflow [Update Storage Host \(on page 87\)](#).

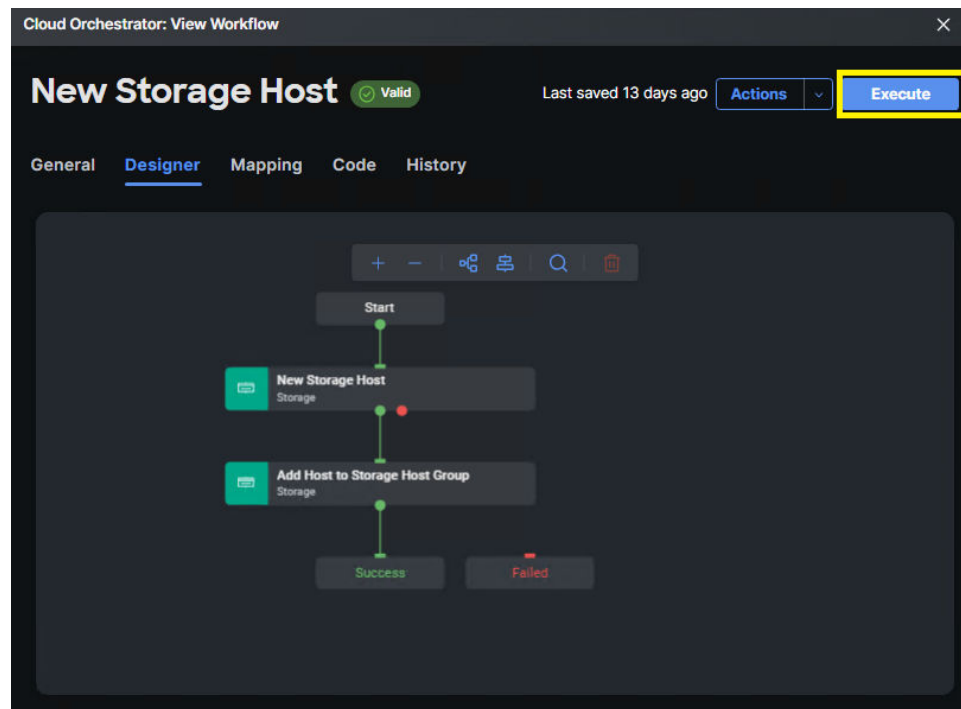
To use New Storage Host from system-defined workflow, follow these steps:

Procedure

1. Select **Cloud Orchestrator** from the system drop-down menu, click **Workflows**, and select **Sample Workflows** tab.



2. From the predefined list, select **New Storage Host**. Click **Execute**.



3. From the **Workflow Input** wizard, select **Storage Device**. Define **Host (Host Group name)**, **Port ID**, **Host Group Number**. For VSI deployments, select **Host Mode VMware Extension**, and **Host Mode Options 54, 63, and 114**. **Multiple Host Mode Options** can be defined by selecting the + icon. Click **Execute**.

Cloud Orchestrator: View Workflow

Execute Workflow: NewStorageHost

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

Host *
VSI_x210c_M6_10_Fab_A

Hitachi Host Group Parameter

Port Id *
CL1-A

Host Group Number *
239

WWNs

IQNs

Hitachi Host Group Options

iSCSI Name

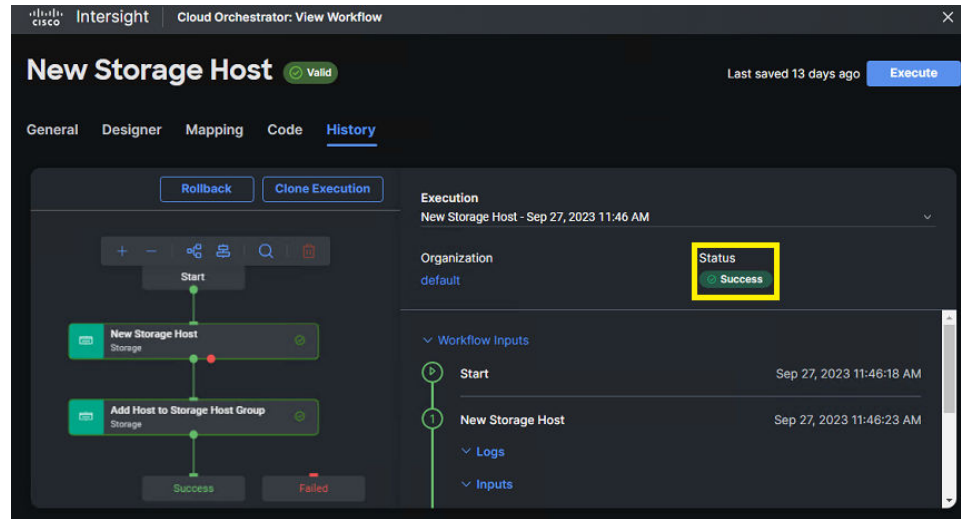
Host Mode
VMware Extension

Host Mode Options	54	
Host Mode Options	63	
Host Mode Options	114	

Quick Creating

Cancel **Execute**

- If input parameters are correct, ICO displays **Success** after the task is complete.



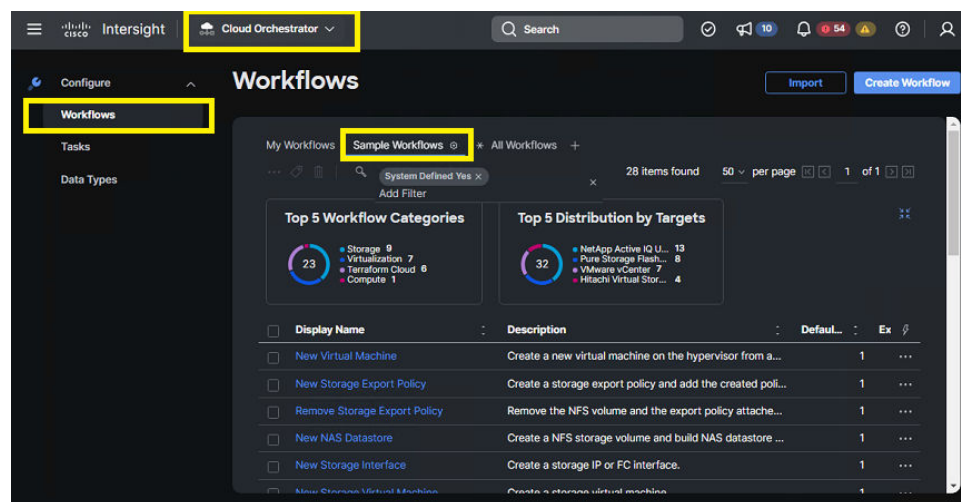
New VMFS Datastore

ICO enables administrators to allocate a VMFS datastore from system-defined workflow New VMFS Datastore, this single workflow is a combination of tasks that carves the virtual volume from an existing pool, adds LUN paths to a single host in a cluster with an associated LUN ID, and then onboards the datastore within VMware vCenter to the selected host. After the initial datastore has been mounted, administrators can use the ICO workflow output logs to identify the volume backing the datastore, after identified administrators must use ICO task [New Storage LUN ID \(on page 46\)](#) to allocate to other hosts within the desired cluster and any other multipaths required. A storage rescan from the ESXi host will be required.

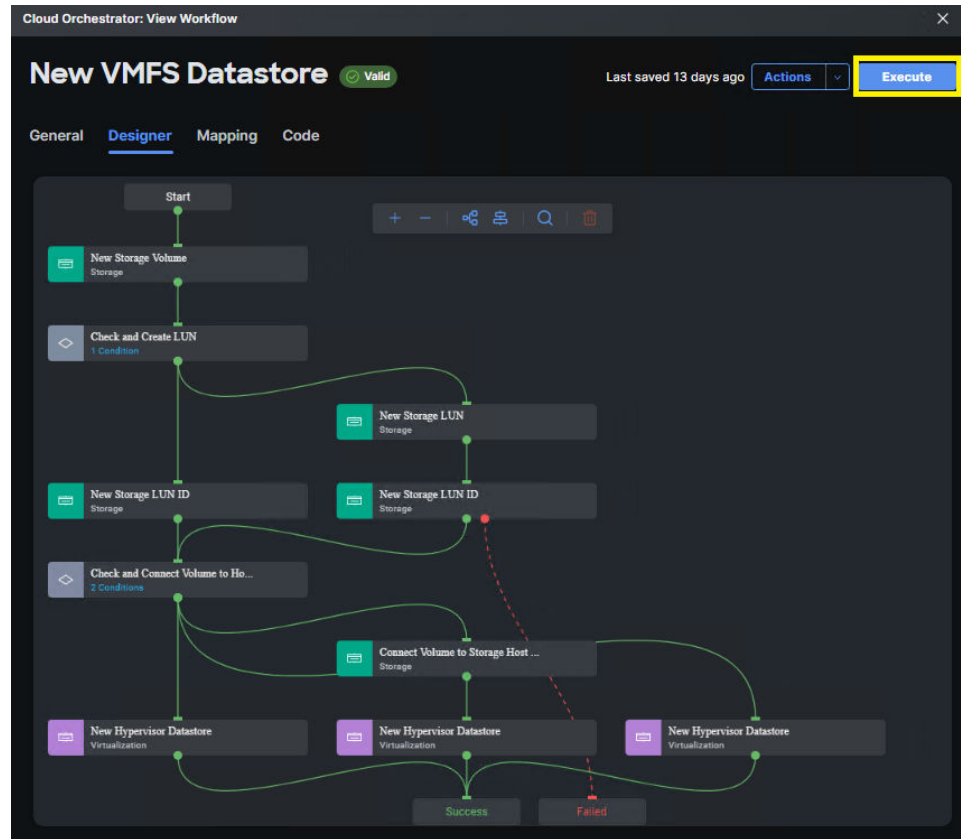
To use New VMFS Datastore from system-defined workflow, follow these steps:

Procedure

- Select **Cloud Orchestrator** from the system drop-down menu, click **Workflows**, and select **Sample Workflows** tab.



- From the predefined list, select **New VMFS Datastore**. Click **Execute**.



- From the **Workflow Input** wizard, select the **Storage Device**, **LUN ID**, **Volume Label**, **Data Reduction Mode**, **Volume Size and Unit**, **Storage Host (Host Group)**, **Port ID**, **Host Group Number**, **Hypervisor Manager**, **Data Center**, **Cluster**, **Host**, **Datastore Name**, and **Datastore Type**. Click **Execute**.

Cloud Orchestrator: View Workflow

Execute Workflow: NewVmfsDatastore

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

LUN number
600

Hitachi volume option.

Pool Id
1

Parity Group

External Parity Group

Volume Label
VMFS_DS_Prod_0

Data Reduction Mode
disabled

Volume Capacity

Size *
150

Unit *
GiB

Storage Host
Selected Storage Host VSI_x210c_M6_00_Fab_A

Hitachi Host Group Parameter

Port Id *
Selected Port Id CL5-B

Host Group Number *
Selected Host Group Number 9

Hypervisor Manager *
Selected Hypervisor Manager vc-67.vsi.hvlab.local.

Datacenter *
Selected Datacenter VSI_SC

Cluster
Selected Cluster VSI_Cluster_UCSx

Host
Selected Host esxi-6.vsi.hvlab.local

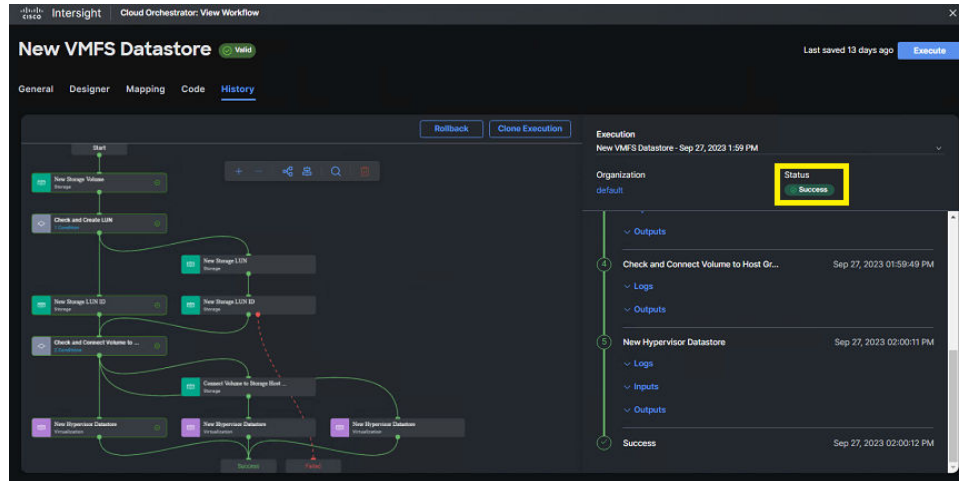
Datastore Name *
VMFS_DS_Prod_0

Datastore Type *
VMFS-6

Cancel Execute

Result

If input parameters are correct, ICO displays Success after the task is complete.



After the task is complete, expanding on New Storage Volume Task, and Outputs will show the created LDEV ID in decimal. If multipathing or any other pathing to additional hosts is required, administrators are required to use [New Storage LUN ID](#) (on page 46) to allocated volume. A manual HBA rescan from the host is required to discover VMFS datastore after allocation is complete.

Execution
New VMFS Datastore - Sep 27, 2023 1:59 PM

Organization: default Status: **Success**

1 New Storage Volume Sep 27, 2023 01:59:45 PM

- Logs
- Inputs
- Outputs**
 - ConfigResults: { 1 }
 - Object: { 4 }
 - ConfigResCtx: { 1 }
 - EntityData: { 1 }
 - task: workflow.ApiTask
 - Message: Volume created successfully.
 - State: Ok
 - Type: Config
 - Volume Capacity: { 2 }
 - Size: 150
 - Unit: G
 - Volume: 75**

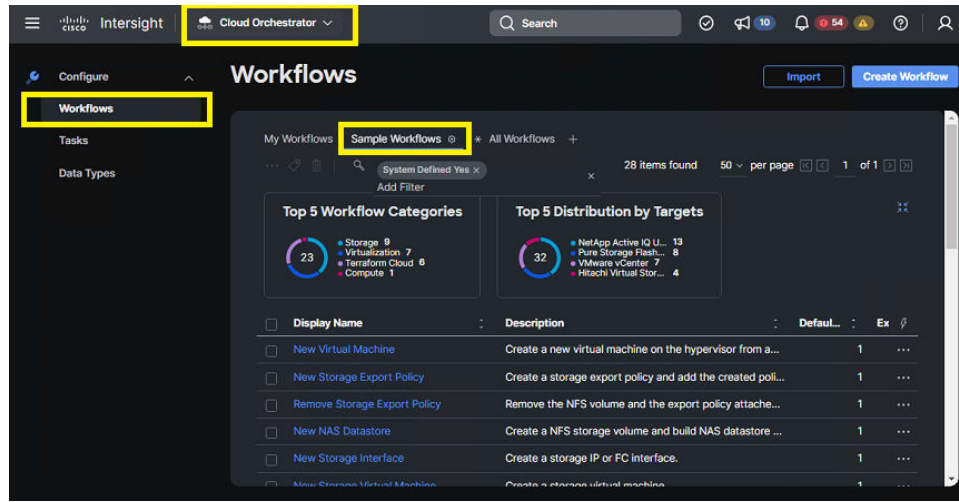
Update Storage Host

The system-defined workflow Update Storage Host allows administrators to add or remove WWNs from predefined storage hosts. Before using Update Storage Host verify that a host group has already been created from the user-defined New Storage Host task, or New Storage Host from the system-defined workflow.

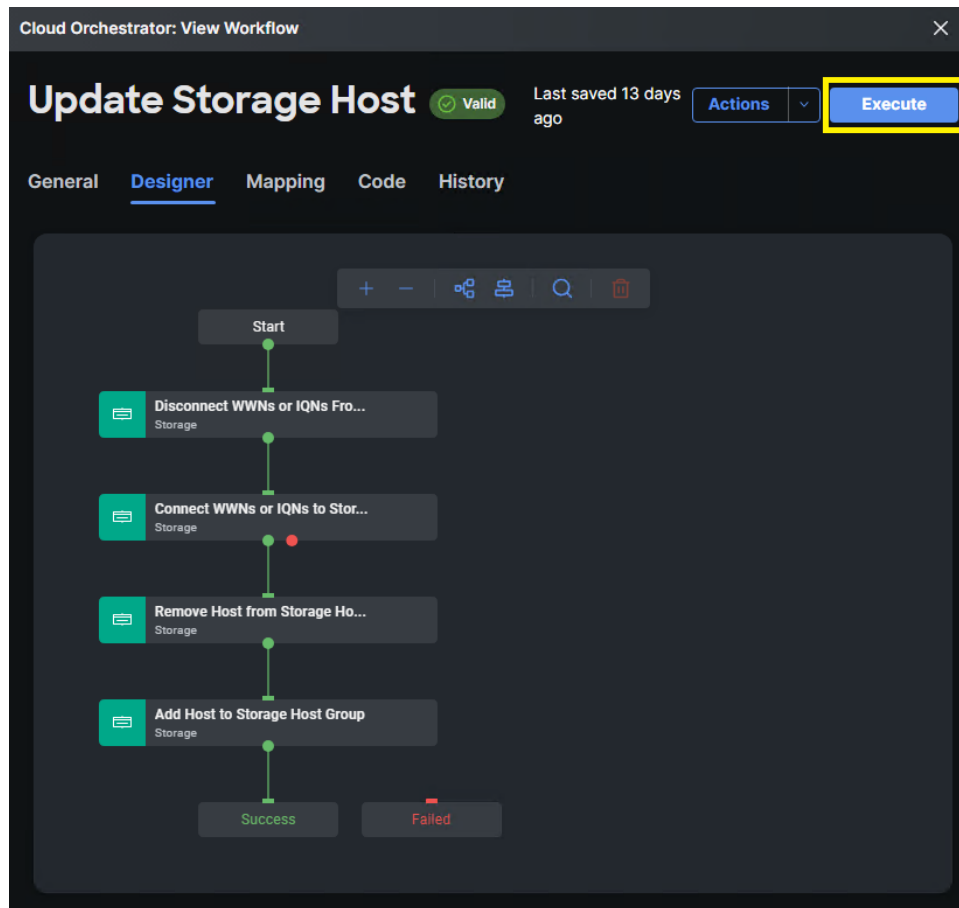
To use Update Storage Host from the system-defined workflow, follow these steps:

Procedure

1. Select **Cloud Orchestrator** from the system drop-down menu, click **Workflows**, and select **Sample Workflowstab**.



2. From the predefined list, select **Update Storage Host**. Click **Execute**.



3. From the **Workflow Input** wizard, select the **Storage Device**. select **Host (Host Group name)**, **Port ID**, **Host Group Number**. Depending on intent of the operation, define WWNs in **Remove WWNs** or **Add WWNs** parameter. Multiple WWNs can be defined by selecting the **+** icon. Click **Execute**.

Cloud Orchestrator: View Workflow

Execute Workflow: UpdateStorageHost

Storage Device *
Selected Storage Device VSP E series

Remove WWNs
20000025B5860A13

Remove IQNs

Host *
Selected Host VSI_x210c_M6_10_Fab_A

Hitachi Host Group Parameter

Port Id *
Selected Port Id CL1-A

Host Group Number *
Selected Host Group Number 239

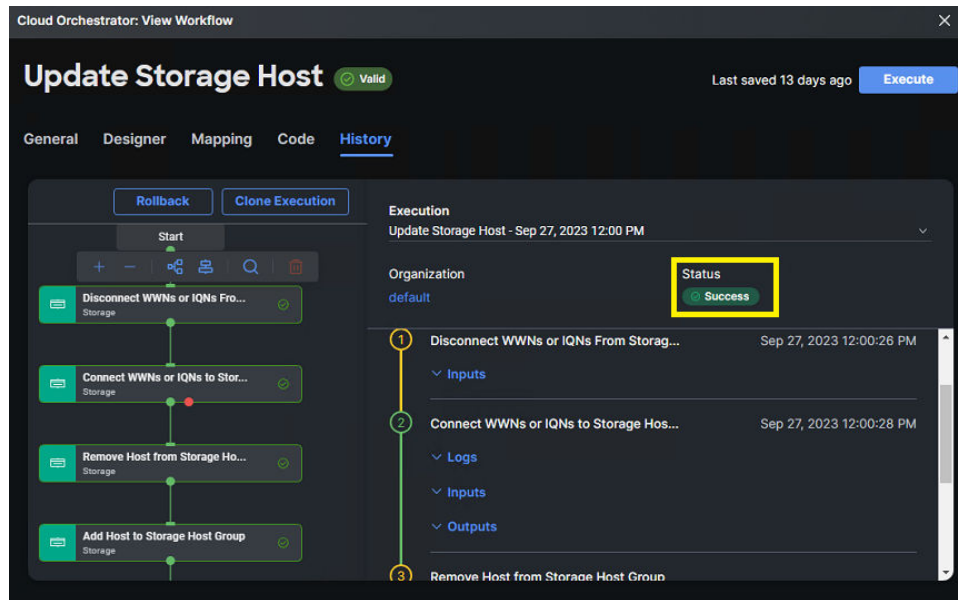
Add WWNs
20000025B5860A13

Add IQNs.

Cancel Execute

Result

If input parameters are correct, ICO displays Success after the task is complete.



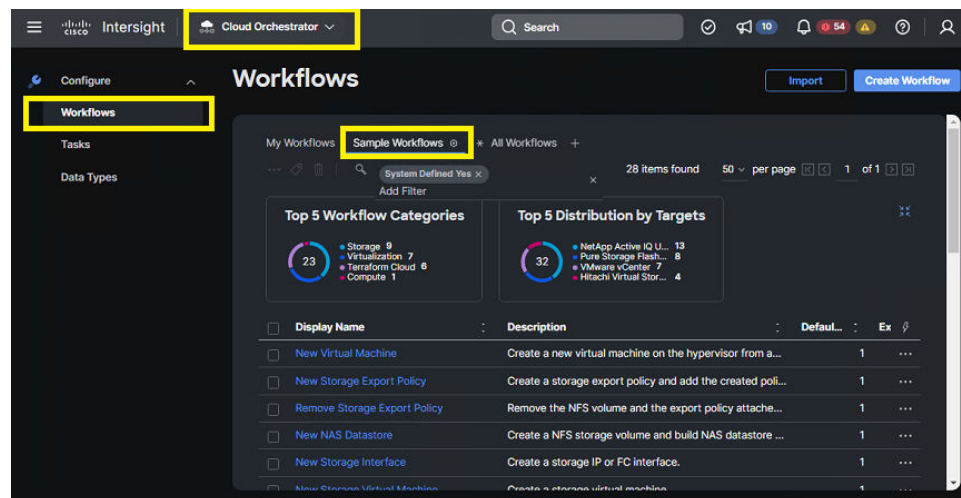
Update VMFS Datastore

Update VMFS Datastore enables administrators to expand back-end volume capacity along with the VMFS datastore capacity from a single workflow. Before using the Update VMFS Datastore, confirm target resources ahead of expansion.

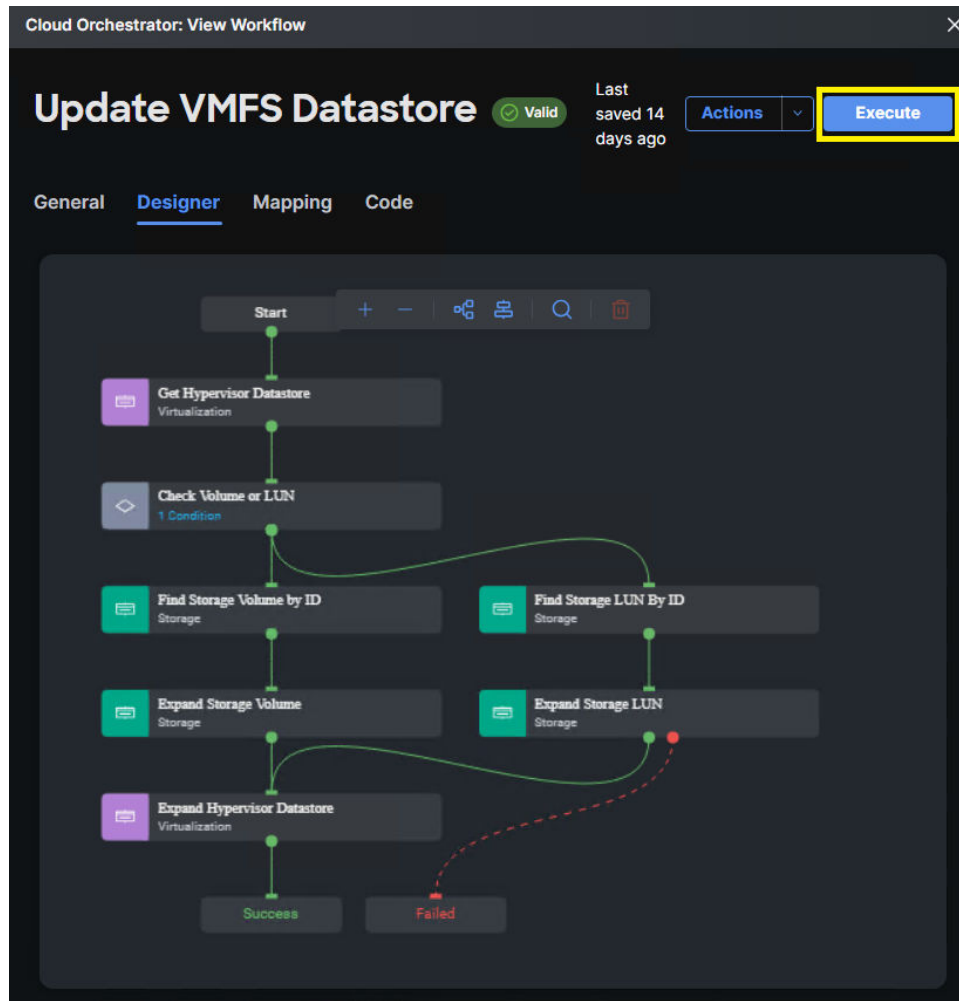
To use Update VMFS Datastore from the system-defined workflow, follow these steps:

Procedure

1. Select **Cloud Orchestrator** from the system drop-down menu, click **Workflows**, and select **Sample Workflows** tab.



2. From the predefined list, select **Remove Storage Host**. Click **Execute**.



3. From the **Workflow Input** wizard, select the **Hypervisor Manager, Datacenter, Cluster, Host, Datastore, Storage Device**, select Hitachi Virtual Storage Platform 360, and define expansion size along with unit. Click **Execute**.

Cloud Orchestrator: View Workflow

Execute Workflow: UpdateVmfsDatastore

Hypervisor Manager *
Selected Hypervisor Manager: vc-67.vsi.hvlab.local

Datacenter *
Selected Datacenter: VSL_SC

Cluster
Selected Cluster: VSL_Cluster_UCSx

Host
Selected Host: esxi-6.vsi.hvlab.local

Datastore *
Selected Datastore: VMFS_DS_Prod_0

Storage Device *
Selected Storage Device: VSP E series

Storage Vendor Expand Volume Capacity

Platform Type

Pure FlashArray
 Hitachi Virtual Storage Platform
 NetApp Active IQ Unified Manager
 None

Additional Volume Capacity

Size *
100

Unit *
GiB

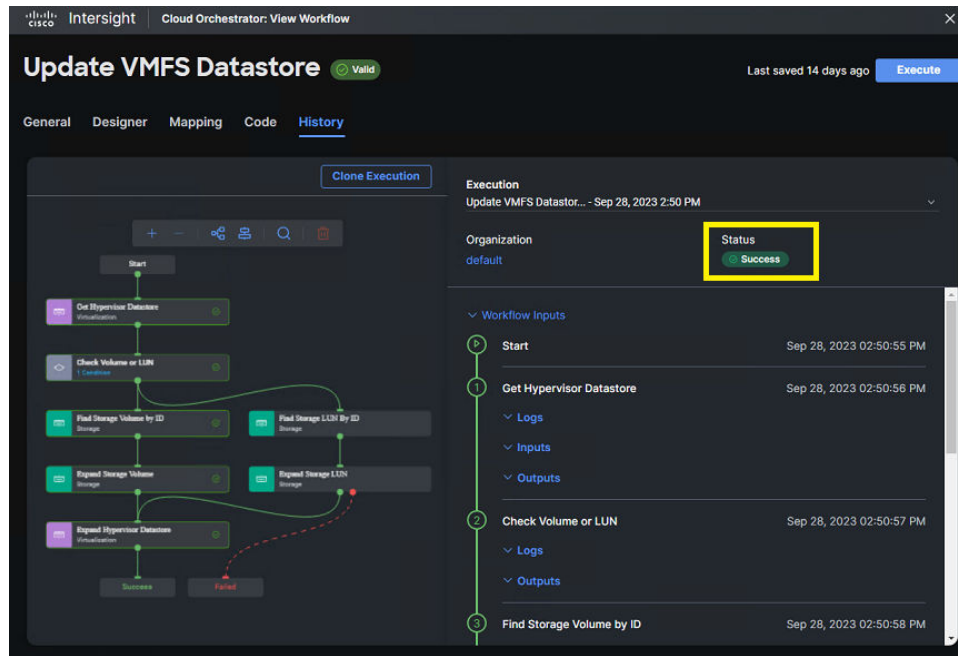
Cancel Execute



Note: If datastore is allocated to multiple hosts within a cluster, this will expand the VMFS datastore for all associated hypervisors.

Result

If input parameters are correct, ICO displays Success after the task is complete.



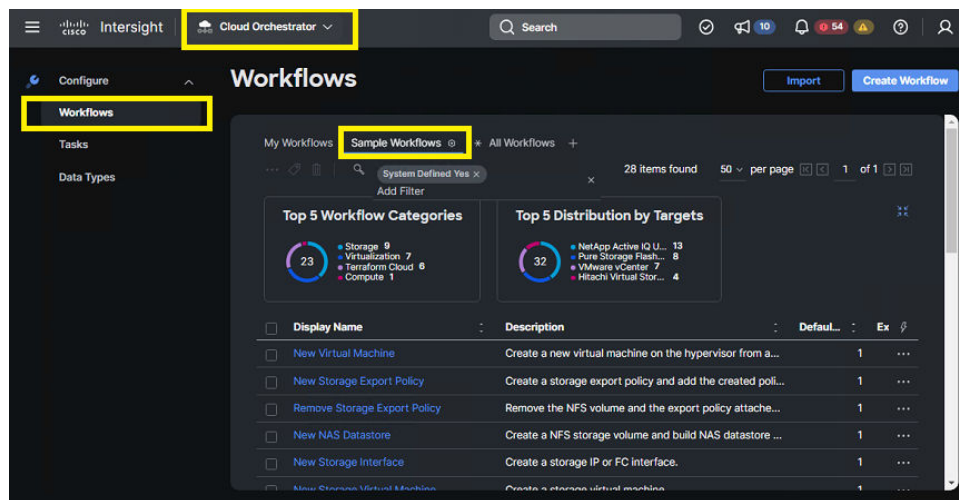
Remove Storage Host

Remove Storage Host system-defined workflow provides another method of deleting a host group on the Hitachi Virtual Storage Platform. This workflow will remove the host group along with any WWNs associated with it. This method can be used instead of the method outlined in [User-defined workflows \(on page 15\)](#).

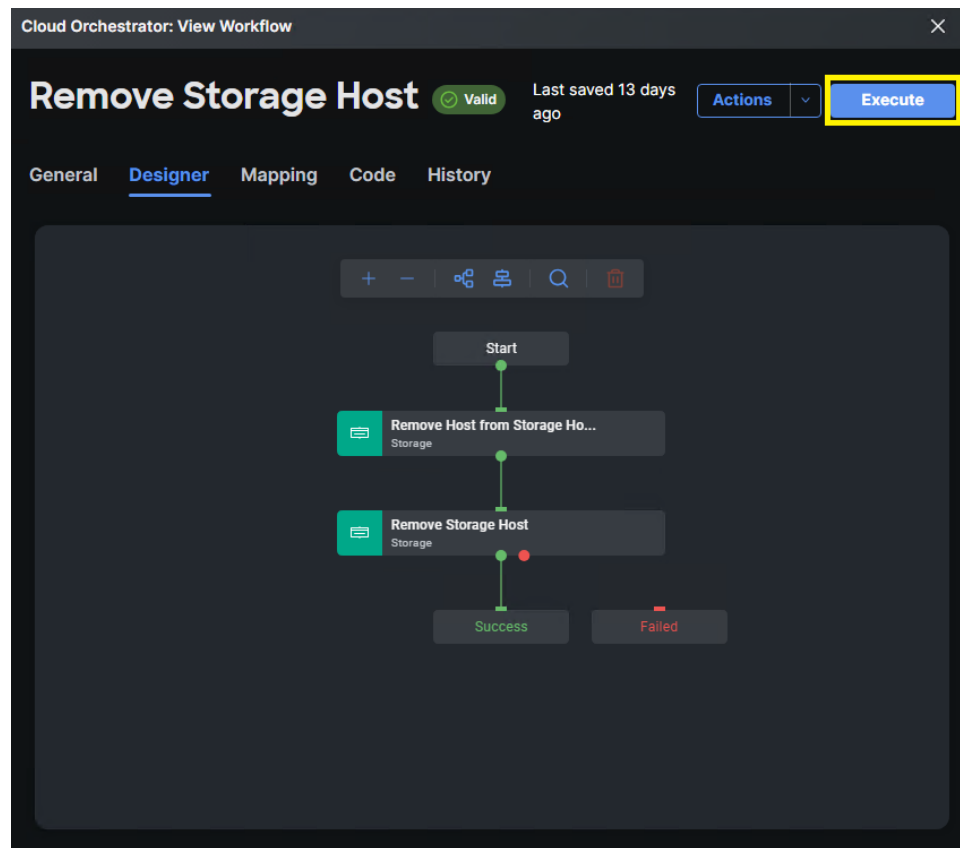
To use Remove Storage Host from the system-defined workflow, follow these steps:

Procedure

1. Select **Cloud Orchestrator** from the system drop-down menu, click **Workflows**, and select **Sample Workflows** tab.



2. From the predefined list, select **Remove Storage Host**. Click **Execute**.



3. From the **Workflow Input** wizard, select the **Storage Device**. Select **Host (Host Group name)**, **Port ID**, **Host Group Number**. Click **Execute**.

Cloud Orchestrator: View Workflow

Execute Workflow: RemoveStorageHost

General

Organization *
default

Workflow Instance Name
Remove Storage Host

Workflow Inputs

Storage Device *
Selected Storage Device VSP E series

Host *
Selected Host VSI_x210c_M6_10_Fab_A

Hitachi Host Group Parameter

Port Id *
Selected Port Id CL1-A

Host Group Number *
Selected Host Group Number 239

Cancel **Execute**

Result

If input parameters are correct, ICO displays Success after the task is complete.

Intersight | Cloud Orchestrator: View Workflow

Remove Storage Host Valid

Last saved 13 days ago **Execute**

General Designer Mapping Code History

Clone Execution

Execution
Remove Storage Host - Sep 27, 2023 12:09 PM

Organization
default

Status
Success

Workflow Inputs

Start Sep 27, 2023 12:09:33 PM

1 Remove Host from Storage Host Group

Inputs

Remove Storage Host Sep 27, 2023 12:09:35 PM

Success Failed

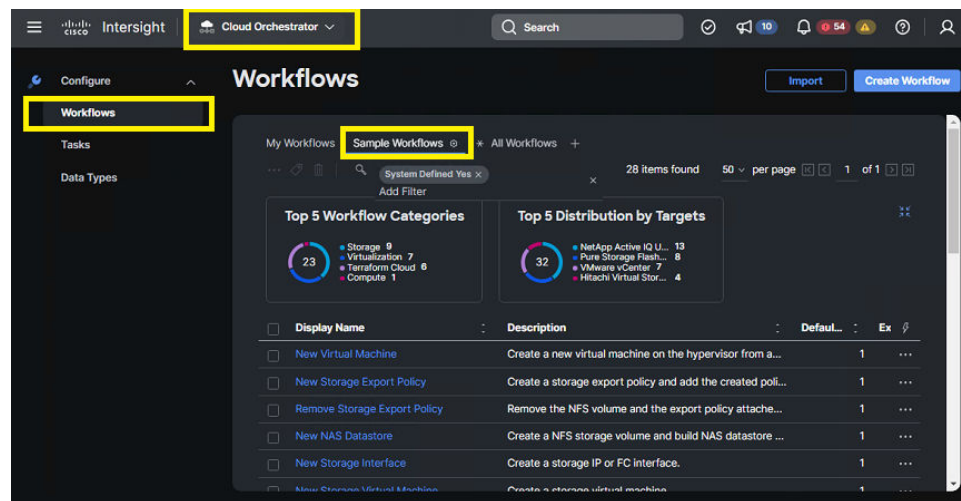
Remove VMFS Datastore

The system-defined workflow Remove VMFS Datastore allows administrators to unmount and delete a VMFS datastore from VMware vCenter and associated ESXi hypervisor and deleting the LUN mapping to the host group and deleting the backend LDEV from the VSP. Before using this system-defined workflow, if multipathing is used and VMFS datastore is mounted on multiple hypervisors administrators must use [Remove Storage LUN ID \(on page 46\)](#) to unallocated additional LUN mappings. After only one path is left to the VMFS datastore, administrators must verify that Host Mode Option (HMO) 91 is enabled on the final host group with its respective mapping.

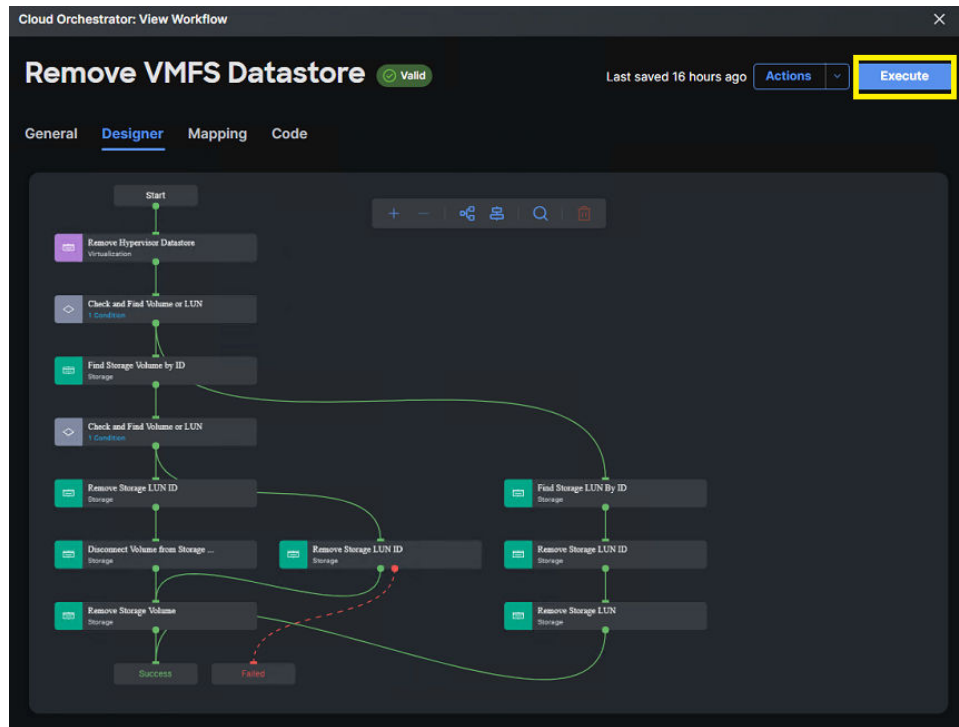
To use Remove VMFS Datastore from the system-defined workflow, follow these steps:

Procedure

1. Select **Cloud Orchestrator** from the system drop-down menu, click **Workflows**, and select **Sample Workflows** tab.



2. From the predefined list, select **Remove VMFS Datastore**. Click **Execute**.



3. From the **Workflow Input** wizard, select the **Hypervisor Manager**, **Datacenter**, **Cluster**, **Host**, **Datastore**, **Storage Device**, **Port ID**, **Host Group Number**, and **Storage Host (Host Group)**. Click **Execute**.

Cloud Orchestrator: View Workflow

Execute Workflow: RemoveVmfsDatastore

Workflow Inputs

Hypervisor Manager *
Selected Hypervisor Manager vc-67.vsi.hvlab.local

Datacenter *
Selected Datacenter VSLSC

Cluster
Selected Cluster VSI_Cluster_UCSx

Host
Selected Host esxi-6.vsi.hvlab.local

Datastore *
Selected Datastore VMFS_DS_Prod_0

Storage Device *
Selected Storage Device VSP E series

Hitachi Host Group Parameter

Port Id *
Selected Port Id CL5-B

Host Group Number *
Selected Host Group Number 9

Storage Host
Selected Storage Host VSI_x210c_M6_00_Fab_A

Cancel **Execute**

Result

If input parameters are correct, ICO displays Success after the task is complete.

The screenshot displays the Cisco Intersight Cloud Orchestrator interface for a workflow titled "Remove VMFS Datastore". The workflow is shown in a flowchart format with steps such as "Remove Hypervisor Datastore", "Check and Find Volume or LUN", "Find Storage Volume by ID", "Remove Storage LUN by ID", "Discover Volume Size Storage", "Remove Storage LUN ID", "Remove Storage LUN", and "Remove Storage Volume". The "History" tab is active, showing a successful execution of the workflow on October 4, 2023, at 10:05 AM. The status "Success" is highlighted with a yellow box. The interface also shows a "Clone Execution" button and a "Last saved 5 days ago" timestamp.

Chapter 8: Conclusion

The capabilities outlined in this document provide administrators, and field engineers with a one-to-one relationship with capabilities normally conducted by native Hitachi Virtual Storage Platform management software. With Cisco Intersight integration with the Hitachi VSP, businesses that leverage Cisco UCS infrastructure within their data centers can use a common management tool to administer their VSP storage systems, thus reducing unnecessary overhead and siloed management approach.

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